Hewlett-Packard Company

TPC Benchmark™ C
Full Disclosure Report
for
HP ProLiant DL585-G1/2.8GHz
using
Microsoft SQL Server 2005 Enterprise Edition
and
Windows Server 2003, Enterprise Edition SP1

First Edition
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September 30, 2005

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Preface

The TPC Benchmark C was developed by the Transaction Processing Performance Council (TPC). The TPC was founded to define transaction processing benchmarks and to disseminate objective, verifiable performance data to the industry. This full disclosure report is based on the TPC Benchmark C Standard Specifications Version 5.4.

TPC Benchmark C Overview

The TPC describes this benchmark in Clause 0.1 of the specifications as follows:

TPC Benchmark™ C (TPC-C) is an OLTP workload. It is a mixture of read-only and update intensive transactions that simulate the activities found in complex OLTP application environments. It does so by exercising a breadth of system components associated with such environments, which are characterized by:

- The simultaneous execution of multiple transaction types that span a breadth of complexity
- On-line and deferred transaction execution modes
- Multiple on-line terminal sessions
- Moderate system and application execution time
- Significant disk input/output
- Transaction integrity (ACID properties)
- Non-uniform distribution of data access through primary and secondary keys
- Databases consisting of many tables with a wide variety of sizes, attributes, and relationships
- Contention on data access and update

The performance metric reported by TPC-C is a "business throughput" measuring the number of orders processed per minute. Multiple transactions are used to simulate the business activity of processing an order, and each transaction is subject to a response time constraint. The performance metric for this benchmark is expressed in transactions-per-minute-C (tpmC). To be compliant with the TPC-C standard, all references to tpmC results must include the tpmC rate, the associated price-per-tpmC, and the availability date of the priced configuration.

Although these specifications express implementation in terms of a relational data model with conventional locking scheme, the database may be implemented using any commercially available database management system (DBMS), database server, file system, or other data repository that provides a functionally equivalent implementation. The terms "table", "row", and "column" are used in this document only as examples of logical data structures.

TPC-C uses terminology and metrics that are similar to other benchmarks, originated by the TPC or others. Such similarity in terminology does not in any way imply that TPC-C results are comparable to other benchmarks. The only benchmark results comparable to TPC-C are other TPC-C results conformant with the same revision.

Despite the fact that this benchmark offers a rich environment that emulates many OLTP applications, this benchmark does not reflect the entire range of OLTP requirements. In addition, the extent to which a customer can achieve the results reported by a vendor is highly dependent on how closely TPC-C approximates the customer application. The relative performance of systems derived from this benchmark does not necessarily hold for other workloads or environments. Extrapolations to any other environment are not recommended.

Benchmark results are highly dependent upon workload, specific application requirements, and systems design and implementation. Relative system performance will vary as a result of these and other factors. Therefore, TPC-C should not be used as a substitute for a specific customer application benchmarking when critical capacity planning and/or product evaluation decisions are contemplated.

Abstract

Overview

This report documents the methodology and results of the TPC Benchmark C test conducted on the HP ProLiant DL585-G1. The operating system used for the benchmark was Windows Server 2003, Enterprise Edition. The DBMS used was Microsoft SQL Server 2005 Enterprise Edition.

TPC Benchmark C Metrics

The standard TPC Benchmark C metrics, tpmC (transactions per minute), price per tpmC (three year capital cost per measured tpmC), and the availability date are reported as:

138,845 tpmC
$3.04 per tpmC USD

The availability date is November 8, 2005.

Standard and Executive Summary Statements

The following pages contain executive summary of results for this benchmark.

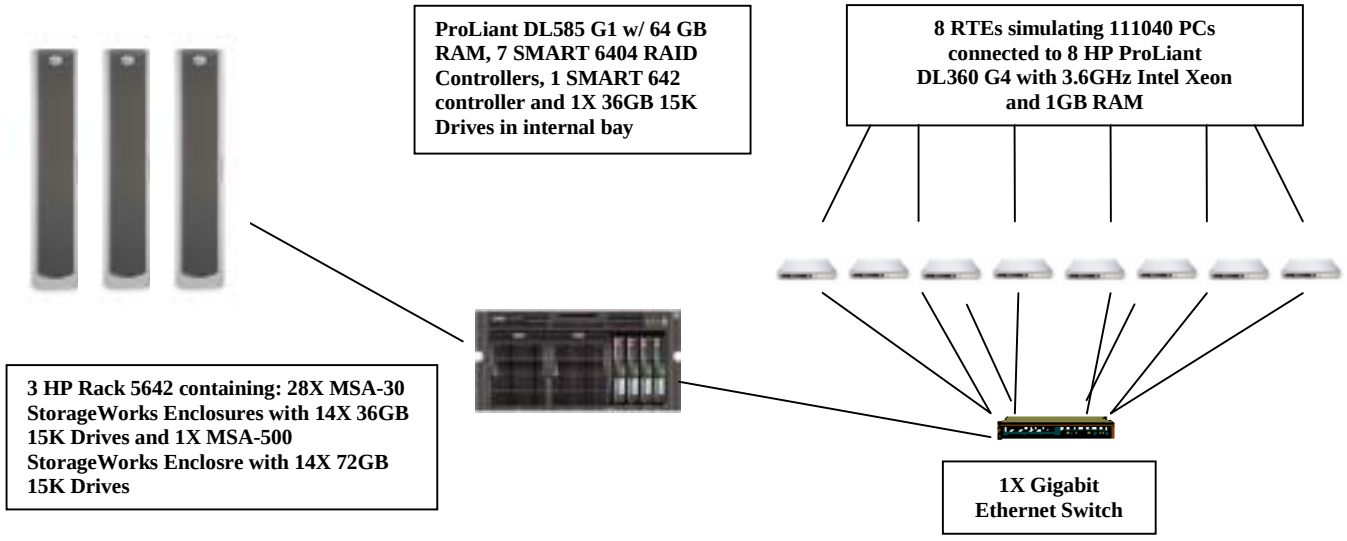
Auditor

The benchmark configuration, environment and methodology were audited by Lorna Livingtree of Performance Metrics, Inc. to verify compliance with the relevant TPC specifications.

Hewlett-Packard Company	ProLiant DL585-G1/2.8GHz C/S with 8 ProLiant DL360R G4	TPC-C Rev. 5.4 **Report Date: Sept 30, 2005**

Total System Cost	TPC-C Throughput	Price/Performance	Availability Date
$422,068 USD	**138,845**	**$3.04 USD**	**Nov 8, 2005**

Processors	Database Manager	Operating System	Other Software	Number of Users
4 AMD Opteron 2.8 GHz – Server 10 Intel Xeon 3.6 GHz – Clients	Microsoft SQL Server 2005 Enterprise Edition	Windows Server 2003, Enterprise Edition SP1	Microsoft Visual C++ Microsoft COM+	**111040**



	Server		Each Client	
System Components	Quantity	Description	Quantity	Description
Processor	4	2.8 GHz AMD Opteron w/ 1MB Cache	6@1 2@2	3.6GHz Intel Xeon w/ 1MB cache
Memory	16	4 GB DDR	4	256MB
Disk Controllers	1 7 1	Integrated Smart 5i Controller SMART 6404 Array Controllers SMART 642 Array Controller	1	Integrated SMART 5i Controller
Disk Drives	14 393	72GB SCSI Drive 36GB SCSI Drive	1	36 GB SCSI Drives
Total Storage		14,277.96GB		36 GB

Hewlett-Packard Company	HP ProLiant DL585 2.8GHz/4P Client/Server				TPC-C Rev. 5.4 Report Date:	30-Sep-05
Description	**Part Number**	**Third Party Brand**	**Unit Price**	**Qty**	**Extended Price**	**3 yr. Maint. Price**
Server Hardware		**Pricing**				
ProLiant DL585 O850 2.8GHz (1 MB) x 2	397296-001	1	12,699	1	12,699	
- 2 GB PC2100 DDR, Integrated Smart Array Controller 5i,						
- Dual Port NC7782 embedded NIC						
2.8GHz/SC (PC2700)	397820-B21	1	4,049	2	8,098	
HP 8GB Reg PC2700 2x4GB Memory	395409-B21	1	7,499	8	59,992	
MSA30 SB storage enclosure	302969-B21	1	2,829	28	79,212	
HP Modular Smart Array 500 G2 Storage	335880-B21	1	4,499	1	4,499	
- 1 MSA500 G2 controller w/ 256 MB cache, 2 SA642 controllers						
HP Modular Smart Array 500 G2 Controller	335881-B21	1	2,499	1	2,499	
HP T500 Uninterruptible Power System	361475-001	1	99	1	99	
HP Smart Array 6404/256MB Controller	273914-B21	1	1,899	7	13,293	
HP s7540 17in. CRT Monitor	PF997AA#ABA	1	149	1	149	
HP PS/2 Scroll Mouse carbonite	DG169AV	1	5	1	5	
HP Enhanced Keyboard	DG170AV#ABA	1	10	1	10	
HP 5642 Unassembled Rack	358254-B21	1	689	3	2,067	
36GB 15K U320 Pluggable Hard Drive	286776-B22	1	299	392	117,208	
36GB 15K U320 Pluggable Hard Drive (OS)	286776-B22	1	299	1	299	
72GB 15K U320 Pluggable Hard Drive	286778-B22	1	529	14	7,406	
FM-MI724-36 3YR 24X7 4HR 500 SERIES SVR	401782-002	1	1,795	1		1,795
MSA30 Carepaq 3yr 4hr 24x7	U8130E	1	1,827	28		51,156
MSA500 Carepaq 3yr 4hr 24x7	U6456E	1	1,950	1		1,950
				Subtotal	**307,535**	**54,901**
Server Software						
Microsoft SQL Server 2005 Enterprise Edition(per processor)	810-00846	Microsoft 2	19,909	4	79,636	Incl Below
Microsoft Visual C++ Standard	254-00170	Microsoft 2	109	1	109	Incl Below
Microsoft Windows 2003 Server, Enterprise Edition SP1	P73-00295	Microsoft 2	2,334	1	2,334	Incl Below
Microsoft Professional Support - 1 incident		Microsoft 2	245	1		245
				Subtotal	**82,079**	**245**
Client Hardware						
HP DL360G4 X3.6GHz/1GB+A11 SCSI US Rack Server	360528-001	1	2,799	8	22,392	
HP s7540 17in. CRT Monitor	PF997AA#ABA	1	149	8	1,192	
HP PS/2 Scroll Mouse carbonite	DG169AV	1	5	8	40	
HP Enhanced Keyboard	DG170AV#ABA	1	10	8	80	
Intel Xeon 3.6GHz 1MB DL360G4 Processor	354583-B21	1	999	2	1,998	
36GB 15K U320 Pluggable Hard Drive	286776-B22	1	299	8	2,392	
HP 3y 4h 24x7 ProLiant DL360 HW Support	U4497E	1	550	8		4,400
				Subtotal	**28,094**	**4,400**
Client Software						
Microsoft Windows 2000 Server	C11-00821	Microsoft 2	738	8	5,904	Incl. Above
				Subtotal	**5,904**	**0**
User Connectivity						
HP Procurve 2824 switch	J4903A	1	2499	1	2,499	
HP CP for HP ProCurve Networking products 3 Yr 4 hr/24x7	U2856E	1	1000	1		1,000
				Subtotal	**2,499**	**0**
Large Purchase and Cash discount (all listed HP products where brand = 1)		16.0% 1			**($54,100)**	**($9,488)**
				Total	**$372,011**	**$50,058**

Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components. Individually negotiated discounts are not permitted. Special prices based on assumptions about past or future purchases are not permitted. All discounts reflect standard pricing policies for the listed components. For complete details, see the pricing sections of the TPC benchmark pricing specifications. If you find that the stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.

Three-Year Cost of Ownership: **USD 422,068**

tpmC Rating: **138,845**

$ / tpmC: **USD 3.04**

Pricing: 1=HP Direct 2= Microsoft

Note 1 = Discount based on HP Direct guidence and large cash purchase level.

Note:The benchmark results and test methodology were audited by Lorna Livingtree of Performance Metrics, Inc.

Numerical Quantities Summary

MQTH, Computed Maximum Qualified Throughput 138,845 tpmC

Response Times (in seconds)	Average	90%	Maximum
New-Order	0.39	0.65	16.12
Payment	0.37	0.64	15.90
Order-Status	0.39	0.65	13.23
Delivery (interactive portion)	0.11	0.11	1.65
Delivery (deferred portion)	0.13	0.16	4.45
Stock-Level	0.38	0.65	14.25
Menu	0.11	0.11	1.66

Transaction Mix, in percent of total transaction	
New-Order	44.92%
Payment	43.03%
Order-Status	4.00%
Delivery	4.01%
Stock-Level	4.03%

Emulation Delay (in seconds)	Resp.Time	Menu
New-Order	0.10	0.10
Payment	0.10	0.10
Order-Status	0.10	0.10
Delivery (interactive)	0.10	0.10
Stock-Level	0.10	0.10

Keying/Think Times (in seconds)	Min.	Average	Max.
New-Order	18.02/0.00	18.03/12.06	18.18/120.53
Payment	3.02/0.00	3.03/12.07	3.18/120.53
Order-Status	2.02/0.00	2.03/10.07	2.17/100.53
Delivery (interactive)	2.02/0.00	2.03/5.07	2.16/50.52
Stock-Level	2.02/0.00	2.03/5.06	2.15/50.53

Test Duration	
Ramp-up time	53 minutes
Measurement interval	120 minutes
Transactions (all types) completed during measurement interval	38,577,909
Ramp down time	5 minutes

Checkpointing	
Number of checkpoints	4
Checkpoint interval	30 minutes

General Items

Test Sponsor

A statement identifying the benchmark sponsor(s) and other participating companies must be provided.

This benchmark was sponsored by Hewlett-Packard Company. The benchmark was developed and engineered by Hewlett-Packard Company. Testing took place at HP benchmarking laboratories in Houston, Texas.

Application Code and Definition Statements

The application program (as defined in clause 2.1.7) must be disclosed. This includes, but is not limited to, the code implementing the five transactions and the terminal input output functions.

Appendix A contains all source code implemented in this benchmark.

Parameter Settings

Settings must be provided for all customer-tunable parameters and options which have been changed from the defaults found in actual products, including by not limited to:

- *Database options*
- *Recover/commit options*
- *Consistency locking options*
- *Operating system and application configuration parameters*

This requirement can be satisfied by providing a full list of all parameters.

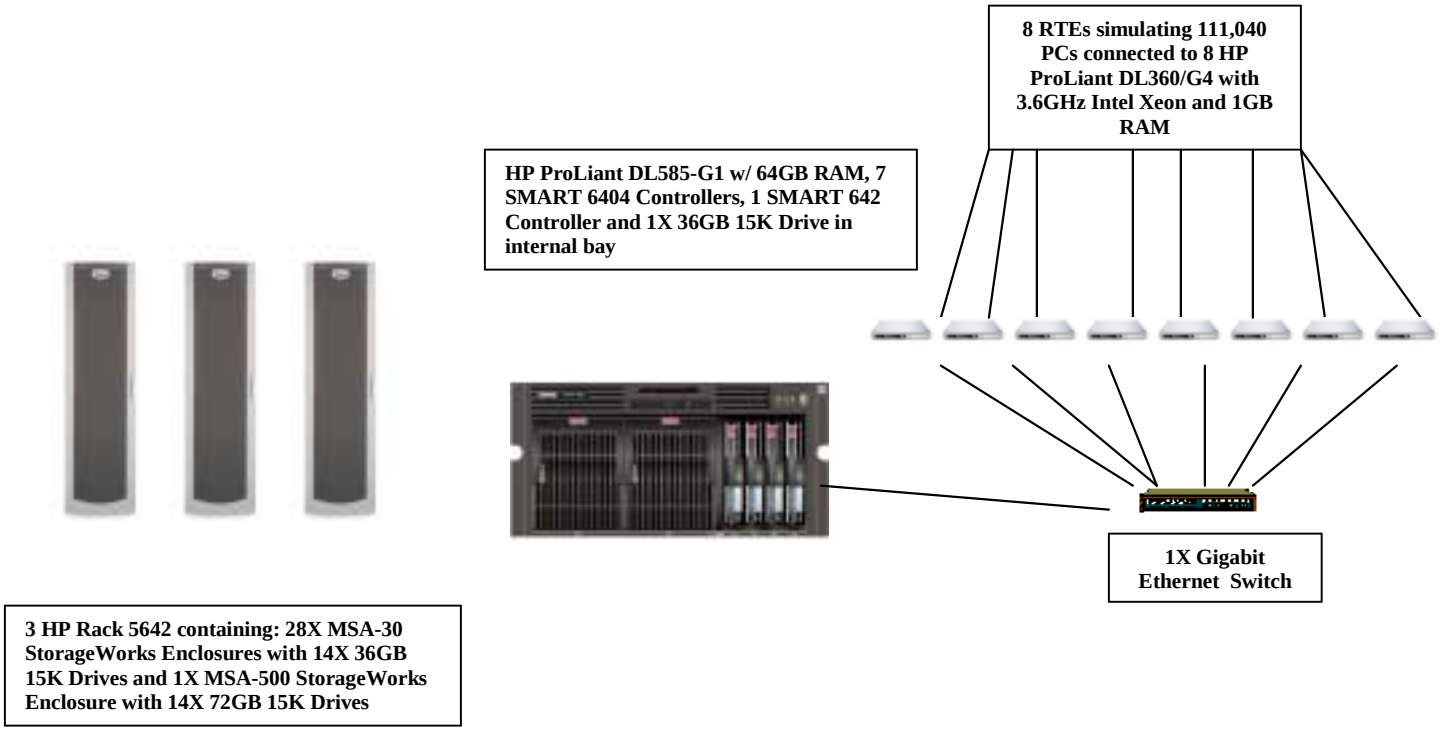
Appendix C contains the tunable parameters to for the database, the operating system, and the transaction monitor.

Configuration Items

Diagrams of both measured and priced configurations must be provided, accompanied by a description of the differences.

The configuration diagram for both the tested and priced systems are the same and included on the following page.

Figure 1. Benchmarked and Priced Configuration



Clause 1 Related Items

Table Definitions

Listing must be provided for all table definition statements and all other statements used to set up the database.

Appendix B contains the code used to define and load the database tables.

Physical Organization of Database

The physical organization of tables and indices within the database must be disclosed.
The tested configuration consisted of: 392 drives at 36GB for database data, (1) 36GB drive for the operating system, and 14 drives at 72GB for database log. There were (56) 36GB drives for database data on each of the seven SMART 6404 controllers, (14) 72GB drives on the MSA-500 controller (which is in turn connected to the SMART 642 controller), and (1) 36GB drive for the O/S on the integrated Smart 5i controller.

Benchmarked Configuration:

SMART 5i Integrated Controller, Array A
LOGICAL DRIVE C: Total Capacity = 36GB
Microsoft Windows 2003 Server, Enterprise Edition

SMART-642 Controller/MSA-500 Controller, Slot 8, Array A
LOGICAL DRIVE E: Total Capacity = 474.85 GB RAID 0+1
MSSQL_tpcc_log

SMART-6404 Controller, Slot 1, Array A
LOGICAL DRIVE: Total Capacity = 28.80 GB RAID 0
Z:\tpcc\misc\misc1
LOGICAL DRIVE: Total Capacity = 48.33 GB RAID 0
Z:\tpcc\cs\cs1
LOGICAL DRIVE: Total Capacity = 436.21 GB RAID 0+1
W:\

SMART-6404 Controller, Slot 1, Array B
LOGICAL DRIVE: Total Capacity = 28.80 GB RAID 0
Z:\tpcc\misc\misc2
LOGICAL DRIVE: Total Capacity = 48.33 GB RAID 0
Z:\tpcc\cs\cs2

SMART-6404 Controller, Slot 2, Array A
LOGICAL DRIVE: Total Capacity = 28.80 GB RAID 0
Z:\tpcc\misc\misc3
LOGICAL DRIVE: Total Capacity = 48.33 GB RAID 0
Z:\tpcc\cs\cs3
LOGICAL DRIVE: Total Capacity = 436.21 GB RAID 0+1
X:\

SMART-6404 Controller, Slot 2, Array B

LOGICAL DRIVE:	Total Capacity =28.80 GB	RAID 0
Z:\tpcc\misc\misc4		
LOGICAL DRIVE:	Total Capacity =48.33 GB	RAID 0
Z:\tpcc\cs\cs4		

SMART-6404 Controller, Slot 3, Array A

LOGICAL DRIVE:	Total Capacity = 28.80 GB	RAID 0
Z:\tpcc\misc\misc5		
LOGICAL DRIVE:	Total Capacity = 48.33 GB	RAID 0
Z:\tpcc\cs\cs5		
LOGICAL DRIVE:	Total Capacity = 436.21 GB	RAID 0+1
Y:\		

SMART-6404 Controller, Slot 3, Array B

LOGICAL DRIVE:	Total Capacity =28.80 GB	RAID 0
Z:\tpcc\misc\misc6		
LOGICAL DRIVE:	Total Capacity =48.33 GB	RAID 0
Z:\tpcc\cs\cs6		

SMART-6404 Controller, Slot 4, Array A

LOGICAL DRIVE:	Total Capacity = 28.80 GB	RAID 0
Z:\tpcc\misc\misc7		
LOGICAL DRIVE:	Total Capacity = 48.33 GB	RAID 0
Z:\tpcc\cs\cs7		
LOGICAL DRIVE:	Total Capacity = 436.21 GB	RAID 0+1
Z:\		

SMART-6404 Controller, Slot 4, Array B

LOGICAL DRIVE:	Total Capacity = 28.80 GB	RAID 0
Z:\tpcc\misc\misc8		
LOGICAL DRIVE:	Total Capacity = 48.33 GB	RAID 0
Z:\tpcc\cs\cs8		

SMART-6404 Controller, Slot 5, Array A

LOGICAL DRIVE:	Total Capacity = 28.80 GB	RAID 0
Z:\tpcc\misc\misc9		
LOGICAL DRIVE:	Total Capacity = 48.33 GB	RAID 0
Z:\tpcc\cs\cs9		

SMART-6404 Controller, Slot 5, Array B

LOGICAL DRIVE:	Total Capacity = 28.80 GB	RAID 0
Z:\tpcc\misc\misc10		
LOGICAL DRIVE:	Total Capacity = 48.33 GB	RAID 0
Z:\tpcc\cs\cs10		

SMART-6404 Controller, Slot 6, Array A

LOGICAL DRIVE:	Total Capacity = 28.80 GB	RAID 0
Z:\tpcc\misc\misc11		
LOGICAL DRIVE:	Total Capacity = 48.33 GB	RAID 0
Z:\tpcc\cs\cs11		

SMART-6404 Controller, Slot 6, Array B

LOGICAL DRIVE:	Total Capacity = 28.80 GB	RAID 0

Z:\tpcc\misc\misc12
LOGICAL DRIVE: Total Capacity = 48.33 GB RAID 0
Z:\tpcc\cs\cs12

SMART-6404 Controller, Slot 7, Array A
LOGICAL DRIVE: Total Capacity = 28.80 GB RAID 0
Z:\tpcc\misc\misc13
LOGICAL DRIVE: Total Capacity = 48.33 GB RAID 0
Z:\tpcc\cs\cs13

SMART-6404 Controller, Slot 7, Array B
LOGICAL DRIVE: Total Capacity = 28.80 GB RAID 0
Z:\tpcc\misc\misc14
LOGICAL DRIVE: Total Capacity = 48.33 GB RAID 0
Z:\tpcc\cs\cs14

Priced Configuration vs. Measured Configuration:

The measured and priced configurations were the same.

Insert and Delete Operations

It must be ascertained that insert and/or delete operations to any of the tables can occur concurrently with the TPC-C transaction mix. Furthermore, any restrictions in the SUT database implementation that precludes inserts beyond the limits defined in Clause 1.4.11 must be disclosed. This includes the maximum number of rows that can be inserted and the minimum key value for these new rows.

All insert and delete functions were fully operational during the entire benchmark.

Partitioning

While there are a few restrictions placed upon horizontal or vertical partitioning of tables and rows in the TPC-C benchmark, any such partitioning must be disclosed.

No partitioning was used in this benchmark.

Replication, Duplication or Additions

Replication of tables, if used, must be disclosed. Additional and/or duplicated attributes in any table must be disclosed along with a statement on the impact on performance.

No replications, duplications or additional attributes were used in this benchmark.

Clause 2 Related Items

Random Number Generation

The method of verification for the random number generation must be described.

In the Benchcraft RTE from Microsoft, each driver engine uses an independent random number sequence. All of the users within a given driver draw from the same sequence.

The Benchcraft RTE computes random integers as described in “Random Numbers Generators: Good Ones Are Hard to Find." Communications of the ACM - October 1988 Volume 31 Number 10.

The seeds for each user were captured and verified by the auditor to be unique. In addition, the contents of the database were systematically searched, and randomly sampled by the auditor for patterns that would indicate the random number generator had affected any kind of a discernible pattern; none were found.

Input/Output Screen Layout

The actual layout of the terminal input/output screens must be disclosed.

All screen layouts followed the specifications exactly.

Priced Terminal Feature Verification

The method used to verify that the emulated terminals provide all the features described in Clause 2.2.2.4 must be explained. Although not specifically priced, the type and model of the terminals used for the demonstration in 8.1.3.3 must be disclosed and commercially available (including supporting software and maintenance).

The terminal attributes were verified by the auditor. The auditor manually exercised each specification on a representative HP ProLiant web server.

Presentation Manager or Intelligent Terminal

Any usage of presentation managers or intelligent terminals must be explained.

Application code running on the client machines implemented the TPC-C user interface. No presentation manager software or intelligent terminal features were used. The source code for the forms applications is listed in Appendix A.

Transaction Statistics

Table 2.1 lists the numerical quantities that Clauses 8.1.3.5 to 8.1.3.11 require.

Table 2.1 Transaction Statistics

Statistic		Value
New Order	Home warehouse order lines	99.00%
	Remote warehouse order lines	1.00%
	Rolled back transactions	1.00%
	Average items per order	10.00
Payment	Home warehouse payments	85.00%
	Remote warehouse payments	15.00%

Statistic		Value
	Accessed by last name	60.00%
Order Status	Accessed by last name	60.11%
Transaction Mix	New Order	44.92%
	Payment	43.03%
	Order status	4.00%
	Delivery	4.01%
	Stock level	4.03%

Queuing Mechanism

The queuing mechanism used to defer the execution of the Delivery transaction must be disclosed.

Microsoft COM+ on each client machine served as the queuing mechanism to the database. Each delivery request was submitted to Microsoft COM+ asynchronously with control being returned to the client process immediately and the deferred delivery part completing asynchronously.

The source code is listed in Appendix A.

Clause 3 Related Items

Transaction System Properties (ACID)

The results of the ACID tests must be disclosed along with a description of how the ACID requirements were met. This includes disclosing which case was followed for the execution of Isolation Test 7.

All ACID tests with the exception of loss-of-data tests were performed on the fully scaled database. All ACID property tests were successful. The executions are described below.

Atomicity

The system under test must guarantee that the database transactions are atomic; the system will either perform all individual operations on the data or will assure that no partially completed operations leave any effects on the data.

Completed Transactions

A row was selected in a script from the warehouse, district and customer tables, and the balances noted. A payment transaction was started with the same warehouse, district and customer identifiers and a known amount. The payment transaction was committed and the rows were verified to contain correctly updated balances.

Aborted Transactions

A row was selected in a script from the warehouse, district and customer tables, and the balances noted. A payment transaction was started with the same warehouse, district and customer identifiers and a known amount. The payment transaction was rolled back and the rows were verified to contain the original balances.

Consistency

Consistency is the property of the application that requires any execution of a database transaction to take the database from one consistent state to another, assuming that the database is initially in a consistent state.

Consistency conditions one through four were tested using a script to issue queries to the database. The results of the queries verified that the database was consistent for all four tests.

A run was executed under full load lasting over two hours and included a checkpoint.

The script was executed again. The result of the same queries verified that the database remained consistent after the run.

Isolation

Sufficient conditions must be enabled at either the system or application level to ensure the required isolation defined above (clause 3.4.1) is obtained.

Isolation tests one through nine were executed using shell scripts to issue queries to the database. Each script included timestamps to demonstrate the concurrency of operations. The results of the queries were captured to files. The captured files were verified by the auditor to demonstrate the required isolation had been met.

In addition, the phantom tests and the stock level tests were executed and verified.

For Isolation test seven, case A was followed.

Durability

The tested system must guarantee durability: the ability to preserve the effects of committed transaction and insure database consistency after recovery from any one of the failures listed in Clause 3.5.3.

Durable Media Failure

Loss of Data and Log

To demonstrate recovery from a permanent failure of durable medium containing DBMS logs and TPC-C tables, the following steps were executed:

- The total number of New Orders was determined by the sum of D_NEXT_O_ID of all rows in the DISTRICT table giving the beginning count.
- The RTEs were started with 10% of the benchmark users.
- The test was allowed to run for a minimum of 10 minutes.
- One log disk was removed from the drive cabinet.
- Since the disk was mirrored, processing was not interrupted. This was verified by checking the users status on the RTE.
- One of the data disks was removed from the drive cabinet.
- When Microsoft SQL Server recorded errors about not being able to access the database, the RTE was shut down.
- A dump of the transaction log was taken and the Microsoft SQL Server was shutdown.
- A new log disk was inserted into the log drive cabinet. A new data disk was inserted into the data drive cabinet. After the RAID recovery process finished, the system was rebooted and Microsoft SQL Server was started.
- The database was restored from backup and the transaction log dump was applied.
- Consistency condition #3 was executed and verified.
- Step 2 was repeated and the difference between the first and second counts was noted.
- An RTE report was generated for the entire run time giving the number of NEW-ORDERS successfully returned to the RTE.
- The counts in step 12 and 13 were compared and the results verified that all committed transactions had been successfully recovered.
- Samples were taken from the RTE files and used to query the database to demonstrate successful transactions had corresponding rows in the ORDER table.

Instantaneous Interruption and Loss of Memory

Because loss of power erases the contents of memory, the instantaneous interruption and the loss of memory tests were combined into a single test. This test was executed on a fully scaled database of 11300 warehouses under a full load of 111040 users. The following steps were executed:

- The total number of New Orders was determined by the sum of D_NEXT_O_ID of all rows in the DISTRICT table giving the beginning count.
- The RTE was started with 111040 users.
- The test was allowed to run for a minimum of 10 minutes.
- A checkpoint was performed.
- System crash and loss of memory were induced by disconnecting the power cords. The power cords were then physically removed from the SUT. No battery backup or Uninterruptible Power Supply (UPS) were used to preserve the contents of memory.
- The RTE was shutdown.
- Power was restored and the system restarted.
- Microsoft SQL Server was restarted and performed an automatic recovery.
- Consistency condition #3 was executed and verified.
- Step 1 was repeated and the difference between the first and second counts was noted.
- An RTE report was generated for the entire run time giving the number of NEW-ORDERS successfully returned to the RTE.

- The counts in step 10 and 11 were compared and the results verified that all committed transactions had been successfully recovered.
- Samples were taken from the RTE files and used to query the database to demonstrate successful transactions had corresponding rows in the ORDER table.

Clause 4 Related Items

Initial Cardinality of Tables

The cardinality (e.g. number of rows) of each table, as it existed at the start of the benchmark run, must be disclosed. If the database was over-scaled and inactive rows of the WAREHOUSE table were deleted, the cardinality of the WAREHOUSE table as initially configured and the number of rows deleted must be disclosed.

Table 4.1 Number of Rows for Server

Table	Cardinality as built
Warehouse	11,300
District	11,3000
Customer	339,000,000
History	339,000,000
Orders	339,000,000
New Order	101,700,000
Order Line	3,389,994,271
Stock	1,130,000,000
Item	100,000
Unused Warehouses	196

Database Layout

The distribution of tables and logs across all media must be explicitly depicted for tested and priced systems.

The benchmarked configuration used 7 SMART-6404 Array controllers with 4 SCSI channels each. Each controller is capable of accessing up to 14 disk drives per channel, and supports RAID 0, RAID 0+1, and RAID 5 per each logical volume configured. The data tables were stored on 14 RAID arrays of (28) 36GB 15K drives each. Each array was configured as RAID 0 and housed logical drives for database data. Some of these controllers also housed a RAID 0+1 volume used for backup of the database. The SMART-642 Array controller was connected to an HP StorageWorks MSA-500 controller which had one array consisting of (14) 72 GB 15K drives, and housed a RAID 0+1 logical volume for the database log .The operating system was housed internally on the integrated Smart 5i controller as one 36GB 15K drive. The Array Accelerators on the data controllers were configured as 100% write cache and were enabled for all logical drives on those controllers. The MSA-500 controller for the transaction log had the mirrored cache enabled. All RAID volumes used hardware RAID.

Section 1.2 of this report details the distribution of database tables across all disks. The code that creates the filegroups and tables is included in Appendix B.

Type of Database

A statement must be provided that describes:

- *The data model implemented by DBMS used (e.g. relational, network, hierarchical).*
- *The database interface (e.g. embedded, call level) and access language (e.g. SQL, DL/1, COBOL read/write used to implement the TPC-C transaction. If more than one interface/access language is used to implement TPC-C, each interface/access language must be described and a list of which interface/access language is used with which transaction type must be disclosed.*

Microsoft SQL Server 2005 Enterprise Edition is a relational DBMS.

The interface used was Microsoft SQL Server stored procedures accessed with Remote Procedure Calls embedded in C code.

Database Mapping

The mapping of database partitions/replications must be explicitly described.

The database was not replicated.

60 Day Space

Details of the 60-day space computations along with proof that the database is configured to sustain 8 hours of growth for the dynamic tables (Order, Order-Line, and History) must be disclosed.

To calculate the space required to sustain the database log for 8 hours of growth at steady state, the following steps were followed:

- The free space on the log file was queried using *dbcc sqlperf(logspace)*.
- Transactions were run against the database with a full load of users.
- The free space was again queried using *dbcc sqlperf(logspace)*.
- The space used was calculated as the difference between the first and second query.
- The number of NEW-ORDERS was verified from the difference in the sum(d_next_o_id) taken from before and after the run.
- The space used was divided by the number of NEW-ORDERS giving a space used per NEW-ORDER transaction.
- The space used per transaction was multiplied by the measured tpmC rate times 480 minutes.

The same methodology was used to compute growth requirements for dynamic tables Order, Order-Line and History.

The details of both the 8-hour transaction log space requirement and the 60-day space requirement is shown in Appendix D.

Clause 5 Related Items

Throughput

Measured tpmC must be reported

Measured tpmC	138,845 tpmC
Price per tpmC	$3.04 USD per tpmC

Response Times

Ninetieth percentile, maximum and average response times must be reported for all transaction types as well as for the menu response time.

Table 5.2: Response Times

Type	Average	90th %	Maximum
New-Order	0.39	0.65	16.12
Payment	0.37	0.64	15.90
Order-Status	0.39	0.65	13.23
Interactive Delivery	0.11	0.11	1.65
Deferred Delivery	0.13	0.16	4.45
Stock-Level	0.38	0.65	14.25
Menu	0.11	0.11	1.66

Keying and Think Times

The minimum, the average, and the maximum keying and think times must be reported for each transaction type.

Table 5.3: Keying Times

Type	Minimum	Average	Maximum
New-Order	18.02	18.03	18.18
Payment	3.02	3.03	3.18
Order-Status	2.02	2.03	2.17
Interactive Delivery	2.02	2.03	2.16
Stock-Level	2.02	2.03	2.15

Table 5.4: Think Times

Type	Minimum	Average	Maximum
New-Order	0.00	12.06	120.53
Payment	0.00	12.07	120.53
Order-Status	0.00	10.07	100.53
Interactive Delivery	0.00	5.07	50.52
Stock-Level	0.00	5.06	50.53

Response Time Frequency Distribution Curves and Other Graphs

Response Time frequency distribution curves (see Clause 5.6.1) must be reported for each transaction type.

The performance curve for response times versus throughput (see Clause 5.6.2) must be reported for the New-Order transaction.

Think Time frequency distribution curves (see Clause 5.6.3) must be reported for each transaction type.

Keying Time frequency distribution curves (see Clause 5.6.4) must be reported for each transaction type.

A graph of throughput versus elapsed time (see Clause 5.6.5) must be reported for the New-Order transaction.

Figure 2. New Order Response Time Distribution

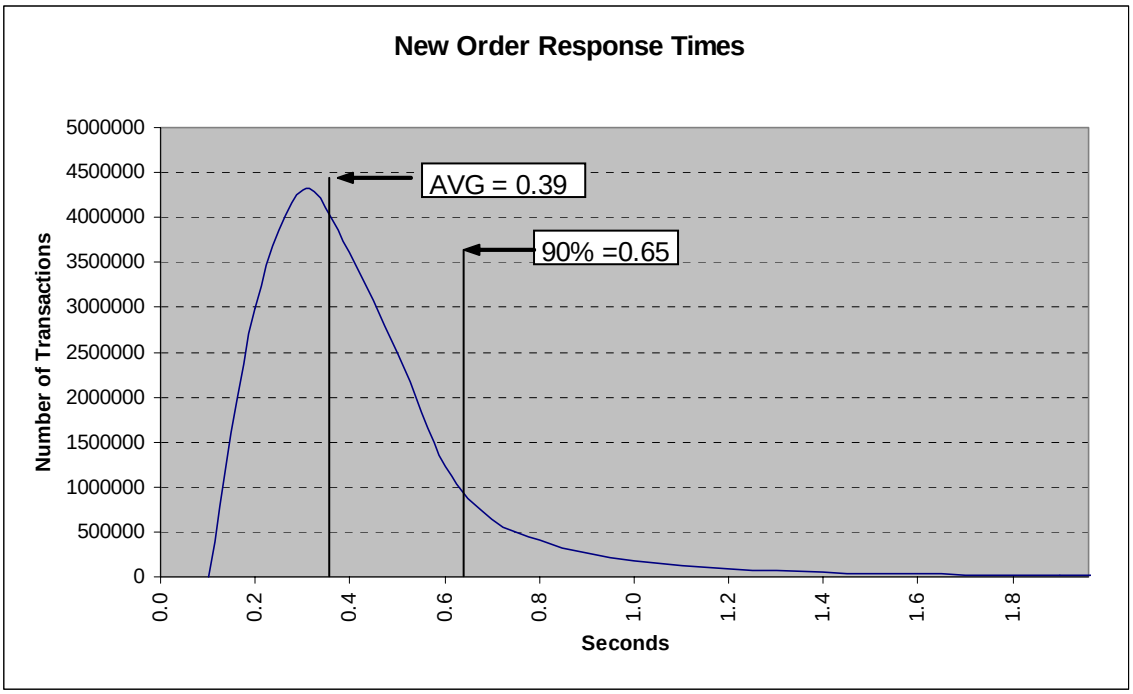


Figure 3. Payment Response Time Distribution

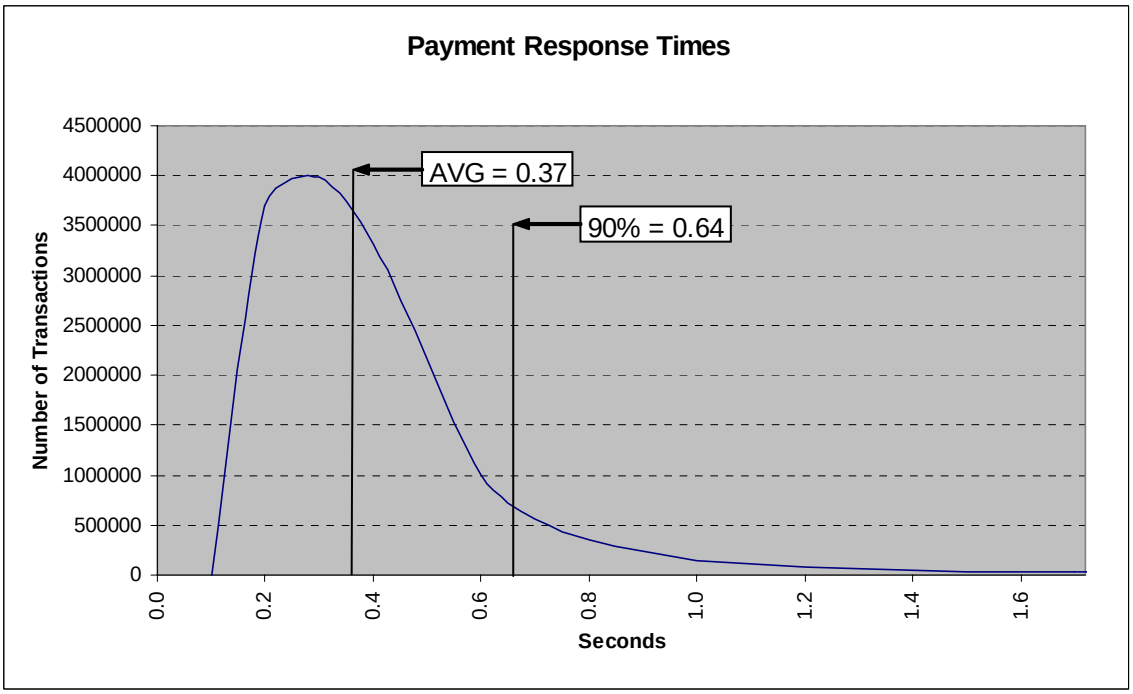


Figure 4. Order Status Response Time Distribution

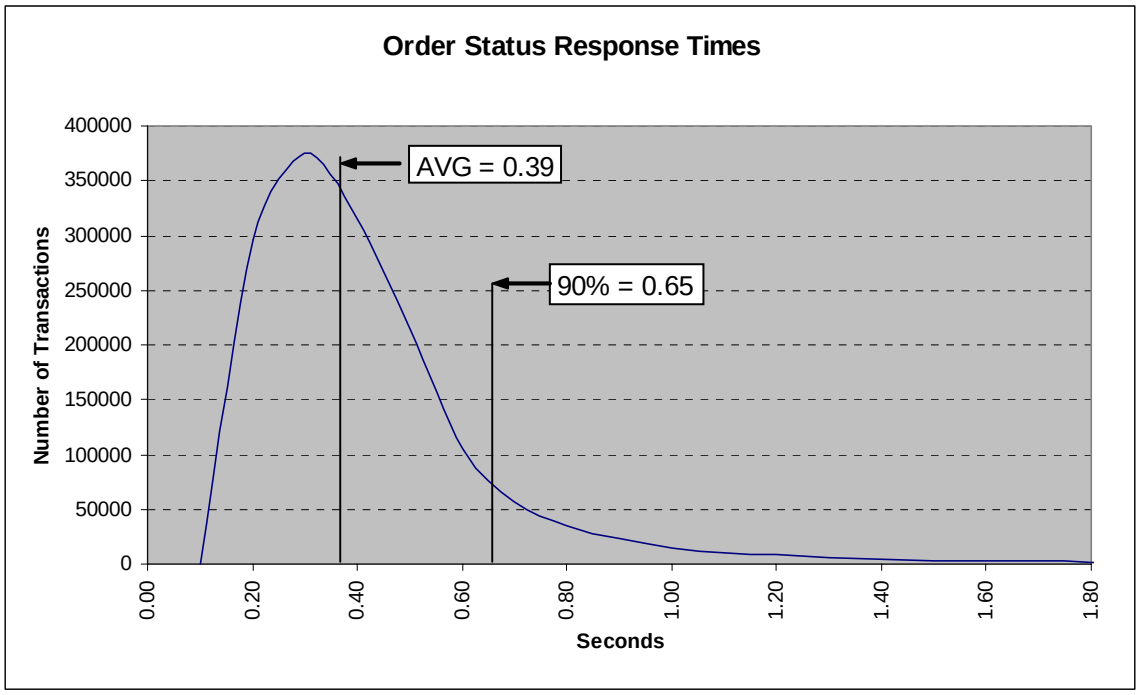


Figure 5. Delivery Response Time Distribution

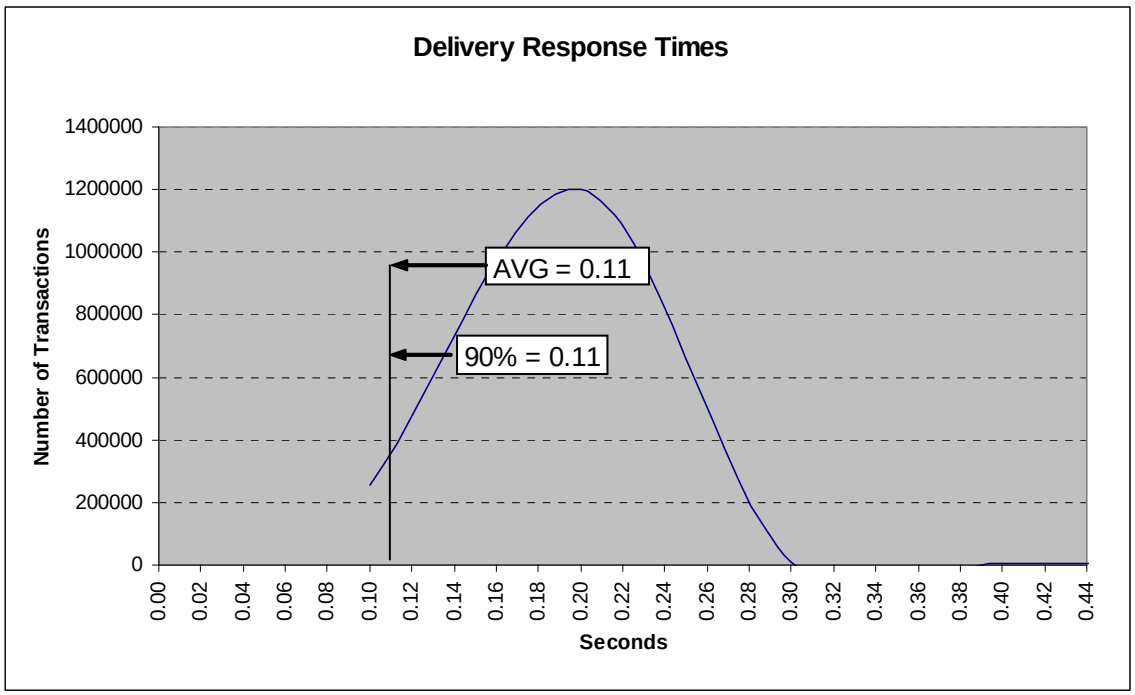


Figure 6. Stock Level Response Time Distribution

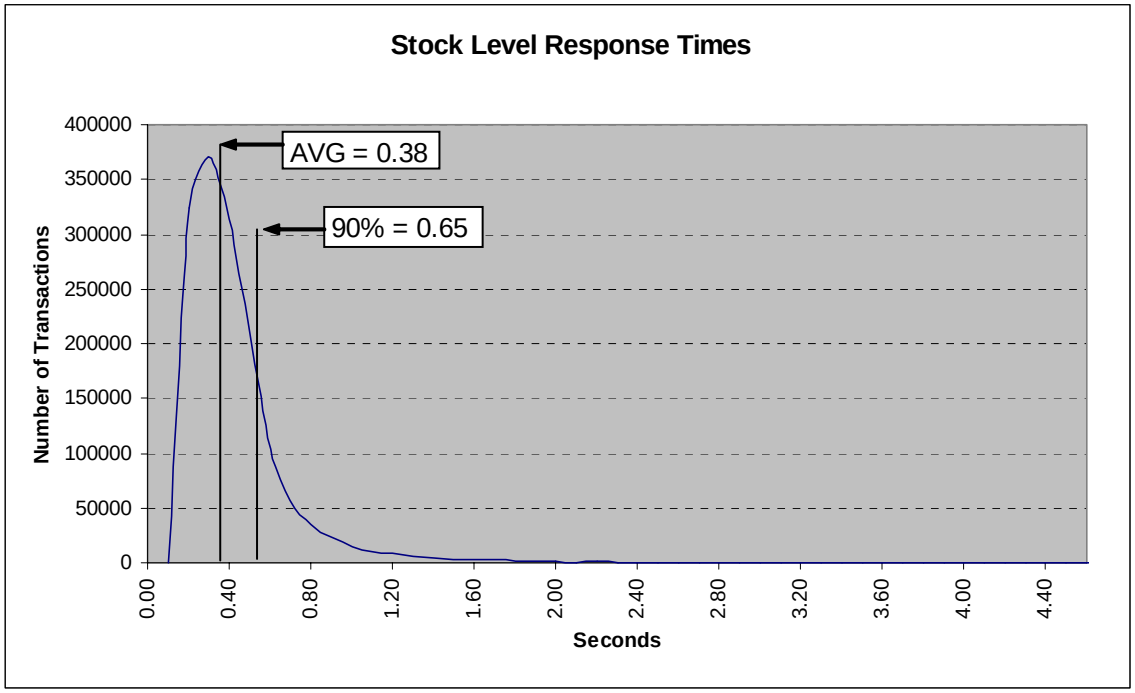


Figure 7. Response Time vs. Throughput

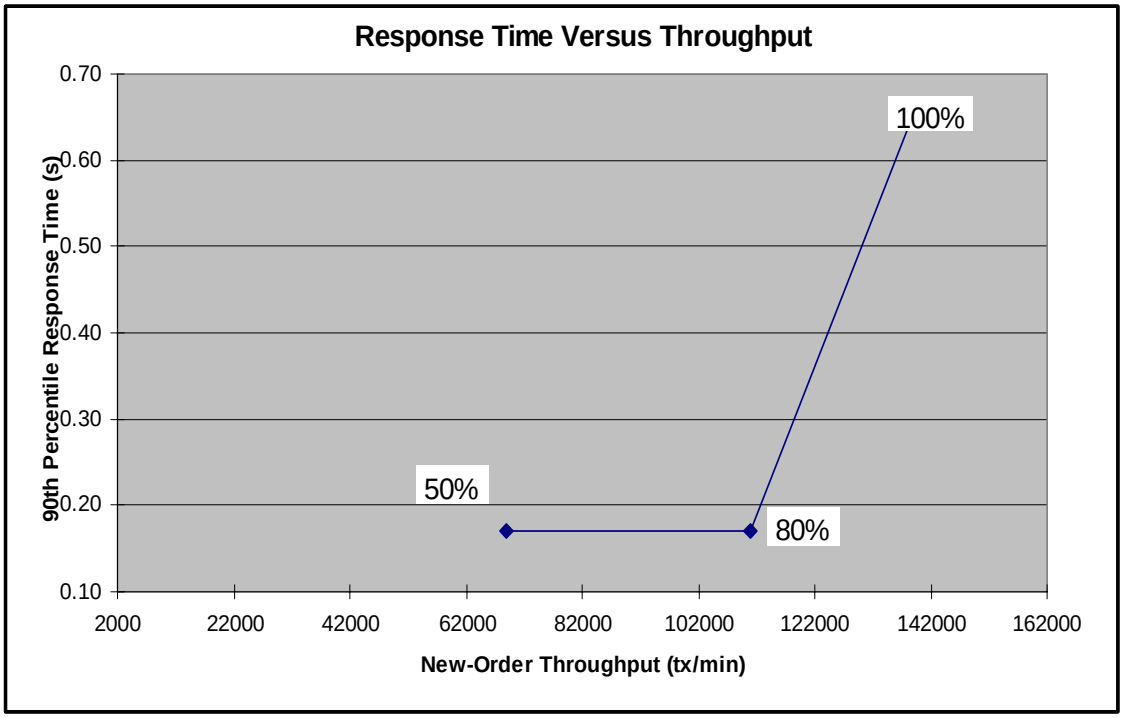


Figure 8. New Order Think Time Distribution

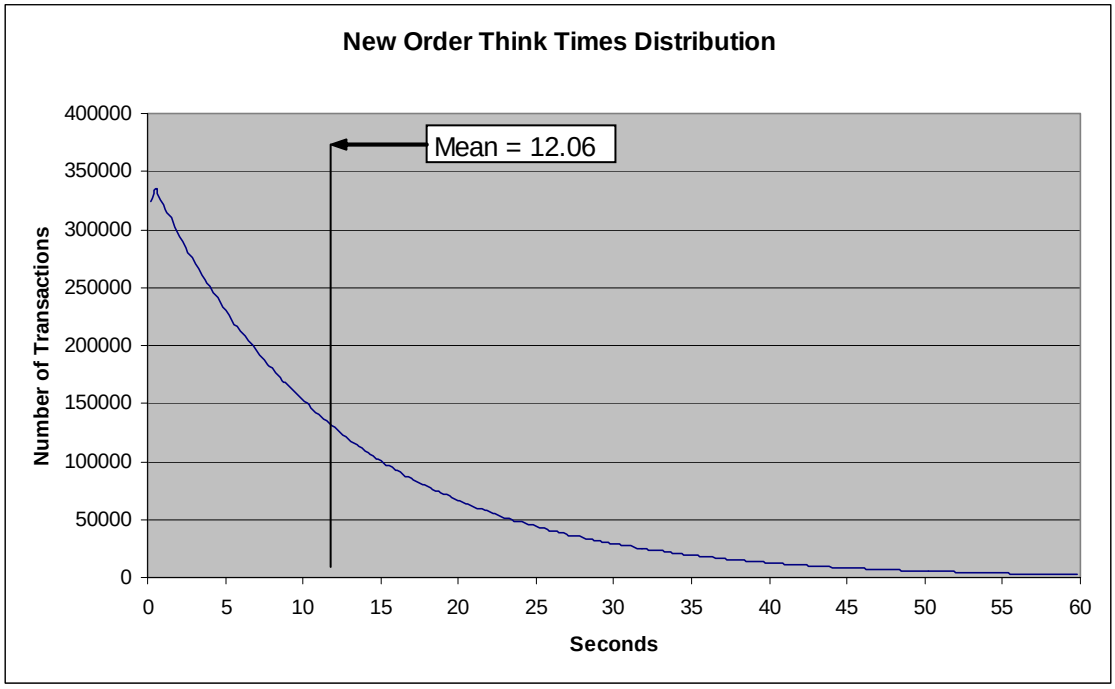
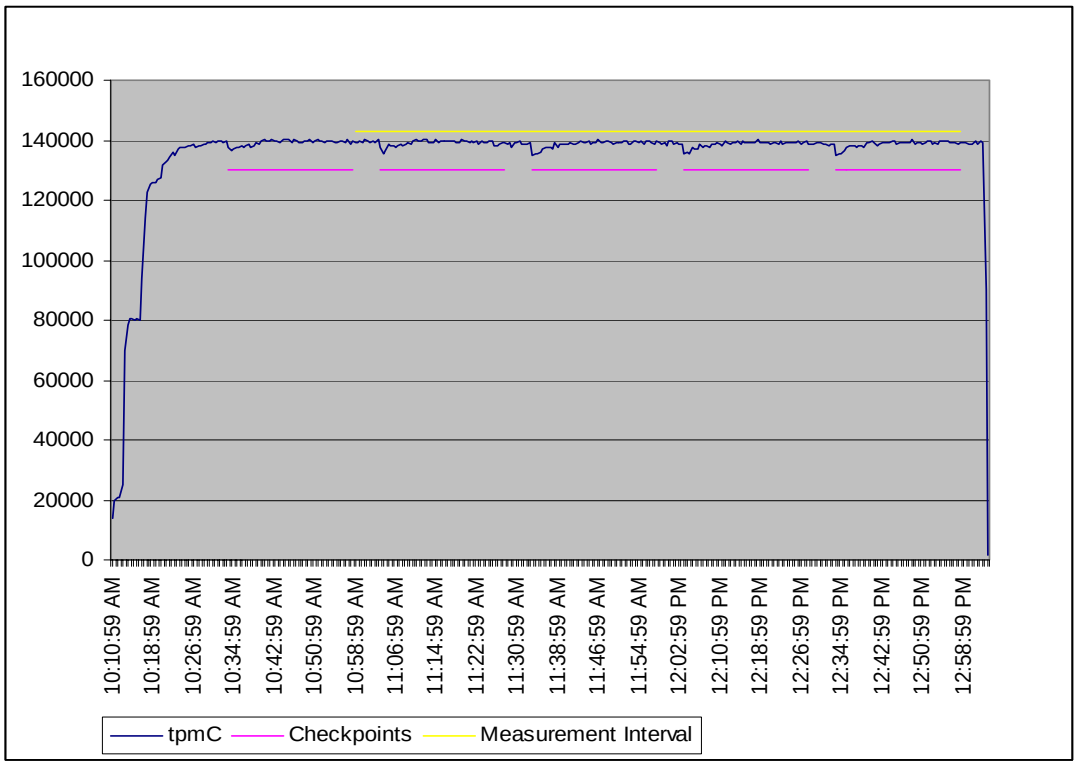


Figure 9. Throughput vs. Time Distribution



Steady State Determination

The method used to determine that the SUT had reached a steady state prior to commencing the measurement interval must be disclosed.

Steady state was determined using real time monitor utilities from the RTE. Steady state was further confirmed by the throughput data collected during the run and graphed in Figure 9.

Work Performed During Steady State

A description of how the work normally performed during a sustained test (for example checkpointing, writing redo/undo log records, etc.), actually occurred during the measurement interval must be reported.

The RTE generated the required input data to choose a transaction from the menu. This data was timestamped. The input screen for the requested transaction was returned and time stamped. The difference between these two timestamps was the menu response time. The RTE writes to the log file once per transaction on selective fields such as order id. There is one log file per driver engine.

The RTE generated the required input data for the chosen transaction. It waited to complete the minimum required key time before transmitting the input screen. The transmission was time stamped. The return of the screen with the required response data was time stamped. The difference between these two timestamps was the response time for that transaction.

The RTE then waited the required think time interval before repeating the process starting at selecting a transaction from the menu.

The RTE transmissions were sent to application processes running on the client machines through Ethernet LANs. These client application processes handled all screen I/O as well as all requests to the database on the server. The applications communicated with the database server over the TCP/IP protocol using the gigabit Ethernet link and ODBC/RPC calls.

To perform checkpoints at specific intervals, the checkpoint was issued with the 1700 value and a script was written to schedule checkpoints at specific intervals. The script included a wait time between each checkpoint equal to 30 minutes so that the checkpoint interval was an integral multiple of the measurement interval, which was 120 minutes. The checkpoint script was started manually after the RTE had all users logged in and the database had achieved steady state.

At each checkpoint, Microsoft SQL Server wrote to disk all memory pages that had been updated but not yet physically written to disk. The positioning of the measurement interval is depicted on the graph in Figure 9.

Measurement Period Duration

A statement of the duration of the measurement interval for the reported Maximum Qualified Throughput (tpmC) must be included.

The reported measured interval was exactly 120 minutes long.

Regulation of Transaction Mix

The method of regulation of the transaction mix (e.g., card decks or weighted random distribution) must be described. If weighted distribution is used and the RTE adjusts the weights associated with each transaction type, the maximum adjustments to the weight from the initial value must be disclosed.

The RTE was given a weighted random distribution, which was not adjusted during the run.

Transaction Statistics

The percentage of the total mix for each transaction type must be disclosed. The percentage of New-Order transactions rolled back as a result of invalid item number must be disclosed. The average number of order-lines entered per New-Order transaction must be disclosed. The percentage of remote order lines per New-Order transaction must be disclosed. The percentage of remote Payment transactions must be disclosed. The percentage of customer selections by customer last name in the Payment and Order-Status transactions must be disclosed. The percentage of Delivery transactions skipped due to there being fewer than necessary orders in the New-Order table must be disclosed.

Table 5.5: Transaction Statistics

Statistic		Value
New Order	Home warehouse order lines	99.00%
	Remote warehouse order lines	1.00%
	Rolled back transactions	1.00%
	Average items per order	10.00
Payment	Home warehouse payments	85.00%
	Remote warehouse payments	15.00%
	Accessed by last name	60.00%
Delivery	Skipped transactions (interactive)	0
	Skipped transactions (deferred)	0
Order Status	Accessed by last name	60.11%
Transaction Mix	New Order	44.92%
	Payment	43.03%
	Order status	4.00%
	Delivery	4.01%
	Stock level	4.03%

Checkpoint Count and Location

The number of checkpoints in the Measurement Interval, the time in seconds from the start of the Measurement Interval to the first checkpoint, and the Checkpoint Interval must be disclosed.

The initial checkpoint was started 27 minutes after the start of the ramp-up. Subsequent checkpoints occurred every 30 minutes. Each checkpoint in the measurement interval lasted approximately 25 minutes. The measurement interval contains four checkpoints.

Checkpoint Duration

The start time and duration in seconds of at least the four longest checkpoints during the Measurement Interval must be disclosed.

Checkpoint Start Time	Duration
11:03:48 a.m.	25 minutes, 00 seconds
11:33:45 a.m.	25 minutes, 00 seconds
12:03:42 p.m.	25 minutes, 00 seconds
12:33:39 p.m	25 minutes, 00 seconds

Clause 6 Related Items

RTE Descriptions

If the RTE is commercially available, then its inputs must be specified. Otherwise, a description must be supplied of what inputs (e.g., scripts) to the RTE had been used.

The RTE used was Microsoft Benchcraft RTE. Benchcraft is a proprietary tool provided by Microsoft and is not commercially available. The RTE's input is listed in Appendix A.

Emulated Components

It must be demonstrated that the functionality and performance of the components being emulated in the Driver System are equivalent to the priced system. The results of the test described in Clause 6.6.3.4 must be disclosed.

The driver system consisted of 8 HP ProLiant servers. These driver machines emulated the users' web browsers.

Functional Diagrams

A complete functional diagram of both the benchmark configuration and the configuration of the proposed (target) system must be disclosed. A detailed list of all hardware and software functionality being performed on the Driver System and its interface to the SUT must be disclosed.

The driver system performed the data generation and input functions of the priced display device. It also captured the input and output data and timestamps for post-processing of the reported metrics. No other functionality was included on the driver system.

Section 1.4 of this report contains detailed diagrams of both the benchmark configuration and the priced configuration.

Networks

The network configuration of both the tested services and proposed (target) services that are being represented and a thorough explanation of exactly which parts of the proposed configuration are being replaced with the Driver System must be disclosed.

The bandwidth of the networks used in the tested/priced configuration must be disclosed.

In the tested configuration, 8 driver (RTE) machines were connected through a gigabit ethernet switch to the client machines at 1Gbs, thus providing the path from the RTEs to the clients. The server (SUT) was connected to the clients through a gigabit ethernet connection using a switch on a separate LAN.

The priced configuration was connected in the same manner as the tested configuration.

Operator Intervention

If the configuration requires operator intervention (see Clause 6.6.6), the mechanism and the frequency of this intervention must be disclosed.

This configuration does not require any operator intervention to sustain eight hours of the reported throughput.

Clause 7 Related Items

System Pricing

A detailed list of hardware and software used in the priced system must be reported. Each separately orderable item must have vendor part number, description, and release/revision level, and either general availability status or committed delivery data. If package-pricing is used, vendor part number of the package and a description uniquely identifying each of the components of the package must be disclosed. Pricing source and effective date(s) of price(s) must also be reported.

The total 3 year price of the entire configuration must be reported, including: hardware, software, and maintenance charges. Separate component pricing is recommended. The basis of all discounts used must be disclosed.

The details of the hardware and software are reported in the front of this report as part of the executive summary. All third party quotations are included at the end of this report as Appendix E.

Availability, Throughput, and Price Performance

The committed delivery date for general availability (availability date) of products used in the price calculation must be reported. When the priced system included products with different availability dates, the reported availability date for the priced system must be the date at which all components are committed to be available.

A statement of the measured tpmC as well as the respective calculations for the 5-year pricing, price/performance (price/tpmC), and the availability date must be included.

- **Maximum Qualified Throughput** **138,845 tpmC**
- **Price per tpmC** **$3.04 USD per tpmC**
- **Availability** **Nov 8, 2005**

Country Specific Pricing

Additional Clause 7 related items may be included in the Full Disclosure Report for each country specific priced configuration. Country specific pricing is subject to Clause 7.1.7

This system is being priced for the United States of America.

Usage Pricing

For any usage pricing, the sponsor must disclose:

- *Usage level at which the component was priced.*
- *A statement of the company policy allowing such pricing.*

The component pricing based on usage is shown below:

- 8 Microsoft Windows 2000 Server
- 1 Microsoft Windows 2003 Server, Enterprise Edition
- 4 Microsoft SQL Server 2005 Enterprise Edition (per processor)
- 1 Microsoft Visual C++
- HP Servers include 3 years of support.

Clause 9 Related Items

Auditor's Report

The auditor's name, address, phone number, and a copy of the auditor's attestation letter indicating compliance must be included in the Full Disclosure Report.

This implementation of the TPC Benchmark C was audited by Lorna Livingtree of Performance Metrics, Inc.

Performance Metrics, Inc.
PO Box 984
Klamath, CA 95548
(phone) (916) 985-1131
(fax) (916) 985-1185
e-mail: lorna@perfmetrics.com

Availability of the Full Disclosure Report

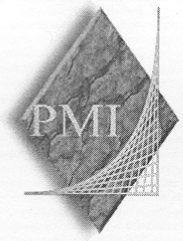
The Full Disclosure Report must be readily available to the public at a reasonable charge, similar to the charges for similar documents by the test sponsor. The report must be made available when results are made public. In order to use the phrase "TPC Benchmark™ C", the Full Disclosure Report must have been submitted to the TPC Administrator as well as written permission obtained to distribute same.

Requests for this TPC Benchmark C Full Disclosure Report should be sent to:

Transaction Processing Performance Council
Presidio of San Francisco
Building 572B Ruger St. (surface)
P.O. Box 29920 (mail)
San Francisco, CA 94129-0920
Voice: 415-561-6272
Fax: 415-561-6120
Email: info@tpc.org

or

Hewlett-Packard Company
Database Performance Engineering
P.O. Box 692000
Houston, TX 77269-2000



PERFORMANCE METRICS INC.
TPC Certified Auditors

September 20, 2005

Mr. Brean Campbell
Hewlett-Packard Company
20555 SH 249
Houston, TX 77077

I have verified by remote the TPC Benchmark™ C for the following configuration:

Platform: HP ProLiant DL585 G1 4P
Database Manager: Microsoft SQL Server 2005 Enterprise Edition
Operating System: Microsoft Windows 2003 Server Enterprise Edition SP1
Transaction Monitor: COM+

System Under Test: HP ProLiant DL585 G1with:				
CPU's	Memory	Disks (total)	90% Response	TpmC
4 AMD Opteron single core @2.8GHz	Main: 64 GB	392 @36GB 14 @ 72GB 1 @ 36GB (os)	0.65	138,845
6 clients: DL360G4 each with:				
1 Intel Xeon @3.6 GHz	Main: 1 GB	1 @ 36GB	Na	Na
2 clients: DL360G4 each with:				
2 Intel Xeon @3.6 GHz	Main: 1 GB	1 @ 36GB	Na	Na

In my opinion, these performance results were produced in compliance with the TPC requirements for the benchmark. The following attributes of the benchmark were given special attention:

- The transactions were correctly implemented.

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- The database files were properly sized.
- The database was properly scaled with 11,300 warehouses, of which 11,104 were active during the measured interval.
- The ACID properties were successfully demonstrated.
- Data loss durability was demonstrated on a subset of the SUT configured with a database properly populated for 1,200 warehouses.
- Input data was generated according to the specified percentages.
- Eight hours of mirrored log space was present on the tested system.
- Eight hours of growth space for the dynamic tables was present on the tested system.
- The data for the 60 days space calculation was verified.
- The controller cache for the log disks was enabled and mirrored.
- The steady state portion of the test was 120 minutes.
- One checkpoint was taken in steady state before the measured interval opened.
- Four checkpoints were completed inside the measured interval.
- The system pricing was checked for major components and maintenance.
- Third party quotes were verified for compliance.
- Client pricing was verified to be compliant with all requirements for substitution.

Auditor Notes:

None.

Sincerely,

Lorna Livingtree

Lorna Livingtree
Auditor

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Appendix A: Source Code

The client source code is listed below.

_delivery.h

```
/* Generated by IDL compiler version DEC DCE V2.0.0-6
*/
#ifndef _delivery_v1_0_included
#define _delivery_v1_0_included
#ifndef IDLBASE_H
#include <dce\idlbase.h>
#endif
#include <dce\rpc.h>
#include "trpc/trpc.h"

#ifdef __cplusplus
    extern "C" {
#endif

#ifndef nbase_v0_0_included
#include "dce\nbase.h"
#endif
#ifndef trpcImports_v0_0_included
#include "trpc\trpcImports.h"
#endif
#ifndef mon_handle_v1_0_included
#include "tpm/mon\mon_handle.h"
#endif
#ifndef tpcc_types_v1_0_included
#include "tpcc_type.h"
#endif
#include <dce\rpcexc.h>
extern EXCEPTION encina_x_transaction_aborted;
extern EXCEPTION encina_x_server_shutdown;
extern EXCEPTION encina_x_permission_denied;
extern EXCEPTION encina_x_object_not_found;
extern EXCEPTION encina_x_empty_slot1;
extern EXCEPTION encina_x_empty_slot2;
extern EXCEPTION encina_x_empty_slot3;
extern EXCEPTION encina_x_empty_slot4;
extern EXCEPTION encina_x_empty_slot5;
extern EXCEPTION encina_x_undefined_exception;
extern void  IDL_STD_STDCALL _delivery_GetApplId(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t handle,
    /* [out] */ trpc_byteData_t applString,
    /* [out] */ idl_ulong_int *applStringLength,
    /* [out] */ trpc_byteData_t address,
    /* [out] */ idl_ulong_int *addressLength,
    /* [out] */ error_status_t *c_status,
    /* [out] */ error_status_t *f_status
#endif
);
extern void  IDL_STD_STDCALL _impTPCCDelivery(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t trpc_h,
    /* [in] */ idl_long_int length,
    /* [in, out] */ idl_char *dataP,
    /* [in, out] */ data_header *headerP,
    /* [in] */ trpc_byteData_t applAndAddress,
    /* [in] */ idl_ulong_int applAndAddressLength,
    /* [in] */ trpc_callbackData_t inCallbackData,
    /* [in] */ idl_ulong_int numOfInCallbackData
#endif
);
globalref mon_handle_t handle;
#if defined(__VMS) && (defined(__DECC) ||
defined(__cplusplus))
#pragma extern_model __save
#pragma extern_model __common_block __shr
#endif
typedef struct _delivery_v1_0_epv_t {
void ( IDL_STD_STDCALL *_delivery_GetApplId)(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t handle,
    /* [out] */ trpc_byteData_t applString,
    /* [out] */ idl_ulong_int *applStringLength,
    /* [out] */ trpc_byteData_t address,
    /* [out] */ idl_ulong_int *addressLength,
    /* [out] */ error_status_t *c_status,
    /* [out] */ error_status_t *f_status
#endif
);
void ( IDL_STD_STDCALL *_impTPCCDelivery)(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t trpc_h,
    /* [in] */ idl_long_int length,
    /* [in, out] */ idl_char *dataP,
    /* [in, out] */ data_header *headerP,
    /* [in] */ trpc_byteData_t applAndAddress,
    /* [in] */ idl_ulong_int applAndAddressLength,
    /* [in] */ trpc_callbackData_t inCallbackData,
    /* [in] */ idl_ulong_int numOfInCallbackData
#endif
);
} _delivery_v1_0_epv_t;
extern rpc_if_handle_t _delivery_v1_0_c_ifspec;
extern rpc_if_handle_t _delivery_v1_0_s_ifspec;
#if defined(__VMS) && (defined(__DECC) ||
defined(__cplusplus))
#pragma extern_model __restore
#endif

#ifdef __cplusplus
    }

#else
#endif
#endif
```

_neworder.h

```
/* Generated by IDL compiler version DEC DCE V2.0.0-6
*/
#ifndef _neworder_v1_0_included
#define _neworder_v1_0_included
#ifndef IDLBASE_H
#include <dce\idlbase.h>
#endif
#include <dce\rpc.h>
#include "trpc/trpc.h"

#ifdef __cplusplus
    extern "C" {
#endif

#ifndef nbase_v0_0_included
#include "dce\nbase.h"
#endif
#ifndef trpcImports_v0_0_included
#include "trpc\trpcImports.h"
#endif
#ifndef mon_handle_v1_0_included
#include "tpm/mon\mon_handle.h"
#endif
#ifndef tpcc_types_v1_0_included
#include "tpcc_type.h"
#endif
#include <dce\rpcexc.h>
extern EXCEPTION encina_x_transaction_aborted;
extern EXCEPTION encina_x_server_shutdown;
extern EXCEPTION encina_x_permission_denied;
extern EXCEPTION encina_x_object_not_found;
extern EXCEPTION encina_x_empty_slot1;
extern EXCEPTION encina_x_empty_slot2;
extern EXCEPTION encina_x_empty_slot3;
extern EXCEPTION encina_x_empty_slot4;
extern EXCEPTION encina_x_empty_slot5;
extern EXCEPTION encina_x_undefined_exception;
extern void  IDL_STD_STDCALL _neworder_GetApplId(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t handle,
    /* [out] */ trpc_byteData_t applString,
    /* [out] */ idl_ulong_int *applStringLength,
    /* [out] */ trpc_byteData_t address,
    /* [out] */ idl_ulong_int *addressLength,
    /* [out] */ error_status_t *c_status,
    /* [out] */ error_status_t *f_status
#endif
);
extern void  IDL_STD_STDCALL _impTPCCNewOrder(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t trpc_h,
    /* [in] */ idl_long_int length,
    /* [in, out] */ idl_char *dataP,
    /* [in, out] */ data_header *headerP,
    /* [in] */ trpc_byteData_t applAndAddress,
    /* [in] */ idl_ulong_int applAndAddressLength,
    /* [in] */ trpc_callbackData_t inCallbackData,
    /* [in] */ idl_ulong_int numOfInCallbackData
```

```
#endif
);
extern void  IDL_STD_STDCALL _impTPCCNOInfo(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t trpc_h,
    /* [out] */ dbInfo_data_t *dataP,
    /* [in] */ trpc_byteData_t applAndAddress,
    /* [in] */ idl_ulong_int applAndAddressLength,
    /* [in] */ trpc_callbackData_t inCallbackData,
    /* [in] */ idl_ulong_int numOfInCallbackData
#endif
);
globalref mon_handle_t handle;
#if defined(__VMS) && (defined(__DECC) ||
defined(__cplusplus))
#pragma extern_model __save
#pragma extern_model __common_block __shr
#endif
typedef struct _neworder_v1_0_epv_t {
void ( IDL_STD_STDCALL *_neworder_GetApplId)(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t handle,
    /* [out] */ trpc_byteData_t applString,
    /* [out] */ idl_ulong_int *applStringLength,
    /* [out] */ trpc_byteData_t address,
    /* [out] */ idl_ulong_int *addressLength,
    /* [out] */ error_status_t *c_status,
    /* [out] */ error_status_t *f_status
#endif
);
void ( IDL_STD_STDCALL *_impTPCCNewOrder)(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t trpc_h,
    /* [in] */ idl_long_int length,
    /* [in, out] */ idl_char *dataP,
    /* [in, out] */ data_header *headerP,
    /* [in] */ trpc_byteData_t applAndAddress,
    /* [in] */ idl_ulong_int applAndAddressLength,
    /* [in] */ trpc_callbackData_t inCallbackData,
    /* [in] */ idl_ulong_int numOfInCallbackData
#endif
);
void ( IDL_STD_STDCALL *_impTPCCNOInfo)(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t trpc_h,
    /* [out] */ dbInfo_data_t *dataP,
    /* [in] */ trpc_byteData_t applAndAddress,
    /* [in] */ idl_ulong_int applAndAddressLength,
    /* [in] */ trpc_callbackData_t inCallbackData,
    /* [in] */ idl_ulong_int numOfInCallbackData
#endif
);
} _neworder_v1_0_epv_t;
extern rpc_if_handle_t _neworder_v1_0_c_ifspec;
extern rpc_if_handle_t _neworder_v1_0_s_ifspec;
#if defined(__VMS) && (defined(__DECC) ||
defined(__cplusplus))
#pragma extern_model __restore
#endif

#ifdef __cplusplus
    }

#else
#endif
#endif
```

_orderstatus.h

```
/* Generated by IDL compiler version DEC DCE V2.0.0-6
*/
#ifndef _orderstatus_v1_0_included
#define _orderstatus_v1_0_included
#ifndef IDLBASE_H
#include <dce\idlbase.h>
#endif
#include <dce\rpc.h>
#include "trpc/trpc.h"

#ifdef __cplusplus
    extern "C" {
#endif

#ifndef nbase_v0_0_included
#include "dce\nbase.h"
#endif
#ifndef trpcImports_v0_0_included
#include "trpc\trpcImports.h"
#endif
#ifndef mon_handle_v1_0_included
#include "tpm/mon\mon_handle.h"
#endif
#ifndef tpcc_types_v1_0_included
#include "tpcc_type.h"
#endif
#include <dce\rpcexc.h>
extern EXCEPTION encina_x_transaction_aborted;
extern EXCEPTION encina_x_server_shutdown;
extern EXCEPTION encina_x_permission_denied;
extern EXCEPTION encina_x_object_not_found;
extern EXCEPTION encina_x_empty_slot1;
extern EXCEPTION encina_x_empty_slot2;
extern EXCEPTION encina_x_empty_slot3;
extern EXCEPTION encina_x_empty_slot4;
extern EXCEPTION encina_x_empty_slot5;
extern EXCEPTION encina_x_undefined_exception;
extern void  IDL_STD_STDCALL _orderstatus_GetApplId(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t handle,
    /* [out] */ trpc_byteData_t applString,
    /* [out] */ idl_ulong_int *applStringLength,
    /* [out] */ trpc_byteData_t address,
    /* [out] */ idl_ulong_int *addressLength,
    /* [out] */ error_status_t *c_status,
    /* [out] */ error_status_t *f_status
#endif
);
extern void  IDL_STD_STDCALL _impTPCCOrderStatus(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t trpc_h,
    /* [in] */ idl_long_int length,
    /* [in, out] */ idl_char *dataP,
    /* [in, out] */ data_header *headerP,
    /* [in] */ trpc_byteData_t applAndAddress,
    /* [in] */ idl_ulong_int applAndAddressLength,
    /* [in] */ trpc_callbackData_t inCallbackData,
    /* [in] */ idl_ulong_int numOfInCallbackData
#endif
);
globalref mon_handle_t handle;
#if defined(__VMS) && (defined(__DECC) ||
defined(__cplusplus))
#pragma extern_model __save
#pragma extern_model __common_block __shr
#endif
typedef struct _orderstatus_v1_0_epv_t {
void ( IDL_STD_STDCALL *_orderstatus_GetApplId)(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t handle,
    /* [out] */ trpc_byteData_t applString,
    /* [out] */ idl_ulong_int *applStringLength,
    /* [out] */ trpc_byteData_t address,
    /* [out] */ idl_ulong_int *addressLength,
    /* [out] */ error_status_t *c_status,
    /* [out] */ error_status_t *f_status
#endif
);
void ( IDL_STD_STDCALL *_impTPCCOrderStatus)(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t trpc_h,
    /* [in] */ idl_long_int length,
    /* [in, out] */ idl_char *dataP,
    /* [in, out] */ data_header *headerP,
    /* [in] */ trpc_byteData_t applAndAddress,
    /* [in] */ idl_ulong_int applAndAddressLength,
    /* [in] */ trpc_callbackData_t inCallbackData,
    /* [in] */ idl_ulong_int numOfInCallbackData
#endif
);
} _orderstatus_v1_0_epv_t;
extern rpc_if_handle_t _orderstatus_v1_0_c_ifspec;
extern rpc_if_handle_t _orderstatus_v1_0_s_ifspec;
#if defined(__VMS) && (defined(__DECC) ||
defined(__cplusplus))
#pragma extern_model __restore
#endif

#ifdef __cplusplus
    }

#else
#endif
#endif
```

_payment.h

```
/* Generated by IDL compiler version DEC DCE V2.0.0-6
*/
#ifndef _payment_v1_0_included
#define _payment_v1_0_included
#ifndef IDLBASE_H
```

```
#include <dce\idlbase.h>
#endif
#include <dce\rpc.h>
#include "trpc/trpc.h"

#ifdef __cplusplus
    extern "C" {
#endif

#ifndef nbase_v0_0_included
#include "dce\nbase.h"
#endif
#ifndef trpcImports_v0_0_included
#include "trpc\trpcImports.h"
#endif
#ifndef mon_handle_v1_0_included
#include "tpm/mon\mon_handle.h"
#endif
#ifndef tpcc_types_v1_0_included
#include "tpcc_type.h"
#endif
#include <dce\rpcexc.h>
extern EXCEPTION encina_x_transaction_aborted;
extern EXCEPTION encina_x_server_shutdown;
extern EXCEPTION encina_x_permission_denied;
extern EXCEPTION encina_x_object_not_found;
extern EXCEPTION encina_x_empty_slot1;
extern EXCEPTION encina_x_empty_slot2;
extern EXCEPTION encina_x_empty_slot3;
extern EXCEPTION encina_x_empty_slot4;
extern EXCEPTION encina_x_empty_slot5;
extern EXCEPTION encina_x_undefined_exception;
extern void  IDL_STD_STDCALL _payment_GetApplId(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t handle,
    /* [out] */ trpc_byteData_t applString,
    /* [out] */ idl_ulong_int *applStringLength,
    /* [out] */ trpc_byteData_t address,
    /* [out] */ idl_ulong_int *addressLength,
    /* [out] */ error_status_t *c_status,
    /* [out] */ error_status_t *f_status
#endif
);
extern void  IDL_STD_STDCALL _impTPCCPayment(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t trpc_h,
    /* [in] */ idl_long_int length,
    /* [in, out] */ idl_char *dataP,
    /* [in, out] */ data_header *headerP,
    /* [in] */ trpc_byteData_t applAndAddress,
    /* [in] */ idl_ulong_int applAndAddressLength,
    /* [in] */ trpc_callbackData_t inCallbackData,
    /* [in] */ idl_ulong_int numOfInCallbackData
#endif
);
globalref mon_handle_t handle;
#if defined(__VMS) && (defined(__DECC) ||
defined(__cplusplus))
#pragma extern_model __save
#pragma extern_model __common_block __shr
#endif
typedef struct _payment_v1_0_epv_t {
void ( IDL_STD_STDCALL *_payment_GetApplId)(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t handle,
    /* [out] */ trpc_byteData_t applString,
    /* [out] */ idl_ulong_int *applStringLength,
    /* [out] */ trpc_byteData_t address,
    /* [out] */ idl_ulong_int *addressLength,
    /* [out] */ error_status_t *c_status,
    /* [out] */ error_status_t *f_status
#endif
);
void ( IDL_STD_STDCALL *_impTPCCPayment)(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t trpc_h,
    /* [in] */ idl_long_int length,
    /* [in, out] */ idl_char *dataP,
    /* [in, out] */ data_header *headerP,
    /* [in] */ trpc_byteData_t applAndAddress,
    /* [in] */ idl_ulong_int applAndAddressLength,
    /* [in] */ trpc_callbackData_t inCallbackData,
    /* [in] */ idl_ulong_int numOfInCallbackData
#endif
);
} _payment_v1_0_epv_t;
extern rpc_if_handle_t _payment_v1_0_c_ifspec;
extern rpc_if_handle_t _payment_v1_0_s_ifspec;
#if defined(__VMS) && (defined(__DECC) ||
defined(__cplusplus))
#pragma extern_model __restore
#endif

#ifdef __cplusplus
    }

#else
#endif
#endif
```

_stocklevel.h

```
/* Generated by IDL compiler version DEC DCE V2.0.0-6
*/
#ifndef _stocklevel_v1_0_included
#define _stocklevel_v1_0_included
#ifndef IDLBASE_H
#include <dce\idlbase.h>
#endif
#include <dce\rpc.h>
#include "trpc/trpc.h"

#ifdef __cplusplus
    extern "C" {
#endif

#ifndef nbase_v0_0_included
#include "dce\nbase.h"
#endif
#ifndef trpcImports_v0_0_included
#include "trpc\trpcImports.h"
#endif
#ifndef mon_handle_v1_0_included
#include "tpm/mon\mon_handle.h"
#endif
#ifndef tpcc_types_v1_0_included
#include "tpcc_type.h"
#endif
#include <dce\rpcexc.h>
extern EXCEPTION encina_x_transaction_aborted;
extern EXCEPTION encina_x_server_shutdown;
extern EXCEPTION encina_x_permission_denied;
extern EXCEPTION encina_x_object_not_found;
extern EXCEPTION encina_x_empty_slot1;
extern EXCEPTION encina_x_empty_slot2;
extern EXCEPTION encina_x_empty_slot3;
extern EXCEPTION encina_x_empty_slot4;
extern EXCEPTION encina_x_empty_slot5;
extern EXCEPTION encina_x_undefined_exception;
extern void  IDL_STD_STDCALL _stocklevel_GetApplId(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t handle,
    /* [out] */ trpc_byteData_t applString,
    /* [out] */ idl_ulong_int *applStringLength,
    /* [out] */ trpc_byteData_t address,
    /* [out] */ idl_ulong_int *addressLength,
    /* [out] */ error_status_t *c_status,
    /* [out] */ error_status_t *f_status
#endif
);
extern void  IDL_STD_STDCALL _impTPCCStockLevel(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t trpc_h,
    /* [in] */ idl_long_int length,
    /* [in, out] */ idl_char *dataP,
    /* [in, out] */ data_header *headerP,
    /* [in] */ trpc_byteData_t applAndAddress,
    /* [in] */ idl_ulong_int applAndAddressLength,
    /* [in] */ trpc_callbackData_t inCallbackData,
    /* [in] */ idl_ulong_int numOfInCallbackData
#endif
);
globalref mon_handle_t handle;
#if defined(__VMS) && (defined(__DECC) ||
defined(__cplusplus))
#pragma extern_model __save
#pragma extern_model __common_block __shr
#endif
typedef struct _stocklevel_v1_0_epv_t {
void ( IDL_STD_STDCALL *_stocklevel_GetApplId)(
#ifdef IDL_PROTOTYPES
    /* [in] */ handle_t handle,
    /* [out] */ trpc_byteData_t applString,
    /* [out] */ idl_ulong_int *applStringLength,
    /* [out] */ trpc_byteData_t address,
    /* [out] */ idl_ulong_int *addressLength,
    /* [out] */ error_status_t *c_status,
    /* [out] */ error_status_t *f_status
#endif
);
void ( IDL_STD_STDCALL *_impTPCCStockLevel)(
#ifdef IDL_PROTOTYPES
```

```
    /* [in] */ handle_t trpc_h,
    /* [in] */ idl_long_int length,
    /* [in, out] */ idl_char *dataP,
    /* [in, out] */ data_header *headerP,
    /* [in] */ trpc_byteData_t applAndAddress,
    /* [in] */ idl_ulong_int applAndAddressLength,
    /* [in] */ trpc_callbackData_t inCallbackData,
    /* [in] */ idl_ulong_int numOfInCallbackData
#endif
);
} _stocklevel_v1_0_epv_t;
extern rpc_if_handle_t _stocklevel_v1_0_c_ifspec;
extern rpc_if_handle_t _stocklevel_v1_0_s_ifspec;
#if defined(__VMS) && (defined(__DECC) ||
defined(__cplusplus))
#pragma extern_model __restore
#endif

#ifdef __cplusplus
    }

#else
#endif
#endif
```

client_utils.c

```
/* client_utils.c
*/

#include <stdio.h>
#include <time.h>
#include <windows.h>
#include <winperf.h>
#include <winsock.h>
#include "client_utils.h"

#define Li2Double(x) ((double)((x).HighPart) *
4.294967296E9 + (double)((x).LowPart))

static LARGE_INTEGER pFreq;
static double sFreq;
static int print_thread_id = 1;
static int user_id = 0;
static char *user_code = "C";

/*
 *  get_thread_id
 *      A function that returns the thread ID of the
current thread
 */
static int get_thread_id()
{
    return(GetCurrentThreadId());
}


/*
 *  get_prefix
 *        Format the output prefix for printing:
 *        It contains the user_id, 'C' or 'T'
depending on whether it
 *        is a terminal or a client and optional a
thread identifier
 *        The prefix is written in the buffer passed
in by the caller.
 */
static void get_prefix(char *buffer)
{
    if (print_thread_id) {
                    int thread_id = get_thread_id();
                    sprintf(buffer,  "%s(%d-%s-
%d)%s",
                    user_id < 10 ?  "  " : user_id <
100 ? " " : "",
                    user_id,
                    user_code,
                    thread_id,
                    thread_id < 10 ? " " : "");
    } else {
                    sprintf(buffer,  "%s(%2d-%s)",
                    user_id < 10 ? " " : "", user_id,
user_code);
    }
}

/*
 * err_printf
 *      A var-arg function that appends the current
time and
 *      other data to the print request and sends it
to stderr
 *      if it is not a web client, to a file if it is
 */
void err_printf(char *format, ...)
{
    time_t cur_timet;
    char time_str[30];
    char line_prefix[50];
    va_list ap;

    va_start(ap, format);

    cur_timet = time(&cur_timet);
    strftime(time_str, 29, "%X",
localtime(&cur_timet));

    get_prefix(line_prefix);

    fprintf(ERROUT, "%s %s - ", line_prefix,
time_str);
    vfprintf(ERROUT, format, ap);
    fflush(ERROUT);

    va_end(ap);
}


/*
 *  encina_error_message
 *  Report an encina error message by interpreting it
and writing
 *  it to both the logfile (if any) and to standard
error
 */
void encina_error_message(char *msg, unsigned long n)
{
    char errorMsg[ENCINA_MAX_STATUS_STRING_SIZE];
    encina_StatusToString(n,
ENCINA_MAX_STATUS_STRING_SIZE, errorMsg);
    err_printf("ERROR: %s.  Error code = %s (%d 0x%x)
\n", msg, errorMsg, n, n);
}

int get_time_init()
{
     QueryPerformanceFrequency(&pFreq);
     sFreq=Li2Double(pFreq);
     return 0;
}

int get_local_time(time_type *timeP)
{
    double cur_t;
    LARGE_INTEGER counter;

    QueryPerformanceCounter(&counter);
    cur_t = Li2Double(counter) / sFreq;
    timeP->sec = (long)cur_t;
/*    timeP->usec = ((long)cur_t - timeP->sec) *
1000000;*/
    timeP->usec = (long)((cur_t - timeP->sec) *
1000000);
          return 0;
}

/*
 *  time_diff_ms
 *      Return the difference in miliseconds between
two times
 */
int time_diff_ms(struct timeval *t2, struct timeval
*t1)
{
    int t_diff;

    t_diff = (t2->tv_usec + 1000000 - t1->tv_usec +
500) / 1000 +
              (t2->tv_sec - t1->tv_sec - 1) * 1000;

    return(t_diff);
}

/*
 * perfClntDataInit:
 *    Initialization for the shared file mapping.
 *
 * return: pointer to the shared memory space
 *
 * This routine creates a named mapped memory section
that is used
```

```
 * to communicate the TPCC performance data to the
extensible
 * counter DLL for NT perfmon.
 */
total_tran_count_t  *perfClntDataInit()
{
    HANDLE hMappedObject;
    total_tran_count_t  *pClntInfo = NULL;
    TCHAR  szMappedObjectName[] =
TEXT("TPCC_CLNT_COUNTER_BLOCK");

        /* create named section for the performance
data */
        hMappedObject =
CreateFileMapping((HANDLE)0xFFFFFFFF,
                      NULL,
                      PAGE_READWRITE,
                      0,
                      sizeof(total_tran_count_t),
                      szMappedObjectName);
        if (hMappedObject == NULL) {
            err_printf("perfClntDataInit:
CreateFileMapping failed %x\n",
                       GetLastError());
            pClntInfo = NULL;
        } else {
            /* map the section and assign the counter
block pointer
             * to this section of memory
             */
            pClntInfo = (total_tran_count_t *)
MapViewOfFile(hMappedObject,
                          FILE_MAP_ALL_ACCESS,
                          0,
                          0,
                          0);
            if (pClntInfo == NULL) {
                err_printf("perfClntDataInit:
MapViewOfFile failed %x\n",
                           GetLastError());
            }
            else {
                err_printf("perfClntDataInit:
MapViewOfFile success \n");
            }
        }

    return(pClntInfo);
}
```

client_utils.h

```
#ifndef TPCC_CLIENT_UTILS_H
#define TPCC_CLIENT_UTILS_H

#include <stdio.h>
#include <time.h>
#include <dce/rpc.h>
#include <dce/dce_error.h>
#include <encina/encina.h>
#include <stdlib.h>
#include <utils/trace.h>
#include <winsock.h>
#include "mon_client.h"
#include "../include/tpcc_type.h"

extern FILE * errtpcc;
extern FILE *logtpcc;
extern int debug;
extern char log_file_name[];
extern void logprintf( char *format, ...);
extern void err_printf( char *format, ...);
extern void encina_error_message(char *msg, unsigned
long n);
extern int time_diff_ms(struct timeval *t2, struct
timeval *t1);

typedef struct {
    int num;
    int errs;
    double RTtotal[2]; // 1 for server RT and 0 for
client RT
    int RTcount;
} tran_info_t;

/*
 * total_tran_count_t
 *
 * structure that holds the total count of
transaction of each type
 * as well as the reposne times.
 *
 */
typedef struct {
    tran_info_t tran[MAX_TRAN_TYPE + 1];
    int errors;
    double time;
} total_tran_count_t;

/* enc_status_t
 * structure that holds error information
 */
typedef struct {
    int status;
    int line;
    char file[268];
    unsigned long encinaError;
    char errorMsg[ENCINA_MAX_STATUS_STRING_SIZE];
} enc_status_t;

#define FALSE 0
#define TRUE  1

#define DPRINT(args)  if (0) err_printf args


#define CHECK_ENVIRON(str,var)  if (str == NULL) {
fprintf(ERROUT, \
                                "%s environment variable is
not defined.\n",var);  }
#define CHK_STATUS(st, val, _errMsg)
\
     if(st) {
          \
         enc_status.status=val;
\
         strcpy(enc_status.file, __FILE__);
\
         enc_status.line= __LINE__;
\
         enc_status.encinaError = st;
          \
         if(_errMsg)strcpy(enc_status.errorMsg,
_errMsg);       \
         if(st!=1) return;
          \
      }

#define UTIL_IDENT(a)           a

#if        ENCINA_C_ANSI_STRING_TOKEN_SUPPORT
#define UTIL_STRING(a)          # a
#define UTIL_CONCAT(a, b)       a ## b
#else   /* ENCINA_C_ANSI_STRING_TOKEN_SUPPORT */
#define UTIL_STRING(a)          "a"
#define UTIL_CONCAT(a, b)       UTIL_IDENT(a)b
#endif  /* ENCINA_C_ANSI_STRING_TOKEN_SUPPORT */

/*  ENCINA_CALL:  Make fail-fast calls on the various
services.  */
#define ENCINA_CALL(proc_name,call)             \
{                                               \
    unsigned long _status;                      \
    ENCINA_CALL_RC(proc_name,call,_status);     \
    if (_status) exit_program(_status);         \
}


#define ENCINA_CALL_RC(proc_name,call,rc)
\
{
\
    char _errorMsg[ENCINA_MAX_STATUS_STRING_SIZE];
\
    DPRINT(("ENCINA_CALL_RC: before call %s\n",
proc_name));                                \
    rc = (call);
\
    DPRINT(("ENCINA_CALL_RC: after call %s\n",
proc_name));                                    \
    if (rc)  {
\
        encina_StatusToString(rc,
ENCINA_MAX_STATUS_STRING_SIZE,        \
                              _errorMsg);
\
        err_printf( "%x \n", rc);
\
        err_printf( "%s \n", _errorMsg);
\
```

```
        err_printf( "%s \n", proc_name);
\
    }
\
}

void err_printf(char *format, ...);
void encina_error_message(char *msg, unsigned long
n);
int get_time_init();
int get_local_time(time_type *timeP);
int time_diff_ms(struct timeval *t2, struct timeval
*t1);

#endif /*  TPCC_CLIENT_UTILS_H  */
```

databuf.h

```
/*
 *     databuf.h
 *
 * $Revision: 1.1 $
 * $Date: 1998/11/06 21:10:11 $
 * $Log:  databuf.h,v $
 * Revision 4.2  95/05/16  10:55:31  10:55:31  tpcc
(TPCC Benchmark)
 * Added necessary RCS ident strings
 *
 * Revision 4.1  95/05/09  15:21:02  15:21:02  strue
(Scott Truesdale)
 * New code from Transarc - initial version
 *
 * Revision 3.2  95/04/03  17:43:09  17:43:09  strue
(Scott Truesdale)
 * Changes from Transarc - added sql error handling
in client; cleaned up debug handling with macros;
added check on db paramters via call to server.
 *
 * Revision 3.1  95/04/03  15:10:30  15:10:30  strue
(Scott Truesdale)
 * Base of rev 3 - shipped to transarc
 *
 *
 *
 *
 *  $TALog: databuf.h,v $
 * Revision 1.1  1998/11/06  21:10:11  dongfeng
 * - Move all files common to client and server to
tpcc/common
 *   directory
 * [added by delta dongfeng-23677-TPCC-new-directory-
structures, r1.1]
 *
 * Revision 1.3  1998/10/22  15:33:04  wenjian
 * Make changes to Encina server code to connect with
SQL server and add
 * callsql.c and sql directory.
 *
 * Add ERR_BAD_ITEM_ID, which is returned by SLQnew
and same as INVALID_NEWO
 * [from r1.2 by delta wenjian-23529-TPCC-integrate-
with-SQL-server, r1.1]
 *
 * Revision 1.2  1998/01/23  15:07:47  oz
 * - Updated the SP TPCC directory to the latest
files used
 *   during the SP tpcc audit.
 * [from r1.1 by delta oz-20774-TPCC-update-to-
latest-SP-version-11-27, r1.1]
 *
 * Revision 1.1  1997/04/20  11:57:57  oz
 * - This is the code base modified at IBM
Poughkeepsie
 *   by Ofer Zajicek and Radha Sivaramakrishnan for
the
 *   SP scaling test for TPCC.
 * [added by delta oz-19782-TPCC-add-ibm-sp-code,
r1.1]
 *
 * Revision 1.31  1995/10/30  19:10:54  oz
 * [merge of changes from 1.29 to 1.30 into 1.27]
 *
 * Revision 1.30  1995/10/27  15:41:30  oz
 * - Modified the tpc-c code to work with the new
informix
 *   sql code that is in ex_trans.ec
 * [from r1.29 by delta oz-16761-TPCC-modify-code-to-
work-with-oracle, r1.1]
 *
 * Revision 1.27  1995/10/20  18:44:30  ctipper
 * [merge of changes from 1.17 to 1.25 into 1.22]
 *
 * Revision 1.25  1995/10/20  18:15:34  ctipper
 * Incorporate changes per code review.
 *
 * - add DISTRIBUTED_TRAN_FAILED,
TPCC_DB_INFO_PARTIAL, and
 * TPCC_DB_INFO_FAILED error codes to tpcc_rc_t
 * - got rid of MAX_NUM_SERVERS variables
 * [from r1.23 by delta ctipper-16547-TPCC-more-
distributed-trans, r1.2]
 *
 * Revision 1.23  1995/10/13  17:00:26  ctipper
 * This delta encompasses all changes necessary to do
distributed, XA
 * transactions with the TPCC benchmark. This
includes the changes
 * necessary to build with Informix version 6.
 *
 * Each client still talks to only one server,
however, if a distributed
 * transaction is necessary, the client sends the
request to a different
 * interface of that server which then forwards all
or part of the
 * request on to the appropriate remote server.
 *
 * - added new error codes to the tpcc_rc_t
enumeration.
 * - defined MAX_NUM_SERVERS to be 10
 * [from r1.19 by delta ctipper-16547-TPCC-more-
distributed-trans, r1.1]
 *
 * Revision 1.19  1995/09/20  21:02:39  oz
 * -Corrected code for the payment transaction
 * - The distributed case now no longer uses
 *   stored procedures
 * [from r1.18 by delta oz-16547-TPCC-add-
distributed-transactions, r1.2]
 *
 * Revision 1.18  1995/09/20  17:51:10  oz
 * - Added distributed transactions for the new order
and
 *   payment transaction
 *
 * - Added new error codes
 * [from r1.17 by delta oz-16547-TPCC-add-
distributed-transactions, r1.1]
 *
 * Revision 1.22  1995/10/02  20:31:07  oz
 * - Corrected definition of ERROR()
 * [from r1.21 by delta oz-16638-tpcc-modify-
terminal-for-RTE, r1.3]
 *
 * Revision 1.21  1995/10/02  18:51:45  oz
 * - Added definitions needed for utils.c and
liberty.c
 * [from r1.20 by delta oz-16638-tpcc-modify-
terminal-for-RTE, r1.2]
 *
 * Revision 1.20  1995/10/02  15:52:35  oz
 * - Modified the TPC-C benchmark to be compatible
with the RTE.
 * - There are now 3 terminal processes:
 *     emulator: the old terminal process with a
built in
 *               simple emulator
 *     curses: An interactive terminal process using
curses
 *     liberty: An interactive terminal process to be
used with
 *              the RTE compatible with the liberty
freedom terminal.
 *
 * - Define TRUE and FALSE only if they are not
already defined.
 *   (curses.h defines TRUE)
 * - Removed READ_TO_DATE and YEAR_TO_SECOND
 * - Added term_type_t
 * - Added
 *        GOOD_INPUT (0)
 *        WRONG_INPUT (10)
 * [from r1.17 by delta oz-16638-tpcc-modify-
terminal-for-RTE, r1.1]
 *
 * Revision 1.17  1995/07/28  15:28:23  oz
 * - Added a -null and -no_marshalling option to TPCC
 *
 * - Added INVALID_TRAN_TYPE return code
 * [from r1.16 by delta oz-16070-TPCC-add-null-and-
marshalling-test, r1.1]
```

```
 *
 * Revision 1.16  1995/07/18  17:02:38  oz
 * - Added a DCE_ERROR error code
 * [from r1.15 by delta oz-15938-TPCC-add-dce-only-
client, r1.1]
 *
 * Revision 1.15  1995/05/22  19:50:48  shl
 * [merge of changes from 1.12 to 1.13 into 1.14]
 *
 * Revision 1.13  1995/05/18  15:11:27  oz
 * [from r1.12 by delta oz-15290-TPCC-incorporate-hp-
drop-of-05-16-95, r1.1]
 *
 * Revision 1.14  1995/05/22  17:26:35  ctipper
 * [merge of changes from 1.5 to 1.9 into 1.11]
 *
 * [*** log entries omitted ***]
 *
 */

#ifndef __TPCC_DATABUF_H__
#define __TPCC_DATABUF_H__

#define I_NAME_LEN      24
#define I_DATA          50
#define W_NAME_LEN      10
#define ADDR_LEN        20
#define STATE_LEN       2
#define ZIP_LEN         9
#define DIST_INFO_LEN   24
#define S_DATA_LEN      50
#define D_NAME_LEN      10
#define H_DATA_LEN      24
#define CARRIER_LEN     2
#define C_LAST_LEN            17
#define C_MID_LEN       2
#define PHONE_LEN       16
#define CREDIT_LEN      2
#define C_DATA_LEN     500
#define BC_DTA_LEN  23

#define YEAR_TO_DATE   1
#define YEAR_TO_SECOND 2

#define ERROR(x) fprintf(stderr,"Error:
%s\n",#x),exit(11)

#define MAX_STR_LEN     255
#define MAX_OL                15

#ifndef TRUE
#define TRUE    1
#endif
#ifndef FALSE
#define FALSE   0
#endif

#define CANCEL             -1

#define DATETIME_LEN    19
```

```
#define D_PER_W         10

#define COLLECTOR   1                   /* ctipper
5/3/95 */

#define ERR_BAD_ITEM_ID  1  /* copied from sql/tpcc.h
*/
#define RPC_ERROR               -2
#define SUCCESS_CODE                     0

#define CHAR_NULL       '\0'            /* strue
1/23/95 */

typedef enum {
    liberty_term,
    curses_term,
    emulator_term
} term_type_t;

typedef enum {
    GOOD_INPUT = 0,

    SQL_ERROR = 2,
    DCE_ERROR = 4,
    NO_SUCH_LAST_NAME = 5,
    INVALID_TRAN_TYPE = 6,
    INVALID_HANDLE = 7,

    WRONG_INPUT = 10,

    DISTRIBUTED_TRAN_FAILED = 15,

    TPCC_DB_INFO_PARTIAL = 20,
    TPCC_DB_INFO_FAILED,

    TPCC_ERROR_BEGIN_NEWO = 110,

    TPCC_ERROR_DECL_NEWO_SEL_ITEM,
    TPCC_ERROR_OPEN_NEWO_SEL_ITEM,
    TPCC_ERROR_OPEN_DIST_NEWO_SEL_ITEM,
    TPCC_ERROR_FETCH_NEWO_SEL_ITEM,
    TPCC_ERROR_FETCH_DIST_NEWO_SEL_ITEM,
    TPCC_ERROR_PREP_NEWO_SEL_STCK,
    TPCC_ERROR_DECL_NEWO_SEL_STCK,
    TPCC_ERROR_OPEN_NEWO_SEL_STCK,
    TPCC_ERROR_OPEN_DIST_NEWO_SEL_STCK,
    TPCC_ERROR_FETCH_NEWO_SEL_STCK,
    TPCC_ERROR_FETCH_DIST_NEWO_SEL_STCK,
    TPCC_ERROR_NEWO_SELECT,
    TPCC_ERROR_NEWO_UPD_STCK,
    TPCC_ERROR_DIST_NEWO_UPD_STCK,
    TPCC_ERROR_NEWO_SELECT_2,
    TPCC_ERROR_DECL_NEWO_SEL_CUST,
    TPCC_ERROR_OPEN_NEWO_SEL_CUST,
    TPCC_ERROR_OPEN_DIST_NEWO_SEL_CUST,
    TPCC_ERROR_FETCH_NEWO_SEL_CUST,
    TPCC_ERROR_FETCH_DIST_NEWO_SEL_CUST,
    TPCC_ERROR_DECL_NEWO_SEL_DIST,
    TPCC_ERROR_OPEN_NEWO_SEL_DIST,
    TPCC_ERROR_OPEN_DIST_NEWO_SEL_DIST,
    TPCC_ERROR_FETCH_NEWO_SEL_DIST,
```

```
    TPCC_ERROR_FETCH_DIST_NEWO_SEL_DIST,
    TPCC_ERROR_PREP_NEWO_INS_OL,
    TPCC_ERROR_DECL_NEWO_INS_OL,
    TPCC_ERROR_OPEN_NEWO_INS_OL,
    TPCC_ERROR_OPEN_DIST_NEWO_INS_OL,
    TPCC_ERROR_PUT_NEWO_INS_OL,
    TPCC_ERROR_PUT_DIST_NEWO_INS_OL,
    TPCC_ERROR_DECL_NEWO_SEL_WARE,
    TPCC_ERROR_OPEN_NEWO_SEL_WARE,
    TPCC_ERROR_OPEN_DIST_NEWO_SEL_WARE,
    TPCC_ERROR_FETCH_NEWO_SEL_WARE,
    TPCC_ERROR_FETCH_DIST_NEWO_SEL_WARE,
    TPCC_ERROR_EXECUTE_NEWO_UPD_INS,
    TPCC_ERROR_UPDATE_NEWO_NEXT_OID,
    TPCC_ERROR_PREP_NEWO_INS,
    TPCC_ERROR_EXECUTE_DIST_NEWO_INS,
    TPCC_ERROR_EXECUTE_NEWO_COMMIT,
    TPCC_ERROR_ROLLBACK_NEWO,
    TPCC_ERROR_REMOTE_OL_SELECT,
    TPCC_ERROR_REMOTE_OL_UPDATE,

    TPCC_ERROR_OPEN_ORDS_CNT_CID = 200,
    TPCC_ERROR_FETCH_ORDS_CNT_CID,
    TPCC_ERROR_OPEN_ORDS_SEL_CLAST,
    TPCC_ERROR_FETCH_ORDS_SEL_CLAST,
    TPCC_ERROR_OPEN_ORDS_SEL_CID,
    TPCC_ERROR_FETCH_ORDS_SEL_CID,
    TPCC_ERROR_OPEN_ORDS_SEL_OLDORD,
    TPCC_ERROR_FETCH_ORDS_OLDORD,
    TPCC_ERROR_OPEN_ORDS_SEL_OL,
    TPCC_ERROR_FETCH_ORDS_SEL_OL,
    TPCC_ERROR_EXECUTE_ORDS_COMMIT,

    TPCC_ERROR_OPEN_DELIVERY_OLDEST_OID = 300,
    TPCC_ERROR_FETCH_DELIVERY_OLDEST_OID,
    TPCC_ERROR_EXECUTE_DELIVERY_COMMIT,
    TPCC_ERROR_OPEN_DELIVERY_SEL_ORD,
    TPCC_ERROR_FETCH_DELIVERY_SEL_ORD,
    TPCC_ERROR_OPEN_DELIVERY_SEL_SUM_OL,
    TPCC_ERROR_FETCH_DELIVERY_SEL_SUM_OL,
    TPCC_ERROR_EXECUTE_DELIVERY_EXEC_DVRY,
    TPCC_ERROR_SELECT_DELIVERY_ORDER_ID,
    TPCC_ERROR_SELECT_DELIVERY_CARRIER_ID,
    TPCC_ERROR_SELECT_DELIVERY_BALANCE,

    TPCC_ERROR_OPEN_STOCKLEVEL_SEL_OID = 400,
    TPCC_ERROR_FETCH_STOCKLEVEL_SEL_OID,
    TPCC_ERROR_OPEN_STOCKLEVEL_CNT_SID,
    TPCC_ERROR_FETCH_STOCKLEVEL_CNT_SID,
    TPCC_ERROR_OPEN_STOCKLEVEL_FIND,
    TPCC_ERROR_FETCH_STOCKLEVEL_FIND,
    TPCC_ERROR_EXECUTE_STOCKLEVEL_COMMIT,

    TPCC_ERROR_OPEN_PAYMENT_CNT_CID = 500,
    TPCC_ERROR_FETCH_PAYMENT_CNT_CID,
    TPCC_ERROR_OPEN_PAYMENT_SEL_CLAST,
    TPCC_ERROR_FETCH_PAYMENT_SEL_CLAST,
    TPCC_ERROR_OPEN_PAYMENT_SEL_CID,
    TPCC_ERROR_FETCH_PAYMENT_SEL_CID,
    TPCC_ERROR_DECL_PAYMENT_SEL_DIST,
    TPCC_ERROR_OPEN_PAYMENT_SEL_DIST,
```

```
    TPCC_ERROR_OPEN_DIST_PAYMENT_SEL_DIST,
    TPCC_ERROR_FETCH_PAYMENT_SEL_DIST,
    TPCC_ERROR_FETCH_DIST_PAYMENT_SEL_DIST,
    TPCC_ERROR_DECL_PAYMENT_SEL_WARE,
    TPCC_ERROR_OPEN_PAYMENT_SEL_WARE,
    TPCC_ERROR_OPEN_DIST_PAYMENT_SEL_WARE,
    TPCC_ERROR_FETCH_PAYMENT_SEL_WARE,
    TPCC_ERROR_FETCH_DIST_PAYMENT_SEL_WARE,
    TPCC_ERROR_EXECUTE_PAYMENT_UPD_CUST_LAST,
    TPCC_ERROR_EXECUTE_PAYMENT_UPD_CUST_ID,
    TPCC_ERROR_COMMIT_PAYMENT_UPD_CUST,
    TPCC_ERROR_SELECT_PAYMENT_W_YTD,
    TPCC_ERROR_SELECT_PAYMENT_D_YTD,
    TPCC_ERROR_BEGIN_PAYMENT,
    TPCC_ERROR_EXECUTE_PAYMENT_COMMIT,
    TPCC_ERROR_PAYMENT_UPD_CUST_BY_NAME,
    TPCC_ERROR_PAYMENT_UPD_CUST_BY_ID,
    TPCC_ERROR_PAYMENT_UPDATE_DIST,
    TPCC_ERROR_PAYMENT_UPDATE_WH,
    TPCC_ERROR_PAYMENT_INSERT_HISTORY,
    TPCC_ERROR_EXECUTE_PAYMENT_WH_DIST

} tpcc_rc_t;

typedef enum {
    TPCC_DEADLOCK_MSG = 10,
    TPCC_RETRY_MSG
} tpcc_msg_t;

#endif /* __TPCC_DATABUF_H__ */
```

delivery.h

```
#ifndef TRANSARC_delivery_h
#define TRANSARC_delivery_h

#include <trpc/trpc.h>
#include "_delivery.h"

#include <encina/c_prologue.h>

#if defined(BUILDDLL)
#define DLLEXPORT __declspec( dllexport )
#else
#define DLLEXPORT extern
#endif

#ifndef ENCINA_STUB_CALLING
#define ENCINA_STUB_CALLING ENCINA_RPC_CALLING
#endif

#define delivery_v1_0_c_ifspec
          _delivery_v1_0_c_ifspec
#define delivery_v1_0_s_ifspec
          _delivery_v1_0_s_ifspec

typedef struct delivery_v1_0_epv {
void (ENCINA_STUB_CALLING *impTPCCDelivery) (
#ifdef IDL_PROTOTYPES
                    idl_long_int length,
                    idl_char *dataP,
                    data_header *headerP,
                    trpc_status_t *trpcStatus
#endif
);

} delivery_v1_0_epv_t;

DLLEXPORT void ENCINA_STUB_CALLING impTPCCDelivery (
#ifdef IDL_PROTOTYPES

                    idl_long_int length,
                    idl_char *dataP,
                    data_header *headerP,
                    trpc_status_t *trpcStatus
#endif
);

trpc_handle_t        ENCINA_CALLING
mon_handle_t_tranBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

void       ENCINA_CALLING mon_handle_t_tranUnBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_handle_t       trpcHandle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

trpc_handle_t        ENCINA_CALLING
mon_handle_t_tranBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

void       ENCINA_CALLING mon_handle_t_tranUnBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_handle_t       trpcHandle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

extern delivery_v1_0_epv_t
          delivery_v1_0_client_epv;
extern _delivery_v1_0_epv_t
          delivery_v1_0_manager_epv;
extern rpc_mgr_epv_t
          delivery_v1_0_mgr_epv;

#include <encina/c_epilogue.h>
#endif /* TRANSARC_delivery_h */
```

dlldata.c

```
/*********************************************************
*****
   DllData file -- generated by MIDL compiler

        DO NOT ALTER THIS FILE

   This file is regenerated by MIDL on every IDL file
compile.

   To completely reconstruct this file, delete it and
rerun MIDL
   on all the IDL files in this DLL, specifying this
file for the
   /dlldata command line option

*********************************************************
****/


#include <rpcproxy.h>

#ifdef __cplusplus
extern "C"   {
#endif

EXTERN_PROXY_FILE( tpcc_com_ps )


PROXYFILE_LIST_START
/* Start of list */
  REFERENCE_PROXY_FILE( tpcc_com_ps ),
/* End of list */
PROXYFILE_LIST_END


DLLDATA_ROUTINES( aProxyFileList, GET_DLL_CLSID )

#ifdef __cplusplus
}  /*extern "C" */
#endif

/* end of generated dlldata file */
```

install.c

```
/*        FILE:                INSTALL.C
 *                                          Microsoft
TPC-C Kit Ver. 4.51.000
 *                                          Copyright
Microsoft, 2003
 *             All Rights Reserved
 *
 *                                          not audited
```

```
 *
 *        PURPOSE:  Automated installation
application for TPC-C Web Kit
 *        Contact:  Charles Levine
(clevine@microsoft.com)
 *
 *  Change history:
 *                4.20.000 - added COM installation
steps
 *      4.50.000 - added IIS6 configuration options
 *                4.51.000 - added routines to copy
Visual Studio runtime module (MSVCR70.DLL)
 *                                      to
SystemRoot\System32
 */

#include <windows.h>
#include <direct.h>
#include <io.h>
#include <stdlib.h>
#include <stdio.h>
#include <commctrl.h>
#include "..\..\common\src\ReadRegistry.h"
#include <process.h>

#include "resource.h"

#define   WM_INITTEXT                   WM_USER+100

HICON              hIcon;
HINSTANCE hInst;

DWORD                          versionExeMS;
DWORD                          versionExeLS;
DWORD                          versionExeMM;
DWORD                          versionDllMS;
DWORD                          versionDllLS;

// TPC-C registry settings
TPCCREGISTRYDATA    Reg;

static    int                  iPoolThreadLimit;
static    int                  iMaxPoolThreads;
static    int                  iThreadTimeout;
static    int                  iListenBackLog;
static    int                  iAcceptExOutstanding;
static    int                  iUriEnableCache;
static    int                  iUriScavengerPeriod;
static    int                  iMaxConnections;

static    int                  iIISMajorVersion;
static    int                  iNumberOfProcessors;

static    int                  iMaxPhysicalMemory;
          //max physical memory in MB
static    char      szLastFileName[64];           //
last file we worked on (for error reporting)


BOOL      CALLBACK  LicenseDlgProc(HWND hwnd, UINT
uMsg, WPARAM wParam, LPARAM lParam);
BOOL      CALLBACK  UpdatedDlgProc(HWND hwnd, UINT
uMsg, WPARAM wParam, LPARAM lParam);
BOOL      CALLBACK  MainDlgProc(HWND hwnd, UINT uMsg,
WPARAM wParam, LPARAM lParam);
BOOL      CALLBACK  CopyDlgProc(HWND hwnd, UINT uMsg,
WPARAM wParam, LPARAM lParam);
static    void                 ProcessOK(HWND hwnd,
char *szDllPath, char *szWindowsPath);
static    void
          ReadRegistrySettings(void);
static    void
          WriteRegistrySettings(char *szDllPath);
static    BOOL                 RegisterDLL(char
*szFileName);
static    int
          CopyFiles(HWND hDlg, char *szDllPath, char
*szWindowsPath);
static    BOOL                 GetInstallPath(char
*szDllPath);
static    BOOL
          GetWindowsInstallPath(char *szWindowsPath);
static    void                 GetVersionInfo(char
*szDLLPath, char *szExePath);
static    BOOL
          CheckWWWebService(void);
static    BOOL
          StartWWWebService(void);
static    BOOL                 StopWWWebService(void);
static    void                 UpdateDialog(HWND
hDlg);
static    void                 ConfigureIIS6(HWND
hwnd, HWND hDlg);

SYSTEM_INFO siSysInfo;

BOOL install_com(char *szDllPath);

#include "..\..\common\src\ReadRegistry.cpp"

int WINAPI WinMain( HINSTANCE hInstance, HINSTANCE
hPrevInstance, LPSTR lpCmdLine, int nCmdShow )
{
          int iRc;

          hInst = hInstance;

          InitCommonControls();

          hIcon = LoadIcon(hInstance,
MAKEINTRESOURCE(IDI_ICON1));

          iRc = DialogBox(hInstance,
MAKEINTRESOURCE(IDD_DIALOG4), GetDesktopWindow(),
LicenseDlgProc);
          if ( iRc )
          {
                    iRc = DialogBox(hInstance,
MAKEINTRESOURCE(IDD_DIALOG1), GetDesktopWindow(),
MainDlgProc);
                    if ( iRc )
                    {
          DialogBoxParam(hInstance,
MAKEINTRESOURCE(IDD_DIALOG2), GetDesktopWindow(),
UpdatedDlgProc, (LPARAM)iRc);
                    }
          }

          DestroyIcon(hIcon);
          return 0;
}

BOOL CALLBACK LicenseDlgProc(HWND hwnd, UINT uMsg,
WPARAM wParam, LPARAM lParam)
{
          HGLOBAL                       hRes;
          HRSRC                         hResInfo;
          BYTE                          *pSrc, *pDst;
          DWORD                         dwSize;
          static HFONT        hFont;

          switch(uMsg)
          {
                    case WM_INITDIALOG:
                              hFont = CreateFont(-12,
0, 0, 0, 400, 0, 0, 0, 0, 0, 0, 0, 0, "Arial");
                              SendMessage(
GetDlgItem(hwnd, IDR_LICENSE1), WM_SETFONT,
(WPARAM)hFont, MAKELPARAM(0, 0) );
                              PostMessage(hwnd,
WM_INITTEXT, (WPARAM)0, (LPARAM)0);
                              return TRUE;
                    case WM_INITTEXT:
                              hResInfo =
FindResource(hInst, MAKEINTRESOURCE(IDR_LICENSE1),
"LICENSE");
                              dwSize =
SizeofResource(hInst, hResInfo);
                              hRes =
LoadResource(hInst, hResInfo );
                              pSrc = (BYTE
*)LockResource(hRes);
                              pDst = (unsigned char
*)malloc(dwSize+1);
                              if ( pDst )
                              {
                                        memcpy(pDst,
pSrc, dwSize);
                                        pDst[dwSize]
= 0;

          SetDlgItemText(hwnd, IDC_LICENSE, (const
char *)pDst);
                                        free(pDst);
                              }
                              else

          SetDlgItemText(hwnd, IDC_LICENSE, (const
char *)pSrc);
                              return TRUE;
                    case WM_DESTROY:
                              DeleteObject(hFont);
```

```
                        return TRUE;
                case WM_COMMAND:
                        if ( wParam == IDOK )

        EndDialog(hwnd, TRUE);
                        if ( wParam == IDCANCEL
)

        EndDialog(hwnd, FALSE);
                default:
                        break;
        }
        return FALSE;
}

BOOL CALLBACK UpdatedDlgProc(HWND hwnd, UINT uMsg,
WPARAM wParam, LPARAM lParam)
{
        switch(uMsg)
        {
                case WM_INITDIALOG:
                        switch(lParam)
                        {
                                case 1:
                                case 2:

        SetDlgItemText(hwnd, IDC_RESULTS, "TPC-C
Web Client Installed");

        break;
                        }
                        return TRUE;
                case WM_COMMAND:
                        if ( wParam == IDOK )

        EndDialog(hwnd, TRUE);
                        break;
                default:
                        break;
        }
        return FALSE;
}

BOOL CALLBACK MainDlgProc(HWND hwnd, UINT uMsg,
WPARAM wParam, LPARAM lParam)
{
        PAINTSTRUCT                 ps;
        MEMORYSTATUS        memoryStatus;
        OSVERSIONINFO       VI;
        char                        szTmp[256];
        static char
        szDllPath[256];
        static char
        szWindowsPath[256];
        static char
        szExePath[256];

        switch(uMsg)
        {
                case WM_INITDIALOG:

        GlobalMemoryStatus(&memoryStatus);
                        iMaxPhysicalMemory  =
(memoryStatus.dwTotalPhys/ 1048576);

                        if (
GetWindowsInstallPath(szWindowsPath) )
                        {

        MessageBox(hwnd, "Error: Cannot determine
Windows System Root.", NULL, MB_ICONSTOP | MB_OK);

        EndDialog(hwnd, FALSE);
                                return TRUE;
                        }

                        if (
GetInstallPath(szDllPath) )
                        {

        MessageBox(hwnd, "Error internet service
inetsrv is not installed.", NULL, MB_ICONSTOP |
MB_OK);

        EndDialog(hwnd, FALSE);
                                return TRUE;
                        }

                        // set default values
                        ZeroMemory( &Reg,
sizeof(Reg) );

        Reg.dwNumberOfDeliveryThreads = 4;
                        Reg.dwMaxConnections =
100;

        Reg.dwMaxPendingDeliveries    = 100;
                        Reg.eDB_Protocol =
DBLIB;
                        Reg.eTxnMon = None;
                        strcpy(Reg.szDbServer,
                "");
                        strcpy(Reg.szDbName,
                "tpcc");
                        strcpy(Reg.szDbUser,
                "sa");

        strcpy(Reg.szDbPassword,      "");

                        iPoolThreadLimit =
iMaxPhysicalMemory * 2;
                        iThreadTimeout = 86400;
                        iListenBackLog = 15;
                        iAcceptExOutstanding =
40;


        ReadTPCCRegistrySettings( &Reg );
                        ReadRegistrySettings();

                        // copy the hardware
information to the SYSTEM_INFO structure

        GetSystemInfo(&siSysInfo);
                        // store the number of
processors on this system
                        iNumberOfProcessors =
siSysInfo.dwNumberOfProcessors;


        GetModuleFileName(hInst, szExePath,
sizeof(szExePath));

        GetVersionInfo(szDllPath, szExePath);

                        wsprintf(szTmp,
"Version %d.%2.2d.%3.3d", versionExeMS, versionExeMM,
versionExeLS);
                        SetDlgItemText(hwnd,
IDC_VERSION, szTmp);

                        SetDlgItemText(hwnd,
IDC_PATH, szDllPath);

                        SetDlgItemText(hwnd,
ED_DB_SERVER, Reg.szDbServer);
                        SetDlgItemText(hwnd,
ED_DB_USER_ID, Reg.szDbUser);
                        SetDlgItemText(hwnd,
ED_DB_PASSWORD, Reg.szDbPassword);
                        SetDlgItemText(hwnd,
ED_DB_NAME, Reg.szDbName);

                        SetDlgItemInt(hwnd,
ED_THREADS, Reg.dwNumberOfDeliveryThreads, FALSE);
                        SetDlgItemInt(hwnd,
ED_MAXCONNECTION, Reg.dwMaxConnections, FALSE);
                        SetDlgItemInt(hwnd,
ED_MAXDELIVERIES, Reg.dwMaxPendingDeliveries, FALSE);
                        SetDlgItemInt(hwnd,
ED_IIS_MAX_THEAD_POOL_LIMIT, iPoolThreadLimit,
FALSE);
                        SetDlgItemInt(hwnd,
ED_IIS_THREAD_TIMEOUT, iThreadTimeout, FALSE);
                        SetDlgItemInt(hwnd,
ED_IIS_LISTEN_BACKLOG, iListenBackLog, FALSE);
                        SetDlgItemInt(hwnd,
ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE,
iAcceptExOutstanding, FALSE);

                        CheckDlgButton(hwnd,
IDC_DBLIB, 0);
                        CheckDlgButton(hwnd,
IDC_ODBC,  0);
                        if ( Reg.eDB_Protocol
== DBLIB )

        CheckDlgButton(hwnd, IDC_DBLIB, 1);
                        else

        CheckDlgButton(hwnd, IDC_ODBC,  1);
```

```
                        // check OS version
level for COM.  Must be at least Windows 2000
                        VI.dwOSVersionInfoSize
= sizeof(VI);
                        GetVersionEx( &VI );
                        if (VI.dwMajorVersion <
5)
                        {
                                HWND hDlg =
GetDlgItem( hwnd, IDC_TM_MTS );
                                EnableWindow(
hDlg, 0 );          // disable COM option
                                if
(Reg.eTxnMon == COM)

          Reg.eTxnMon = None;
                        }

                        CheckDlgButton(hwnd,
IDC_TM_NONE,   0);
                        CheckDlgButton(hwnd,
IDC_TM_TUXEDO, 0);
                        CheckDlgButton(hwnd,
IDC_TM_MTS,    0);
                        CheckDlgButton(hwnd,
IDC_TM_ENCINA,      0);
                        switch (Reg.eTxnMon)
                        {
                        case None:

          CheckDlgButton(hwnd, IDC_TM_NONE,   1);
                                break;
                        case TUXEDO:

          CheckDlgButton(hwnd, IDC_TM_TUXEDO, 1);
                                break;
                        case ENCINA:

          CheckDlgButton(hwnd, IDC_TM_ENCINA, 1);
                                break;
                        case COM:

          CheckDlgButton(hwnd, IDC_TM_MTS,        1);
                                break;
                        }

                        return TRUE;
                case WM_PAINT:
                        if ( IsIconic(hwnd) )
                        {

          BeginPaint(hwnd, &ps);

          DrawIcon(ps.hdc, 0, 0, hIcon);

          EndPaint(hwnd, &ps);
                                return TRUE;
                        }
                        break;
                case WM_COMMAND:
                        if ( HIWORD(wParam) ==
BN_CLICKED )
                        {
                                switch(
LOWORD(wParam) )
                                {

          case IDC_DBLIB:

          return TRUE;

          case IDC_ODBC:

          return TRUE;

          case IDOK:

          ProcessOK(hwnd, szDllPath, szWindowsPath);

          return TRUE;

          case IDCANCEL:

          EndDialog(hwnd, FALSE);

          return TRUE;

          default:

          return FALSE;
                                }
                        }
                        break;
                default:
                        break;
          }
          return FALSE;
}

static void ProcessOK(HWND hwnd, char *szDllPath,
char *szWindowsPath)
{
          int             d;
          HWND      hDlg;
          int             rc;
          BOOL      bSvcRunning;

          char      szFullName[256];
          char      szErrTxt[128];

          // read settings from dialog
          Reg.dwNumberOfDeliveryThreads  =
GetDlgItemInt(hwnd, ED_THREADS, &d, FALSE);
          Reg.dwMaxConnections = GetDlgItemInt(hwnd,
ED_MAXCONNECTION, &d, FALSE);
          Reg.dwMaxPendingDeliveries =
GetDlgItemInt(hwnd, ED_MAXDELIVERIES, &d, FALSE);

          GetDlgItemText(hwnd, ED_DB_SERVER,
Reg.szDbServer, sizeof(Reg.szDbServer));
          GetDlgItemText(hwnd, ED_DB_USER_ID,
Reg.szDbUser, sizeof(Reg.szDbUser));
          GetDlgItemText(hwnd, ED_DB_PASSWORD,
Reg.szDbPassword, sizeof(Reg.szDbPassword));
          GetDlgItemText(hwnd, ED_DB_NAME,
Reg.szDbName, sizeof(Reg.szDbName));

          if ( IsDlgButtonChecked(hwnd, IDC_DBLIB) )
          {
                    Reg.eDB_Protocol = DBLIB;
                    rc = 1;
          }
          else if ( IsDlgButtonChecked(hwnd,
IDC_ODBC) )
          {
                    Reg.eDB_Protocol = ODBC;
                    rc = 2;
          }

          if ( IsDlgButtonChecked(hwnd, IDC_TM_NONE)
)
                    Reg.eTxnMon = None;
          else if ( IsDlgButtonChecked(hwnd,
IDC_TM_TUXEDO) )
                    Reg.eTxnMon = TUXEDO;
          else if ( IsDlgButtonChecked(hwnd,
IDC_TM_MTS) )
                    Reg.eTxnMon = COM;
          else if ( IsDlgButtonChecked(hwnd,
IDC_TM_ENCINA) )
                    Reg.eTxnMon = ENCINA;

          iPoolThreadLimit = GetDlgItemInt(hwnd,
ED_IIS_MAX_THEAD_POOL_LIMIT, &d, FALSE);
          iThreadTimeout = GetDlgItemInt(hwnd,
ED_IIS_THREAD_TIMEOUT,        &d, FALSE);
          iListenBackLog = GetDlgItemInt(hwnd,
ED_IIS_LISTEN_BACKLOG, &d, FALSE);
          iAcceptExOutstanding = GetDlgItemInt(hwnd,
ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE, &d, FALSE);


          ShowWindow(hwnd, SW_HIDE);
          hDlg = CreateDialog(hInst,
MAKEINTRESOURCE(IDD_DIALOG3), hwnd, CopyDlgProc);
          ShowWindow(hDlg, SW_SHOWNA);
          UpdateDialog(hDlg);

          // check to see if the web services are
running
          bSvcRunning = CheckWWWebService();
          if ( bSvcRunning )
          {
                    SetDlgItemText(hDlg, IDC_STATUS,
"Stopping Web Service.");
                    SendDlgItemMessage(hDlg,
IDC_PROGRESS1, PBM_STEPIT, 0, 0);
                    UpdateDialog(hDlg);

                    StopWWWebService();
```

```
                    SendDlgItemMessage(hDlg,
IDC_PROGRESS1, PBM_STEPIT, 0, 0);
                    UpdateDialog(hDlg);
          }

          // write binaries to inetpub\wwwroot
          rc = CopyFiles(hDlg, szDllPath,
szWindowsPath);
          if ( !rc )
          {
                    ShowWindow(hwnd, SW_SHOWNA);
                    DestroyWindow(hDlg);
                    strcpy( szErrTxt, "Error(s)
occured when creating " );
                    strcat( szErrTxt, szLastFileName
);
                    MessageBox(hwnd, szErrTxt, NULL,
MB_ICONSTOP | MB_OK);
                    EndDialog(hwnd, 0);
                    return;
          }

          // while we have the web services shutdown,
check to see if this
          // is IIS6.  If it is, then call
ConfigureIIS6
          if ( iIISMajorVersion == 6)
          {
                    ConfigureIIS6(hwnd, hDlg);
          }

          //if we stopped service restart it.
          if ( bSvcRunning )
          {
                    SetDlgItemText(hDlg, IDC_STATUS,
"Starting Web Service.");
                    SendDlgItemMessage(hDlg,
IDC_PROGRESS1, PBM_STEPIT, 0, 0);
                    UpdateDialog(hDlg);
                    StartWWWebService();
          }

          // update registry
          SetDlgItemText(hDlg, IDC_STATUS, "Updating
Registry.");
          SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
          UpdateDialog(hDlg);
          WriteRegistrySettings(szDllPath);

          // register com proxy stub
          strcpy(szFullName, szDllPath);
          strcat(szFullName, "tpcc_com_ps.dll");
          if (!RegisterDLL(szFullName))
          {
                    ShowWindow(hwnd, SW_SHOWNA);
                    DestroyWindow(hDlg);
                    strcpy( szErrTxt, "Error occured
when registering " );
                    strcat( szErrTxt, szFullName );
                    MessageBox(hwnd, szErrTxt, NULL,
MB_ICONSTOP | MB_OK);
                    EndDialog(hwnd, 0);
                    return;
          }

          // if using COM
          if (Reg.eTxnMon == COM)
          {
                    SetDlgItemText(hDlg, IDC_STATUS,
"Configuring COM.");
                    SendDlgItemMessage(hDlg,
IDC_PROGRESS1, PBM_STEPIT, 0, 0);
                    UpdateDialog(hDlg);

                    if (install_com(szDllPath))
                    {
                              ShowWindow(hwnd,
SW_SHOWNA);
                              DestroyWindow(hDlg);
                              strcpy( szErrTxt,
"Error occured when configuring COM settings." );
                              MessageBox(hwnd,
szErrTxt, NULL, MB_ICONSTOP | MB_OK);
                              EndDialog(hwnd, 0);
                              return;
                    }
          }

          Sleep(100);

          ShowWindow(hwnd, SW_SHOWNA);
          DestroyWindow(hDlg);

          EndDialog(hwnd, rc);
          return;
}

static void ReadRegistrySettings(void)
{
          HKEY      hKey;
          DWORD     size;
          DWORD     type;

          if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SOFTWARE\\Microsoft\\InetStp", 0, KEY_READ, &hKey)
== ERROR_SUCCESS )
          {
                    size = sizeof(iIISMajorVersion);
                    if ( RegQueryValueEx(hKey,
"MajorVersion", 0, &type, (char *)&iIISMajorVersion,
&size) == ERROR_SUCCESS )
                              if ( !iIISMajorVersion
)

          iIISMajorVersion = 5;
          }

          if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\Inetinfo\\Param
eters", 0, KEY_READ, &hKey) == ERROR_SUCCESS )
          {
                    if ( iIISMajorVersion == 6)
                    {
                              // since IIS6 handles
the pool thread parameters differently, we need to
fill in the dialog
                              // with the
MaxPoolThreads rather thatn PoolThreadLimit
                              // for ease of coding,
we are just going to stuff the value into
iPoolThreadLimit
                    size = sizeof(iPoolThreadLimit);
                              if (
RegQueryValueEx(hKey, "MaxPoolThreads", 0, &type,
(char *)&iPoolThreadLimit, &size) == ERROR_SUCCESS )
                              if ( !iPoolThreadLimit
)

          iPoolThreadLimit =  iMaxPhysicalMemory * 2;
                    }
                    else
                    {
                              size =
sizeof(iPoolThreadLimit);
                              if (
RegQueryValueEx(hKey, "MaxPoolThreads", 0, &type,
(char *)&iPoolThreadLimit, &size) == ERROR_SUCCESS )
                              if ( !iPoolThreadLimit
)

          iPoolThreadLimit =  iMaxPhysicalMemory * 2;
                    }

                    size = sizeof(iThreadTimeout);
                    if ( RegQueryValueEx(hKey,
"ThreadTimeout", 0, &type, (char *)&iThreadTimeout,
&size) == ERROR_SUCCESS )
                              if ( !iThreadTimeout )

          iThreadTimeout = 86400;

                    size = sizeof(iListenBackLog);
                    if ( RegQueryValueEx(hKey,
"ListenBackLog", 0, &type, (char *)&iListenBackLog,
&size) == ERROR_SUCCESS )
                              if ( !iListenBackLog )

          iListenBackLog = 15;

                    RegCloseKey(hKey);
          }

          if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\W3SVC\\Paramete
rs", 0, KEY_READ, &hKey) == ERROR_SUCCESS )
          {
                    size =
sizeof(iAcceptExOutstanding);
                    if ( RegQueryValueEx(hKey,
"AcceptExOutstanding", 0, &type, (char
*)&iAcceptExOutstanding, &size) == ERROR_SUCCESS )
```

```
                        if (
!iAcceptExOutstanding )

          iAcceptExOutstanding = 40;

                    RegCloseKey(hKey);
          }
          if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\HTTP\\Parameter
s", 0, KEY_READ, &hKey) == ERROR_SUCCESS )
          {
                    size = sizeof(iUriEnableCache);
                    if ( RegQueryValueEx(hKey,
"UriEnableCache", 0, &type, (char *)&iUriEnableCache,
&size) == ERROR_SUCCESS )
                        if ( !iUriEnableCache )

          iUriEnableCache = 0;

                    size =
sizeof(iUriScavengerPeriod);
                    if ( RegQueryValueEx(hKey,
"UriScavengerPeriod", 0, &type, (char
*)&iUriScavengerPeriod, &size) == ERROR_SUCCESS )
                        if (
!iUriScavengerPeriod )

          iUriScavengerPeriod = 10800;

                    size = sizeof(iMaxConnections);
                    if ( RegQueryValueEx(hKey,
"MaxConnections", 0, &type, (char *)&iMaxConnections,
&size) == ERROR_SUCCESS )
                        if ( !iMaxConnections )

          iMaxConnections = 100000;

                    RegCloseKey(hKey);
          }
}


static void WriteRegistrySettings(char *szDllPath)
{
          HKEY      hKey;
          DWORD     dwDisposition;
          char      szTmp[256];
          char      *ptr;
          int                 iRc;

          if ( RegCreateKeyEx(HKEY_LOCAL_MACHINE,
"SOFTWARE\\Microsoft\\TPCC", 0, NULL,
REG_OPTION_NON_VOLATILE, KEY_ALL_ACCESS, NULL, &hKey,
&dwDisposition) == ERROR_SUCCESS )
          {
                    strcpy(szTmp, szDllPath);
                    ptr = strstr(szTmp, "tpcc");
                    if ( ptr )
                              *ptr = 0;

                    RegSetValueEx(hKey, "Path", 0,
REG_SZ, szTmp, strlen(szTmp)+1);

                    RegSetValueEx(hKey,
"NumberOfDeliveryThreads", 0, REG_DWORD, (char
*)&Reg.dwNumberOfDeliveryThreads,
sizeof(Reg.dwNumberOfDeliveryThreads));
                    RegSetValueEx(hKey,
"MaxConnections", 0, REG_DWORD, (char
*)&Reg.dwMaxConnections,
sizeof(Reg.dwMaxConnections));
                    RegSetValueEx(hKey,
"MaxPendingDeliveries", 0, REG_DWORD, (char
*)&Reg.dwMaxPendingDeliveries,
sizeof(Reg.dwMaxPendingDeliveries));

                    RegSetValueEx(hKey,
"DB_Protocol", 0, REG_SZ,
szDBNames[Reg.eDB_Protocol],
strlen(szDBNames[Reg.eDB_Protocol])+1);
                    RegSetValueEx(hKey, "TxnMonitor",
0, REG_SZ, szTxnMonNames[Reg.eTxnMon],
strlen(szTxnMonNames[Reg.eTxnMon])+1);

                    RegSetValueEx(hKey, "DbServer",
0, REG_SZ, Reg.szDbServer, strlen(Reg.szDbServer)+1);
                    RegSetValueEx(hKey, "DbName", 0,
REG_SZ, Reg.szDbName, strlen(Reg.szDbName)+1);
                    RegSetValueEx(hKey, "DbUser", 0,
REG_SZ, Reg.szDbUser, strlen(Reg.szDbUser)+1);
                    RegSetValueEx(hKey, "DbPassword",
0, REG_SZ, Reg.szDbPassword,
strlen(Reg.szDbPassword)+1);

                    strcpy(szTmp, "YES");
                    RegSetValueEx(hKey,
"COM_SinglePool", 0, REG_SZ, szTmp, strlen(szTmp)+1);

                    RegFlushKey(hKey);
                    RegCloseKey(hKey);
          }

          if (
(iRc=RegCreateKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\Inetinfo\\Param
eters", 0, NULL, REG_OPTION_NON_VOLATILE,
KEY_ALL_ACCESS, NULL, &hKey, &dwDisposition)) ==
ERROR_SUCCESS )
          {
                    // if this is IIS6, then we need
to treat the PoolThreadLimit differently
                    // if IIS6, then PoolThreadLimit
is the maximum number of threads for the entire
system.
                    // IIS6 added MaxPoolThreads
which controls the number of threads per processor.
For IIS6
                    // we will set MaxPoolThreads to
the value the user proivided in the dialog and then
set
                    // PoolThreadLimit to
MaxPoolThreads * number of processors on this system
                    if ( iIISMajorVersion == 6 )
                    {
                              iMaxPoolThreads =
iPoolThreadLimit;
                              iPoolThreadLimit =
iMaxPoolThreads * iNumberOfProcessors;
                              RegSetValueEx(hKey,
"PoolThreadLimit", 0, REG_DWORD, (char
*)&iPoolThreadLimit, sizeof(iPoolThreadLimit));
                              RegSetValueEx(hKey,
"MaxPoolThreads", 0, REG_DWORD, (char
*)&iMaxPoolThreads, sizeof(iMaxPoolThreads));
                    }
                    else
                    {
                              RegSetValueEx(hKey,
"PoolThreadLimit", 0, REG_DWORD, (char
*)&iPoolThreadLimit, sizeof(iPoolThreadLimit));
                    }

                    RegSetValueEx(hKey,
"ThreadTimeout", 0, REG_DWORD, (char
*)&iThreadTimeout, sizeof(iThreadTimeout));
                    RegSetValueEx(hKey,
"ListenBackLog", 0, REG_DWORD, (char
*)&iListenBackLog, sizeof(iListenBackLog));

                    RegFlushKey(hKey);
                    RegCloseKey(hKey);
          }

          if (
(iRc=RegCreateKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\W3SVC\\Paramete
rs", 0, NULL, REG_OPTION_NON_VOLATILE,
KEY_ALL_ACCESS, NULL, &hKey, &dwDisposition)) ==
ERROR_SUCCESS )
          {
                    RegSetValueEx(hKey,
"AcceptExOutstanding", 0, REG_DWORD, (char
*)&iAcceptExOutstanding,
sizeof(iAcceptExOutstanding));

                    RegFlushKey(hKey);
                    RegCloseKey(hKey);
          }

          return;
}

BOOL CALLBACK CopyDlgProc(HWND hwnd, UINT uMsg,
WPARAM wParam, LPARAM lParam)
{
          if ( uMsg == WM_INITDIALOG )
          {
                    SendDlgItemMessage(hwnd,
IDC_PROGRESS1, PBM_SETRANGE, 0, MAKELPARAM(0, 16));
                    SendDlgItemMessage(hwnd,
IDC_PROGRESS1, PBM_SETSTEP, (WPARAM)1, 0);
```

```
                return TRUE;
        }
        return FALSE;
}

BOOL RegisterDLL(char *szFileName)
{
        HINSTANCE hLib;
        FARPROC             lpDllEntryPoint;

        hLib = LoadLibrary(szFileName);
        if ( hLib == NULL )
                return FALSE;
        // Find the entry point.
        lpDllEntryPoint = GetProcAddress(hLib,
"DllRegisterServer");
        if (lpDllEntryPoint != NULL)
        {
                return ((*lpDllEntryPoint)() ==
S_OK);
        }
        else
                return FALSE;       //unable to
locate entry point
}

BOOL FileFromResource( char *szResourceName, int
iResourceId, char *szDllPath, char *szFileName )
{
        HGLOBAL                     hDLL;
        HRSRC                       hResInfo;
        HANDLE                      hFile;
        DWORD                       dwSize;
        BYTE                        *pSrc;
        DWORD                       d;
        char
        szFullName[256];

        hResInfo = FindResource(hInst,
MAKEINTRESOURCE(iResourceId), szResourceName);

        strcpy(szFullName, szDllPath);
        strcat(szFullName, szFileName);

        dwSize = SizeofResource(hInst, hResInfo);
        hDLL = LoadResource(hInst, hResInfo );
        pSrc = (BYTE *)LockResource(hDLL);
        remove(szFullName);

        if ( !(hFile = CreateFile(szFullName,
GENERIC_WRITE, 0, NULL, CREATE_ALWAYS,
FILE_ATTRIBUTE_NORMAL, NULL)) )
                return FALSE;

        if ( !WriteFile(hFile, pSrc, dwSize, &d,
NULL) )
                return FALSE;

        CloseHandle(hFile);

        UnlockResource(hDLL);
        FreeResource(hDLL);
        return TRUE;
}

static int CopyFiles(HWND hDlg, char *szDllPath, char
*szWindowsPath)
{
        SetDlgItemText(hDlg, IDC_STATUS, "Copying
Files...");
        SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
        UpdateDialog(hDlg);

        // install TPCC.DLL
        strcpy( szLastFileName, "tpcc.dll" );
        if (!FileFromResource( "TPCCDLL",
IDR_TPCCDLL, szDllPath, szLastFileName ))
                return 0;
        SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
        UpdateDialog(hDlg);


        // install MSVCR70.DLL
        strcpy( szLastFileName, "msvcr70.dll" );
        if (!FileFromResource( "MSVCRT70",
IDR_MSVCRT701, szWindowsPath, szLastFileName ))
                return 0;
        SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
        UpdateDialog(hDlg);

        // install tpcc_dblib.dll
        strcpy( szLastFileName, "tpcc_dblib.dll" );
        if (!FileFromResource( "DBLIB_DLL",
IDR_DBLIB_DLL, szDllPath, szLastFileName ))
                return 0;
        SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
        UpdateDialog(hDlg);

        // install tpcc_odbc.dll
        strcpy( szLastFileName, "tpcc_odbc.dll" );
        if (!FileFromResource( "ODBC_DLL",
IDR_ODBC_DLL, szDllPath, szLastFileName ))
                return 0;
        SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
        UpdateDialog(hDlg);

        // install tuxapp.exe
        strcpy( szLastFileName, "tuxapp.exe" );
        if (!FileFromResource( "TUXEDO_APP",
IDR_TUXEDO_APP, szDllPath, szLastFileName ))
                return 0;
        //SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
        //UpdateDialog(hDlg);

        // install tpcc_tuxedo.dll
        strcpy( szLastFileName, "tpcc_tuxedo.dll"
);
        if (!FileFromResource( "TUXEDO_DLL",
IDR_TUXEDO_DLL, szDllPath, szLastFileName ))
                return 0;
        //SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
        //UpdateDialog(hDlg);

        // install tpcc_com.dll
        strcpy( szLastFileName, "tpcc_com.dll" );
        if (!FileFromResource( "COM_DLL",
IDR_COM_DLL, szDllPath, szLastFileName ))
                return 0;
        SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
        UpdateDialog(hDlg);

        // install tpcc_com_all.tlb
        strcpy( szLastFileName, "tpcc_com_all.tlb"
);
        if (!FileFromResource( "COM_TYPLIB",
IDR_COMTYPLIB_DLL, szDllPath, szLastFileName ))
                return 0;
        SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
        UpdateDialog(hDlg);

        // install tpcc_com_ps.dll
        strcpy( szLastFileName, "tpcc_com_ps.dll"
);
        if (!FileFromResource( "COM_PS_DLL",
IDR_COMPS_DLL, szDllPath, szLastFileName ))
                return 0;
        SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
        UpdateDialog(hDlg);

        // install tpcc_com_all.dll
        strcpy( szLastFileName, "tpcc_com_all.dll"
);
        if (!FileFromResource( "COM_ALL_DLL",
IDR_COMALL_DLL, szDllPath, szLastFileName ))
                return 0;
        SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
        UpdateDialog(hDlg);

        SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
        UpdateDialog(hDlg);

        return 1;
}

static BOOL GetInstallPath(char *szDllPath)
{
    HKEY  hKey;
        BYTE      szData[256];
        DWORD     sv;
        BOOL      bRc;
```

```
        int                 len;
        int                 iRc;


        // Registry key
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\InetStp\PathWWW
Root is used to find the
        // IIS default web site directory and
determine that IIS is installed.

        szDllPath[0] =  0;
        bRc = TRUE;
        if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SOFTWARE\\Microsoft\\InetStp", 0, KEY_ALL_ACCESS,
&hKey) == ERROR_SUCCESS )
        {
                sv = sizeof(szData);
                iRc = RegQueryValueEx( hKey,
"PathWWWRoot", NULL, NULL, szData, &sv );  // used by
IIS 5.0 & 6.0
                if (iRc == ERROR_SUCCESS)
                {
                        bRc = FALSE;
                        strcpy(szDllPath,
szData);
                        len =
strlen(szDllPath);
                        if ( szDllPath[len-1]
!= '\\' )
                        {

        szDllPath[len] = '\\';

        szDllPath[len+1] = 0;
                        }
                }

                RegCloseKey(hKey);
        }

        return bRc;
}

static BOOL GetWindowsInstallPath(char
*szWindowsPath)
{
    HKEY  hKey;
        BYTE      szData[256];
        DWORD     sv;
        BOOL      bRc;
        int                 len;
        int                 iRc;


        // Registry key
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows
NT\CurrentVersion\SystemRoot is used to find the
        // system root to install the VC70 DLL.

        szWindowsPath[0] =  0;
        bRc = TRUE;
        if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SOFTWARE\\Microsoft\\Windows NT\\CurrentVersion", 0,
KEY_ALL_ACCESS, &hKey) == ERROR_SUCCESS )
        {
                sv = sizeof(szData);
                iRc = RegQueryValueEx( hKey,
"SystemRoot", NULL, NULL, szData, &sv );
                if (iRc == ERROR_SUCCESS)
                {
                        bRc = FALSE;
                        strcpy(szWindowsPath,
szData);
                        len =
strlen(szWindowsPath);
                        if ( szWindowsPath[len-
1] != '\\' )
                        {

        szWindowsPath[len] = '\\';

        szWindowsPath[len+1] = 0;
                        }
                        // now append the path
to SYSTEM32
                        strcat(szWindowsPath,
"SYSTEM32\\");
                }

                RegCloseKey(hKey);
        }

        return bRc;
}
static void GetVersionInfo(char *szDLLPath, char
*szExePath)
{
        DWORD                                   d;
        DWORD
        dwSize;
        DWORD
        dwBytes;
        char
        *ptr;
        VS_FIXEDFILEINFO    *vs;

        versionDllMS = 0;
        versionDllLS = 0;
        if ( _access(szDLLPath, 00) == 0 )
        {
                dwSize =
GetFileVersionInfoSize(szDLLPath, &d);
                if ( dwSize )
                {
                        ptr = (char
*)malloc(dwSize);

        GetFileVersionInfo(szDLLPath, 0, dwSize,
ptr);
                        VerQueryValue(ptr,
"\\",&vs, &dwBytes);
                        versionDllMS = vs-
>dwProductVersionMS;
                        versionDllLS = vs-
>dwProductVersionLS;
                        free(ptr);
                }
        }

        versionExeMS = 0x7FFF;
        versionExeLS = 0x7FFF;
        dwSize = GetFileVersionInfoSize(szExePath,
&d);
        if ( dwSize )
        {
                ptr = (char *)malloc(dwSize);
                GetFileVersionInfo(szExePath, 0,
dwSize, ptr);
                VerQueryValue(ptr, "\\",&vs,
&dwBytes);

                versionExeMS = vs-
>dwProductVersionMS;
                versionExeLS = LOWORD(vs-
>dwProductVersionLS);
                versionExeMM = HIWORD(vs-
>dwProductVersionLS);
                free(ptr);
        }
        return;
}

static BOOL CheckWWWebService(void)
{
        SC_HANDLE           schSCManager;
        SC_HANDLE           schService;
        SERVICE_STATUS      ssStatus;

        schSCManager = OpenSCManager(NULL, NULL,
SC_MANAGER_ALL_ACCESS);
        schService = OpenService(schSCManager,
TEXT("W3SVC"), SERVICE_ALL_ACCESS);
        if (schService == NULL)
                return FALSE;

        if (! QueryServiceStatus(schService,
&ssStatus) )
                goto ServiceNotRunning;

        if ( !ControlService(schService,
SERVICE_CONTROL_STOP, &ssStatus) )
                goto ServiceNotRunning;
        //start Service pending, Check the status
until the service is running.
        if (! QueryServiceStatus(schService,
&ssStatus) )
                goto ServiceNotRunning;

        CloseServiceHandle(schService);
        return TRUE;

ServiceNotRunning:
```

```
        CloseServiceHandle(schService);
        return FALSE;
}

static BOOL StartWWWebService(void)
{
        SC_HANDLE           schSCManager;
        SC_HANDLE           schService;
        SERVICE_STATUS      ssStatus;
        DWORD
        dwOldCheckPoint;

        schSCManager = OpenSCManager(NULL, NULL,
SC_MANAGER_ALL_ACCESS);
        schService = OpenService(schSCManager,
TEXT("W3SVC"), SERVICE_ALL_ACCESS);
        if (schService == NULL)
                return FALSE;

        if (! StartService(schService, 0, NULL) )
                goto StartWWWebErr;
        //start Service pending, Check the status
until the service is running.
        if (! QueryServiceStatus(schService,
&ssStatus) )
                goto StartWWWebErr;
        while( ssStatus.dwCurrentState !=
SERVICE_RUNNING)
        {

                dwOldCheckPoint =
ssStatus.dwCheckPoint;
        //Save the current checkpoint.
                Sleep(ssStatus.dwWaitHint);

        //Wait for the specified interval.
                if (
!QueryServiceStatus(schService, &ssStatus) )
        //Check the status again.
                        break;
                if (dwOldCheckPoint >=
ssStatus.dwCheckPoint)                  //Break if
the checkpoint has not been incremented.
                        break;
        }

        if (ssStatus.dwCurrentState ==
SERVICE_RUNNING)
                goto StartWWWebErr;

        CloseServiceHandle(schService);
        return TRUE;

StartWWWebErr:
        CloseServiceHandle(schService);
        return FALSE;
}

static BOOL StopWWWebService(void)
{
        SC_HANDLE           schSCManager;
        SC_HANDLE           schService;
        SERVICE_STATUS      ssStatus;
        DWORD
        dwOldCheckPoint;

        schSCManager = OpenSCManager(NULL, NULL,
SC_MANAGER_ALL_ACCESS);
        //schService = OpenService(schSCManager,
TEXT("W3SVC"), SERVICE_ALL_ACCESS);
        schService = OpenService(schSCManager,
TEXT("IISADMIN"), SERVICE_ALL_ACCESS);
        if (schService == NULL)
                return FALSE;

        if (! QueryServiceStatus(schService,
&ssStatus) )
                goto StopWWWebErr;

        if ( !ControlService(schService,
SERVICE_CONTROL_STOP, &ssStatus) )
                goto StopWWWebErr;
        //start Service pending, Check the status
until the service is running.
        if (! QueryServiceStatus(schService,
&ssStatus) )
                goto StopWWWebErr;
        while( ssStatus.dwCurrentState ==
SERVICE_RUNNING)
        {

                dwOldCheckPoint =
ssStatus.dwCheckPoint;
        //Save the current checkpoint.
                Sleep(ssStatus.dwWaitHint);

        //Wait for the specified interval.
                if (
!QueryServiceStatus(schService, &ssStatus) )
        //Check the status again.
                        break;
                if (dwOldCheckPoint >=
ssStatus.dwCheckPoint)                  //Break if
the checkpoint has not been incremented.
                        break;
        }

        if (ssStatus.dwCurrentState ==
SERVICE_RUNNING)
                goto StopWWWebErr;

        CloseServiceHandle(schService);
        return TRUE;

StopWWWebErr:
        CloseServiceHandle(schService);
        return FALSE;
}

static void UpdateDialog(HWND hDlg)
{
        MSG msg;

        UpdateWindow(hDlg);
        while( PeekMessage(&msg, hDlg, 0, 0,
PM_REMOVE) )
        {
                TranslateMessage(&msg);
                DispatchMessage(&msg);
        }
        Sleep(250);
        return;
}

static void ConfigureIIS6(HWND hwnd, HWND hDlg)
{
        int             irc;
        char    szErrTxt[128];
        FILE    *fErrorFile;

        SetDlgItemText(hDlg, IDC_STATUS,
"Configuring IIS6...");
        //SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
        UpdateDialog(hDlg);

        irc = system("IIS6_CONFIG.CMD");

        // since the return code from the command
file is always 1,
        // check to see if the file iis6_config.err
exists
        // if it does, then something hosed
        fErrorFile = fopen("IIS6_CONFIG.err","r");
        if ( fErrorFile != NULL )
        {
                ShowWindow(hwnd, SW_SHOWNA);
                DestroyWindow(hDlg);
                strcpy( szErrTxt, "IIS6
configuration error." );
                strcat( szErrTxt, "Check
iis6_config.err" );
                MessageBox(hwnd, szErrTxt, NULL,
MB_ICONSTOP | MB_OK);
                EndDialog(hwnd, 0);
                return;
        }
}
```

install.h

```
//{{NO_DEPENDENCIES}}
// Microsoft Developer Studio generated include file.
// Used by install.rc
//

#define IDD_DIALOG1                             101
#define IDI_ICON1                               102
#define IDR_TPCCDLL                             103
#define IDD_DIALOG2                             105
#define IDI_ICON2                               106
```

```
#define IDR_DELIVERY                            107
#define IDD_DIALOG3                             108

#define BN_LOG
        1001
#define ED_KEEP
        1002
#define ED_THREADS
        1003
#define ED_THREADS2
        1004
#define IDC_PATH
        1007
#define IDC_VERSION
        1009
#define IDC_RESULTS
        1010
#define IDC_PROGRESS1
        1011
#define IDC_STATUS
        1012
#define IDC_BUTTON1
        1013
#define ED_MAXCONNECTION
        1014
#define ED_IIS_MAX_THEAD_POOL_LIMIT
        1015
#define ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE
        1017
#define ED_IIS_THREAD_TIMEOUT
        1018
#define ED_IIS_LISTEN_BACKLOG
        1019
#define IDC_DBLIB
        1021
#define IDC_ODBC
        1022
#define IDC_CONNECT_POOL
                1023
#define ED_USER_CONNECT_DELAY_TIME
        1024

// Next default values for new objects
//
```

install.rc

```
// Microsoft Visual C++ generated resource script.
//
#include "resource.h"

#define APSTUDIO_READONLY_SYMBOLS
////////////////////////////////////////////////////
//////////////////////
//
// Generated from the TEXTINCLUDE 2 resource.
//
#include "afxres.h"

////////////////////////////////////////////////////
//////////////////////
#undef APSTUDIO_READONLY_SYMBOLS

////////////////////////////////////////////////////
//////////////////////
// English (U.S.) resources

#if !defined(AFX_RESOURCE_DLL) ||
defined(AFX_TARG_ENU)
#ifdef _WIN32
LANGUAGE LANG_ENGLISH, SUBLANG_ENGLISH_US
#pragma code_page(1252)
#endif //_WIN32

////////////////////////////////////////////////////
//////////////////////
//
// Dialog
//

IDD_DIALOG1 DIALOGEX 0, 0, 219, 351
STYLE DS_SETFONT | DS_MODALFRAME | DS_CENTER |
WS_MINIMIZEBOX | WS_POPUP |
    WS_CAPTION | WS_SYSMENU
CAPTION "TPC-C Web Client Installation Utility"
FONT 8, "MS Sans Serif", 0, 0, 0x1
BEGIN
    EDITTEXT        ED_THREADS,164,45,34,12,ES_RIGHT
| ES_NUMBER,
                    WS_EX_RTLREADING
    EDITTEXT
ED_MAXDELIVERIES,164,59,34,12,ES_RIGHT | ES_NUMBER,
                    WS_EX_RTLREADING
    EDITTEXT
ED_MAXCONNECTION,164,73,34,12,ES_RIGHT | ES_NUMBER,
                    WS_EX_RTLREADING
    CONTROL
"None",IDC_TM_NONE,"Button",BS_AUTORADIOBUTTON |
                    WS_GROUP |
WS_TABSTOP,43,100,33,10
    CONTROL
"COM",IDC_TM_MTS,"Button",BS_AUTORADIOBUTTON |
                    WS_TABSTOP,43,113,32,10
    CONTROL
"TUXEDO",IDC_TM_TUXEDO,"Button",BS_AUTORADIOBUTTON |
                    WS_TABSTOP,106,100,46,10
    CONTROL
"ENCINA",IDC_TM_ENCINA,"Button",BS_AUTORADIOBUTTON |
                    WS_DISABLED |
WS_TABSTOP,106,113,43,10
    EDITTEXT
ED_DB_SERVER,131,152,67,12,ES_AUTOHSCROLL
    EDITTEXT
ED_DB_USER_ID,131,165,67,12,ES_AUTOHSCROLL
    EDITTEXT
ED_DB_PASSWORD,131,178,67,12,ES_AUTOHSCROLL
    EDITTEXT
ED_DB_NAME,131,191,67,12,ES_AUTOHSCROLL
    CONTROL
"DBLIB",IDC_DBLIB,"Button",BS_AUTORADIOBUTTON |
WS_GROUP |
                    WS_TABSTOP,45,219,39,12
    CONTROL
"ODBC",IDC_ODBC,"Button",BS_AUTORADIOBUTTON |
WS_TABSTOP,
                    91,219,39,12
    EDITTEXT
ED_IIS_MAX_THEAD_POOL_LIMIT,164,263,34,12,ES_RIGHT |
                    ES_NUMBER,WS_EX_RTLREADING
    EDITTEXT
ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE,164,277,34,12,ES_RI
GHT |
                    ES_NUMBER,WS_EX_RTLREADING
    EDITTEXT
ED_IIS_THREAD_TIMEOUT,164,291,34,12,ES_RIGHT |
ES_NUMBER,
                    WS_EX_RTLREADING
    EDITTEXT
ED_IIS_LISTEN_BACKLOG,164,305,34,12,ES_RIGHT |
ES_NUMBER,
                    WS_EX_RTLREADING
    DEFPUSHBUTTON   "OK",IDOK,53,331,50,14
    PUSHBUTTON      "Cancel",IDCANCEL,119,331,50,14
    EDITTEXT
IDC_PATH,106,26,91,13,ES_AUTOHSCROLL | ES_READONLY
    LTEXT           "Number of Delivery
Threads:",IDC_STATIC,35,45,115,12
    LTEXT           "Max Number of
Connections:",IDC_STATIC,35,73,115,12
    RTEXT           "Version
4.11",IDC_VERSION,120,4,89,9
    LTEXT           "IIS Max Thread Pool
Limit:",IDC_STATIC,36,263,115,12
    LTEXT           "Web Service Backlog Queue
Size:",IDC_STATIC,36,277,115,
                    12
    LTEXT           "IIS Thread Timeout
(seconds):",IDC_STATIC,36,291,115,12
    LTEXT           "IIS Listen
Backlog:",IDC_STATIC,36,307,115,10
    GROUPBOX        "Database
Interface",IDC_STATIC,35,208,163,27,WS_GROUP
    LTEXT           "Installation
directory:",IDC_STATIC,35,29,71,10
    GROUPBOX        "Transaction
Monitor",IDC_STATIC,33,90,165,37
    LTEXT           "Server
Name:",IDC_STATIC,35,155,56,8
    LTEXT           "User ID:",IDC_STATIC,35,168,60,8
    LTEXT           "User
Password:",IDC_STATIC,35,181,83,8
    LTEXT           "Database
Name:",IDC_STATIC,35,194,54,8
    GROUPBOX        "SQL Server Connection
Properties",IDC_STATIC,22,139,187,
                    102
    GROUPBOX        "Web Client
Properties",IDC_STATIC,22,15,187,118
```

```
    GROUPBOX        "IIS
Settings",IDC_STATIC,22,247,187,79
    LTEXT           "Max Pending
Deliveries:",IDC_STATIC,35,59,115,12
END

IDD_DIALOG2 DIALOGEX 0, 0, 117, 62
STYLE DS_SETFONT | DS_SETFOREGROUND | DS_3DLOOK |
DS_CENTER | WS_POPUP |
    WS_BORDER
EXSTYLE WS_EX_STATICEDGE
FONT 12, "MS Sans Serif", 0, 0, 0x1
BEGIN
    DEFPUSHBUTTON   "OK",IDOK,33,45,50,9
    CTEXT           "HTML TPC-C Installation
Successfull",IDC_RESULTS,7,22,
                    102,18,0,WS_EX_CLIENTEDGE
    ICON
IDI_ICON2,IDC_STATIC,50,7,18,20,SS_REALSIZEIMAGE,
                    WS_EX_TRANSPARENT
END

IDD_DIALOG3 DIALOG  0, 0, 91, 40
STYLE DS_SYSMODAL | DS_SETFONT | DS_MODALFRAME |
DS_3DLOOK | DS_CENTER |
    WS_CAPTION
CAPTION "Installing TPC-C Web Client"
FONT 12, "Arial Black"
BEGIN
    CONTROL
"Progress1",IDC_PROGRESS1,"msctls_progress32",WS_BORD
ER,
                    7,20,77,13
    CTEXT
"Static",IDC_STATUS,7,7,77,12,SS_SUNKEN
END

IDD_DIALOG4 DIALOG  0, 0, 291, 202
STYLE DS_SETFONT | DS_MODALFRAME | DS_CENTER |
WS_POPUP | WS_CAPTION |
    WS_SYSMENU
CAPTION "Client End User License"
FONT 8, "MS Sans Serif"
BEGIN
    EDITTEXT
IDC_LICENSE,7,7,271,167,ES_MULTILINE | ES_AUTOVSCROLL
|
                    ES_AUTOHSCROLL | ES_READONLY |
WS_VSCROLL | WS_HSCROLL
    DEFPUSHBUTTON   "I &Agree",IDOK,87,181,50,14
    PUSHBUTTON      "&Cancel",IDCANCEL,153,181,50,14
END


/////////////////////////////////////////////////////
//////////////////////
//
// DESIGNINFO
//

#ifdef APSTUDIO_INVOKED
GUIDELINES DESIGNINFO
BEGIN
    IDD_DIALOG1, DIALOG
    BEGIN
        LEFTMARGIN, 22
        RIGHTMARGIN, 209
        VERTGUIDE, 35
        VERTGUIDE, 198
        TOPMARGIN, 4
        BOTTOMMARGIN, 345
    END

    IDD_DIALOG2, DIALOG
    BEGIN
        LEFTMARGIN, 7
        RIGHTMARGIN, 109
        TOPMARGIN, 7
        BOTTOMMARGIN, 54
    END

    IDD_DIALOG3, DIALOG
    BEGIN
        LEFTMARGIN, 7
        RIGHTMARGIN, 84
        TOPMARGIN, 7
        BOTTOMMARGIN, 33
    END

    IDD_DIALOG4, DIALOG
    BEGIN
        LEFTMARGIN, 7
        RIGHTMARGIN, 278
        TOPMARGIN, 7
        BOTTOMMARGIN, 195
    END
END
#endif    // APSTUDIO_INVOKED


#ifdef APSTUDIO_INVOKED
/////////////////////////////////////////////////////
//////////////////////
//
// TEXTINCLUDE
//

1 TEXTINCLUDE
BEGIN
    "resource.h\0"
END

2 TEXTINCLUDE
BEGIN
    "#include ""afxres.h""\r\n"
    "\0"
END

3 TEXTINCLUDE
BEGIN
    "\r\n"
    "\0"
END

#endif    // APSTUDIO_INVOKED


/////////////////////////////////////////////////////
//////////////////////
//
// Icon
//

// Icon with lowest ID value placed first to ensure
application icon
// remains consistent on all systems.
IDI_ICON1               ICON
"icon1.ico"
IDI_ICON2               ICON
"icon2.ico"

/////////////////////////////////////////////////////
//////////////////////
//
// TPCCDLL
//

IDR_TPCCDLL             TPCCDLL
"..\\..\\isapi_dll\\bin\\tpcc.dll"

/////////////////////////////////////////////////////
//////////////////////
//
// Version
//

VS_VERSION_INFO VERSIONINFO
 FILEVERSION 0,4,50,0
 PRODUCTVERSION 0,4,50,0
 FILEFLAGSMASK 0x3fL
#ifdef _DEBUG
 FILEFLAGS 0x1L
#else
 FILEFLAGS 0x0L
#endif
 FILEOS 0x40004L
 FILETYPE 0x1L
 FILESUBTYPE 0x0L
BEGIN
    BLOCK "StringFileInfo"
    BEGIN
        BLOCK "040904b0"
        BEGIN
            VALUE "Comments", "TPC-C Web Client
Installer"
            VALUE "CompanyName", "Microsoft"
            VALUE "FileDescription", "install"
            VALUE "FileVersion", "0, 4, 20, 0"
            VALUE "InternalName", "install"
            VALUE "LegalCopyright", "Copyright ©
1999"
            VALUE "OriginalFilename", "install.exe"
            VALUE "ProductName", "Microsoft install"
```

```
            VALUE "ProductVersion", "0, 4, 20, 0"
        END
    END
    BLOCK "VarFileInfo"
    BEGIN
        VALUE "Translation", 0x409, 1200
    END
END


/////////////////////////////////////////////////
//////////////////////
//
// LICENSE
//

IDR_LICENSE1            LICENSE
"license.txt"

/////////////////////////////////////////////////
//////////////////////
//
// DBLIB_DLL
//

IDR_DBLIB_DLL           DBLIB_DLL
"..\\..\\db_dblib_dll\\bin\\Release\\tpcc_dblib.dll"

/////////////////////////////////////////////////
//////////////////////
//
// ODBC_DLL
//

IDR_ODBC_DLL            ODBC_DLL
"..\\..\\db_odbc_dll\\bin\\Release\\tpcc_odbc.dll"

/////////////////////////////////////////////////
//////////////////////
//
// TUXEDO_APP
//

IDR_TUXEDO_APP          TUXEDO_APP
"..\\..\\tuxapp\\bin\\tuxapp.exe"

/////////////////////////////////////////////////
//////////////////////
//
// TUXEDO_DLL
//

IDR_TUXEDO_DLL          TUXEDO_DLL
"..\\..\\tm_tuxedo_dll\\bin\\tpcc_tuxedo.dll"

/////////////////////////////////////////////////
//////////////////////
//
// COM_DLL
//

IDR_COM_DLL             COM_DLL
"..\\..\\tm_com_dll\\bin\\tpcc_com.dll"

/////////////////////////////////////////////////
//////////////////////
//
// COM_PS_DLL
//

IDR_COMPS_DLL           COM_PS_DLL
"..\\..\\tpcc_com_ps\\bin\\tpcc_com_ps.dll"

/////////////////////////////////////////////////
//////////////////////
//
// COM_ALL_DLL
//

IDR_COMALL_DLL          COM_ALL_DLL
"..\\..\\tpcc_com_all\\bin\\tpcc_com_all.dll"

/////////////////////////////////////////////////
//////////////////////
//
// COM_TYPLIB
//

IDR_COMTYPLIB_DLL       COM_TYPLIB
"..\\..\\tpcc_com_all\\src\\tpcc_com_all.tlb"

/////////////////////////////////////////////////
//////////////////////
//
// MSVCRT70
//

IDR_MSVCRT701           MSVCRT70
"C:\\WINDOWS\\system32\\msvcr70.dll"
#endif    // English (U.S.) resources
/////////////////////////////////////////////////
//////////////////////



#ifndef APSTUDIO_INVOKED
/////////////////////////////////////////////////
//////////////////////
//
// Generated from the TEXTINCLUDE 3 resource.
//


/////////////////////////////////////////////////
//////////////////////
#endif    // not APSTUDIO_INVOKED
```

install_com.cpp

```
/*        FILE:               INSTALL_COM.CPP
 *                                          Microsoft
TPC-C Kit Ver. 4.51.000
 *                                          Copyright
Microsoft, 1999
 *              All Rights Reserved
 *
 *                                          not audited
 *
 *        PURPOSE:  installation code for COM
application for TPC-C Web Kit
 *        Contact:  Charles Levine
(clevine@microsoft.com)
 *
 *  Change history:
 *                  4.20.000 - first version
 */

#define _WIN32_WINNT 0x0500

#include <comdef.h>
#include <comadmin.h>
#include <stdio.h>
#include <tchar.h>

extern "C"
{
          BOOL install_com(char *szDllPath);
}

BOOL install_com(char *szDllPath)
{
          ICOMAdminCatalog*   pCOMAdminCat = NULL;
          ICatalogCollection* pCatalogCollectionApp
= NULL;
          ICatalogCollection* pCatalogCollectionCo
= NULL;
          ICatalogCollection* pCatalogCollectionItf
= NULL;
          ICatalogCollection*
          pCatalogCollectionMethod = NULL;

          ICatalogObject*
          pCatalogObjectApp    = NULL;
          ICatalogObject*
          pCatalogObjectCo     = NULL;
          ICatalogObject*
          pCatalogObjectItf    = NULL;
          ICatalogObject*
          pCatalogObjectMethod = NULL;

          _bstr_t
          bstrTemp, bstrTemp2, bstrTemp3, bstrTemp4;
          _bstr_t
          bstrDllPath = szDllPath;
```

```
        _variant_t
        vTmp, vKey;
        long
        lActProp, lCount, lCountCo, lCountItf,
lCountMethod;
        bool
        bTmp;


        CoInitializeEx(NULL, COINIT_MULTITHREADED);

        HRESULT hr =
CoCreateInstance(CLSID_COMAdminCatalog,

                                        NULL,


        CLSCTX_INPROC_SERVER,


        IID_ICOMAdminCatalog,

                                        (void**)
&pCOMAdminCat);

        if (!SUCCEEDED(hr)) goto Error;

        bstrTemp = "Applications";

        // Attempt to connect to "Applications" in
the Catalog
        hr = pCOMAdminCat->GetCollection(bstrTemp,

                                        (IDispatch**)
&pCatalogCollectionApp);
        if (!SUCCEEDED(hr)) goto Error;

        // Attempt to load the "Applications"
collection
        hr = pCatalogCollectionApp->Populate();
        if (!SUCCEEDED(hr)) goto Error;

        hr = pCatalogCollectionApp-
>get_Count(&lCount);
        if (!SUCCEEDED(hr)) goto Error;

        // iterate through applications to delete
existing "TPC-C" application (if any)
        while (lCount > 0)
        {
                hr = pCatalogCollectionApp-
>get_Item(lCount - 1, (IDispatch**)
&pCatalogObjectApp);
                if (!SUCCEEDED(hr)) goto Error;

                hr = pCatalogObjectApp-
>get_Name(&vTmp);
                if (!SUCCEEDED(hr)) goto Error;

                if (wcscmp(vTmp.bstrVal, L"TPC-
C"))
                {
                        lCount--;
                        continue;
                }
                else
                {
                        hr =
pCatalogCollectionApp->Remove(lCount - 1);
                        if (!SUCCEEDED(hr))
goto Error;
                        break;
                }
        }

        hr = pCatalogCollectionApp-
>SaveChanges(&lActProp);
        if (!SUCCEEDED(hr)) goto Error;

        // add the new application
        hr = pCatalogCollectionApp-
>Add((IDispatch**) &pCatalogObjectApp);
        if (!SUCCEEDED(hr)) goto Error;

        // set properties
        bstrTemp = "Name";
        vTmp = "TPC-C";
        hr = pCatalogObjectApp->put_Value(bstrTemp,
vTmp);
        if (!SUCCEEDED(hr)) goto Error;

        // set as a library (in process)
application
        bstrTemp = "Activation";
        lActProp = COMAdminActivationInproc;
        vTmp = lActProp;
        hr = pCatalogObjectApp->put_Value(bstrTemp,
vTmp);
        if (!SUCCEEDED(hr)) goto Error;

        // set security level to process
        bstrTemp = "AccessChecksLevel";
        lActProp =
COMAdminAccessChecksApplicationLevel;
        vTmp = lActProp;
        hr = pCatalogObjectApp->put_Value(bstrTemp,
vTmp);
        if (!SUCCEEDED(hr)) goto Error;

        // save key to get the Components
collection later
        hr = pCatalogObjectApp->get_Key(&vKey);
        if (!SUCCEEDED(hr)) goto Error;

        // save changes (app creation) so component
installation will work
        hr = pCatalogCollectionApp-
>SaveChanges(&lActProp);
        if (!SUCCEEDED(hr)) goto Error;

        pCatalogObjectApp->Release();
        pCatalogObjectApp = NULL;

        bstrTemp  = "TPC-C";
                // app name
        bstrTemp2 =         bstrDllPath +
"tpcc_com_all.dll";         // DLL
        bstrTemp3 =         bstrDllPath +
"tpcc_com_all.tlb";         // type library (TLB)
        bstrTemp4 =         bstrDllPath +
"tpcc_com_ps.dll";          // proxy/stub dll

        hr = pCOMAdminCat-
>InstallComponent(bstrTemp,


        bstrTemp2,


        bstrTemp3,


        bstrTemp4);
        if (!SUCCEEDED(hr)) goto Error;


        bstrTemp = "Components";
        hr = pCatalogCollectionApp-
>GetCollection(bstrTemp, vKey, (IDispatch**)
&pCatalogCollectionCo);
        if (!SUCCEEDED(hr)) goto Error;

        hr = pCatalogCollectionCo->Populate();
        if (!SUCCEEDED(hr)) goto Error;

        hr = pCatalogCollectionCo-
>get_Count(&lCountCo);
        if (!SUCCEEDED(hr)) goto Error;

        // iterate through components in
application and set the properties
        while (lCountCo > 0)
        {
                hr = pCatalogCollectionCo-
>get_Item(lCountCo - 1, (IDispatch**)
&pCatalogObjectCo);
                if (!SUCCEEDED(hr)) goto Error;

                // used for debugging (view the
name)
                hr = pCatalogObjectCo-
>get_Name(&vTmp);
                if (!SUCCEEDED(hr)) goto Error;

                bstrTemp = "ConstructionEnabled";
                bTmp = TRUE;
                vTmp = bTmp;
                hr = pCatalogObjectCo-
>put_Value(bstrTemp, vTmp);
                if (!SUCCEEDED(hr)) goto Error;

                bstrTemp = "ConstructorString";
```

```
                    bstrTemp2 = "dummy string (do not
remove)";
                    vTmp = bstrTemp2;
                    hr = pCatalogObjectCo-
>put_Value(bstrTemp, vTmp);
                    if (!SUCCEEDED(hr)) goto Error;

                    bstrTemp =
"JustInTimeActivation";
                    bTmp = TRUE;
                    vTmp = bTmp;
                    hr = pCatalogObjectCo-
>put_Value(bstrTemp, vTmp);
                    if (!SUCCEEDED(hr)) goto Error;

                    bstrTemp = "MaxPoolSize";
                    vTmp.Clear();       // clear
variant so it isn't stored as a bool (_variant_t
feature)
                    vTmp = (long)30;
                    hr = pCatalogObjectCo-
>put_Value(bstrTemp, vTmp);
                    if (!SUCCEEDED(hr)) goto Error;

                    bstrTemp =
"ObjectPoolingEnabled";
                    bTmp = TRUE;
                    vTmp = bTmp;
                    hr = pCatalogObjectCo-
>put_Value(bstrTemp, vTmp);
                    if (!SUCCEEDED(hr)) goto Error;



                    // save key to get the
InterfacesForComponent collection
                    hr = pCatalogObjectCo-
>get_Key(&vKey);
                    if (!SUCCEEDED(hr)) goto Error;

                    bstrTemp =
"InterfacesForComponent";
                    hr = pCatalogCollectionCo-
>GetCollection(bstrTemp, vKey, (IDispatch**)
&pCatalogCollectionItf);
                    if (!SUCCEEDED(hr)) goto Error;

                    hr = pCatalogCollectionItf-
>Populate();
                    if (!SUCCEEDED(hr)) goto Error;

                    hr = pCatalogCollectionItf-
>get_Count(&lCountItf);
                    if (!SUCCEEDED(hr)) goto Error;

                    // iterate through interfaces in
component
                    while (lCountItf > 0)
                    {
                                        hr =
pCatalogCollectionItf->get_Item(lCountItf - 1,
(IDispatch**) &pCatalogObjectItf);
                                        if (!SUCCEEDED(hr))
goto Error;

                                        // save key to get the
MethodsForInterface collection
                                        hr = pCatalogObjectItf-
>get_Key(&vKey);
                                        if (!SUCCEEDED(hr))
goto Error;

                                        bstrTemp =
"MethodsForInterface";
                                        hr =
pCatalogCollectionItf->GetCollection(bstrTemp, vKey,
(IDispatch**) &pCatalogCollectionMethod);
                                        if (!SUCCEEDED(hr))
goto Error;

                                        hr =
pCatalogCollectionMethod->Populate();
                                        if (!SUCCEEDED(hr))
goto Error;

                                        hr =
pCatalogCollectionMethod->get_Count(&lCountMethod);
                                        if (!SUCCEEDED(hr))
goto Error;

                                        // iterate through
methods of interface
                                        while (lCountMethod >
0)
                                        {
                                                hr =
pCatalogCollectionMethod->get_Item(lCountMethod - 1,
(IDispatch**) &pCatalogObjectMethod);
                                                if
(!SUCCEEDED(hr)) goto Error;

                                                bstrTemp =
"AutoComplete";
                                                bTmp = TRUE;
                                                vTmp = bTmp;
                                                hr =
pCatalogObjectMethod->put_Value(bstrTemp, vTmp);
                                                if
(!SUCCEEDED(hr)) goto Error;


                                        pCatalogObjectMethod->Release();

                                        pCatalogObjectMethod = NULL;

                                                lCountMethod-
-;
                                        }

                                        // save changes
                                        hr =
pCatalogCollectionMethod->SaveChanges(&lActProp);
                                        if (!SUCCEEDED(hr))
goto Error;

                                        pCatalogObjectItf-
>Release();
                                        pCatalogObjectItf =
NULL;

                                        lCountItf--;

                                }


                                pCatalogObjectCo->Release();
                                pCatalogObjectCo = NULL;

                                lCountCo--;
                        }


                        // save changes
                        hr = pCatalogCollectionCo-
>SaveChanges(&lActProp);
                        if (!SUCCEEDED(hr)) goto Error;

                        pCatalogCollectionApp->Release();
                        pCatalogCollectionApp = NULL;

                        pCatalogCollectionCo->Release();
                        pCatalogCollectionCo = NULL;

                        pCatalogCollectionItf->Release();
                        pCatalogCollectionItf = NULL;

                        pCatalogCollectionMethod->Release();
                        pCatalogCollectionMethod = NULL;


Error:
                        CoUninitialize();

                        if (!SUCCEEDED(hr))
                        {
                                LPTSTR lpBuf;
                                DWORD dwRes =
FormatMessage(FORMAT_MESSAGE_ALLOCATE_BUFFER |
FORMAT_MESSAGE_FROM_SYSTEM,

                                                NULL,

                                                hr,


                        MAKELANGID(LANG_NEUTRAL, SUBLANG_DEFAULT),

                                                (LPTSTR)
&lpBuf,

                                                0,
```

```
                                        NULL);
//                  _tprintf(__T("Error adding
components.  HRESULT: 0x%x\n%s"), hr, lpBuf);
                    return TRUE;
          }
          else
                    return FALSE;
}
```

license.txt

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```

Methods.h

```
/*        FILE:                   METHODS.H
 *                                                Microsoft
TPC-C Kit Ver. 4.20.000
 *                                                Copyright
Microsoft, 1999
 *             All Rights Reserved
 *
 *                                                not yet
audited
 *
 *        PURPOSE:  Header file for COM components.
 *
 *  Change history:
 *                  4.20.000 - first version
 */


enum COMPONENT_ERROR
{
          ERR_MISSING_REGISTRY_ENTRIES = 1,
          ERR_LOADDLL_FAILED,
          ERR_GETPROCADDR_FAILED,
          ERR_UNKNOWN_DB_PROTOCOL
};

class CCOMPONENT_ERR : public CBaseErr
{
          public:
                    CCOMPONENT_ERR(COMPONENT_ERROR
Err)
                    {
                              m_Error = Err;
                              m_szTextDetail = NULL;
                              m_SystemErr = 0;
                              m_szErrorText = NULL;
                    };

                    CCOMPONENT_ERR(COMPONENT_ERROR
Err, char *szTextDetail, DWORD dwSystemErr)
                    {
                              m_Error = Err;
                              m_szTextDetail = new
char[strlen(szTextDetail)+1];
                              strcpy( m_szTextDetail,
szTextDetail );
                              m_SystemErr =
dwSystemErr;
                              m_szErrorText = NULL;
                    };

                    ~CCOMPONENT_ERR()
                    {
                              if (m_szTextDetail !=
NULL)
                                        delete []
m_szTextDetail;
                              if (m_szErrorText !=
NULL)
                                        delete []
m_szErrorText;
                    };

                    COMPONENT_ERROR     m_Error;
                    char
          *m_szTextDetail;
                    char
          *m_szErrorText;
                    DWORD
          m_SystemErr;

                    int ErrorType() {return
ERR_TYPE_COMPONENT;};
                    char *ErrorTypeStr() { return
"COMPONENT"; }
                    int ErrorNum() {return m_Error;};
                    char *ErrorText();
};


static void WriteMessageToEventLog(LPTSTR lpszMsg);


////////////////////////////////////////////////////
//////////////////////
// CTPCC_Common
class CTPCC_Common :
          public ITPCC,
          public IObjectControl,
          public IObjectConstruct,
```

```
        public
CComObjectRootEx<CComSingleThreadModel>
{
public:
BEGIN_COM_MAP(CTPCC_Common)
        COM_INTERFACE_ENTRY(ITPCC)
        COM_INTERFACE_ENTRY(IObjectControl)
        COM_INTERFACE_ENTRY(IObjectConstruct)
END_COM_MAP()

        CTPCC_Common();
        ~CTPCC_Common();

// ITPCC
public:
        HRESULT __stdcall NewOrder(
        VARIANT txn_in, VARIANT* txn_out);
        HRESULT __stdcall Payment(
        VARIANT txn_in, VARIANT* txn_out);
        HRESULT __stdcall Delivery(
        VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
        HRESULT __stdcall StockLevel( VARIANT
txn_in, VARIANT* txn_out);
        HRESULT __stdcall OrderStatus(
        VARIANT txn_in, VARIANT* txn_out);

        HRESULT __stdcall CallSetComplete();

// IObjectControl
        STDMETHODIMP_(BOOL) CanBePooled() { return
m_bCanBePooled; }
        STDMETHODIMP Activate() { return S_OK; }
        // we don't support COM Services
transactions (no enlistment)
        STDMETHODIMP_(void) Deactivate() { /*
nothing to do */ }

// IObjectConstruct
        STDMETHODIMP Construct(IDispatch * pUnk);

        // helper methods
private:
        BOOL                m_bCanBePooled;
        CTPCC_BASE          *m_pTxn;

        struct COM_DATA
        {
                int retval;
                int error;
                union
                {
                        NEW_ORDER_DATA
        NewOrder;
                        PAYMENT_DATA
        Payment;
                        DELIVERY_DATA
        Delivery;
                        STOCK_LEVEL_DATA
        StockLevel;
                        ORDER_STATUS_DATA
        OrderStatus;
                } u;
        };

};

////////////////////////////////////////////////
//////////////////////
// CTPCC
class CTPCC :
        public CTPCC_Common,
        public CComCoClass<CTPCC, &CLSID_TPCC>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_TPCC)

BEGIN_COM_MAP(CTPCC)
        //COM_INTERFACE_ENTRY2(IUnknown,
CComObjectRootEx<CComSingleThreadModel>)
        COM_INTERFACE_ENTRY2(IUnknown, ITPCC)
        COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

};


////////////////////////////////////////////////
//////////////////////
// CNewOrder
class CNewOrder :
        public CTPCC_Common,
        public CComCoClass<CNewOrder,
&CLSID_NewOrder>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_NEWORDER)

BEGIN_COM_MAP(CNewOrder)
//      COM_INTERFACE_ENTRY2(IUnknown,
CComObjectRootEx)
        COM_INTERFACE_ENTRY2(IUnknown, ITPCC)
        COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

// ITPCC
public:
//      HRESULT __stdcall NewOrder(
        VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
        HRESULT __stdcall Payment(
        VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
        HRESULT __stdcall StockLevel( VARIANT
txn_in, VARIANT* txn_out) {return E_NOTIMPL;}
        HRESULT __stdcall OrderStatus(
        VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
};

        ////////////////////////////////////////
////////////////////////////////
// COrderStatus
class COrderStatus :
        public CTPCC_Common,
        public CComCoClass<COrderStatus,
&CLSID_OrderStatus>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_ORDERSTATUS)

BEGIN_COM_MAP(COrderStatus)
//      COM_INTERFACE_ENTRY2(IUnknown,
CComObjectRootEx)
        COM_INTERFACE_ENTRY2(IUnknown, ITPCC)
        COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

// ITPCC
public:
        HRESULT __stdcall NewOrder(
        VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
        HRESULT __stdcall Payment(
        VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
        HRESULT __stdcall StockLevel( VARIANT
txn_in, VARIANT* txn_out) {return E_NOTIMPL;}
//      HRESULT __stdcall OrderStatus(
        VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
};


////////////////////////////////////////////////
//////////////////////
// CPayment
class CPayment :
        public CTPCC_Common,
        public CComCoClass<CPayment,
&CLSID_Payment>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_PAYMENT)

BEGIN_COM_MAP(CPayment)
//      COM_INTERFACE_ENTRY2(IUnknown,
CComObjectRootEx)
        COM_INTERFACE_ENTRY2(IUnknown, ITPCC)
        COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

// ITPCC
public:
        HRESULT __stdcall NewOrder(
        VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
//      HRESULT __stdcall Payment(
        VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
```

```
        HRESULT __stdcall StockLevel( VARIANT
txn_in, VARIANT* txn_out) {return E_NOTIMPL;}
        HRESULT __stdcall OrderStatus(
        VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
};


////////////////////////////////////////////////
//////////////////////
// CStockLevel
class CStockLevel :
        public CTPCC_Common,
        public CComCoClass<CStockLevel,
&CLSID_StockLevel>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_STOCKLEVEL)

BEGIN_COM_MAP(CStockLevel)
//      COM_INTERFACE_ENTRY2(IUnknown,
CComObjectRootEx)
        COM_INTERFACE_ENTRY2(IUnknown, ITPCC)
        COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

// ITPCC
public:
        HRESULT __stdcall NewOrder(
        VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
        HRESULT __stdcall Payment(
        VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
//      HRESULT __stdcall StockLevel( VARIANT
txn_in, VARIANT* txn_out) {return E_NOTIMPL;}
        HRESULT __stdcall OrderStatus(
        VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
};
```

mon_client.c

```
/*
 *      mon_client.c
 *
 */

#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <stdarg.h>
#include <time.h>
#include <pthread.h>
#include <tpm/mon/mon.h>
#include <utils/trace.h>
#include "../include/delivery.h"
#include "../include/neworder.h"
#include "../include/payment.h"
#include "../include/stocklevel.h"
#include "../include/orderstatus.h"
#include "../include/tpcc_type.h"
#include "mon_client.h"
#include "client_utils.h"

extern total_tran_count_t  *perfClntDataInit();
static void read_mon_environment(void);

static char *cellName;
static int envRetrieval = 0;
static int useSecurity = FALSE;
static CRITICAL_SECTION    init_lock;
static total_tran_count_t  *pClientInfo=NULL;  /*
keep stats for the client process */
static num_active_threads = 0;
static int iStatsFrequency = 1;
FILE    *errtpcc;
char    *errFile = "C:/temp/tpcc_encina.out";
enc_status_t enc_status;

#define NewOrder_code    NEWO_TRANS
#define Payment_code     PAYMENT_TRANS
#define OrderStatus_code ORDER_STAT_TRANS
#define Delivery_code    DELIVERY_TRANS
#define StockLevel_code  STOCK_TRANS


#define INT_ENV_VALUE(var, default) \
  (var = getenv(#var) ? atoi(getenv(#var)) : default)

#define PRE_RPC_WORK(headerP, tran, sub_tran) \
        if (iStatsFrequency > 0) \
                    pre_rpc(headerP, tran, sub_tran);
\
         else
                    \
                    (headerP)->stats = 0;
#define POST_RPC_WORK(headerP, tran) \
        if (iStatsFrequency > 0) \
                    post_rpc(headerP, tran)

/*  CALTPCC
 *  Macro to sends 1 RPC and then handles any errors.
 *
 *  The macro takes the name of the RPC (e.g.,
NewOrder)
 *  and makes the RPC by calling the appropriate
function
 *  (e.g., impTPCCNewOrder).
 */
#define
CALLTPCC(name,length,dataP,header,trpcStatusP)
\
{
\

UTIL_CONCAT(impTPCC,name)(length,dataP,&header,trpcSt
atusP);        \
  if (*(trpcStatusP)) {
\
    char msg[100];
\
    sprintf(msg, "TRPC error during impTPCC%s",
UTIL_STRING(name));    \
    header.returncode = TRPC_ERROR;
\
    encina_error_message(msg, *(trpcStatusP));
\
  } else if ((header.returncode != TPCC_SUCCESS) &&
\
             (header.returncode != INVALID_NEWO)) {
\
    char msg[100];
\
    sprintf(msg, "App error during impTPCC%s: ",
UTIL_STRING(name));   \
    encina_error_message(msg, header.returncode);
\
  }
\
}

/*
 *  pre_rpc --   For debug purposes
 *
 *  Called before an RPC is made.
 *  Set the state of the thread and keep track of the
time the RPC is sent.
 *  This is used by the Background thread to report
the state of the client.
 */
static void pre_rpc(data_header *headerP,
                    int tran_type,
                    int sub_tran_type)
{
    if (iStatsFrequency < 1) {
                    headerP->stats = 0;
    } else {
        int num;
        num = ++ (pClientInfo->tran[tran_type].num);
        headerP->stats = (num % iStatsFrequency==0) ?
1 : 0;
        if (headerP->stats)
                    { /* measure the time for RT */

          get_local_time(&headerP->clnt_start);
                    headerP->srv_start.sec = 0;   /*
initialize the server time */
                    headerP->srv_start.usec = 0;
                    headerP->srv_end.sec = 0;
                    headerP->srv_end.usec = 0;
                    }
    }
}

/*
 *  post_rpc
 *
 *  Called when the RPC returns from the server
 *
```

```
 *  Keeps track of the client response time and the
server response time
 *  as well as the state of the thread.  This is used
by the background
 *  debug thread to report the state of the client
 */
static void post_rpc(data_header *headerP,
                     int tran_type)
{
    double time_diff;
    int tran_failed;
    struct timeval start_time, end_time;

    if (headerP->stats)
                get_local_time(&headerP-
>clnt_end);
    else
                return;

    /* Store the info for each client.
     * Note: Since we don't use mutex for performance
reason, pClientInfo
     *       may not be accurate if more than one
thread work on the same
     *       data at a same time. But this should
give us reasonable info.
     */
    if ((headerP->returncode == TPCC_SUCCESS) ||
        (headerP->returncode == INVALID_NEWO)) {
      tran_failed = 0;
    } else {
      pClientInfo->tran[tran_type].errs ++;
      pClientInfo->errors ++;
      tran_failed = 1;
    }
    if (headerP->stats && tran_type <= MAX_TRAN_TYPE
&& tran_type > 0
        && !tran_failed) {
          /* update total server round trip response
time */
          start_time.tv_sec = headerP-
>srv_start.sec;
          start_time.tv_usec = headerP-
>srv_start.usec;
          end_time.tv_sec = headerP->srv_end.sec;
          end_time.tv_usec = headerP->srv_end.usec;
        time_diff = time_diff_ms(&end_time,
&start_time);
        pClientInfo->tran[tran_type].RTtotal[1] +=
time_diff;
          DPRINT(("srv start_time %d.%d, end_time
%d.%d, time_diff %f\n",
                           start_time.tv_sec,
start_time.tv_usec,
                           end_time.tv_sec,
end_time.tv_usec,
                           time_diff));

        /* update total client round trip response
time */
          start_time.tv_sec = headerP-
>clnt_start.sec;
          start_time.tv_usec = headerP-
>clnt_start.usec;
          end_time.tv_sec = headerP->clnt_end.sec;
          end_time.tv_usec = headerP-
>clnt_end.usec;
        time_diff = time_diff_ms(&end_time,
&start_time);
        pClientInfo->tran[tran_type].RTtotal[0] +=
time_diff;
          DPRINT(("clnt start_time %d.%d, end_time
%d.%d, time_diff %f\n",
                           start_time.tv_sec,
start_time.tv_usec,
                           end_time.tv_sec,
end_time.tv_usec,
                           time_diff));

          /* update num for the number of trans
which have RT measured */
      pClientInfo->tran[tran_type].RTcount ++;

    }
}

/*
 *  The following send_*** functions are called from
CTPCC_ENCINA class.
 *
 */

/*
 *  send_new_order
 *       Send a new order request to the server
 */
int send_new_order(long length, unsigned char *dataP)
{
    trpc_status_t trpcStatus;
    data_header  header;

    PRE_RPC_WORK(&header, NEWO_TRANS, 0);

CALLTPCC(NewOrder,length,dataP,header,&trpcStatus)
    POST_RPC_WORK(&header, NEWO_TRANS);
    if (header.returncode == INVALID_NEWO)
          return TPCC_SUCCESS;
    else
          return header.returncode;
}

/*
 *  send_payment
 *       Send a payment request to the server
 */
int send_payment(long length, unsigned char *dataP)
{
    trpc_status_t trpcStatus;
    data_header  header;

    PRE_RPC_WORK(&header, PAYMENT_TRANS, 0);

CALLTPCC(Payment,length,dataP,header,&trpcStatus);
    POST_RPC_WORK(&header, PAYMENT_TRANS);
    return header.returncode;
}

/*
 *  send_order_status
 *       Send a order status request to the server
 */
int send_order_status(long length, unsigned char
*dataP)
{
    trpc_status_t trpcStatus;
    data_header  header;

    PRE_RPC_WORK(&header, ORDER_STAT_TRANS, 0);

CALLTPCC(OrderStatus,length,dataP,header,&trpcStatus)
;
    POST_RPC_WORK(&header, ORDER_STAT_TRANS);
    return header.returncode;
}

/*
 *  send_delivery
 *       Send a delivery request to the server
 */
int send_delivery(long length, unsigned char *dataP)
{
    trpc_status_t trpcStatus;
    data_header  header;

    PRE_RPC_WORK(&header, DELIVERY_TRANS, 0);

CALLTPCC(Delivery,length,dataP,header,&trpcStatus);
    POST_RPC_WORK(&header, DELIVERY_TRANS);
    return header.returncode;
}

/*
 *  send_stock_level
 *       Send a stock level request to the server
 */
int send_stock_level(long length, unsigned char
*dataP)
{
    trpc_status_t trpcStatus;
    data_header  header;

    PRE_RPC_WORK(&header, STOCK_TRANS, 0);

CALLTPCC(StockLevel,length,dataP,header,&trpcStatus);
    POST_RPC_WORK(&header, STOCK_TRANS);
    return header.returncode;
}



/*
 *  Enroll the client:
```

```
 *        get the necessary handles.
 *  This function should be called only once. Use
static var client_enrolled to control it.
 */
void enroll_client()
{
    static  char  *clientName="tpcc_client";
    unsigned long status ;
    static  int   client_enrolled = 0;
    unsigned32      client_authnLevel;
    unsigned32      client_authzSvc;
    time_type a_time;
          char err_msg[100];

    MUTEX_INIT(&init_lock);
    get_local_time(&a_time);
    srand(a_time.sec ^ a_time.usec);

    MUTEX_LOCK(&init_lock);
    if (client_enrolled) {
          MUTEX_UNLOCK(&init_lock);
                  return;
    }

    /* open output file for tracing */
    errtpcc = fopen(errFile, "w");
    if(!errtpcc)
    {
                  sprintf(err_msg, "Cannot open
file %s", errFile);
                  CHK_STATUS(1,
ERROUT_FILE_NOT_FOUND,err_msg);
    }

    get_time_init();
          // initialize the space for perfmon
    pClientInfo = perfClntDataInit();
    if (pClientInfo == NULL)  // in case something
wrong
          pClientInfo =
malloc(sizeof(total_tran_count_t));
    memset(pClientInfo, 0,
sizeof(total_tran_count_t));

    read_mon_environment();

    if(!cellName)
          CHK_STATUS(30, CELL_NAME_UNAVAILABLE,
                  "ENCINA_TPM_CELL is not set!");

    if (useSecurity) {
                  client_authnLevel =
rpc_c_protect_level_connect;
                  client_authzSvc =
rpc_c_authz_dce;
    } else {
                  client_authnLevel =
rpc_c_protect_level_none;
                  client_authzSvc =
rpc_c_authz_none;
    }

    if (envRetrieval == 0) {

ENCINA_CALL_RC("mon_RetrieveEnable",mon_RetrieveEnabl
e(FALSE),status);
          CHK_STATUS(status, MON_RETRIEVEENABLE_FAILED,
                    "mon_RetrieveEnable failed");
    }

    err_printf("enroll_client: calling mon_InitClient
\n");

ENCINA_CALL_RC("mon_InitClient",mon_InitClient(client
Name,cellName),status);
    CHK_STATUS(status, MON_INITCLIENT_FAILED,
                "mon_InitClient failed");

    DPRINT(("mon_SecuritySetDefaults-> authn %d,
authz %d\n",
              client_authnLevel, client_authzSvc));
    ENCINA_CALL_RC("mon_SecuritySetDefaults",

          mon_SecuritySetDefaults(client_authnLevel,c
lient_authzSvc),
                  status);
    CHK_STATUS(status, MON_SECURITYSET_FAILED,
              "mon_SecuritySetDefaults failed");


ENCINA_CALL_RC("mon_SetHandleCacheRefreshInterval",

          mon_SetHandleCacheRefreshInterval(300),
status);
    CHK_STATUS(status, MON_SETREFRESHINTERVAL_FAILED,
              "mon_SetHandleCacheRefreshInterval
failed");

    {
        dbInfo_data_t data;
        trpc_status_t trpcStatus;
        /* Get DB Info -- currently id does not do
anything
         but it will tell us if there is a server
out there.
          Better to know instead of when all the
terminals
          are up and ready
         */
        impTPCCNOInfo(&data, &trpcStatus);
        if (trpcStatus) {
            char msg[100];
            sprintf(msg, "TRPC error during db info
at init.");
            encina_error_message(msg, trpcStatus);
            CHK_STATUS(33,NOINFO_TRPC_ERROR,
                        "TRPC error during db info at
init");
        }
    }

    client_enrolled = 1;
    MUTEX_UNLOCK(&init_lock);
    err_printf("end of enroll_client\n");
}


/*-------------------------------------------------
-----------*/
/*        Read environment paramaters and registry
entries      */
/*-------------------------------------------------
-----------*/
static void read_mon_environment()
{
    char *env_str;
    char    *registryKey =
"SOFTWARE\\TransarcCorporation\\TxTpcc";
    HKEY    hKey;
    DWORD   size;
    DWORD   type;
    char    szTmp[256];

    cellName = getenv("ENCINA_TPM_CELL");
    CHECK_ENVIRON(cellName, "ENCINA_TPM_CELL");

    if (env_str = getenv("TPCC_ENV_RETRIEVE")) {
        envRetrieval = atoi(env_str);
    }

    if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
registryKey, 0, KEY_READ, &hKey) != ERROR_SUCCESS )
          return;

    size = sizeof(szTmp);
    if ( RegQueryValueEx(hKey, "StatsFrequency", 0,
&type, szTmp, &size)==ERROR_SUCCESS)
          iStatsFrequency = atoi(szTmp);

    RegCloseKey(hKey);
}
```

mon_client.h

```
/*
 *        mon_client.h
 *
 */

#ifndef MON_CLIENT_H
#define MON_CLIENT_H

#define MUTEX_T CRITICAL_SECTION
#define MUTEX_LOCK(a) EnterCriticalSection(a)
#define MUTEX_UNLOCK(a) LeaveCriticalSection(a)
#define MUTEX_INIT(mut)
InitializeCriticalSection(mut)
#define MUTEX_DESTROY(mut) DeleteCriticalSection(mut)
#define ERROUT errtpcc

/*initialization status */
#define INIT_SUCCESS 0
```

```
#define INIT_FAILED  1
#define CELL_NAME_UNAVAILABLE 2
#define MON_RETRIEVEENABLE_FAILED 3
#define MON_INITCLIENT_FAILED 4
#define MON_SECURITYSET_FAILED 5
#define MON_SETREFRESHINTERVAL_FAILED 6
#define NOINFO_TRPC_ERROR 7
#define ENROLL_CLIENT_EXCEPTION 8
#define ERROUT_FILE_NOT_FOUND 9
#define LOG_FILE_NOT_FOUND 10
#define TPCC_KEY_NOT_FOUND 11
#define TERM_ALLOC_FAILED 12

/*
 *  Routines and declarations that are common to all
clients
 */
#if defined(__cplusplus)
extern "C" {
#endif
int send_new_order(long, unsigned char *);
int send_payment(long, unsigned char *);
int send_order_status(long, unsigned char *);
int send_delivery(long, unsigned char *);
int send_stock_level(long, unsigned char *);
void enroll_client();
#if defined(__cplusplus)
}
#endif

#endif  /*  MON_CLIENT_H  */
```

neworder.h

```
#ifndef TRANSARC_neworder_h
#define TRANSARC_neworder_h

#include <trpc/trpc.h>
#include "_neworder.h"

#include <encina/c_prologue.h>

#if defined(BUILDDLL)
#define DLLEXPORT __declspec( dllexport )
#else
#define DLLEXPORT extern
#endif

#ifndef ENCINA_STUB_CALLING
#define ENCINA_STUB_CALLING ENCINA_RPC_CALLING
#endif

#define neworder_v1_0_c_ifspec
          _neworder_v1_0_c_ifspec
#define neworder_v1_0_s_ifspec
          _neworder_v1_0_s_ifspec

typedef struct neworder_v1_0_epv {
void (ENCINA_STUB_CALLING *impTPCCNewOrder) (
#ifdef IDL_PROTOTYPES

                    idl_long_int length,
                    idl_char *dataP,
                    data_header *headerP,
                    trpc_status_t *trpcStatus
#endif
);

void (ENCINA_STUB_CALLING *impTPCCNOInfo) (
#ifdef IDL_PROTOTYPES

                    dbInfo_data_t *dataP,
                    trpc_status_t *trpcStatus
#endif
);

} neworder_v1_0_epv_t;

DLLEXPORT void ENCINA_STUB_CALLING impTPCCNewOrder (
#ifdef IDL_PROTOTYPES

                    idl_long_int length,
                    idl_char *dataP,
                    data_header *headerP,
                    trpc_status_t *trpcStatus
#endif
);

DLLEXPORT void ENCINA_STUB_CALLING impTPCCNOInfo (
#ifdef IDL_PROTOTYPES

                    dbInfo_data_t *dataP,
                    trpc_status_t *trpcStatus
#endif
);

trpc_handle_t        ENCINA_CALLING
mon_handle_t_tranBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

void       ENCINA_CALLING mon_handle_t_tranUnBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_handle_t       trpcHandle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

trpc_handle_t        ENCINA_CALLING
mon_handle_t_tranBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

void       ENCINA_CALLING mon_handle_t_tranUnBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_handle_t       trpcHandle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

extern neworder_v1_0_epv_t
          neworder_v1_0_client_epv;
extern _neworder_v1_0_epv_t
          neworder_v1_0_manager_epv;
extern rpc_mgr_epv_t
          neworder_v1_0_mgr_epv;

#include <encina/c_epilogue.h>
#endif /* TRANSARC_neworder_h */
```

orderstatus.h

```
#ifndef TRANSARC_orderstatus_h
#define TRANSARC_orderstatus_h

#include <trpc/trpc.h>
#include "_orderstatus.h"

#include <encina/c_prologue.h>

#if defined(BUILDDLL)
#define DLLEXPORT __declspec( dllexport )
#else
#define DLLEXPORT extern
#endif

#ifndef ENCINA_STUB_CALLING
#define ENCINA_STUB_CALLING ENCINA_RPC_CALLING
#endif

#define orderstatus_v1_0_c_ifspec
          _orderstatus_v1_0_c_ifspec
#define orderstatus_v1_0_s_ifspec
          _orderstatus_v1_0_s_ifspec

typedef struct orderstatus_v1_0_epv {
void (ENCINA_STUB_CALLING *impTPCCOrderStatus) (
#ifdef IDL_PROTOTYPES

                    idl_long_int length,
                    idl_char *dataP,
                    data_header *headerP,
                    trpc_status_t *trpcStatus
#endif
);

} orderstatus_v1_0_epv_t;
```

```
DLLEXPORT void ENCINA_STUB_CALLING impTPCCOrderStatus
(
#ifdef IDL_PROTOTYPES

                    idl_long_int length,
                    idl_char *dataP,
                    data_header *headerP,
                    trpc_status_t *trpcStatus
#endif
);

trpc_handle_t        ENCINA_CALLING
mon_handle_t_tranBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

void       ENCINA_CALLING mon_handle_t_tranUnBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_handle_t       trpcHandle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

trpc_handle_t        ENCINA_CALLING
mon_handle_t_tranBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

void       ENCINA_CALLING mon_handle_t_tranUnBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_handle_t       trpcHandle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

extern orderstatus_v1_0_epv_t
          orderstatus_v1_0_client_epv;
extern _orderstatus_v1_0_epv_t
          orderstatus_v1_0_manager_epv;
extern rpc_mgr_epv_t
          orderstatus_v1_0_mgr_epv;

#include <encina/c_epilogue.h>
#endif /* TRANSARC_orderstatus_h */
```

payment.h

```
#ifndef TRANSARC_payment_h

#define TRANSARC_payment_h

#include <trpc/trpc.h>
#include "_payment.h"

#include <encina/c_prologue.h>

#if defined(BUILDDLL)
#define DLLEXPORT __declspec( dllexport )
#else
#define DLLEXPORT extern
#endif

#ifndef ENCINA_STUB_CALLING
#define ENCINA_STUB_CALLING ENCINA_RPC_CALLING
#endif

#define payment_v1_0_c_ifspec _payment_v1_0_c_ifspec
#define payment_v1_0_s_ifspec _payment_v1_0_s_ifspec

typedef struct payment_v1_0_epv {
void (ENCINA_STUB_CALLING *impTPCCPayment) (
#ifdef IDL_PROTOTYPES

                    idl_long_int length,
                    idl_char *dataP,
                    data_header *headerP,
                    trpc_status_t *trpcStatus
#endif
);

} payment_v1_0_epv_t;

DLLEXPORT void ENCINA_STUB_CALLING impTPCCPayment (
#ifdef IDL_PROTOTYPES

                    idl_long_int length,
                    idl_char *dataP,
                    data_header *headerP,
                    trpc_status_t *trpcStatus
#endif
);

trpc_handle_t        ENCINA_CALLING
mon_handle_t_tranBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

void       ENCINA_CALLING mon_handle_t_tranUnBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_handle_t       trpcHandle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

trpc_handle_t        ENCINA_CALLING
mon_handle_t_tranBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

void       ENCINA_CALLING mon_handle_t_tranUnBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_handle_t       trpcHandle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

extern payment_v1_0_epv_t
          payment_v1_0_client_epv;
extern _payment_v1_0_epv_t
          payment_v1_0_manager_epv;
extern rpc_mgr_epv_t
          payment_v1_0_mgr_epv;

#include <encina/c_epilogue.h>
#endif /* TRANSARC_payment_h */
```

ReadRegistry.cpp

```
/*        FILE:               READREGISTRY.CPP
 *                                          Microsoft
TPC-C Kit Ver. 4.20.000
 *                                          Copyright
Microsoft, 1999
 *              All Rights Reserved
 *
 *                                          not yet
audited
 *
 *        PURPOSE:  Implementation for TPC-C Tuxedo
class.
 *        Contact:  Charles Levine
(clevine@microsoft.com)
 *
 *  Change history:
 *                  4.20.000 - first version
 */


/* FUNCTION: ReadTPCCRegistrySettings
 *
 * PURPOSE:         This function reads the NT
registry for startup parameters. There parameters are
 *                          under the TPCC key.
 *
 * RETURNS          FALSE = no errors
```

```
 *                              TRUE  = error reading
registry
 */
BOOL ReadTPCCRegistrySettings( TPCCREGISTRYDATA *pReg
)
{
          HKEY      hKey;
          DWORD     size;
          DWORD     type;
          DWORD     dwTmp;
          char      szTmp[256];

          if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SOFTWARE\\Microsoft\\TPCC", 0, KEY_READ, &hKey) !=
ERROR_SUCCESS )
                    return TRUE;

          // determine database protocol to use; may
be either ODBC or DBLIB
          pReg->eDB_Protocol = Unspecified;
          size = sizeof(szTmp);
          if ( RegQueryValueEx(hKey, "DB_Protocol",
0, &type, (BYTE *)&szTmp, &size) == ERROR_SUCCESS )
          {
                    if ( !stricmp(szTmp,
szDBNames[ODBC]) )
                              pReg->eDB_Protocol =
ODBC;
                    else if ( !stricmp(szTmp,
szDBNames[DBLIB]) )
                              pReg->eDB_Protocol =
DBLIB;
          }

          pReg->eTxnMon = None;
          // determine txn monitor to use; may be
either TUXEDO, or blank
          size = sizeof(szTmp);
          if ( RegQueryValueEx(hKey, "TxnMonitor", 0,
&type, (BYTE *)&szTmp, &size) == ERROR_SUCCESS )
          {
                    if ( !stricmp(szTmp,
szTxnMonNames[TUXEDO]) )
                              pReg->eTxnMon = TUXEDO;
                    else if ( !stricmp(szTmp,
szTxnMonNames[ENCINA]) )
                              pReg->eTxnMon = ENCINA;
                    else if ( !stricmp(szTmp,
szTxnMonNames[COM]) )
                              pReg->eTxnMon = COM;
          }

          pReg->bCOM_SinglePool = FALSE;
          size = sizeof(szTmp);
          if ( RegQueryValueEx(hKey,
"COM_SinglePool", 0, &type, (BYTE *)&szTmp, &size) ==
ERROR_SUCCESS )
          {
                    if ( !stricmp(szTmp, "YES") )
                              pReg->bCOM_SinglePool =
TRUE;
          }

          pReg->dwMaxConnections = 0;
          size = sizeof(dwTmp);
          if ( ( RegQueryValueEx(hKey,
"MaxConnections", 0, &type, (LPBYTE)&dwTmp, &size) ==
ERROR_SUCCESS )
                    && (type == REG_DWORD) )
                    pReg->dwMaxConnections = dwTmp;

          pReg->dwMaxPendingDeliveries = 0;
          size = sizeof(dwTmp);
          if ( ( RegQueryValueEx(hKey,
"MaxPendingDeliveries", 0, &type, (LPBYTE)&dwTmp,
&size) == ERROR_SUCCESS )
                    && (type == REG_DWORD) )
                    pReg->dwMaxPendingDeliveries =
dwTmp;

          pReg->dwNumberOfDeliveryThreads = 0;
          size = sizeof(dwTmp);
          if ( ( RegQueryValueEx(hKey,
"NumberOfDeliveryThreads", 0, &type, (LPBYTE)&dwTmp,
&size) == ERROR_SUCCESS )
                    && (type == REG_DWORD) )
                    pReg->dwNumberOfDeliveryThreads =
dwTmp;

          size = sizeof( pReg->szPath );
          if ( RegQueryValueEx(hKey, "Path", 0,
&type, (BYTE *)&pReg->szPath, &size) != ERROR_SUCCESS
)
                    pReg->szPath[0] = 0;

          size = sizeof( pReg->szDbServer );
          if ( RegQueryValueEx(hKey, "DbServer", 0,
&type, (BYTE *)&pReg->szDbServer, &size) !=
ERROR_SUCCESS )
                    pReg->szDbServer[0] = 0;

          size = sizeof( pReg->szDbName );
          if ( RegQueryValueEx(hKey, "DbName", 0,
&type, (BYTE *)&pReg->szDbName, &size) !=
ERROR_SUCCESS )
                    pReg->szDbName[0] = 0;

          size = sizeof( pReg->szDbUser );
          if ( RegQueryValueEx(hKey, "DbUser", 0,
&type, (BYTE *)&pReg->szDbUser, &size) !=
ERROR_SUCCESS )
                    pReg->szDbUser[0] = 0;

          size = sizeof( pReg->szDbPassword );
          if ( RegQueryValueEx(hKey, "DbPassword", 0,
&type, (BYTE *)&pReg->szDbPassword, &size) !=
ERROR_SUCCESS )
                    pReg->szDbPassword[0] = 0;

          size = sizeof( pReg->szSPPrefix );
          if ( RegQueryValueExW(hKey, L"SPPrefix", 0,
&type, (BYTE *)&pReg->szSPPrefix, &size) !=
ERROR_SUCCESS )
                    pReg->szSPPrefix[0] = L'\0';

          pReg->dwConnectDelay = 0;
          size = sizeof(dwTmp);
          if ( ( RegQueryValueEx(hKey,
"ConnectDelay", 0, &type, (LPBYTE)&dwTmp, &size) ==
ERROR_SUCCESS )
                    && (type == REG_DWORD) )
                    pReg->dwConnectDelay = dwTmp;

          pReg->bCallNoDuplicatesNewOrder = FALSE;
          size = sizeof(dwTmp);
          if ( ( RegQueryValueEx(hKey,
"CallNoDuplicatesNewOrder", 0, &type, (LPBYTE)&dwTmp,
&size) == ERROR_SUCCESS )
                    && (type == REG_DWORD) )
                    pReg->bCallNoDuplicatesNewOrder =
dwTmp;

          RegCloseKey(hKey);

          return FALSE;
}
```

ReadRegistry.h

```
/*        FILE:                ReadRegistry.h
 *                                        Microsoft
TPC-C Kit Ver. 4.20.000
 *                                        Copyright
Microsoft, 1999
 *              All Rights Reserved
 *
 *                                        not audited
 *
 *        PURPOSE:  Header for registry related code.
 *
 *  Change history:
 *                  4.20.000 - first version
 */

enum DBPROTOCOL { Unspecified, ODBC, DBLIB };
const char *szDBNames[] = { "Unspecified", "ODBC",
"DBLIB" };

enum TXNMON { None, TUXEDO, ENCINA, COM };
const char *szTxnMonNames[] = { "NONE", "TUXEDO",
"ENCINA", "COM" };

//This structure defines the data necessary to keep
distinct for each terminal or client connection.
typedef struct _TPCCREGISTRYDATA
{
          enum DBPROTOCOL eDB_Protocol;
          enum TXNMON eTxnMon;
          BOOL bCOM_SinglePool;
          DWORD dwMaxConnections;
```

```
        DWORD dwMaxPendingDeliveries;
        DWORD dwNumberOfDeliveryThreads;
        char szPath[128];
        char szDbServer[32];
        char szDbName[32];
        char szDbUser[32];
        char szDbPassword[32];
        wchar_t szSPPrefix[32];
        //tpcc_odbc.dll stored procedures prefix
        DWORD dwConnectDelay;         // delay in
ms to use in pacing connection open and close
        BOOL bCallNoDuplicatesNewOrder;        //
whether to check for non-duplicate item ids and call
a different New Order SP
} TPCCREGISTRYDATA, *PTPCCREGISTRYDATA;

BOOL ReadTPCCRegistrySettings( TPCCREGISTRYDATA *pReg
);
```

RESOURCE.H

```
//{{NO_DEPENDENCIES}}
// Microsoft Visual C++ generated include file.
// Used by install.rc
//
#define IDD_DIALOG1                     101
#define IDI_ICON1                       102
#define IDR_TPCCDLL                     103
#define IDD_DIALOG2                     105
#define IDI_ICON2                       106
#define IDR_DELIVERY                    107
#define IDD_DIALOG3                     108
#define IDR_LICENSE1                    112
#define IDD_DIALOG4                     113
#define IDR_TPCCOBJ1                    117
#define IDR_TPCCSTUB1                   118
#define IDR_DBLIB_DLL                   122
#define IDR_ODBC_DLL                    123
#define IDR_TUXEDO_APP                  124
#define IDR_TUXEDO_DLL                  125
#define IDR_COM_DLL                     126
#define IDR_COMPS_DLL                   127
#define IDR_COMALL_DLL                  128
#define IDR_COMTYPLIB_DLL               129
#define IDR_MSVCRT701                   130
#define BN_LOG                          1001
#define ED_KEEP                         1002
#define ED_THREADS                      1003
#define ED_THREADS2                     1004
#define IDC_PATH                        1007
#define IDC_VERSION                     1009
#define IDC_RESULTS                     1010
#define IDC_PROGRESS1                   1011
#define IDC_STATUS                      1012
#define IDC_BUTTON1                     1013
#define ED_MAXCONNECTION                1014
#define ED_IIS_MAX_THEAD_POOL_LIMIT     1015
#define ED_MAXDELIVERIES                1016
#define ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE 1017
#define ED_IIS_THREAD_TIMEOUT           1018
#define ED_IIS_LISTEN_BACKLOG           1019
#define IDC_DBLIB                       1021
#define IDC_LICENSE                     1022
#define IDC_ODBC                        1022
#define IDC_CONNECT_POOL                1023
#define ED_DB_SERVER                    1023
#define ED_USER_CONNECT_DELAY_TIME      1024
#define ED_DB_USER_ID                   1024
#define IDC_MTS                         1025
#define IDC_TM_MTS                      1025
#define IDC_TM_TUXEDO                   1026
#define IDC_TM_NONE                     1027
#define ED_DB_PASSWORD                  1028
#define ED_DB_NAME                      1029
#define IDC_TM_ENCINA                   1030

// Next default values for new objects
//
#ifdef APSTUDIO_INVOKED
#ifndef APSTUDIO_READONLY_SYMBOLS
#define _APS_NEXT_RESOURCE_VALUE        131
#define _APS_NEXT_COMMAND_VALUE         40001
#define _APS_NEXT_CONTROL_VALUE         1031
#define _APS_NEXT_SYMED_VALUE           101
#endif
#endif
```

stocklevel.h

```
#ifndef TRANSARC_stocklevel_h
#define TRANSARC_stocklevel_h

#include <trpc/trpc.h>
#include "_stocklevel.h"

#include <encina/c_prologue.h>

#if defined(BUILDDLL)
#define DLLEXPORT __declspec( dllexport )
#else
#define DLLEXPORT extern
#endif

#ifndef ENCINA_STUB_CALLING
#define ENCINA_STUB_CALLING ENCINA_RPC_CALLING
#endif

#define stocklevel_v1_0_c_ifspec
          _stocklevel_v1_0_c_ifspec
#define stocklevel_v1_0_s_ifspec
          _stocklevel_v1_0_s_ifspec

typedef struct stocklevel_v1_0_epv {
void (ENCINA_STUB_CALLING *impTPCCStockLevel) (
#ifdef IDL_PROTOTYPES

                    idl_long_int length,
                    idl_char *dataP,
                    data_header *headerP,
                    trpc_status_t *trpcStatus
#endif
);

} stocklevel_v1_0_epv_t;

DLLEXPORT void ENCINA_STUB_CALLING impTPCCStockLevel
(
#ifdef IDL_PROTOTYPES

                    idl_long_int length,
                    idl_char *dataP,
                    data_header *headerP,
                    trpc_status_t *trpcStatus
#endif
);

trpc_handle_t        ENCINA_CALLING
mon_handle_t_tranBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

void       ENCINA_CALLING mon_handle_t_tranUnBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_handle_t       trpcHandle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

trpc_handle_t        ENCINA_CALLING
mon_handle_t_tranBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

void       ENCINA_CALLING mon_handle_t_tranUnBind(
#ifdef IDL_PROTOTYPES
          mon_handle_t        handle,
          trpc_handle_t       trpcHandle,
          trpc_tranInfo_t     *tranInfoP,
          trpc_ifSpec_t *ifSpecP
#endif
          );

extern stocklevel_v1_0_epv_t
          stocklevel_v1_0_client_epv;
extern _stocklevel_v1_0_epv_t
          stocklevel_v1_0_manager_epv;
extern rpc_mgr_epv_t
          stocklevel_v1_0_mgr_epv;

#include <encina/c_epilogue.h>
#endif /* TRANSARC_stocklevel_h */
```

tpcc.cpp

```
/*        FILE:               TPCC.C
 *                                    Microsoft
TPC-C Kit Ver. 4.20.000
 *                                    Copyright
Microsoft, 1999
 *              All Rights Reserved
 *
 *                                    Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *        PURPOSE:  Main module for TPCC.DLL which is
an ISAPI service dll.
 *        Contact:  Charles Levine
(clevine@microsoft.com)
 *
 *  Change history:
 *                  4.20.000 - reworked error
handling; added options for COM and Encina txn
monitors
 */

#include <windows.h>
#include <process.h>
#include <tchar.h>
#include <stdio.h>
#include <stdarg.h>
#include <malloc.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include <sys\timeb.h>
#include <io.h>
#include <assert.h>

#include <sqltypes.h>

#ifdef ICECAP
#include <icapexp.h>
#endif

#include "..\..\common\src\trans.h"
         //tpckit transaction header contains
definations of structures specific to TPC-C
#include "..\..\common\src\error.h"
#include "..\..\common\src\txn_base.h"
#include "..\..\common\src\ReadRegistry.h"

#include "..\..\common\txnlog\include\rtetime.h"
#include "..\..\common\txnlog\include\spinlock.h"
#include "..\..\common\txnlog\include\txnlog.h"

// Database layer includes
#include "..\..\db_dblib_dll\src\tpcc_dblib.h"
         // DBLIB implementation of TPC-C txns
#include "..\..\db_odbc_dll\src\tpcc_odbc.h"
         // ODBC implementation of TPC-C txns

// Txn monitor layer includes
#include "..\..\tm_com_dll\src\tpcc_com.h"
                  // COM Services implementation on
TPC-C txns
#include "..\..\tm_tuxedo_dll\src\tpcc_tux.h"
         // interface to Tuxedo libraries
#include "..\..\tm_encina_dll\src\tpcc_enc.h"
         // interface to Encina libraries

#include "httpext.h"
         //ISAPI DLL information header
#include "tpcc.h"
         //this dlls specific structure, value e.t.
header.


#define   LEN_ERR_STRING      256

// defines for Make<Txn>Form calls to distinguish
input and output flavors
#define   OUTPUT_FORM         0
#define INPUT_FORM  1

char
         szMyComputerName[MAX_COMPUTERNAME_LENGTH+1]
;

//Terminal client id structure
TERM      Term = { 0, 0, 0, NULL };

// The WEBCLIENT_VERSION string specifies the version
level of this web client interface.
// The RTE must be synchronized with the interface
level on login, otherwise the login
// will fail.  This is a sanity check to catch
problems resulting from mismatched versions
// of the RTE and web client.
#define WEBCLIENT_VERSION "420"

static    CRITICAL_SECTION
          TermCriticalSection;

static  HINSTANCE hLibInstanceTm = NULL;
static  HINSTANCE hLibInstanceDb = NULL;

TYPE_CTPCC_DBLIB    *pCTPCC_DBLIB_new;
TYPE_CTPCC_ODBC                *pCTPCC_ODBC_new;
TYPE_CTPCC_TUXEDO   *pCTPCC_TUXEDO_new;
TYPE_CTPCC_ENCINA   *pCTPCC_ENCINA_new;
TYPE_CTPCC_ENCINA   *pCTPCC_ENCINA_post_init;
TYPE_CTPCC_COM                 *pCTPCC_COM_new;

// For deferred Delivery txns:

CTxnLog
          *txnDelilog = NULL;
          //used to log delivery transaction
information

HANDLE
          hWorkerSemaphore    = INVALID_HANDLE_VALUE;
HANDLE
          hDoneEvent                                =
INVALID_HANDLE_VALUE;
HANDLE
          *pDeliHandles                = NULL;

// configuration settings from registry
TPCCREGISTRYDATA              Reg;


DWORD
          dwNumDeliveryThreads = 4;
CRITICAL_SECTION              DelBuffCriticalSection;
                    //critical section for delivery
transactions cache
DELIVERY_TRANSACTION          *pDelBuff
          = NULL;
DWORD
          dwDelBuffSize                = 100;
          // size of circular buffer for delivery
txns
DWORD
          dwDelBuffFreeCount;
          // number of buffers free
DWORD
          dwDelBuffBusyIndex  = 0;                //
index position of entry waiting to be delivered
DWORD
          dwDelBuffFreeIndex  = 0;                //
index position of unused entry

// Critical section to synchronize connection open
and close.
//
CRITICAL_SECTION hConnectCriticalSection;

#include "..\..\common\src\ReadRegistry.cpp"

/* FUNCTION: DllMain
 *
 * PURPOSE:         This function is the entry point
for the DLL.  This implementation is based on the
 *                  fact that
DLL_PROCESS_ATTACH is only called from the inet
service once.
 *
 * ARGUMENTS:       HANDLE    hModule
                    module handle
 *                                    DWORD
          ul_reason_for_call  reason for call
 *                                    LPVOID
          lpReserved
          reserved for future use
 *
 * RETURNS:                   BOOL      FALSE
                              errors occured in
initialization
 *
          TRUE                                      DLL
successfully initialized
 */
```

```
BOOL APIENTRY DllMain(HANDLE hModule, DWORD
ul_reason_for_call, LPVOID lpReserved)
{
         DWORD  i;
         char szEvent[LEN_ERR_STRING] = "\0";
         char szLogFile[128];
         char szDllName[128];

// debugging....
// DebugBreak();

         try
         {
                  switch( ul_reason_for_call )
                  {
                           case
DLL_PROCESS_ATTACH:
                                    {

         DWORD dwSize = MAX_COMPUTERNAME_LENGTH+1;

         GetComputerName(szMyComputerName, &dwSize);

         szMyComputerName[dwSize] = 0;
                                    }


         DisableThreadLibraryCalls((HMODULE)hModule)
;

         InitializeCriticalSection(&TermCriticalSect
ion);

                                    if (
ReadTPCCRegistrySettings( &Reg ) )

         throw new CWEBCLNT_ERR(
ERR_MISSING_REGISTRY_ENTRIES );

                                    dwDelBuffSize
= min( Reg.dwMaxPendingDeliveries, 10000 );  // min
with 10000 as a sanity constraint

         dwNumDeliveryThreads = min(
Reg.dwNumberOfDeliveryThreads, 100 );  // min with
100 as a sanity constraint

                                    TermInit();

                                    // load DLL
for txn monitor
                                    if
(Reg.eTxnMon == TUXEDO)
                                    {

         strcpy( szDllName, Reg.szPath );

         strcat( szDllName, "tpcc_tuxedo.dll");

         hLibInstanceTm = LoadLibrary( szDllName );
                                                  if
(hLibInstanceTm == NULL)

         throw new CWEBCLNT_ERR( ERR_LOADDLL_FAILED,
szDllName, GetLastError() );

                                                  //
get function pointer to wrapper for class constructor

         pCTPCC_TUXEDO_new = (TYPE_CTPCC_TUXEDO*)
GetProcAddress(hLibInstanceTm,"CTPCC_TUXEDO_new");
                                                  if
(pCTPCC_TUXEDO_new == NULL)

         throw new CWEBCLNT_ERR(
ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                                    }
                                    else if
(Reg.eTxnMon == ENCINA)
                                    {

         strcpy( szDllName, Reg.szPath );

         strcat( szDllName, "tpcc_encina.dll");

         hLibInstanceTm = LoadLibrary( szDllName );
                                                  if
(hLibInstanceTm == NULL)

         throw new CWEBCLNT_ERR( ERR_LOADDLL_FAILED,
szDllName, GetLastError() );
                                                  //
get function pointer to wrapper for class constructor

         pCTPCC_ENCINA_new = (TYPE_CTPCC_ENCINA*)
GetProcAddress(hLibInstanceTm,"CTPCC_ENCINA_new");

         pCTPCC_ENCINA_post_init =
(TYPE_CTPCC_ENCINA*)
GetProcAddress(hLibInstanceTm,"CTPCC_ENCINA_post_init
");
                                                  if
(pCTPCC_ENCINA_new == NULL)

         throw new CWEBCLNT_ERR(
ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                                    }
                                    else if
(Reg.eTxnMon == COM)
                                    {

         strcpy( szDllName, Reg.szPath );

         strcat( szDllName, "tpcc_com.dll");

         hLibInstanceTm = LoadLibrary( szDllName );
                                                  if
(hLibInstanceTm == NULL)

         throw new CWEBCLNT_ERR( ERR_LOADDLL_FAILED,
szDllName, GetLastError() );
                                                  //
get function pointer to wrapper for class constructor

         pCTPCC_COM_new = (TYPE_CTPCC_COM*)
GetProcAddress(hLibInstanceTm,"CTPCC_COM_new");
                                                  if
(pCTPCC_COM_new == NULL)

         throw new CWEBCLNT_ERR(
ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                                    }

                                    // load DLL
for database connection
                                    if
((Reg.eTxnMon == None) || (dwNumDeliveryThreads > 0))
                                    {
                                                  if
(Reg.eDB_Protocol == DBLIB)
                                                  {

         strcpy( szDllName, Reg.szPath );

         strcat( szDllName, "tpcc_dblib.dll");

         hLibInstanceDb = LoadLibrary( szDllName );

         if (hLibInstanceDb == NULL)

                  throw new CWEBCLNT_ERR(
ERR_LOADDLL_FAILED, szDllName, GetLastError() );


         // get function pointer to wrapper for
class constructor

         pCTPCC_DBLIB_new = (TYPE_CTPCC_DBLIB*)
GetProcAddress(hLibInstanceDb,"CTPCC_DBLIB_new");

         if (pCTPCC_DBLIB_new == NULL)

                  throw new CWEBCLNT_ERR(
ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                                                  }
         else if (Reg.eDB_Protocol == ODBC)
                                                  {

         strcpy( szDllName, Reg.szPath );

         strcat( szDllName, "tpcc_odbc.dll");

         hLibInstanceDb = LoadLibrary( szDllName );

         if (hLibInstanceDb == NULL)

                  throw new CWEBCLNT_ERR(
ERR_LOADDLL_FAILED, szDllName, GetLastError() );
```

```
        // get function pointer to wrapper for
class constructor

        pCTPCC_ODBC_new = (TYPE_CTPCC_ODBC*)
GetProcAddress(hLibInstanceDb,"CTPCC_ODBC_new");

        if (pCTPCC_ODBC_new == NULL)

                throw new CWEBCLNT_ERR(
ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );


                                                }
                                        }

                                        if
(dwNumDeliveryThreads)
                                        {
                                                //
Initialize delivery delay critical section
                                                //

        InitializeCriticalSection(&hConnectCritical
Section);

                                                //
for deferred delivery txns:

        hDoneEvent = CreateEvent( NULL, TRUE /*
manual reset */, FALSE /* initially not signalled */,
NULL );

        InitializeCriticalSection(&DelBuffCriticalS
ection);

        hWorkerSemaphore = CreateSemaphore( NULL,
0, dwDelBuffSize, NULL );

        dwDelBuffFreeCount = dwDelBuffSize;


        InitJulianTime(NULL);

                                                //
create unique log file name based on delilog-yymmdd-
hhmm.log

        SYSTEMTIME Time;

        GetLocalTime( &Time );

        wsprintf( szLogFile, "%sdelivery-
%2.2d%2.2d%2.2d-%2.2d%2.2d-%2.2ds%2.2dms.log",

        Reg.szPath, Time.wYear % 100, Time.wMonth,
Time.wDay, Time.wHour, Time.wMinute, Time.wSecond,
Time.wMilliseconds );

        txnDelilog = new CTxnLog(szLogFile,
TXN_LOG_WRITE);

        //write event into txn log for START

        txnDelilog-
>WriteCtrlRecToLog(TXN_EVENT_START, szMyComputerName,
sizeof(szMyComputerName));

                                                //
allocate structures for delivery buffers and thread
mgmt

        pDeliHandles = new
HANDLE[dwNumDeliveryThreads];

        pDelBuff = new
DELIVERY_TRANSACTION[dwDelBuffSize];
                                                //
launch DeliveryWorkerThread to perform actual
delivery txns

        for(i=0; i<dwNumDeliveryThreads; i++)
                                                {

        pDeliHandles[i] = (HANDLE) _beginthread(
DeliveryWorkerThread, 0, NULL );

        if (pDeliHandles[i] ==
INVALID_HANDLE_VALUE)

                throw new CWEBCLNT_ERR(
ERR_DELIVERY_THREAD_FAILED );
                                                }
                                        }

                                        break;


                                case
DLL_PROCESS_DETACH:
                                        if
(dwNumDeliveryThreads)
                                        {
                                                if
(txnDelilog != NULL)
                                                {

        //write event into txn log for STOP

        txnDelilog-
>WriteCtrlRecToLog(TXN_EVENT_STOP, szMyComputerName,
sizeof(szMyComputerName));


        // This will do a clean shutdown of the
delivery log file

        CTxnLog   *txnDelilogLocal = txnDelilog;

        txnDelilog= NULL;

        delete txnDelilogLocal;
                                                }
                                        }

        delete [] pDeliHandles;

        delete [] pDelBuff;


        CloseHandle( hWorkerSemaphore );

        CloseHandle( hDoneEvent );

        DeleteCriticalSection(&DelBuffCriticalSecti
on);
                                                //
Delete delivery delay critical section
                                                //

        DeleteCriticalSection(&hConnectCriticalSect
ion);
                                        }


        DeleteCriticalSection(&TermCriticalSection)
;
                                        if
(hLibInstanceTm != NULL)

        FreeLibrary( hLibInstanceTm );

        hLibInstanceTm = NULL;

                                        if
(hLibInstanceDb != NULL)

        FreeLibrary( hLibInstanceDb );

        hLibInstanceDb = NULL;

                                        Sleep(500);
                                        break;

                                default:
                                        /* nothing
*/;
                }
        }
        catch (CBaseErr *e)
        {
                TCHAR szMsg[256];

                _sntprintf(szMsg, sizeof(szMsg),
"%s error, code %d: %s",
                                        e-
>ErrorTypeStr(), e->ErrorNum(), e->ErrorText());
                WriteMessageToEventLog( szMsg );
                delete e;
                TerminateExtension(0);
                return FALSE;
```

```
        }
        catch (...)
        {

        WriteMessageToEventLog(TEXT("Unhandled
exception.  DLL could not load."));
                TerminateExtension(0);
                return FALSE;
        }

        return TRUE;
}


/* FUNCTION: GetExtensionVersion
 *
 * PURPOSE:         This function is called by the
inet service when the DLL is first loaded.
 *
 * ARGUMENTS:       HSE_VERSION_INFO    *pVer
        passed in structure in which to place
expected version number.
 *
 * RETURNS:                 TRUE      inet service
expected return value.
 */

BOOL WINAPI GetExtensionVersion(HSE_VERSION_INFO
*pVer)
{
        pVer->dwExtensionVersion =
MAKELONG(HSE_VERSION_MINOR, HSE_VERSION_MAJOR);
        lstrcpyn(pVer->lpszExtensionDesc, "TPC-C
Server.", HSE_MAX_EXT_DLL_NAME_LEN);

        // TODO: why do we need this here instead
of in the DLL attach?
        if (Reg.eTxnMon == ENCINA)
                pCTPCC_ENCINA_post_init();

        return TRUE;
}

/* FUNCTION: TerminateExtension
 *
 * PURPOSE:         This function is called by the
inet service when the DLL is about to be unloaded.
 *                          Release all resources
in anticipation of being unloaded.
 *
 * RETURNS:                 TRUE      inet service
expected return value.
 */

BOOL WINAPI TerminateExtension( DWORD dwFlags )
{
        if (pDeliHandles)
        {
                SetEvent( hDoneEvent );
                for(DWORD i=0;
i<dwNumDeliveryThreads; i++)
                                WaitForSingleObject(
pDeliHandles[i], INFINITE );
        }

        TermDeleteAll();
        return TRUE;
}


/* FUNCTION: HttpExtensionProc
 *
 * PURPOSE:         This function is the main entry
point for the TPCC DLL. The internet service
 *                          calls this function
passing in the http string.
 *
 * ARGUMENTS:       EXTENSION_CONTROL_BLOCK
        *pECB     structure pointer to passed in
internet
 *

                service information.
 *
 * RETURNS:                 DWORD
        HSE_STATUS_SUCCESS
                connection can be dropped if
error
 *
        HSE_STATUS_SUCCESS_AND_KEEP_CONN
        keep connect valid comment sent
 *
 * COMMENTS:        None
 *
 */

DWORD WINAPI
HttpExtensionProc(EXTENSION_CONTROL_BLOCK *pECB)
{
        int                             iCmd, FormId,
TermId, iSyncId;
        char                szBuffer[4096];

        int                             lpbSize;
        static char         szHeader[] = "200 Ok";
        DWORD               dwSize = 6;
        // initial value is strlen(szHeader)
        char                szHeader1[4096];


#ifdef ICECAP
        StartCAP();
#endif

        try
        {
                //process http query
                ProcessQueryString(pECB, &iCmd,
&FormId, &TermId, &iSyncId);

                if (TermId != 0)
                {
                                if ( TermId < 0 ||
TermId >= Term.iNumEntries ||
Term.pClientData[TermId].iNextFree != -1 )
                                {
                                        //
debugging...
                                        char
szTmp[128];
                                        wsprintf(
szTmp, "Invalid term ID; TermId = %d", TermId );

          WriteMessageToEventLog( szTmp );

                                        throw new
CWEBCLNT_ERR( ERR_INVALID_TERMID );
                                }

                                //must have a valid
syncid here since termid is valid
                                if (iSyncId !=
Term.pClientData[TermId].iSyncId)
                                        throw new
CWEBCLNT_ERR( ERR_INVALID_SYNC_CONNECTION );

                                //set use time

          Term.pClientData[TermId].iTickCount =
GetTickCount();
                }


                switch(iCmd)
                {
                case 0:
                                WelcomeForm(pECB,
szBuffer);
                                break;
                case 1:
                                switch( FormId )
                                {
                                        case
WELCOME_FORM:
                                        case
MAIN_MENU_FORM:

          break;
                                        case
NEW_ORDER_FORM:

          ProcessNewOrderForm(pECB, TermId,
szBuffer);

          break;
                                        case
PAYMENT_FORM:

          ProcessPaymentForm(pECB, TermId, szBuffer);

          break;
                                        case
DELIVERY_FORM:
```

```
          ProcessDeliveryForm(pECB, TermId,
szBuffer);

          break;
                                        case
ORDER_STATUS_FORM:

          ProcessOrderStatusForm(pECB, TermId,
szBuffer);

          break;
                                        case
STOCK_LEVEL_FORM:

          ProcessStockLevelForm(pECB, TermId,
szBuffer);

          break;
                              }
                              break;
                    case 2:
                              // new-order selected
from menu; display new-order input form

          MakeNewOrderForm(TermId, NULL, INPUT_FORM,
szBuffer);
                              break;
                    case 3:
                              // payment selected
from menu; display payment input form
                              MakePaymentForm(TermId,
NULL, INPUT_FORM, szBuffer);
                              break;
                    case 4:
                              // delivery selected
from menu; display delivery input form

          MakeDeliveryForm(TermId, NULL, INPUT_FORM,
szBuffer);
                              break;
                    case 5:
                              // order-status
selected from menu; display order-status input form

          MakeOrderStatusForm(TermId, NULL,
INPUT_FORM, szBuffer);
                              break;
                    case 6:
                              // stock-level selected
from menu; display stock-level input form

          MakeStockLevelForm(TermId, NULL,
INPUT_FORM, szBuffer);
                              break;
                    case 7:
                              // ExitCmd
                              TermDelete(TermId);
                              WelcomeForm(pECB,
szBuffer);
                              break;
                    case 8:
                              SubmitCmd(pECB,
szBuffer);
                              break;
                    case 9:
                              // menu

          MakeMainMenuForm(TermId,
Term.pClientData[TermId].iSyncId, szBuffer);
                              break;
                    case 10:
                              // CMD=Clear
                              // resets all
connections; should only be used when no other
connections are active
                              TermDeleteAll();
                              TermInit();
                              WelcomeForm(pECB,
szBuffer);
                              break;
                    case 11:  // CMD=Stats
                              StatsCmd(pECB,
szBuffer);
                              break;
                    }
          }
          catch (CBaseErr *e)
          {
                    ErrorForm( pECB, e->ErrorType(),
e->ErrorNum(), TermId, iSyncId, e->ErrorText(),
szBuffer );
                    delete e;
          }
          catch (...)
          {
                    ErrorForm( pECB, ERR_TYPE_WEBDLL,
0, TermId, iSyncId, "Error: Unhandled exception in
Web Client.", szBuffer );
          }

#ifdef ICECAP
          StopCAP();
#endif


          lpbSize = strlen(szBuffer);
          wsprintf(szHeader1,
                              "Content-Type:
text/html\r\n"
                              "Content-Length:
%d\r\n"
                              "Connection: Keep-
Alive\r\n\r\n" , lpbSize);
          strcat( szHeader1, szBuffer );

          (*pECB->ServerSupportFunction)(pECB-
>ConnID, HSE_REQ_SEND_RESPONSE_HEADER, szHeader,
(LPDWORD) &dwSize, (LPDWORD)szHeader1);

          //finish up and keep connection
          pECB->dwHttpStatusCode = 200;
          return HSE_STATUS_SUCCESS_AND_KEEP_CONN;
}


void WriteMessageToEventLog(LPTSTR lpszMsg)
{
    TCHAR   szMsg[256];
    HANDLE  hEventSource;
    LPTSTR  lpszStrings[2];

    // Use event logging to log the error.
    //
    hEventSource = RegisterEventSource(NULL,
TEXT("TPCC.DLL"));

    _stprintf(szMsg, TEXT("Error in TPCC.DLL: "));
    lpszStrings[0] = szMsg;
    lpszStrings[1] = lpszMsg;

    if (hEventSource != NULL)
         {
        ReportEvent(hEventSource, // handle of event
source
            EVENTLOG_ERROR_TYPE,  // event type
            0,                    // event category
            0,                    // event ID
            NULL,                 // current user's
SID
            2,                    // strings in
lpszStrings
            0,                    // no bytes of raw
data
            (LPCTSTR *)lpszStrings,    // array of
error strings
            NULL);                // no raw data

        (VOID) DeregisterEventSource(hEventSource);
    }
}


/* FUNCTION: DeliveryWorkerThread
 *
 * PURPOSE:         This function processes deferred
delivery txns.  There are typically several
 *                           threads running this
routine.  The number of threads is determined by an
entry
 *                           read from the registry.
The thread waits for work by waiting on semaphore.
 *                           When a delivery txn is
posted, the semaphore is released.  After processing
 *                           the delivery txn,
information is logged to record the txn status and
execution
 *                           time.
 */

/*static*/ void DeliveryWorkerThread(void *ptr)
{
          CTPCC_BASE                    *pTxn = NULL;
```

```
        DELIVERY_TRANSACTION
        delivery;
        PDELIVERY_DATA
        pDeliveryData;
        TXN_RECORD_TPCC_DELIV_DEF     txnDeliRec;

        DWORD
        index;
        HANDLE
        handles[2];

        SYSTEMTIME                    trans_end;
                //delivery transaction finished
time
        SYSTEMTIME                    trans_start;
        //delivery transaction start time

        assert(txnDelilog != NULL);

        try
        {
                if (Reg.eDB_Protocol == ODBC)
                {
                        if (Reg.dwConnectDelay
> 0)
                        {
                                //
Synchronize connect (for VIA)
                                //

        EnterCriticalSection(&hConnectCriticalSecti
on);


        Sleep(Reg.dwConnectDelay);

                                pTxn =
pCTPCC_ODBC_new( Reg.szDbServer, Reg.szDbUser,
Reg.szDbPassword,


        szMyComputerName, Reg.szDbName,


        Reg.szSPPrefix,
Reg.bCallNoDuplicatesNewOrder );


        LeaveCriticalSection(&hConnectCriticalSecti
on);
                        }
                }
                else
                {
                        if (Reg.eDB_Protocol ==
DBLIB)
                                pTxn =
pCTPCC_DBLIB_new( Reg.szDbServer, Reg.szDbUser,
Reg.szDbPassword, szMyComputerName, Reg.szDbName );
                }
                        pDeliveryData = pTxn-
>BuffAddr_Delivery();
        }
        catch (CBaseErr *e)
        {
                char szTmp[1024];
                wsprintf( szTmp, "Error in
Delivery Txn thread.  Could not connect to database.
"
                                        "%s.
Server=%s, User=%s, Password=%s, Database=%s",
                                        e-
>ErrorText(), Reg.szDbServer, Reg.szDbUser,
Reg.szDbPassword, Reg.szDbName );
                WriteMessageToEventLog( szTmp );
                delete e;
                goto ErrorExit;
        }
        catch (...)
        {

        WriteMessageToEventLog(TEXT("Unhandled
exception caught in DeliveryWorkerThread."));
                goto ErrorExit;
        }

        while (TRUE)
        {
                try
                {
                        //while delivery thread
running, i.e. user has not requested termination
                        while (TRUE)
                        {
                                        // need to
wait for multiple objects: program exit or worker
semaphore;
                                        handles[0] =
hDoneEvent;
                                        handles[1] =
hWorkerSemaphore;
                                        index =
WaitForMultipleObjects( 2, &handles[0], FALSE,
INFINITE );
                                        if (index ==
WAIT_OBJECT_0)

        goto ErrorExit;


        ZeroMemory(&txnDeliRec,
sizeof(txnDeliRec));

        txnDeliRec.TxnType =
TXN_REC_TYPE_TPCC_DELIV_DEF;

                                        // make a
local copy of current entry from delivery buffer and
increment buffer index

        EnterCriticalSection(&DelBuffCriticalSectio
n);
                                        delivery =
*(pDelBuff+dwDelBuffBusyIndex);

        dwDelBuffFreeCount++;

        dwDelBuffBusyIndex++;
                                        if
(dwDelBuffBusyIndex == dwDelBuffSize)   // wrap-
around if at end of buffer

        dwDelBuffBusyIndex = 0;


        LeaveCriticalSection(&DelBuffCriticalSectio
n);


        pDeliveryData->w_id = delivery.w_id;

        pDeliveryData->o_carrier_id =
delivery.o_carrier_id;


        txnDeliRec.w_id = pDeliveryData->w_id;

        txnDeliRec.o_carrier_id = pDeliveryData-
>o_carrier_id;

        txnDeliRec.TxnStartT0 =
Get64BitTime(&delivery.queue);

                                        GetLocalTime(
&trans_start );
                                        pTxn-
>Delivery();
                                        GetLocalTime(
&trans_end );

                                        //log txn

        txnDeliRec.TxnStatus = ERR_SUCCESS;
                                        for (int i=0;
i<10; i++)

        txnDeliRec.o_id[i] = pDeliveryData-
>o_id[i];

        txnDeliRec.DeltaT4 =
(int)(Get64BitTime(&trans_end) -
txnDeliRec.TxnStartT0);

        txnDeliRec.DeltaTxnExec =
(int)(Get64BitTime(&trans_end) -
Get64BitTime(&trans_start));

                                        if
(txnDelilog != NULL)
```

```
                txnDelilog->WriteToLog(&txnDeliRec);
                                }
                        }
                        catch (CBaseErr *e)
                        {
                                char szTmp[1024];
                                wsprintf( szTmp, "%s
Error (code %d) in Delivery Txn thread. %s",

e->ErrorTypeStr(), e->ErrorNum(), e->ErrorText() );
                                WriteMessageToEventLog(
szTmp );

                                // log the error txn
                                txnDeliRec.TxnStatus =
e->ErrorType();
                                if (txnDelilog != NULL)
                                        txnDelilog-
>WriteToLog(&txnDeliRec);

                                delete e;
                        }
                        catch (...)
                        {
                                // unhandled exception;
shouldn't happen; not much we can do...

                WriteMessageToEventLog(TEXT("Unhandled
exception caught in DeliveryWorkerThread."));
                        }
                }

ErrorExit:
                if (Reg.dwConnectDelay > 0)
                {
                        // Synchronize disconnect (for
VIA)
                        //

                EnterCriticalSection(&hConnectCriticalSecti
on);

                        Sleep(Reg.dwConnectDelay);

                        delete pTxn;


                LeaveCriticalSection(&hConnectCriticalSecti
on);
                }

                _endthread();
}

/* FUNCTION: PostDeliveryInfo
 *
 * PURPOSE:         This function enters the delivery
txn into the deferred delivery buffer.
 *
 * RETURNS:                     BOOL      FALSE
                delivery information posted successfully
 *
                TRUE      error cannot post delivery info
 */

BOOL PostDeliveryInfo(long w_id, short o_carrier_id)
{
                BOOL bError;

                EnterCriticalSection(&DelBuffCriticalSectio
n);
                if (dwDelBuffFreeCount > 0)
                {
                        bError = FALSE;
                        (pDelBuff+dwDelBuffFreeIndex)-
>w_id                           = w_id;
                        (pDelBuff+dwDelBuffFreeIndex)-
>o_carrier_id       = o_carrier_id;

                GetLocalTime(&(pDelBuff+dwDelBuffFreeIndex)
->queue);

                        dwDelBuffFreeCount--;
                        dwDelBuffFreeIndex++;
                        if (dwDelBuffFreeIndex ==
dwDelBuffSize)
                                dwDelBuffFreeIndex = 0;
                        // wrap-around if at end of
buffer
                }
                else
                        // No free buffers.  Return an
error, which indicates that the delivery buffer is
full.
                        // Most likely, the number of
delivery worker threads needs to be increased to keep
up
                        // with the txn rate.
                        bError = TRUE;
                LeaveCriticalSection(&DelBuffCriticalSectio
n);

                if (!bError)
                        // increment worker semaphore to
wake up a worker thread
                        ReleaseSemaphore(
hWorkerSemaphore, 1, NULL );

                return bError;
}

/* FUNCTION: ProcessQueryString
 *
 * PURPOSE:         This function extracts the
relevent information out of the http command passed
in from
 *                              the browser.
 *
 * COMMENTS:        If this is the initial connection
i.e. client is at welcome screen then
 *                                  there will
not be a terminal id or current form id.  If this is
the case
 *                                  then the
pTermid and pFormid return values are undefined.
 */

void ProcessQueryString(EXTENSION_CONTROL_BLOCK
*pECB, int *pCmd, int *pFormId, int *pTermId, int
*pSyncId)
{
                char *ptr = pECB->lpszQueryString;
                char szBuffer[25];
                int i;

                //allowable client command strings i.e.
CMD=command
                static char *szCmds[] =
                {
                        "Process", "..NewOrder..",
"..Payment..", "..Delivery..", "..Order-Status..",
"..Stock-Level..",
                        "..Exit..", "Submit", "Menu",
"Clear", "Stats", ""
                };

                *pCmd      = 0;               // default is
the login screen
                *pTermId = 0;

                // if no params (i.e., empty query string),
then return login screen
                if (strlen(pECB->lpszQueryString) == 0)
                        return;

                // parse FORMID, TERMID, and SYNCID
                *pFormId = GetIntKeyValue(&ptr, "FORMID",
NO_ERR, NO_ERR);
                *pTermId = GetIntKeyValue(&ptr, "TERMID",
NO_ERR, NO_ERR);
                *pSyncId = GetIntKeyValue(&ptr, "SYNCID",
NO_ERR, NO_ERR);

                // parse CMD
                GetKeyValue(&ptr, "CMD", szBuffer,
sizeof(szBuffer), ERR_COMMAND_UNDEFINED);

                // see which command it matches
                for(i=0; ; i++)
                {
                        if (szCmds[i][0] == 0)
                                // no more; no match;
return error
                                throw new CWEBCLNT_ERR(
ERR_COMMAND_UNDEFINED );
                        if ( !strcmp(szCmds[i], szBuffer)
)
                        {
                                *pCmd = i+1;
                                break;
                        }
```

```
        }
}

/* FUNCTION: void WelcomeForm
 *
 */

void WelcomeForm(EXTENSION_CONTROL_BLOCK *pECB, char
*szBuffer)
{
        char szTmp[1024];

        //welcome to tpc-c html form buffer, this
is first form client sees.
        strcpy( szBuffer,
        "<HTML><HEAD><TITLE>TPC-C Web
Client</TITLE></HEAD><BODY>"

        "<B><BIG>Microsoft TPC-C Web Client (ver
4.20)</BIG></B> <BR> <BR>"

        "<font face=\"Courier New\"><PRE>"

        "Compiled: "__DATE__", "__TIME__" <BR>"

        "Source:   "__FILE__" ("__TIMESTAMP__")
<BR>"

        "</PRE></font>"

        "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"

        "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\"
VALUE=\"0\">"

        "<INPUT TYPE=\"hidden\" NAME=\"ERROR\"
VALUE=\"0\">"

        "<INPUT TYPE=\"hidden\" NAME=\"FORMID\"
VALUE=\"1\">"

        "<INPUT TYPE=\"hidden\" NAME=\"TERMID\"
VALUE=\"0\">"

        "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\"
VALUE=\"0\">"

        "<INPUT TYPE=\"hidden\" NAME=\"VERSION\"
VALUE=\"" WEBCLIENT_VERSION "\">"
                          );

        sprintf( szTmp,     "Configuration
Settings: <BR><font face=\"Courier New\"
color=\"blue\"><PRE>"

        "Txn Monitor            = <B>%s</B><BR>"

        "Database protocol      = <B>%s</B><BR>"

        "Max Connections        = <B>%d</B><BR>"
                                                "#
of Delivery Threads  = <B>%d</B><BR>"

        "Max Pending Deliveries = <B>%d</B><BR>"
                                ,
szTxnMonNames[Reg.eTxnMon],
szDBNames[Reg.eDB_Protocol],
                                Reg.dwMaxConnections,
dwNumDeliveryThreads, dwDelBuffSize );
        strcat( szBuffer, szTmp);

        if (Reg.eTxnMon == COM)
        {
                sprintf( szTmp,     "COM Single
Pool        = <B>%s</B><BR>",
                                Reg.bCOM_SinglePool ?
"YES" : "NO" );
                strcat( szBuffer, szTmp);
        }
        strcat( szBuffer, "</PRE></font>");

        if (Reg.eTxnMon == None)
                // connection options may be
specified when not using a txn monitor
                sprintf( szTmp,     "Please enter
your database options for this connection:<BR>"

        "<font face=\"Courier New\"
color=\"blue\"><PRE>"

        "DB Server    = <INPUT NAME=\"db_server\"
SIZE=20 VALUE=\"%s\"><BR>"

        "DB User ID   = <INPUT NAME=\"db_user\"
SIZE=20 VALUE=\"%s\"><BR>"

        "DB Password  = <INPUT NAME=\"db_passwd\"
SIZE=20 VALUE=\"%s\"><BR>"

        "DB Name      = <INPUT NAME=\"db_name\"
SIZE=20 VALUE=\"%s\"><BR>"

        "</PRE></font>"
                                              ,
Reg.szDbServer, Reg.szDbUser, Reg.szDbPassword,
Reg.szDbName );
        else
                // if using a txn monitor,
connection options are determined from registry;
can't
                // set per user.  show options
fyi
                sprintf( szTmp,     "Database
options which will be used by the transaction
monitor:<BR>"

        "<font face=\"Courier New\"
color=\"blue\"><PRE>"

        "DB Server              = <B>%s</B><BR>"

        "DB User ID             = <B>%s</B><BR>"

        "DB Password            = <B>%s</B><BR>"

        "DB Name                = <B>%s</B><BR>"

        "</PRE></font>"
                                        ,
Reg.szDbServer, Reg.szDbUser, Reg.szDbPassword,
Reg.szDbName );
        strcat( szBuffer, szTmp);

        sprintf( szTmp,     "Please enter your
Warehouse and District for this session:<BR>"

        "<font face=\"Courier New\"
color=\"blue\"><PRE>" );
        strcat( szBuffer, szTmp);
        strcat( szBuffer,   "Warehouse ID = <INPUT
NAME=\"w_id\" SIZE=6><BR>"

        "District ID  = <INPUT NAME=\"d_id\"
SIZE=2><BR>"

        "</PRE></font><HR>"

        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"Submit\">"

        "</FORM></BODY></HTML>");
}

/* FUNCTION: SubmitCmd
 *
 * PURPOSE:         This function allocated a new
terminal id in the Term structure array.
 *
 */

void SubmitCmd(EXTENSION_CONTROL_BLOCK *pECB, char
*szBuffer)
{
        int                iNewTerm;
        char      *ptr = pECB->lpszQueryString;

        char      szVersion[32]       = { 0 };
        char      szServer[32]        = { 0 };
        char      szUser[32]                    =
"sa";
        char      szPassword[32]      = { 0 };
        char      szDatabase[32]      = "tpcc";

        // validate version field; the version
field ensures that the RTE is synchronized with the
web client
        GetKeyValue(&ptr, "VERSION", szVersion,
sizeof(szVersion), ERR_VERSION_MISMATCH);
        if ( strcmp( szVersion, WEBCLIENT_VERSION )
)
```

```
                    throw new CWEBCLNT_ERR(
ERR_VERSION_MISMATCH );

          if (Reg.eTxnMon == None)
          {
                    // parse Server name
                    GetKeyValue(&ptr, "db_server",
szServer, sizeof(szServer), ERR_NO_SERVER_SPECIFIED);
                    // parse User name
                    GetKeyValue(&ptr, "db_user",
szUser, sizeof(szUser), NO_ERR);
                    // parse Password
                    GetKeyValue(&ptr, "db_passwd",
szPassword, sizeof(szPassword), NO_ERR);
                    // parse Database name
                    GetKeyValue(&ptr, "db_name",
szDatabase, sizeof(szDatabase), NO_ERR);
          }

          // parse warehouse ID
          int w_id = GetIntKeyValue(&ptr, "w_id",
ERR_HTML_ILL_FORMED, ERR_W_ID_INVALID);
          if ( w_id < 1 )
                    throw new CWEBCLNT_ERR(
ERR_W_ID_INVALID );

          // parse district ID
          int d_id = GetIntKeyValue(&ptr, "d_id",
ERR_HTML_ILL_FORMED, ERR_D_ID_INVALID);
          if ( d_id < 1 || d_id > 10 )
                    throw new CWEBCLNT_ERR(
ERR_D_ID_INVALID );


          iNewTerm = TermAdd();

          Term.pClientData[iNewTerm].w_id = w_id;
          Term.pClientData[iNewTerm].d_id = d_id;

          try
          {
                    if (Reg.eTxnMon == TUXEDO)

          Term.pClientData[iNewTerm].pTxn =
pCTPCC_TUXEDO_new();
                    else if (Reg.eTxnMon == ENCINA)

          Term.pClientData[iNewTerm].pTxn =
pCTPCC_ENCINA_new();
                    else if (Reg.eTxnMon == COM)

          Term.pClientData[iNewTerm].pTxn =
pCTPCC_COM_new( Reg.bCOM_SinglePool );
                    else if (Reg.eDB_Protocol ==
ODBC)

          Term.pClientData[iNewTerm].pTxn =
pCTPCC_ODBC_new(    szServer, szUser, szPassword,
szMyComputerName,
          szDatabase, Reg.szSPPrefix,


          Reg.bCallNoDuplicatesNewOrder );
                    else if (Reg.eDB_Protocol ==
DBLIB)

          Term.pClientData[iNewTerm].pTxn =
pCTPCC_DBLIB_new( szServer, szUser, szPassword,
szMyComputerName, szDatabase );
          }
          catch (...)
          {
                    TermDelete(iNewTerm);
                    throw;              // pass
exception upward
          }

          MakeMainMenuForm(iNewTerm,
Term.pClientData[iNewTerm].iSyncId, szBuffer);
}

/* FUNCTION: StatsCmd
 *
 * PURPOSE:         This function returns to the
browser the total number of active terminal ids.
 *                              This routine is for
development/debugging purposes.
 *
 */

void StatsCmd(EXTENSION_CONTROL_BLOCK *pECB, char
*szBuffer)
{
          int i;
          int       iTotal;

          EnterCriticalSection(&TermCriticalSection);

          iTotal = 0;
          for(i=0; i<Term.iNumEntries; i++)
          {
                    if (Term.pClientData[i].iNextFree
== -1)
                              iTotal++;
          }

          LeaveCriticalSection(&TermCriticalSection);

          wsprintf( szBuffer,

          "<HTML><HEAD><TITLE>TPC-C Web Client
Stats</TITLE></HEAD>"
                              "<BODY><B><BIG> Total
Active Connections: %d </BIG></B><BR></BODY></HTML>"
                              , iTotal );
}

char *CWEBCLNT_ERR::ErrorText()
{
          static SERRORMSG errorMsgs[] =
          {
                    {         ERR_COMMAND_UNDEFINED,

          "Command undefined."

                                                       },
                    {         ERR_D_ID_INVALID,

          "Invalid District ID Must be 1 to 10."

                    },
                    {
          ERR_DELIVERY_CARRIER_ID_RANGE,
                    "Delivery Carrier ID out of range
must be 1 - 10."
          },
                    {
          ERR_DELIVERY_CARRIER_INVALID,
          "Delivery Carrier ID invalid must be
numeric 1 - 10."                                    },
                    {
          ERR_DELIVERY_MISSING_OCD_KEY,
          "Delivery missing Carrier ID key \"OCD*\"."

                    },
                    {
          ERR_DELIVERY_THREAD_FAILED,
                    "Could not start delivery worker
thread."
                    },
                    {         ERR_GETPROCADDR_FAILED,

          "Could not map proc in DLL.  GetProcAddr
error.  DLL="                                       },
                    {         ERR_HTML_ILL_FORMED,

          "Required key field is missing from HTML
string."                                            },
                    {
          ERR_INVALID_SYNC_CONNECTION,
          "Invalid Terminal Sync ID."

                                                  },
                    {         ERR_INVALID_TERMID,

          "Invalid Terminal ID."

                                                       },
                    {         ERR_LOADDLL_FAILED,

          "Load of DLL failed.  DLL="

                                                  },
                    {
          ERR_MAX_CONNECTIONS_EXCEEDED,
          "No connections available.  Max Connections
is probably too low."   },
                    {
          ERR_MISSING_REGISTRY_ENTRIES,
```

```
        "Required registry entries are missing.
Rerun INSTALL to correct."    },
                {
          ERR_NEWORDER_CUSTOMER_INVALID,
                "New Order customer id invalid
data type, range = 1 to 3000."                    },
                {
          ERR_NEWORDER_CUSTOMER_KEY,
                "New Order missing Customer key
\"CID*\"."
                          },
                {
          ERR_NEWORDER_DISTRICT_INVALID,
                "New Order District ID Invalid
range 1 - 10."
                },
                {
          ERR_NEWORDER_FORM_MISSING_DID,
                "New Order missing District key
\"DID*\"."
                          },
                {
          ERR_NEWORDER_ITEMID_INVALID,
          "New Order Item Id is wrong data type, must
be numeric."                          },
                {
          ERR_NEWORDER_ITEMID_RANGE,
                "New Order Item Id is out of
range. Range = 1 to 999999."                      },
                {
          ERR_NEWORDER_ITEMID_WITHOUT_SUPPW,
          "New Order Item_Id field entered without a
corresponding Supp_W."        },
                {
          ERR_NEWORDER_MISSING_IID_KEY,
          "New Order missing Item Id key \"IID*\"."

                },
                {
          ERR_NEWORDER_MISSING_QTY_KEY,
          "New Order Missing Qty key \"Qty##*\"."

                },
                {
          ERR_NEWORDER_MISSING_SUPPW_KEY,
                "New Order missing Supp_W key
\"SP##*\"."
                          },
                {
          ERR_NEWORDER_NOITEMS_ENTERED,
          "New Order No order lines entered."

                          },
                {
          ERR_NEWORDER_QTY_INVALID,
                "New Order Qty invalid must be
numeric range 1 - 99."
          },
                {         ERR_NEWORDER_QTY_RANGE,
```

```
          "New Order Qty is out of range. Range = 1
to 99."                                           },
                {
          ERR_NEWORDER_QTY_WITHOUT_SUPPW,
                "New Order Qty field entered
without a corresponding Supp_W."                  },
                {
          ERR_NEWORDER_SUPPW_INVALID,
                "New Order Supp_W invalid data
type must be numeric."
          },          {
          ERR_NO_SERVER_SPECIFIED,
                "No Server name specified."

                                                  },
                {
          ERR_ORDERSTATUS_CID_AND_CLT,
          "Order Status Only Customer ID or Last Name
may be entered, not both."    },
                {
          ERR_ORDERSTATUS_CID_INVALID,
          "Order Status Customer ID invalid, range
must be numeric 1 - 3000."    },
                {
          ERR_ORDERSTATUS_CLT_RANGE,
                "Order Status Customer last name
longer than 16 characters."             },
                {
          ERR_ORDERSTATUS_DID_INVALID,
          "Order Status District invalid, value must
be numeric 1 - 10."           },
                {
          ERR_ORDERSTATUS_MISSING_CID_CLT,
          "Order Status Either Customer ID or Last
Name must be entered."                  },
                {
          ERR_ORDERSTATUS_MISSING_CID_KEY,
          "Order Status missing Customer key
\"CID*\"."
                          },
                {
          ERR_ORDERSTATUS_MISSING_CLT_KEY,
          "Order Status missing Customer Last Name
key \"CLT*\"."                                    },
                {
          ERR_ORDERSTATUS_MISSING_DID_KEY,
          "Order Status missing District key
\"DID*\"."
                          },
                {
          ERR_PAYMENT_CDI_INVALID,
                "Payment Customer district
invalid must be numeric."
          },
                {
          ERR_PAYMENT_CID_AND_CLT,
                "Payment Only Customer ID or Last
Name may be entered, not both."         },
                {
          ERR_PAYMENT_CUSTOMER_INVALID,
```

```
          "Payment Customer data type invalid, must
be numeric."                                      },
                {
          ERR_PAYMENT_CWI_INVALID,
                "Payment Customer Warehouse
invalid, must be numeric."
          },
                {
          ERR_PAYMENT_DISTRICT_INVALID,
          "Payment District ID is invalid, must be 1
- 10."                                            },
                {
          ERR_PAYMENT_HAM_INVALID,
                "Payment Amount invalid data type
must be numeric."
          },
                {         ERR_PAYMENT_HAM_RANGE,

          "Payment Amount out of range, 0 - 9999.99."

                },
                {
          ERR_PAYMENT_LAST_NAME_TO_LONG,
                "Payment Customer last name
longer than 16 characters."
          },
                {
          ERR_PAYMENT_MISSING_CDI_KEY,
          "Payment missing Customer district key
\"CDI*\"."
          },
                {
          ERR_PAYMENT_MISSING_CID_CLT,
          "Payment Either Customer ID or Last Name
must be entered."                       },
                {
          ERR_PAYMENT_MISSING_CID_KEY,
          "Payment missing Customer Key \"CID*\"."

                },
                {
          ERR_PAYMENT_MISSING_CLT_KEY,
          "Payment missing Customer Last Name key
\"CLT*\"."
          },
                {
          ERR_PAYMENT_MISSING_CWI_KEY,
          "Payment missing Customer Warehouse key
\"CWI*\"."
          },
                {
          ERR_PAYMENT_MISSING_DID_KEY,
          "Payment missing District Key \"DID*\"."

                },
                {
          ERR_PAYMENT_MISSING_HAM_KEY,
          "Payment missing Amount key \"HAM*\"."

                },
```

```
                {
        ERR_STOCKLEVEL_MISSING_THRESHOLD_KEY,
        "Stock Level; missing Threshold key
\"TT*\"."
        },
                {
        ERR_STOCKLEVEL_THRESHOLD_INVALID,
        "Stock Level; Threshold value must be in
the range = 1 - 99."                    },
                {
        ERR_STOCKLEVEL_THRESHOLD_RANGE,
                "Stock Level Threshold out of
range, range must be 1 - 99."                   },
                {       ERR_VERSION_MISMATCH,

        "Invalid version field.  RTE and Web Client
are probably out of sync." },
                {       ERR_W_ID_INVALID,

        "Invalid Warehouse ID."

                                                },
                {       0,

                        ""




                                                }
        };

        char szTmp[256];
        int i = 0;
        while (TRUE)
        {
                if (errorMsgs[i].szMsg[0] == 0)
                {
                        strcpy( szTmp, "Unknown
error number." );
                        break;
                }
                if (m_Error ==
errorMsgs[i].iError)
                {
                        strcpy( szTmp,
errorMsgs[i].szMsg );
                        break;
                }
                i++;
        }

        if (m_szTextDetail)
                strcat( szTmp, m_szTextDetail );
        if (m_SystemErr)
                wsprintf( szTmp+strlen(szTmp), "
Error=%d", m_SystemErr );

        m_szErrorText = new char[strlen(szTmp)+1];
        strcpy( m_szErrorText, szTmp );
        return m_szErrorText;

}
```

```
/* FUNCTION: GetKeyValue
 *
 * PURPOSE:         This function parses a http
formatted string for specific key values.
 *
 * ARGUMENTS:       char
        *pQueryString       http string from client
browser
 *                                       char
                *pKey                           key
value to look for
 *                                       char
                *pValue
        character array into which to place key's
value
 *                                       int
                                iMax
        maximum length of key value array.
 *                                       WEBERROR
        err
        error value to throw
 *
 * RETURNS:                     nothing.
 *
 * ERROR:           if (the pKey value is not found)
then
 *                                                      if
(err == 0)
 *
        return (empty string)
 *
        else
 *
        throw CWEBCLNT_ERR(err)
 *
 * COMMENTS:        http keys are formatted either
KEY=value& or KEY=value\0. This DLL formats
 *                                       TPC-C input
fields in such a manner that the keys can be
extracted in the
 *                                       above manner.
 */

void GetKeyValue(char **pQueryString, char *pKey,
char *pValue, int iMax, WEBERROR err)
{
        char *ptr;

        if ( !(ptr=strstr(*pQueryString, pKey)) )
                goto ErrorExit;
        ptr += strlen(pKey);
        if ( *ptr != '=' )
                goto ErrorExit;
        ptr++;

        iMax--;  // one position is for terminating
null
        while( *ptr && *ptr != '&' && iMax)
        {
                *pValue++ = *ptr++;
                iMax--;
        }
        *pValue = 0;  // terminating null

        *pQueryString = ptr;
        return;

ErrorExit:
        if (err != NO_ERR)
                throw new CWEBCLNT_ERR( err );
        *pValue = 0;  // return empty result string
}

/* FUNCTION: GetIntKeyValue
 *
 * PURPOSE:         This function parses a http
formatted string for a specific key value.
 *
 * ARGUMENTS:       char
        *pQueryString       http string from client
browser
 *                                       char
                *pKey                           key
value to look for
 *                                       WEBERROR
        NoKeyErr            error value to throw if
key not found
 *                                       WEBERROR
        NotIntErr           error value to throw if
value not numeric
 *
 * RETURNS:                     integer
 *
 * ERROR:           if (the pKey value is not found)
then
 *                                                      if
(NoKeyErr != NO_ERR)
 *
        throw CWEBCLNT_ERR(err)
 *
        else
 *
        return 0
 *                                       else if (non-
numeric char found) then
 *                                                      if
(NotIntErr != NO_ERR) then
 *
        throw CWEBCLNT_ERR(err)
 *
        else
 *
        return 0
 *
 * COMMENTS:        http keys are formatted either
KEY=value& or KEY=value\0. This DLL formats
 *                                       TPC-C input
fields in such a manner that the keys can be
extracted in the
 *                                       above manner.
 */
```

```
int GetIntKeyValue(char **pQueryString, char *pKey,
WEBERROR NoKeyErr, WEBERROR NotIntErr)
{
          char *ptr0;
          char *ptr;

          if ( !(ptr=strstr(*pQueryString, pKey)) )
                    goto ErrorNoKey;
          ptr += strlen(pKey);
          if ( *ptr != '=' )
                    goto ErrorNoKey;
          ptr++;

          ptr0 = ptr;                    // remember
starting point
          // scan string until a terminator (null or
&) or a non-digit
          while( *ptr && *ptr != '&' && isdigit(*ptr)
)
                    ptr++;

          // make sure we stopped scanning for the
right reason
          if ((ptr0 == ptr) || (*ptr && *ptr != '&'))
          {
                    if (NotIntErr != NO_ERR)
                              throw new CWEBCLNT_ERR(
NoKeyErr );
                    return 0;
          }

          *pQueryString = ptr;
          return atoi(ptr0);

ErrorNoKey:
          if (NoKeyErr != NO_ERR)
                    throw new CWEBCLNT_ERR( NoKeyErr
);
          return 0;
}

/* FUNCTION: TermInit
 *
 * PURPOSE:         This function initializes the
client terminal structure; it is called when the
TPCC.DLL
 *                           is first loaded by the
inet service.
 *
 */

void TermInit(void)
{
          EnterCriticalSection(&TermCriticalSection);

          Term.iMasterSyncId  = 1;
          Term.iNumEntries    =
Reg.dwMaxConnections+1;

          Term.pClientData    = NULL;
          Term.pClientData    =
(PCLIENTDATA)malloc(Term.iNumEntries *
sizeof(CLIENTDATA));
          if (Term.pClientData == NULL)
          {

          LeaveCriticalSection(&TermCriticalSection);
                    throw new CWEBCLNT_ERR(
ERR_MEM_ALLOC_FAILED );
          }

          ZeroMemory( Term.pClientData,
Term.iNumEntries * sizeof(CLIENTDATA) );

          Term.iFreeList                =
Term.iNumEntries-1;
          // build free list
          // note: Term.pClientData[0].iNextFree gets
set to -1, which marks it as "in use".
          //       This is intentional, as the zero
entry is used as an anchor and never
          //                   allocated as an actual
terminal.
          for(int i=0; i<Term.iNumEntries; i++)
                    Term.pClientData[i].iNextFree =
i-1;

          LeaveCriticalSection(&TermCriticalSection);
}

/* FUNCTION: TermDeleteAll
 *
 * PURPOSE:         This function frees allocated
resources associated with the terminal structure.
 *
 * ARGUMENTS:       none
 *
 * RETURNS:                  None
 *
 * COMMENTS:        This function is called only when
the inet service unloads the TPCC.DLL
 *
 */

void TermDeleteAll(void)
{
          EnterCriticalSection(&TermCriticalSection);

          for(int i=1; i<Term.iNumEntries; i++)
          {
                    if (Term.pClientData[i].iNextFree
== -1)
                              delete
Term.pClientData[i].pTxn;
          }

          Term.iFreeList                = 0;
          Term.iNumEntries    = 0;
          if ( Term.pClientData )
                    free(Term.pClientData);
          Term.pClientData    = NULL;
          LeaveCriticalSection(&TermCriticalSection);
}

/* FUNCTION: TermAdd
 *
 * PURPOSE:         This function assigns a terminal
id which is used to identify a client browser.
 *
 * RETURNS:                  int
          assigned terminal id
 *
 */

int TermAdd(void)
{
          DWORD     i;
          int                 iNewTerm, iTickCount;

          if (Term.iNumEntries == 0)
                    return -1;

          EnterCriticalSection(&TermCriticalSection);
          if (Term.iFreeList != 0)
          {         // position is available
                    iNewTerm = Term.iFreeList;
                    Term.iFreeList =
Term.pClientData[iNewTerm].iNextFree;

          Term.pClientData[iNewTerm].iNextFree = -1;
// indicates this position is in use
          }
          else
          {         // no open slots, so find the
slot that hasn't been used in the longest time and
reuse it
                    for(iNewTerm=1, i=1,
iTickCount=0x7FFFFFFF; i<Reg.dwMaxConnections; i++)
                    {
                              if (iTickCount >
Term.pClientData[i].iTickCount)
                              {
                                        iTickCount =
Term.pClientData[i].iTickCount;
                                        iNewTerm = i;
                              }
                    }
                    // if oldest term is less than
one minute old, it probably means that more
connections
                    // are being attempted than were
specified as "Max Connections" at install.  In this
case,
                    // do not bump existing
connection; instead, return error to requestor.
                    if ((GetTickCount() - iTickCount)
< 60000)
                    {

          LeaveCriticalSection(&TermCriticalSection);
```

```
                              throw new CWEBCLNT_ERR(
ERR_MAX_CONNECTIONS_EXCEEDED );
                    }
          }

          Term.pClientData[iNewTerm].iTickCount =
GetTickCount();
          Term.pClientData[iNewTerm].iSyncId =
Term.iMasterSyncId++;
          Term.pClientData[iNewTerm].pTxn = NULL;

          LeaveCriticalSection(&TermCriticalSection);
          return iNewTerm;
}

/* FUNCTION: TermDelete
 *
 * PURPOSE:          This function makes a terminal
entry in the Term array available for reuse.
 *
 * ARGUMENTS:        int
                              id
          Terminal id of client exiting
 *
 */

void TermDelete(int id)
{
          if ( id > 0 && id < Term.iNumEntries )
          {
                    delete Term.pClientData[id].pTxn;

                    // put onto free list

          EnterCriticalSection(&TermCriticalSection);

                    Term.pClientData[id].iNextFree =
Term.iFreeList;
                    Term.iFreeList = id;


          LeaveCriticalSection(&TermCriticalSection);
          }
}


/* FUNCTION: MakeErrorForm
 */

void ErrorForm(EXTENSION_CONTROL_BLOCK *pECB, int
iType, int iErrorNum, int iTermId, int iSyncId, char
*szErrorText, char *szBuffer )
{
          wsprintf(szBuffer,
                    "<HTML><HEAD><TITLE>TPC-C
Error</TITLE></HEAD><BODY>"
                    "<FORM ACTION=\"tpcc.dll\"
METHOD=\"GET\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"STATUSID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"ERROR\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"FORMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"TERMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"SYNCID\" VALUE=\"%d\">"
                    "<BOLD>An Error
Occurred</BOLD><BR><BR>"
                    "%s"
                    "<BR><BR><HR>"
                    "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                    "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Payment..\">"
                    "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Delivery..\">"
                    "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Order-Status..\">"
                    "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Stock-Level..\">"
                    "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Exit..\">"
                    "</FORM></BODY></HTML>"
                    , iType, iErrorNum,
MAIN_MENU_FORM, iTermId, iSyncId, szErrorText );
}

/* FUNCTION: MakeMainMenuForm
 */

void MakeMainMenuForm(int iTermId, int iSyncId, char
*szForm)
{
          wsprintf(szForm,
                    "<HTML><HEAD><TITLE>TPC-C Main
Menu</TITLE></HEAD><BODY>"
                    "Select Desired
Transaction.<BR><HR>"
                    "<FORM ACTION=\"tpcc.dll\"
METHOD=\"GET\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"STATUSID\" VALUE=\"0\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"ERROR\" VALUE=\"0\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"FORMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"TERMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"SYNCID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                    "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Payment..\">"
                    "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Delivery..\">"
                    "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Order-Status..\">"
                    "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Stock-Level..\">"
                    "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Exit..\">"
                    "</FORM></BODY></HTML>"
                    , MAIN_MENU_FORM, iTermId,
iSyncId);
}

/* FUNCTION: MakeStockLevelForm
 *
 * PURPOSE:          This function constructs the
Stock Level HTML page.
 *
 * COMMENTS:         The internal client buffer is
created when the terminal id is assigned and should
not
 *                                   be freed
except when the client terminal id is no longer
needed.
 */

void MakeStockLevelForm(int iTermId, STOCK_LEVEL_DATA
*pStockLevelData, BOOL bInput, char *szForm)
{
          int       c;

          c = wsprintf(szForm,
                    "<HTML><HEAD><TITLE>TPC-C Stock
Level</TITLE></HEAD><FORM ACTION=\"tpcc.dll\"
METHOD=\"GET\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"STATUSID\" VALUE=\"0\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"ERROR\" VALUE=\"0\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"FORMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"TERMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"SYNCID\" VALUE=\"%d\">"
                    "<PRE><font face=\"Courier\">
Stock-Level<BR>"
                    "Warehouse: %6.6d   District:
%2.2d<BR> <BR>",
                    STOCK_LEVEL_FORM, iTermId,
Term.pClientData[iTermId].iSyncId,
                    Term.pClientData[iTermId].w_id,
Term.pClientData[iTermId].d_id);

          if ( bInput )
          {
                    strcpy(szForm+c,
                                        "Stock Level Threshold:
<INPUT NAME=\"TT*\" SIZE=2><BR> <BR>"
                                        "low stock:
</font><BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR>
<BR>"
                                        " <BR> <BR> <BR> <BR>
<BR> <BR> <BR></PRE><HR>"
```

```
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Process\">"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Menu\">"
                        "</FORM></HTML>" );
        }
        else
        {
                wsprintf(szForm+c,
                        "Stock Level Threshold:
%2.2d<BR> <BR>"
                        "low stock:
%3.3d</font> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR>
<BR>"
                        " <BR> <BR> <BR> <BR>
<BR> <BR> <BR> <BR></PRE><HR>"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Payment..\">"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Delivery..\">"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Order-Status..\">"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Stock-Level..\">"
                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Exit..\">"
                        "</FORM></HTML>"
                        , pStockLevelData-
>threshold, pStockLevelData->low_stock);
        }
}

/* FUNCTION: MakeNewOrderForm
 *
 * COMMENTS:        The internal client buffer is
created when the terminal id is assigned and should
not
 *                                      be freed
except when the client terminal id is no longer
needed.
 */

void MakeNewOrderForm(int iTermId, NEW_ORDER_DATA
*pNewOrderData, BOOL bInput, char *szForm)
{
        int             i, c;
        BOOL    bValid;
        static  char szBR[] = " <BR> <BR> <BR>
<BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR>
<BR> <BR>";

        if (!bInput)
                assert( pNewOrderData-
>exec_status_code == eOK || pNewOrderData-
>exec_status_code == eInvalidItem );

        bValid = (bInput || (pNewOrderData-
>exec_status_code == eOK));

        c = wsprintf(szForm,
                        "<HTML><HEAD><TITLE>TPC-C New
Order</TITLE></HEAD><BODY>"
                        "<FORM ACTION=\"tpcc.dll\"
METHOD=\"GET\">"
                        "<INPUT TYPE=\"hidden\"
NAME=\"STATUSID\" VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\"
NAME=\"ERROR\" VALUE=\"0\">"
                        "<INPUT TYPE=\"hidden\"
NAME=\"FORMID\" VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\"
NAME=\"TERMID\" VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\"
NAME=\"SYNCID\" VALUE=\"%d\">"
                        "<PRE><font face=\"Courier\">
New Order<BR>"
                        , bValid ? 0 : ERR_BAD_ITEM_ID,
NEW_ORDER_FORM, iTermId,
Term.pClientData[iTermId].iSyncId);

        if ( bInput )
        {
                c += wsprintf(szForm+c,
"Warehouse: %6.6d   ", Term.pClientData[iTermId].w_id
);

                strcpy( szForm+c,
                                "District: <INPUT
NAME=\"DID*\" SIZE=1>
Date:<BR>"
                                "Customer:  <INPUT
NAME=\"CID*\" SIZE=4>   Name:
Credit:      %Disc:<BR>"
                                "Order Number:
Number of Lines:           W_tax:         D_tax:<BR>
<BR>"
                                " Supp_W  Item_Id  Item
Name                Qty  Stock  B/G  Price
Amount<BR>"
                                "  <INPUT
NAME=\"SP00*\" SIZE=4>  <INPUT NAME=\"IID00*\"
SIZE=6>                         <INPUT
NAME=\"Qty00*\" SIZE=1><BR>"
                                "  <INPUT
NAME=\"SP01*\" SIZE=4>  <INPUT NAME=\"IID01*\"
SIZE=6>                         <INPUT
NAME=\"Qty01*\" SIZE=1><BR>"
                                "  <INPUT
NAME=\"SP02*\" SIZE=4>  <INPUT NAME=\"IID02*\"
SIZE=6>                         <INPUT
NAME=\"Qty02*\" SIZE=1><BR>"
                                "  <INPUT
NAME=\"SP03*\" SIZE=4>  <INPUT NAME=\"IID03*\"
SIZE=6>                         <INPUT
NAME=\"Qty03*\" SIZE=1><BR>"
                                "  <INPUT
NAME=\"SP04*\" SIZE=4>  <INPUT NAME=\"IID04*\"
SIZE=6>                         <INPUT
NAME=\"Qty04*\" SIZE=1><BR>"
                                "  <INPUT
NAME=\"SP05*\" SIZE=4>  <INPUT NAME=\"IID05*\"
SIZE=6>                         <INPUT
NAME=\"Qty05*\" SIZE=1><BR>"
                                "  <INPUT
NAME=\"SP06*\" SIZE=4>  <INPUT NAME=\"IID06*\"
SIZE=6>                         <INPUT
NAME=\"Qty06*\" SIZE=1><BR>"
                                "  <INPUT
NAME=\"SP07*\" SIZE=4>  <INPUT NAME=\"IID07*\"
SIZE=6>                         <INPUT
NAME=\"Qty07*\" SIZE=1><BR>"
                                "  <INPUT
NAME=\"SP08*\" SIZE=4>  <INPUT NAME=\"IID08*\"
SIZE=6>                         <INPUT
NAME=\"Qty08*\" SIZE=1><BR>"
                                "  <INPUT
NAME=\"SP09*\" SIZE=4>  <INPUT NAME=\"IID09*\"
SIZE=6>                         <INPUT
NAME=\"Qty09*\" SIZE=1><BR>"
                                "  <INPUT
NAME=\"SP10*\" SIZE=4>  <INPUT NAME=\"IID10*\"
SIZE=6>                         <INPUT
NAME=\"Qty10*\" SIZE=1><BR>"
                                "  <INPUT
NAME=\"SP11*\" SIZE=4>  <INPUT NAME=\"IID11*\"
SIZE=6>                         <INPUT
NAME=\"Qty11*\" SIZE=1><BR>"
                                "  <INPUT
NAME=\"SP12*\" SIZE=4>  <INPUT NAME=\"IID12*\"
SIZE=6>                         <INPUT
NAME=\"Qty12*\" SIZE=1><BR>"
                                "  <INPUT
NAME=\"SP13*\" SIZE=4>  <INPUT NAME=\"IID13*\"
SIZE=6>                         <INPUT
NAME=\"Qty13*\" SIZE=1><BR>"
                                "  <INPUT
NAME=\"SP14*\" SIZE=4>  <INPUT NAME=\"IID14*\"
SIZE=6>                         <INPUT
NAME=\"Qty14*\" SIZE=1><BR>"
                                "Execution Status:
Total:<BR>"
                                "</font></PRE><HR>"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Process\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Menu\">"
                                "</FORM></HTML>"
                                );
        }
        else
        {
                c += wsprintf(szForm+c,
"Warehouse: %6.6d   District: %2.2d
Date: ",
                                pNewOrderData->w_id,
                                pNewOrderData->d_id);

                if ( bValid )
                {
```

```
                              c += wsprintf(szForm+c,
"%2.2d-%2.2d-%4.4d %2.2d:%2.2d:%2.2d",

          pNewOrderData->o_entry_d.day,

          pNewOrderData->o_entry_d.month,

          pNewOrderData->o_entry_d.year,

          pNewOrderData->o_entry_d.hour,

          pNewOrderData->o_entry_d.minute,

          pNewOrderData->o_entry_d.second);
                    }

                    c += wsprintf(szForm+c,
"<BR>Customer:  %4.4d   Name: %-16s   Credit: %-2s
",
                              pNewOrderData->c_id,
pNewOrderData->c_last, pNewOrderData->c_credit);

                    if ( bValid )
                    {
                              c += sprintf(szForm+c,

          "%%Disc: %5.2f            <BR>"

          "Order Number: %8.8d  Number of Lines:
%2.2d        W_tax: %5.2f   D_tax: %5.2f  <BR> <BR>"

          " Supp_W  Item_Id  Item Name
Qty  Stock  B/G  Price    Amount<BR>",

          100.0*pNewOrderData->c_discount,

          pNewOrderData->o_id,

          pNewOrderData->o_ol_cnt,
                                        100.0 *
pNewOrderData->w_tax,
                                        100.0 *
pNewOrderData->d_tax);

                              for(i=0;
i<pNewOrderData->o_ol_cnt; i++)
                              {
                                        c +=
sprintf(szForm+c, "%6.6d   %6.6d   %-24s  %2.2d
%3.3d    %1.1s   $%6.2f  $%7.2f  <BR>",

          pNewOrderData->OL[i].ol_supply_w_id,

          pNewOrderData->OL[i].ol_i_id,

          pNewOrderData->OL[i].ol_i_name,

          pNewOrderData->OL[i].ol_quantity,

          pNewOrderData->OL[i].ol_stock,

          pNewOrderData->OL[i].ol_brand_generic,

          pNewOrderData->OL[i].ol_i_price,

          pNewOrderData->OL[i].ol_amount );
                              }
                    }
                    else
                    {
                              c += wsprintf(szForm+c,
                                        "%Disc:<BR>"
                                        "Order
Number: %8.8d  Number of Lines:              W_tax:
D_tax:<BR> <BR>"
                                        " Supp_W
Item_Id  Item Name                 Qty  Stock  B/G
Price    Amount<BR>"
                                        ,
pNewOrderData->o_id);

                              i = 0;
                    }

                    strncpy( szForm+c, szBR, (15-i)*5
);
                    c += (15-i)*5;

                    if ( bValid )
                              c += sprintf(szForm+c,
"Execution Status: Transaction commited.
Total:  $%8.2f  ",

          pNewOrderData->total_amount);
                    else
                              c += wsprintf(szForm+c,
"Execution Status: Item number is not valid.
Total:");

                    strcpy(szForm+c,
                              "
<BR></font></PRE><HR>"
                              "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                              "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Payment..\">"
                              "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Delivery..\">"
                              "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Order-Status..\">"
                              "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Stock-Level..\">"
                              "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Exit..\">"
                              "</FORM></HTML>"
                              );
          }
}

/* FUNCTION: MakePaymentForm
 *
 * COMMENTS:        The internal client buffer is
created when the terminal id is assigned and should
not
 *                                        be freed
except when the client terminal id is no longer
needed.
 */

void MakePaymentForm(int iTermId, PAYMENT_DATA
*pPaymentData, BOOL bInput, char *szForm)
{
          int c;

          c = wsprintf(szForm,
                    "<HTML><HEAD><TITLE>TPC-C
Payment</TITLE></HEAD><BODY>"
                    "<FORM ACTION=\"tpcc.dll\"
METHOD=\"GET\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"STATUSID\" VALUE=\"0\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"ERROR\" VALUE=\"0\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"FORMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"TERMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"SYNCID\" VALUE=\"%d\">"
                    "<PRE><font face=\"Courier\">
Payment<BR>"
                    "Date: "
                    , PAYMENT_FORM, iTermId,
Term.pClientData[iTermId].iSyncId);

          if ( !bInput )
          {
                    c += wsprintf(szForm+c, "%2.2d-
%2.2d-%4.4d %2.2d:%2.2d:%2.2d",
                              pPaymentData-
>h_date.day,
                              pPaymentData-
>h_date.month,
                              pPaymentData-
>h_date.year,
                              pPaymentData-
>h_date.hour,
                              pPaymentData-
>h_date.minute,
                              pPaymentData-
>h_date.second);
          }

          if ( bInput )
          {
                    c += wsprintf(szForm+c,
                              "<BR> <BR>Warehouse:
%6.6d"
                              "
District: <INPUT NAME=\"DID*\" SIZE=1><BR> <BR> <BR>
<BR> <BR>"
```

```
                              "Customer: <INPUT
NAME=\"CID*\" SIZE=4>"
                              "Cust-Warehouse: <INPUT
NAME=\"CWI*\" SIZE=4>  "
                              "Cust-District: <INPUT
NAME=\"CDI*\" SIZE=1><BR>"
                              "Name:
<INPUT NAME=\"CLT*\" SIZE=16>
Since:<BR>"
                              "
Credit:<BR>"
                              "
Disc:<BR>"
                              "
Phone:<BR> <BR>"
                              "Amount Paid:
$<INPUT NAME=\"HAM*\" SIZE=7>      New Cust-
Balance:<BR>"
                              "Credit Limit:<BR>
<BR>Cust-Data: <BR> <BR> <BR> <BR>
<BR></font></PRE><HR>"
                              "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Process\"><INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Menu\">"
                              "</BODY></FORM></HTML>"
                              ,
Term.pClientData[iTermId].w_id);
          }
          else
          {
                    c += wsprintf(szForm+c,
                              "<BR> <BR>Warehouse:
%6.6d                        District: %2.2d<BR>"
                              "%-20s
%-20s<BR>"
                              "%-20s
%-20s<BR>"
                              "%-20s %-2s %5.5s-%4.4s
%-20s %-2s %5.5s-%4.4s<BR> <BR>"
                              "Customer: %4.4d  Cust-
Warehouse: %6.6d  Cust-District: %2.2d<BR>"
                              "Name:   %-16s %-2s %-
16s     Since:  %2.2d-%2.2d-%4.4d<BR>"
                              "        %-20s
Credit: %-2s<BR>"

                              ,
Term.pClientData[iTermId].w_id, pPaymentData->d_id
                              , pPaymentData-
>w_street_1, pPaymentData->d_street_1
                              , pPaymentData-
>w_street_2, pPaymentData->d_street_2
                              , pPaymentData->w_city,
pPaymentData->w_state, pPaymentData->w_zip,
pPaymentData->w_zip+5
                              , pPaymentData->d_city,
pPaymentData->d_state, pPaymentData->d_zip,
pPaymentData->d_zip+5
                              , pPaymentData->c_id,
pPaymentData->c_w_id,         pPaymentData->c_d_id
                              , pPaymentData-
>c_first, pPaymentData->c_middle, pPaymentData-
>c_last
                              , pPaymentData-
>c_since.day, pPaymentData->c_since.month,
                    pPaymentData->c_since.year
                              , pPaymentData-
>c_street_1, pPaymentData->c_credit
                              );

          c += sprintf(szForm+c,
                              "        %-20s
%%Disc:  %5.2f<BR>",
                              pPaymentData-
>c_street_2, 100.0*pPaymentData->c_discount);

                    c += wsprintf(szForm+c,
                              "        %-20s %-2s
%5.5s-%4.4s       Phone:  %6.6s-%3.3s-%3.3s-%4.4s<BR>
<BR>",
                              pPaymentData->c_city,
pPaymentData->c_state, pPaymentData->c_zip,
pPaymentData->c_zip+5,
                              pPaymentData->c_phone,
pPaymentData->c_phone+6, pPaymentData->c_phone+9,
pPaymentData->c_phone+12 );

                    c += sprintf(szForm+c,
                              "Amount Paid:
$%7.2f      New Cust-Balance: $%14.2f<BR>"
                              "Credit Limit:
$%13.2f<BR> <BR>"
                              , pPaymentData-
>h_amount, pPaymentData->c_balance
                              , pPaymentData-
>c_credit_lim
                              );

                    if ( pPaymentData->c_credit[0] ==
'B' && pPaymentData->c_credit[1] == 'C' )
                              c += wsprintf(szForm+c,

                    "Cust-Data: %-50.50s<BR>           %-
50.50s<BR>           %-50.50s<BR>           %-
50.50s<BR>",

                    pPaymentData->c_data, pPaymentData-
>c_data+50, pPaymentData->c_data+100, pPaymentData-
>c_data+150 );
                    else
                              strcpy(szForm+c, "Cust-
Data: <BR> <BR> <BR> <BR>");

                    strcat(szForm,      "
<BR></font></PRE><HR>"

          "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..NewOrder..\">"

          "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Payment..\">"

          "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Delivery..\">"

          "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Order-Status..\">"

          "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Stock-Level..\">"

          "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Exit..\">"

          "</BODY></FORM></HTML>");
          }

}

/* FUNCTION: MakeOrderStatusForm
 *
 * COMMENTS:        The internal client buffer is
created when the terminal id is assigned and should
not
 *                                      be freed
except when the client terminal id is no longer
needed.
 */

void MakeOrderStatusForm(int iTermId,
ORDER_STATUS_DATA *pOrderStatusData, BOOL bInput,
char *szForm)
{
          int               i, c;
          static char szBR[] = " <BR> <BR> <BR> <BR>
<BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR>
<BR>";

          c = wsprintf(szForm,
                    "<HTML><HEAD><TITLE>TPC-C Order-
Status</TITLE></HEAD><BODY>"
                    "<FORM ACTION=\"tpcc.dll\"
METHOD=\"GET\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"STATUSID\" VALUE=\"0\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"ERROR\" VALUE=\"0\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"FORMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"TERMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"SYNCID\" VALUE=\"%d\">"
                    "<PRE><font face=\"Courier\">
Order-Status<BR>"
                    "Warehouse: %6.6d   ",
                    ORDER_STATUS_FORM, iTermId,
Term.pClientData[iTermId].iSyncId,
Term.pClientData[iTermId].w_id);

          if ( bInput )
          {
```

```
                    strcpy(szForm+c,
                                "District: <INPUT
NAME=\"DID*\" SIZE=1><BR>"
                                "Customer: <INPUT
NAME=\"CID*\" SIZE=4>   Name:
<INPUT NAME=\"CLT*\" SIZE=23><BR>"
                                "Cust-Balance:<BR>
<BR>"
                                "Order-Number:
Entry-Date:                         Carrier-
Number:<BR>"
                                "Supply-W     Item-Id
Qty     Amount      Delivery-Date<BR> <BR> <BR> <BR>
<BR>"
                                " <BR> <BR> <BR> <BR>
<BR> <BR> <BR> <BR> <BR> <BR> <BR></font></PRE>"
                                "<HR><INPUT
TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Process\"><INPUT
TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Menu\">"
                                "</BODY></FORM></HTML>"
);
          }
          else
          {
                    c += wsprintf(szForm+c,
                                "District: %2.2d<BR>"
                                "Customer: %4.4d
Name: %-16s %-2s %-16s<BR>",
                                pOrderStatusData->d_id,
pOrderStatusData->c_id,
                                pOrderStatusData-
>c_first, pOrderStatusData->c_middle,
pOrderStatusData->c_last);

                    c += sprintf(szForm+c, "Cust-
Balance: $%9.2f<BR> <BR>",
                                pOrderStatusData-
>c_balance);

                    c += wsprintf(szForm+c,
                                "Order-Number: %8.8d
Entry-Date: %2.2d-%2.2d-%4.4d %2.2d:%2.2d:%2.2d
Carrier-Number: %2.2d<BR>"
                                "Supply-W     Item-Id
Qty     Amount      Delivery-Date<BR>",
                                pOrderStatusData->o_id,
                                pOrderStatusData-
>o_entry_d.day,
                                pOrderStatusData-
>o_entry_d.month,
                                pOrderStatusData-
>o_entry_d.year,
                                pOrderStatusData-
>o_entry_d.hour,
                                pOrderStatusData-
>o_entry_d.minute,
                                pOrderStatusData-
>o_entry_d.second,
                                pOrderStatusData-
>o_carrier_id);
                    for(i=0; i< pOrderStatusData-
>o_ol_cnt; i++)
                    {
                              c += sprintf(szForm+c,
"  %6.6d     %6.6d     %2.2d     $%8.2f      %2.2d-
%2.2d-%4.4d<BR>",

          pOrderStatusData->OL[i].ol_supply_w_id,

          pOrderStatusData->OL[i].ol_i_id,

          pOrderStatusData->OL[i].ol_quantity,

          pOrderStatusData->OL[i].ol_amount,

          pOrderStatusData->OL[i].ol_delivery_d.day,

          pOrderStatusData-
>OL[i].ol_delivery_d.month,

          pOrderStatusData-
>OL[i].ol_delivery_d.year);
                    }

                    strncpy( szForm+c, szBR, (15-i)*5
);
                    c += (15-i)*5;

                    strcpy(szForm+c,

          "</font></PRE><HR><INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Payment..\">"
                                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Delivery..\">"
                                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Order-Status..\">"
                                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Stock-Level..\">"
                                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Exit..\">"
                                        "</BODY></FORM></HTML>"
);
          }
}

/* FUNCTION: MakeDeliveryForm
 *
 * COMMENTS:        The internal client buffer is
created when the terminal id is assigned and should
not
 *                                        be freed
except when the client terminal id is no longer
needed.
 */

void MakeDeliveryForm(int iTermId, DELIVERY_DATA
*pDeliveryData, BOOL bInput, char *szForm)
{
          int       c;
          c = wsprintf(szForm,
                    "<HTML><HEAD><TITLE>TPC-C
Delivery</TITLE></HEAD><BODY>"
                    "<FORM ACTION=\"tpcc.dll\"
METHOD=\"GET\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"STATUSID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"ERROR\" VALUE=\"0\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"FORMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"TERMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\"
NAME=\"SYNCID\" VALUE=\"%d\">"
                    "<PRE><font face=\"Courier\">
Delivery<BR>"
                    "Warehouse: %6.6d<BR> <BR>",
                    (!bInput && (pDeliveryData-
>exec_status_code != eOK)) ? ERR_TYPE_DELIVERY_POST :
0,
                    DELIVERY_FORM, iTermId,
Term.pClientData[iTermId].iSyncId,
Term.pClientData[iTermId].w_id);

          if ( bInput )
          {
                    strcpy( szForm+c,
                                "Carrier Number: <INPUT
NAME=\"OCD*\" SIZE=1><BR> <BR>"
                                "Execution Status: <BR>
<BR> <BR> <BR> <BR> <BR> <BR> <BR>"
                                " <BR> <BR> <BR> <BR>
<BR> <BR> <BR> <BR> </font></PRE><HR>"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Process\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Menu\">"
                                "</BODY></FORM></HTML>"
);
          }
          else
          {
                    wsprintf( szForm+c,
                                "Carrier Number:
%2.2d<BR> <BR>"
                                "Execution Status: %s
<BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR>"
                                " <BR> <BR> <BR> <BR>
<BR> <BR> <BR> <BR> </font></PRE>"
                                "<HR><INPUT
TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Payment..\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Delivery..\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Order-Status..\">"
                                "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Stock-Level..\">"
```

```
                              "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..Exit..\">"
                              "</BODY></FORM></HTML>"

                              , pDeliveryData-
>o_carrier_id,
                              (pDeliveryData-
>exec_status_code == eOK) ? "Delivery has been
queued." : "Delivery Post Failed     "
                              );
          }
}

/* FUNCTION: ProcessNewOrderForm
 *
 * PURPOSE:          This function gets and validates
the input data from the new order form
 *                              filling in the required
input variables. it then calls the SQLNewOrder
 *                              transaction, constructs
the output form and writes it back to client
 *                              browser.
 */

void ProcessNewOrderForm(EXTENSION_CONTROL_BLOCK
          *pECB, int iTermId, char *szBuffer)
{
          PNEW_ORDER_DATA               pNewOrder;

          pNewOrder = Term.pClientData[iTermId].pTxn-
>BuffAddr_NewOrder();

          ZeroMemory(pNewOrder,
sizeof(NEW_ORDER_DATA));
          pNewOrder->w_id =
Term.pClientData[iTermId].w_id;
          GetNewOrderData(pECB->lpszQueryString,
pNewOrder);

          Term.pClientData[iTermId].pTxn->NewOrder();

          pNewOrder = Term.pClientData[iTermId].pTxn-
>BuffAddr_NewOrder();
          MakeNewOrderForm(iTermId, pNewOrder,
OUTPUT_FORM, szBuffer );
}

/* FUNCTION: void ProcessPaymentForm
 *
 * PURPOSE:          This function gets and validates
the input data from the payment form
 *                              filling in the required
input variables. It then calls the SQLPayment
 *                              transaction, constructs
the output form and writes it back to client
 *                              browser.
 *
 * ARGUMENTS:        EXTENSION_CONTROL_BLOCK
          *pECB     passed in structure pointer from
inetsrv.
 *                                        int

          iTermId   client browser terminal id
 *
 */

void ProcessPaymentForm(EXTENSION_CONTROL_BLOCK
*pECB, int iTermId, char *szBuffer)
{
          PPAYMENT_DATA       pPayment;

          pPayment = Term.pClientData[iTermId].pTxn-
>BuffAddr_Payment();
          ZeroMemory(pPayment, sizeof(PAYMENT_DATA));
          pPayment->w_id =
Term.pClientData[iTermId].w_id;
          GetPaymentData(pECB->lpszQueryString,
pPayment);

          Term.pClientData[iTermId].pTxn->Payment();

          pPayment = Term.pClientData[iTermId].pTxn-
>BuffAddr_Payment();
          MakePaymentForm(iTermId, pPayment,
OUTPUT_FORM, szBuffer);
}

/* FUNCTION: ProcessOrderStatusForm
 *
 * PURPOSE:          This function gets and validates
the input data from the Order Status
 *                              form filling in the
required input variables. It then calls the
 *                              SQLOrderStatus
transaction, constructs the output form and writes it
 *                              back to client browser.
 *
 * ARGUMENTS:        EXTENSION_CONTROL_BLOCK
          *pECB     passed in structure pointer from
inetsrv.
 *                                        int

          iTermId   client browser terminal id
 *
 */

void ProcessOrderStatusForm(EXTENSION_CONTROL_BLOCK
*pECB, int iTermId, char *szBuffer)
{
          PORDER_STATUS_DATA  pOrderStatus;

          pOrderStatus =
Term.pClientData[iTermId].pTxn-
>BuffAddr_OrderStatus();
          ZeroMemory(pOrderStatus,
sizeof(ORDER_STATUS_DATA));
          pOrderStatus->w_id =
Term.pClientData[iTermId].w_id;
          GetOrderStatusData(pECB->lpszQueryString,
pOrderStatus);
          Term.pClientData[iTermId].pTxn-
>OrderStatus();

          pOrderStatus =
Term.pClientData[iTermId].pTxn-
>BuffAddr_OrderStatus();
          MakeOrderStatusForm(iTermId, pOrderStatus,
OUTPUT_FORM, szBuffer);
}

/* FUNCTION: ProcessDeliveryForm
 *
 * PURPOSE:          This function gets and validates
the input data from the delivery form
 *                              filling in the required
input variables. It then calls the PostDeliveryInfo
 *                              Api, The client is then
informed that the transaction has been posted.
 *
 * ARGUMENTS:        EXTENSION_CONTROL_BLOCK
          *pECB     passed in structure pointer from
inetsrv.
 *                                        int

          iTermId   client browser terminal id
 *
 */

void ProcessDeliveryForm(EXTENSION_CONTROL_BLOCK
*pECB, int iTermId, char *szBuffer)
{
          char      *ptr = pECB->lpszQueryString;

          PDELIVERY_DATA      pDelivery;

          pDelivery = Term.pClientData[iTermId].pTxn-
>BuffAddr_Delivery();
          ZeroMemory(pDelivery,
sizeof(DELIVERY_DATA));
          pDelivery->w_id =
Term.pClientData[iTermId].w_id;

          pDelivery->o_carrier_id       =
GetIntKeyValue(&ptr, "OCD*",
ERR_DELIVERY_MISSING_OCD_KEY,
ERR_DELIVERY_CARRIER_INVALID);
          if ( pDelivery->o_carrier_id > 10 ||
pDelivery->o_carrier_id < 1 )
                    throw new CWEBCLNT_ERR(
ERR_DELIVERY_CARRIER_ID_RANGE );

          if (dwNumDeliveryThreads)
          {
                    //post delivery info
                    if ( PostDeliveryInfo(pDelivery-
>w_id, pDelivery->o_carrier_id) )
                              pDelivery-
>exec_status_code = eDeliveryFailed;
                    else
                              pDelivery-
>exec_status_code = eOK;
```

```
        }
        else // delivery is done synchronously if
no delivery threads configured
                Term.pClientData[iTermId].pTxn-
>Delivery();

        pDelivery = Term.pClientData[iTermId].pTxn-
>BuffAddr_Delivery();
        MakeDeliveryForm(iTermId, pDelivery,
OUTPUT_FORM, szBuffer);
}

/* FUNCTION: ProcessStockLevelForm
 *
 * PURPOSE:         This function gets and validates
the input data from the Stock Level
 *                          form filling in the
required input variables. It then calls the
 *                          SQLStockLevel
transaction, constructs the output form and writes it
 *                          back to client browser.
 *
 * ARGUMENTS:       EXTENSION_CONTROL_BLOCK
        *pECB     passed in structure pointer from
inetsrv.
 *                                      int

        iTermId   client browser terminal id
 *
 */

void ProcessStockLevelForm(EXTENSION_CONTROL_BLOCK
*pECB, int iTermId, char *szBuffer)
{
        char                *ptr = pECB-
>lpszQueryString;

        PSTOCK_LEVEL_DATA   pStockLevel;

        pStockLevel =
Term.pClientData[iTermId].pTxn-
>BuffAddr_StockLevel();
        ZeroMemory( pStockLevel,
sizeof(STOCK_LEVEL_DATA) );

        pStockLevel->w_id =
Term.pClientData[iTermId].w_id;
        pStockLevel->d_id =
Term.pClientData[iTermId].d_id;

        pStockLevel->threshold =
GetIntKeyValue(&ptr, "TT*",
ERR_STOCKLEVEL_MISSING_THRESHOLD_KEY,
ERR_STOCKLEVEL_THRESHOLD_INVALID);
        if ( pStockLevel->threshold >= 100 ||
pStockLevel->threshold < 0 )
                throw new CWEBCLNT_ERR(
ERR_STOCKLEVEL_THRESHOLD_RANGE );

        Term.pClientData[iTermId].pTxn-
>StockLevel();

        pStockLevel =
Term.pClientData[iTermId].pTxn-
>BuffAddr_StockLevel();
        MakeStockLevelForm(iTermId, pStockLevel,
OUTPUT_FORM, szBuffer);
}

/* FUNCTION: GetNewOrderData
 *
 * PURPOSE:         This function extracts and
validates the new order form data from an http
command string.
 *
 * ARGUMENTS:       LPSTR
        lpszQueryString              client
browser http command string
 *
        NEW_ORDER_DATA      *pNewOrderData
        pointer to new order data structure
 *
 */

void GetNewOrderData(LPSTR lpszQueryString,
NEW_ORDER_DATA *pNewOrderData)
{
        char      szTmp[26];
        int                 i;
        short     items;
        int                 ol_i_id, ol_quantity;
        char      *ptr = lpszQueryString;

        static char szSP[MAX_OL_NEW_ORDER_ITEMS][6]
=
                  { "SP00*", "SP01*", "SP02*",
"SP03*", "SP04*",
                    "SP05*", "SP06*", "SP07*",
"SP08*", "SP09*",
                    "SP10*", "SP11*", "SP12*",
"SP13*", "SP14*" };
        static char
szIID[MAX_OL_NEW_ORDER_ITEMS][7] =
                  { "IID00*", "IID01*", "IID02*",
"IID03*", "IID04*",
                    "IID05*", "IID06*", "IID07*",
"IID08*", "IID09*",
                    "IID10*", "IID11*", "IID12*",
"IID13*", "IID14*" };
        static char
szQty[MAX_OL_NEW_ORDER_ITEMS][7] =
                  { "Qty00*", "Qty01*", "Qty02*",
"Qty03*", "Qty04*",
                    "Qty05*", "Qty06*", "Qty07*",
"Qty08*", "Qty09*",
                    "Qty10*", "Qty11*", "Qty12*",
"Qty13*", "Qty14*" };

        pNewOrderData->d_id = GetIntKeyValue(&ptr,
"DID*", ERR_NEWORDER_FORM_MISSING_DID,
ERR_NEWORDER_DISTRICT_INVALID);

        pNewOrderData->c_id = GetIntKeyValue(&ptr,
"CID*", ERR_NEWORDER_CUSTOMER_KEY,
ERR_NEWORDER_CUSTOMER_INVALID);

        for(i=0, items=0; i<MAX_OL_NEW_ORDER_ITEMS;
i++)
        {
                GetKeyValue(&ptr, szSP[i], szTmp,
sizeof(szTmp), ERR_NEWORDER_MISSING_SUPPW_KEY);
                if ( szTmp[0] )
                {
                        if ( !IsNumeric(szTmp)
)
                                throw new
CWEBCLNT_ERR( ERR_NEWORDER_SUPPW_INVALID );
                        pNewOrderData-
>OL[items].ol_supply_w_id = atoi(szTmp);

                        ol_i_id =
pNewOrderData->OL[items].ol_i_id =

                GetIntKeyValue(&ptr, szIID[i],
ERR_NEWORDER_MISSING_IID_KEY,
ERR_NEWORDER_ITEMID_INVALID);
                        if ( ol_i_id > 999999
|| ol_i_id < 1 )
                                throw new
CWEBCLNT_ERR( ERR_NEWORDER_ITEMID_RANGE );

                        ol_quantity =
pNewOrderData->OL[items].ol_quantity =

                GetIntKeyValue(&ptr, szQty[i],
ERR_NEWORDER_MISSING_QTY_KEY,
ERR_NEWORDER_QTY_INVALID);
                        if ( ol_quantity > 99
|| ol_quantity < 1 )
                                throw new
CWEBCLNT_ERR( ERR_NEWORDER_QTY_RANGE );

                        items++;
                }
                else
                {       // nothing entered for
supply warehouse, so item id and qty must also be
blank
                        GetKeyValue(&ptr,
szIID[i], szTmp, sizeof(szTmp),
ERR_NEWORDER_MISSING_IID_KEY);
                        if ( szTmp[0] )
                                throw new
CWEBCLNT_ERR( ERR_NEWORDER_ITEMID_WITHOUT_SUPPW );

                        GetKeyValue(&ptr,
szQty[i], szTmp, sizeof(szTmp),
ERR_NEWORDER_MISSING_QTY_KEY);
                        if ( szTmp[0] )
                                throw new
CWEBCLNT_ERR( ERR_NEWORDER_QTY_WITHOUT_SUPPW );
                }
        }
```

```
        if ( items == 0 )
                throw new CWEBCLNT_ERR(
ERR_NEWORDER_NOITEMS_ENTERED );

        pNewOrderData->o_ol_cnt = items;
}

/* FUNCTION: GetPaymentData
 *
 * PURPOSE:         This function extracts and
validates the payment form data from an http command
string.
 *
 * ARGUMENTS:       LPSTR
        lpszQueryString               client
browser http command string
 *                                    PAYMENT_DATA
        *pPaymentData                 pointer to
payment data structure
 */

void GetPaymentData(LPSTR lpszQueryString,
PAYMENT_DATA *pPaymentData)
{
        char      szTmp[26];
        char      *ptr = lpszQueryString;
        BOOL      bCustIdBlank;
        int                 iLen;

        pPaymentData->d_id = GetIntKeyValue(&ptr,
"DID*", ERR_PAYMENT_MISSING_DID_KEY,
ERR_PAYMENT_DISTRICT_INVALID);

        GetKeyValue(&ptr, "CID*", szTmp,
sizeof(szTmp), ERR_PAYMENT_MISSING_CID_KEY);
        if ( szTmp[0] == 0 )
        {
                bCustIdBlank = TRUE;
                pPaymentData->c_id = 0;
        }
        else
        {       // parse customer id and verify
that last name was NOT entered
                bCustIdBlank = FALSE;
                if ( !IsNumeric(szTmp) )
                        throw new CWEBCLNT_ERR(
ERR_PAYMENT_CUSTOMER_INVALID );
                pPaymentData->c_id = atoi(szTmp);
        }

        pPaymentData->c_w_id = GetIntKeyValue(&ptr,
"CWI*", ERR_PAYMENT_MISSING_CWI_KEY,
ERR_PAYMENT_CWI_INVALID);
        pPaymentData->c_d_id = GetIntKeyValue(&ptr,
"CDI*", ERR_PAYMENT_MISSING_CDI_KEY,
ERR_PAYMENT_CDI_INVALID);

        if ( bCustIdBlank )
        {       // customer id is blank, so last
name must be entered
                GetKeyValue(&ptr, "CLT*", szTmp,
sizeof(szTmp), ERR_PAYMENT_MISSING_CLT_KEY);
                if ( szTmp[0] == 0 )
                        throw new CWEBCLNT_ERR(
ERR_PAYMENT_MISSING_CID_CLT );

                _strupr( szTmp );
                if ( strlen(szTmp) >
LAST_NAME_LEN )
                        throw new CWEBCLNT_ERR(
ERR_PAYMENT_LAST_NAME_TO_LONG );

                strcpy(pPaymentData->c_last,
szTmp);
                // pad with spaces so that the
client layer doesn't have to do it
                // before passing parameters to
stored procedure
                iLen = strlen(pPaymentData-
>c_last);
                memset(pPaymentData->c_last +
iLen, ' ', LAST_NAME_LEN - iLen);
                pPaymentData-
>c_last[LAST_NAME_LEN] = 0;
        }
        else
        {       // parse customer id and verify
that last name was NOT entered
                GetKeyValue(&ptr, "CLT*", szTmp,
sizeof(szTmp), ERR_PAYMENT_MISSING_CLT_KEY);
                if ( szTmp[0] != 0 )
                        throw new CWEBCLNT_ERR(
ERR_PAYMENT_CID_AND_CLT );
        }

        GetKeyValue(&ptr, "HAM*", szTmp,
sizeof(szTmp), ERR_PAYMENT_MISSING_HAM_KEY);
        if (!IsDecimal(szTmp))
                throw new CWEBCLNT_ERR(
ERR_PAYMENT_HAM_INVALID );
        pPaymentData->h_amount = atof(szTmp);
        if ( pPaymentData->h_amount >= 10000.00 ||
pPaymentData->h_amount < 0 )
                throw new CWEBCLNT_ERR(
ERR_PAYMENT_HAM_RANGE );
}

/* FUNCTION: GetOrderStatusData
 *
 * PURPOSE:         This function extracts and
validates the payment form data from an http command
string.
 *
 */
void GetOrderStatusData(LPSTR lpszQueryString,
ORDER_STATUS_DATA *pOrderStatusData)
{
        char      szTmp[26];
        char      *ptr = lpszQueryString;
        int                 iLen;

        pOrderStatusData->d_id =
GetIntKeyValue(&ptr, "DID*",
ERR_ORDERSTATUS_MISSING_DID_KEY,
ERR_ORDERSTATUS_DID_INVALID);

        GetKeyValue(&ptr, "CID*", szTmp,
sizeof(szTmp), ERR_ORDERSTATUS_MISSING_CID_KEY);
        if ( szTmp[0] == 0 )
        {       // customer id is blank, so last
name must be entered
                pOrderStatusData->c_id = 0;
                GetKeyValue(&ptr, "CLT*", szTmp,
sizeof(szTmp), ERR_ORDERSTATUS_MISSING_CLT_KEY);
                if ( szTmp[0] == 0 )
                        throw new CWEBCLNT_ERR(
ERR_ORDERSTATUS_MISSING_CID_CLT );

                _strupr( szTmp );
                if ( strlen(szTmp) >
LAST_NAME_LEN )
                        throw new CWEBCLNT_ERR(
ERR_ORDERSTATUS_CLT_RANGE );

                strcpy(pOrderStatusData->c_last,
szTmp);
                // pad with spaces so that the
client layer doesn't have to do it
                // before passing parameters to
stored procedure
                iLen = strlen(pOrderStatusData-
>c_last);
                memset(pOrderStatusData->c_last +
iLen, ' ', LAST_NAME_LEN - iLen);
                pOrderStatusData-
>c_last[LAST_NAME_LEN] = 0;
        }
        else
        {       // parse customer id and verify
that last name was NOT entered
                if ( !IsNumeric(szTmp) )
                        throw new CWEBCLNT_ERR(
ERR_ORDERSTATUS_CID_INVALID );
                pOrderStatusData->c_id =
atoi(szTmp);
                GetKeyValue(&ptr, "CLT*", szTmp,
sizeof(szTmp), ERR_ORDERSTATUS_MISSING_CLT_KEY);
                if ( szTmp[0] != 0 )
                        throw new CWEBCLNT_ERR(
ERR_ORDERSTATUS_CID_AND_CLT );
        }

}

/* FUNCTION: BOOL IsNumeric(char *ptr)
 *
 * PURPOSE:         This function determines if a
string is numeric. It fails if any characters other
 *                          than numeric and null
terminator are present.
 *
```

```
 * ARGUMENTS:       char
        *ptr      pointer to string to check.
 *
 * RETURNS:                  BOOL      FALSE     if
string is not all numeric
 *
         TRUE      if string contains only numeric
characters i.e. '0' - '9'
 */

BOOL IsNumeric(char *ptr)
{
         if ( *ptr == 0 )
                  return FALSE;

         while( *ptr && isdigit(*ptr) )
                  ptr++;
         return ( !*ptr );
}

/* FUNCTION: BOOL IsDecimal(char *ptr)
 *
 * PURPOSE:         This function determines if a
string is a non-negative decimal value.
 *          It fails if any characters other than a
series of numbers followed by
 *                           a decimal point,
another series of numbers, and a null terminator are
present.
 *
 * ARGUMENTS:       char
        *ptr      pointer to string to check.
 *
 * RETURNS:                  BOOL      FALSE     if
string is not a valid non-negative decimal value
 *
         TRUE      if string is OK
 */

BOOL IsDecimal(char *ptr)
{
         char *dotptr;
         BOOL  bValid;

         if ( *ptr == 0 )
                  return FALSE;

         // find decimal point
         dotptr = strchr( ptr, '.' );
         if (dotptr == NULL)
                  // no decimal point, so just
check for numeric
                  return IsNumeric(ptr);
         *dotptr = 0;  // temporarily replace
decimal with a terminator

         if ( *ptr != 0 )
                  bValid = IsNumeric(ptr);
         // string starts with decimal point
         else if (*(dotptr+1) == 0)
                  return FALSE;  // nothing but a
decimal point is bad
         else
                  bValid = TRUE;

         if (*(dotptr+1) != 0)
                  // check text after decimal point
                  bValid &= IsNumeric(dotptr+1);

         *dotptr = '.';  // replace decimal point
         return bValid;
}
```

tpcc.h

```
/*       FILE:               TPCC.H
 *                                          Microsoft
TPC-C Kit Ver. 4.20.000
 *                                          Copyright
Microsoft, 1999
 *             All Rights Reserved
 *
 *                                          Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *       PURPOSE:  Header file for ISAPI TPCC.DLL,
defines structures and functions used in the isapi
tpcc.dll.
 *
 */

//VERSION RESOURCE DEFINES
#define _APS_NEXT_RESOURCE_VALUE
                  101
#define _APS_NEXT_COMMAND_VALUE
                                 40001
#define _APS_NEXT_CONTROL_VALUE
                                 1000
#define _APS_NEXT_SYMED_VALUE
                  101

#define TP_MAX_RETRIES
                                          50


//note that the welcome form must be processed first
as terminal ids assigned here, once the
//terminal id is assigned then the forms can be
processed in any order.
#define WELCOME_FORM
                                 1
         //beginning form no term id assigned, form
id
#define MAIN_MENU_FORM
                                 2
         //term id assigned main menu form id
#define NEW_ORDER_FORM
                                 3
         //new order form id
#define PAYMENT_FORM
                                 4
         //payment form id
#define DELIVERY_FORM
                                 5
         //delivery form id
#define ORDER_STATUS_FORM
                  6                  //order
status id
#define STOCK_LEVEL_FORM
                  7                  //stock level
form id

//This macro is used to prevent the compiler error
unused formal parameter
#define UNUSEDPARAM(x) (x = x)


//This structure defines the data necessary to keep
distinct for each terminal or client connection.
typedef struct _CLIENTDATA
{
         int                        iNextFree;
                                    //index of
next free element or -1 if this entry in use.
         int                        w_id;
                                    //warehouse
id assigned at welcome form
         int                        d_id;
                                    //district id
assigned at welcome form

         int                        iSyncId;
                                 //syncronization id
         int                        iTickCount;
                                    //time of
last access;

         CTPCC_BASE          *pTxn;

} CLIENTDATA, *PCLIENTDATA;


//This structure is used to define the operational
interface for terminal id support
typedef struct _TERM
{
         int                        iNumEntries;

         //total allocated terminal array entries
         int                        iFreeList;

         //next available terminal array element or
-1 if none
         int
         iMasterSyncId;
                  //syncronization id
         CLIENTDATA          *pClientData;
                                    //pointer to
allocated client data
} TERM;
```

```
typedef TERM *PTERM;
                                        //pointer to
terminal structure type


          enum WEBERROR
          {
                    NO_ERR,
                    ERR_COMMAND_UNDEFINED,
                    ERR_D_ID_INVALID,
                    ERR_DELIVERY_CARRIER_ID_RANGE,
                    ERR_DELIVERY_CARRIER_INVALID,
                    ERR_DELIVERY_MISSING_OCD_KEY,
                    ERR_DELIVERY_THREAD_FAILED,
                    ERR_GETPROCADDR_FAILED,
                    ERR_HTML_ILL_FORMED,
                    ERR_INVALID_SYNC_CONNECTION,
                    ERR_INVALID_TERMID,
                    ERR_LOADDLL_FAILED,
                    ERR_MAX_CONNECTIONS_EXCEEDED,
                    ERR_MEM_ALLOC_FAILED,
                    ERR_MISSING_REGISTRY_ENTRIES,
                    ERR_NEWORDER_CUSTOMER_INVALID,
                    ERR_NEWORDER_CUSTOMER_KEY,
                    ERR_NEWORDER_DISTRICT_INVALID,
                    ERR_NEWORDER_FORM_MISSING_DID,
                    ERR_NEWORDER_ITEMID_INVALID,
                    ERR_NEWORDER_ITEMID_RANGE,

          ERR_NEWORDER_ITEMID_WITHOUT_SUPPW,
                    ERR_NEWORDER_MISSING_IID_KEY,
                    ERR_NEWORDER_MISSING_QTY_KEY,
                    ERR_NEWORDER_MISSING_SUPPW_KEY,
                    ERR_NEWORDER_NOITEMS_ENTERED,
                    ERR_NEWORDER_QTY_INVALID,
                    ERR_NEWORDER_QTY_RANGE,
                    ERR_NEWORDER_QTY_WITHOUT_SUPPW,
                    ERR_NEWORDER_SUPPW_INVALID,
                    ERR_NO_SERVER_SPECIFIED,
                    ERR_ORDERSTATUS_CID_AND_CLT,
                    ERR_ORDERSTATUS_CID_INVALID,
                    ERR_ORDERSTATUS_CLT_RANGE,
                    ERR_ORDERSTATUS_DID_INVALID,
                    ERR_ORDERSTATUS_MISSING_CID_CLT,
                    ERR_ORDERSTATUS_MISSING_CID_KEY,
                    ERR_ORDERSTATUS_MISSING_CLT_KEY,
                    ERR_ORDERSTATUS_MISSING_DID_KEY,
                    ERR_PAYMENT_CDI_INVALID,
                    ERR_PAYMENT_CID_AND_CLT,
                    ERR_PAYMENT_CUSTOMER_INVALID,
                    ERR_PAYMENT_CWI_INVALID,
                    ERR_PAYMENT_DISTRICT_INVALID,
                    ERR_PAYMENT_HAM_INVALID,
                    ERR_PAYMENT_HAM_RANGE,
                    ERR_PAYMENT_LAST_NAME_TO_LONG,
                    ERR_PAYMENT_MISSING_CDI_KEY,
                    ERR_PAYMENT_MISSING_CID_CLT,
                    ERR_PAYMENT_MISSING_CID_KEY,
                    ERR_PAYMENT_MISSING_CLT,
                    ERR_PAYMENT_MISSING_CLT_KEY,
                    ERR_PAYMENT_MISSING_CWI_KEY,
                    ERR_PAYMENT_MISSING_DID_KEY,
                    ERR_PAYMENT_MISSING_HAM_KEY,

          ERR_STOCKLEVEL_MISSING_THRESHOLD_KEY,
                    ERR_STOCKLEVEL_THRESHOLD_INVALID,
                    ERR_STOCKLEVEL_THRESHOLD_RANGE,
                    ERR_VERSION_MISMATCH,
                    ERR_W_ID_INVALID
          };

class CWEBCLNT_ERR : public CBaseErr
{
          public:

                    CWEBCLNT_ERR(WEBERROR Err)
                    {
                              m_Error = Err;
                              m_szTextDetail = NULL;
                              m_SystemErr = 0;
                              m_szErrorText = NULL;
                    };

                    CWEBCLNT_ERR(WEBERROR Err, char
*szTextDetail, DWORD dwSystemErr)
                    {
                              m_Error = Err;
                              m_szTextDetail = new
char[strlen(szTextDetail)+1];
                              strcpy( m_szTextDetail,
szTextDetail );
                              m_SystemErr =
dwSystemErr;
                              m_szErrorText = NULL;
                    };

                    ~CWEBCLNT_ERR()
                    {
                              if (m_szTextDetail !=
NULL)
                                        delete []
m_szTextDetail;
                              if (m_szErrorText !=
NULL)
                                        delete []
m_szErrorText;
                    };

                    WEBERROR  m_Error;
                    char
          *m_szTextDetail;    //
                    char
          *m_szErrorText;
                    DWORD               m_SystemErr;

                    int ErrorType() {return
ERR_TYPE_WEBDLL;};
                    char *ErrorTypeStr() { return
"WEBCLIENT"; }
                    int ErrorNum() {return m_Error;};
                    char *ErrorText();
};

//These constants have already been defined in
engstut.h, but since we do
//not want to include it in the delisrv executable
#define   TXN_EVENT_START               2
#define   TXN_EVENT_STOP                4
#define TXN_EVENT_WARNING     6
          //used to record a warning into the log

//function prototypes

BOOL APIENTRY DllMain(HANDLE hModule, DWORD
ul_reason_for_call, LPVOID lpReserved);
void WriteMessageToEventLog(LPTSTR lpszMsg);
void ProcessQueryString(EXTENSION_CONTROL_BLOCK
*pECB, int *pCmd, int *pFormId, int *pTermId, int
*pSyncId);
void WelcomeForm(EXTENSION_CONTROL_BLOCK *pECB, char
*szBuffer);
void SubmitCmd(EXTENSION_CONTROL_BLOCK *pECB, char
*szBuffer);
void BeginCmd(EXTENSION_CONTROL_BLOCK *pECB, int
iFormId, int iTermId);
void ProcessCmd(EXTENSION_CONTROL_BLOCK *pECB, int
iFormId, int iTermId);
void StatsCmd(EXTENSION_CONTROL_BLOCK *pECB, char
*szBuffer);
void ErrorMessage(EXTENSION_CONTROL_BLOCK *pECB, int
iError, int iErrorType, char *szMsg, int iTermId);
void GetKeyValue(char **pQueryString, char *pKey,
char *pValue, int iMax, WEBERROR err);
int  GetIntKeyValue(char **pQueryString, char *pKey,
WEBERROR NoKeyErr, WEBERROR NotIntErr);
void TermInit(void);
void TermDeleteAll(void);
int  TermAdd(void);
void TermDelete(int id);
void ErrorForm(EXTENSION_CONTROL_BLOCK *pECB, int
iType, int iErrorNum, int iTermId, int iSyncId, char
*szErrorText, char *szBuffer );
void MakeMainMenuForm(int iTermId, int iSyncId, char
*szForm);
void MakeStockLevelForm(int iTermId, STOCK_LEVEL_DATA
*pStockLevelData, BOOL bInput, char *szForm);
void MakeNewOrderForm(int iTermId, NEW_ORDER_DATA
*pNewOrderData, BOOL bInput, char *szForm);
void MakePaymentForm(int iTermId, PAYMENT_DATA
*pPaymentData, BOOL bInput, char *szForm);
void MakeOrderStatusForm(int iTermId,
ORDER_STATUS_DATA *pOrderStatusData, BOOL bInput,
char *szForm);
void MakeDeliveryForm(int iTermId, DELIVERY_DATA
*pDeliveryData, BOOL bInput, char *szForm);
void ProcessNewOrderForm(EXTENSION_CONTROL_BLOCK
          *pECB, int iTermId, char *szBuffer);
void ProcessPaymentForm(EXTENSION_CONTROL_BLOCK
*pECB, int iTermId, char *szBuffer);
void ProcessOrderStatusForm(EXTENSION_CONTROL_BLOCK
*pECB, int iTermId, char *szBuffer);
```

```
void ProcessDeliveryForm(EXTENSION_CONTROL_BLOCK
*pECB, int iTermId, char *szBuffer);
void ProcessStockLevelForm(EXTENSION_CONTROL_BLOCK
*pECB, int iTermId, char *szBuffer);
void GetNewOrderData(LPSTR lpszQueryString,
NEW_ORDER_DATA *pNewOrderData);
void GetPaymentData(LPSTR lpszQueryString,
PAYMENT_DATA *pPaymentData);
void GetOrderStatusData(LPSTR lpszQueryString,
ORDER_STATUS_DATA *pOrderStatusData);
BOOL PostDeliveryInfo(long w_id, short o_carrier_id);
BOOL IsNumeric(char *ptr);
BOOL IsDecimal(char *ptr);
void DeliveryWorkerThread(void *ptr);
```

tpcc.rc

```
//Microsoft Developer Studio generated resource
script.
//
#include "resource.h"

#define APSTUDIO_READONLY_SYMBOLS
////////////////////////////////////////////////
////////////////////////
//
// Generated from the TEXTINCLUDE 2 resource.
//
#include "afxres.h"

////////////////////////////////////////////////
////////////////////////
#undef APSTUDIO_READONLY_SYMBOLS

////////////////////////////////////////////////
////////////////////////
// English (U.S.) resources

#if !defined(AFX_RESOURCE_DLL) ||
defined(AFX_TARG_ENU)
#ifdef _WIN32
LANGUAGE LANG_ENGLISH, SUBLANG_ENGLISH_US
#pragma code_page(1252)
#endif //_WIN32

#ifndef _MAC
////////////////////////////////////////////////
////////////////////////
//
// Version
//

VS_VERSION_INFO VERSIONINFO
 FILEVERSION 0,4,0,0
 PRODUCTVERSION 0,4,0,0
 FILEFLAGSMASK 0x3fL
#ifdef _DEBUG
 FILEFLAGS 0x1L
#else
 FILEFLAGS 0x0L
#endif
 FILEOS 0x40004L
 FILETYPE 0x2L
 FILESUBTYPE 0x0L
BEGIN
    BLOCK "StringFileInfo"
    BEGIN
        BLOCK "040904b0"
        BEGIN
            VALUE "Comments", "TPC-C HTML DLL Server
(DBLIB)\0"
            VALUE "CompanyName", "Microsoft\0"
            VALUE "FileDescription", "TPC-C HTML DLL
Server (DBLIB)\0"
            VALUE "FileVersion", "0, 4, 0, 0\0"
            VALUE "InternalName", "tpcc\0"
            VALUE "LegalCopyright", "Copyright ©
1997\0"
            VALUE "OriginalFilename", "tpcc.dll\0"
            VALUE "ProductName", "Microsoft tpcc\0"
            VALUE "ProductVersion", "0, 4, 0, 0\0"
        END
    END
    BLOCK "VarFileInfo"
    BEGIN
        VALUE "Translation", 0x409, 1200
    END
END

#endif    // !_MAC


#ifdef APSTUDIO_INVOKED
////////////////////////////////////////////////
////////////////////////
//
// TEXTINCLUDE
//

1 TEXTINCLUDE DISCARDABLE
BEGIN
    "resource.h\0"
END

2 TEXTINCLUDE DISCARDABLE
BEGIN
    "#include ""afxres.h""\r\n"
    "\0"
END

3 TEXTINCLUDE DISCARDABLE
BEGIN
    "\r\n"
    "\0"
END

#endif    // APSTUDIO_INVOKED


////////////////////////////////////////////////
////////////////////////
//
// Dialog
//

IDD_DIALOG1 DIALOG DISCARDABLE  0, 0, 186, 95
STYLE DS_MODALFRAME | WS_POPUP | WS_CAPTION |
WS_SYSMENU
CAPTION "Dialog"
FONT 8, "MS Sans Serif"
BEGIN
    DEFPUSHBUTTON   "OK",IDOK,129,7,50,14
    PUSHBUTTON      "Cancel",IDCANCEL,129,24,50,14
END


////////////////////////////////////////////////
////////////////////////
//
// DESIGNINFO
//

#ifdef APSTUDIO_INVOKED
GUIDELINES DESIGNINFO DISCARDABLE
BEGIN
    IDD_DIALOG1, DIALOG
    BEGIN
        LEFTMARGIN, 7
        RIGHTMARGIN, 179
        TOPMARGIN, 7
        BOTTOMMARGIN, 88
    END
END
#endif    // APSTUDIO_INVOKED

#endif    // English (U.S.) resources
////////////////////////////////////////////////
////////////////////////



#ifndef APSTUDIO_INVOKED
////////////////////////////////////////////////
////////////////////////
//
// Generated from the TEXTINCLUDE 3 resource.
//


////////////////////////////////////////////////
////////////////////////
#endif    // not APSTUDIO_INVOKED
```

tpcc_com.cpp

```
/*        FILE:                TPCC_COM.CPP
 *                                        Microsoft
TPC-C Kit Ver. 4.20.000
 *                                        Copyright
Microsoft, 1999
```

```
 *              All Rights Reserved
 *
 *                                      not yet
audited
 *
 *        PURPOSE:  Source file for TPC-C COM+ class
implementation.
 *        Contact:  Charles Levine
(clevine@microsoft.com)
 *
 *  Change history:
 *                  4.20.000 - first version
 */

// needed for CoinitializeEx
#define _WIN32_WINNT 0x0400

#include <windows.h>

// need to declare functions for export
#define DllDecl  __declspec( dllexport )

#include "..\..\common\src\trans.h"
          //tpckit transaction header contains
definations of structures specific to TPC-C
#include "..\..\common\src\error.h"
#include "..\..\common\src\txn_base.h"
#include "tpcc_com.h"

#include "..\..\tpcc_com_ps\src\tpcc_com_ps_i.c"
#include "..\..\tpcc_com_all\src\tpcc_com_all_i.c"

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_COM* CTPCC_COM_new(BOOL
bSinglePool)
{
          return new CTPCC_COM(bSinglePool);
}

CTPCC_COM::CTPCC_COM(BOOL bSinglePool)
{
          HRESULT hr = NULL;
          long lRet = 0;
          ULONG ulTmpSize = 0;

          m_pTxn                        = NULL;
          m_pNewOrder                   = NULL;
          m_pPayment                    = NULL;
          m_pStockLevel       = NULL;
          m_pOrderStatus      = NULL;

          m_bSinglePool       = bSinglePool;

          ulTmpSize = (ULONG) sizeof(COM_DATA);
          VariantInit(&m_vTxn);
          m_vTxn.vt = VT_SAFEARRAY;

          m_vTxn.parray =
SafeArrayCreateVector(VT_UI1, ulTmpSize, ulTmpSize);
          if (!m_vTxn.parray)
                    throw new CCOMERR( E_FAIL );
          memset((void*)m_vTxn.parray-
>pvData,0,ulTmpSize);
          m_pTxn = (COM_DATA*)m_vTxn.parray->pvData;

          hr = CoInitializeEx(NULL,
COINIT_MULTITHREADED);
          if (FAILED(hr))
          {
                    throw new CCOMERR( hr );
          }

          // create components
          if (m_bSinglePool)
          {
                    hr = CoCreateInstance(CLSID_TPCC,
NULL, CLSCTX_SERVER, IID_ITPCC, (void
**)&m_pNewOrder);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    // all txns will use same
component
                    m_pPayment = m_pNewOrder;
                    m_pStockLevel = m_pNewOrder;
                    m_pOrderStatus = m_pNewOrder;
          }
          else
          {
                    // use different components for
each txn

                    hr =
CoCreateInstance(CLSID_NewOrder, NULL, CLSCTX_SERVER,
IID_ITPCC, (void **)&m_pNewOrder);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    hr =
CoCreateInstance(CLSID_Payment, NULL, CLSCTX_SERVER,
IID_ITPCC, (void **)&m_pPayment);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    hr =
CoCreateInstance(CLSID_StockLevel, NULL,
CLSCTX_SERVER, IID_ITPCC, (void **)&m_pStockLevel);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    hr =
CoCreateInstance(CLSID_OrderStatus, NULL,
CLSCTX_SERVER, IID_ITPCC, (void **)&m_pOrderStatus);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);
          }

          // call setcomplete to release each
component back into pool
          hr = m_pNewOrder->CallSetComplete();
          if (FAILED(hr))
                    throw new CCOMERR(hr);

          if (!m_bSinglePool)
          {
                    hr = m_pPayment-
>CallSetComplete();
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    hr = m_pStockLevel-
>CallSetComplete();
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    hr = m_pOrderStatus-
>CallSetComplete();
                    if (FAILED(hr))
                              throw new CCOMERR(hr);
          }
}

CTPCC_COM::~CTPCC_COM()
{
          if (m_pTxn)
                    SafeArrayDestroy(m_vTxn.parray);

          ReleaseInterface(m_pNewOrder);
          if (!m_bSinglePool)
          {
                    ReleaseInterface(m_pPayment);
                    ReleaseInterface(m_pStockLevel);
                    ReleaseInterface(m_pOrderStatus);
          }
          CoUninitialize();
}

void CTPCC_COM::NewOrder()
{
          VARIANT   vTxn_out;

          HRESULT hr = m_pNewOrder->NewOrder(m_vTxn,
&vTxn_out);
          if (FAILED(hr))
                    throw new CCOMERR( hr );
          memcpy(m_pTxn, (void *)vTxn_out.parray-
>pvData,vTxn_out.parray->rgsabound[0].cElements);
          SafeArrayDestroy(vTxn_out.parray);

          if ( m_pTxn->ErrorType != ERR_SUCCESS )
                    throw new CCOMERR( m_pTxn-
>ErrorType, m_pTxn->error );
}

void CTPCC_COM::Payment()
{
          VARIANT   vTxn_out;

          HRESULT hr = m_pPayment->Payment(m_vTxn,
&vTxn_out);
          if (FAILED(hr))
                    throw new CCOMERR( hr );
```

```
        memcpy(m_pTxn, (void *)vTxn_out.parray-
>pvData,vTxn_out.parray->rgsabound[0].cElements);
        SafeArrayDestroy(vTxn_out.parray);

        if ( m_pTxn->ErrorType != ERR_SUCCESS )
                throw new CCOMERR( m_pTxn-
>ErrorType, m_pTxn->error );
}

void CTPCC_COM::StockLevel()
{
        VARIANT   vTxn_out;

        HRESULT hr = m_pStockLevel-
>StockLevel(m_vTxn, &vTxn_out);
        if (FAILED(hr))
                throw new CCOMERR( hr );
        memcpy(m_pTxn, (void *)vTxn_out.parray-
>pvData,vTxn_out.parray->rgsabound[0].cElements);
        SafeArrayDestroy(vTxn_out.parray);

        if ( m_pTxn->ErrorType != ERR_SUCCESS )
                throw new CCOMERR( m_pTxn-
>ErrorType, m_pTxn->error );
}

void CTPCC_COM::OrderStatus()
{
        VARIANT   vTxn_out;

        HRESULT hr = m_pOrderStatus-
>OrderStatus(m_vTxn, &vTxn_out);
        if (FAILED(hr))
                throw new CCOMERR( hr );
        memcpy(m_pTxn, (void *)vTxn_out.parray-
>pvData,vTxn_out.parray->rgsabound[0].cElements);
        SafeArrayDestroy(vTxn_out.parray);

        if ( m_pTxn->ErrorType != ERR_SUCCESS )
                throw new CCOMERR( m_pTxn-
>ErrorType, m_pTxn->error );
}
```

tpcc_com.h

```
/*      FILE:                   TPCC_COM.H
 *                                      Microsoft
TPC-C Kit Ver. 4.20.000
 *                                      Copyright
Microsoft, 1999
 *              All Rights Reserved
 *
 *                                      not yet
audited
 *
 *      PURPOSE:  Header file for TPC-C COM+ class
implementation.
 *
 *  Change history:
 *                  4.20.000 - first version
 */

#pragma once

#include <stdio.h>
#include "..\..\tpcc_com_ps\src\tpcc_com_ps.h"

// need to declare functions for import, unless
define has already been created
// by the DLL's .cpp module for export.
#ifndef DllDecl
#define DllDecl  __declspec( dllimport )
#endif

class CCOMERR : public CBaseErr
{
        private:
                char m_szErrorText[64];

        public:
                // use this interface for genuine
COM errors
                CCOMERR( HRESULT hr )
                {
                        m_hr = hr;
                        m_iErrorType = 0;
                        m_iError = 0;
                }

                // use this interface to
impersonate a non-COM error type
                CCOMERR( int iErrorType, int
iError )
                {
                        m_iErrorType =
iErrorType;
                        m_iError = iError;
                        m_hr = S_OK;
                }

                int             m_hr;
                int             m_iErrorType;
                int             m_iError;

                // A CCOMERR class can
impersonate another class, which happens if the error
                // was not actually a COM
Services error, but was simply transmitted back via
COM.
                int ErrorType()
                {
                        if (m_iErrorType == 0)
                                return
ERR_TYPE_COM;
                        else
                                return
m_iErrorType;
                }

                char *ErrorTypeStr() { return
"COM"; }
                int ErrorNum() {return m_hr;}

                char *ErrorText()
                {
                        if (m_hr == S_OK)
                                sprintf(
m_szErrorText, "Error: Class %d, error # %d",
m_iErrorType, m_iError );
                        else
                                sprintf(
m_szErrorText, "Error: COM HRESULT %x", m_hr );
                        return m_szErrorText;
                }
};

class DllDecl CTPCC_COM : public CTPCC_BASE
{
        private:
                BOOL m_bSinglePool;

                // COM Interface pointers
                ITPCC*
        m_pNewOrder;
                ITPCC*
        m_pPayment;
                ITPCC*
        m_pStockLevel;
                ITPCC*
        m_pOrderStatus;

                struct COM_DATA
                {
                        int ErrorType;
                        int error;
                        union
                        {

        NEW_ORDER_DATA                  NewOrder;
                                        PAYMENT_DATA
                Payment;
                                        DELIVERY_DATA
                Delivery;

        STOCK_LEVEL_DATA    StockLevel;

        ORDER_STATUS_DATA   OrderStatus;
                        } u;
                } *m_pTxn;

                VARIANT m_vTxn;
        public:
                CTPCC_COM(BOOL bSinglePool);
                ~CTPCC_COM(void);

                inline PNEW_ORDER_DATA
        BuffAddr_NewOrder()           { return
&m_pTxn->u.NewOrder;    };
                inline PPAYMENT_DATA
        BuffAddr_Payment()            { return
&m_pTxn->u.Payment;     };
```

```
                    inline PDELIVERY_DATA
          BuffAddr_Delivery()           { return
&m_pTxn->u.Delivery;    };
                    inline PSTOCK_LEVEL_DATA
          BuffAddr_StockLevel()         { return
&m_pTxn->u.StockLevel;  };
                    inline PORDER_STATUS_DATA
          BuffAddr_OrderStatus()        { return
&m_pTxn->u.OrderStatus; };

                    void NewOrder                 ();
                    void Payment                  ();
                    void StockLevel               ();
                    void OrderStatus    ();
                    void Delivery                 ()
{ throw new CCOMERR(E_NOTIMPL); }  // not supported
};


inline void ReleaseInterface(IUnknown *pUnk)
{
          if (pUnk)
          {
                    pUnk->Release();
                    pUnk = NULL;
          }
}


// wrapper routine for class constructor
extern "C" __declspec(dllexport) CTPCC_COM*
CTPCC_COM_new(BOOL);

typedef CTPCC_COM* (TYPE_CTPCC_COM)(BOOL);
```

tpcc_com_all.cpp

```
/*        FILE:                TPCC_COM_ALL.CPP
 *                                       Microsoft
TPC-C Kit Ver. 4.20.000
 *                                       Copyright
Microsoft, 1999
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 *
 *                                       Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *        PURPOSE:  Implementation for TPC-C Tuxedo
class.
 *        Contact:  Charles Levine
(clevine@microsoft.com)
 *
 *  Change history:
 *                4.20.000 - updated rev number to
match kit
 */


#define STRICT
#define _WIN32_WINNT 0x0400
#define _ATL_APARTMENT_THREADED

#include <stdio.h>
#include <atlbase.h>
//You may derive a class from CComModule and use it
if you want to override
//something, but do not change the name of _Module
extern CComModule _Module;

#include <atlcom.h>
#include <initguid.h>
#include <transact.h>
//#include <atlimpl.cpp>
#include <comsvcs.h>

#include <sqltypes.h>
#include <sql.h>
#include <sqlext.h>

#include "tpcc_com_ps.h"
#include "..\..\common\src\trans.h"
                                  //tpckit transaction
header contains defination of structures specific to
TPC-C
#include "..\..\common\src\txn_base.h"
#include "..\..\common\src\error.h"
#include "..\..\common\src\ReadRegistry.h"
#include "..\..\db_dblib_dll\src\tpcc_dblib.h"
          // DBLIB implementation of TPC-C txns
#include "..\..\db_odbc_dll\src\tpcc_odbc.h"
          // ODBC implementation of TPC-C txns

#include "resource.h"
#include "tpcc_com_all.h"
#include "tpcc_com_all_i.c"
#include "Methods.h"
#include "..\..\tpcc_com_ps\src\tpcc_com_ps_i.c"
#include "..\..\common\src\ReadRegistry.cpp"


CComModule _Module;

BEGIN_OBJECT_MAP(ObjectMap)
          OBJECT_ENTRY(CLSID_TPCC, CTPCC)
          OBJECT_ENTRY(CLSID_NewOrder, CNewOrder)
          OBJECT_ENTRY(CLSID_OrderStatus,
COrderStatus)
          OBJECT_ENTRY(CLSID_Payment, CPayment)
          OBJECT_ENTRY(CLSID_StockLevel, CStockLevel)
END_OBJECT_MAP()


// configuration settings from registry
TPCCREGISTRYDATA    Reg;
char
          szMyComputerName[MAX_COMPUTERNAME_LENGTH+1]
;

static  HINSTANCE hLibInstanceDb = NULL;

TYPE_CTPCC_DBLIB    *pCTPCC_DBLIB_new;
TYPE_CTPCC_ODBC               *pCTPCC_ODBC_new;

// Critical section to synchronize connection open
and close.
//
CRITICAL_SECTION hConnectCriticalSection;

////////////////////////////////////////////////////
//////////////////////
// DLL Entry Point

extern "C"
BOOL WINAPI DllMain(HINSTANCE hInstance, DWORD
dwReason, LPVOID /*lpReserved*/)
{
          char szDllName[128];

          try
          {
                    if (dwReason ==
DLL_PROCESS_ATTACH)
                    {
                              _Module.Init(ObjectMap,
hInstance);

          DisableThreadLibraryCalls(hInstance);

                              DWORD dwSize =
MAX_COMPUTERNAME_LENGTH+1;

          GetComputerName(szMyComputerName, &dwSize);

          szMyComputerName[dwSize] = 0;

                              if (
ReadTPCCRegistrySettings( &Reg ) )
                                        throw new
CCOMPONENT_ERR( ERR_MISSING_REGISTRY_ENTRIES );

                              if (Reg.eDB_Protocol ==
DBLIB)
                              {
                                        strcpy(
szDllName, Reg.szPath );
                                        strcat(
szDllName, "tpcc_dblib.dll");

          hLibInstanceDb = LoadLibrary( szDllName );
                                        if
(hLibInstanceDb == NULL)

          throw new CCOMPONENT_ERR(
ERR_LOADDLL_FAILED, szDllName, GetLastError() );

                                        // get
function pointer to wrapper for class constructor
```

```
        pCTPCC_DBLIB_new = (TYPE_CTPCC_DBLIB*)
GetProcAddress(hLibInstanceDb,"CTPCC_DBLIB_new");
                                        if
(pCTPCC_DBLIB_new == NULL)

        throw new CCOMPONENT_ERR(
ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                                }
                                else if
(Reg.eDB_Protocol == ODBC)
                                {
                                        strcpy(
szDllName, Reg.szPath );
                                        strcat(
szDllName, "tpcc_odbc.dll");

        hLibInstanceDb = LoadLibrary( szDllName );
                                        if
(hLibInstanceDb == NULL)

        throw new CCOMPONENT_ERR(
ERR_LOADDLL_FAILED, szDllName, GetLastError() );

                                        // get
function pointer to wrapper for class constructor

        pCTPCC_ODBC_new = (TYPE_CTPCC_ODBC*)
GetProcAddress(hLibInstanceDb,"CTPCC_ODBC_new");
                                        if
(pCTPCC_ODBC_new == NULL)

        throw new CCOMPONENT_ERR(
ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                                }
                                else
                                        throw new
CCOMPONENT_ERR( ERR_UNKNOWN_DB_PROTOCOL );

                                if (Reg.dwConnectDelay
> 0)
                                {

        InitializeCriticalSection(&hConnectCritical
Section);
                                }

                        }
                        else if (dwReason ==
DLL_PROCESS_DETACH)
                                _Module.Term();

        }
        catch (CBaseErr *e)
        {
                TCHAR szMsg[256];

                _sntprintf(szMsg, sizeof(szMsg),
"%s error, code %d: %s",
                                        e-
>ErrorTypeStr(), e->ErrorNum(), e->ErrorText());
                WriteMessageToEventLog( szMsg );

                delete e;
                return FALSE;
        }
        catch (...)
        {

        WriteMessageToEventLog(TEXT("Unhandled
exception in object DllMain"));
                return FALSE;
        }

        return TRUE;        // OK
}

////////////////////////////////////////////////////
//////////////////////
// Used to determine whether the DLL can be unloaded
by OLE

STDAPI DllCanUnloadNow(void)
{
        return (_Module.GetLockCount()==0) ? S_OK :
S_FALSE;
}

////////////////////////////////////////////////////
//////////////////////
// Returns a class factory to create an object of the
requested type

STDAPI DllGetClassObject(REFCLSID rclsid, REFIID
riid, LPVOID* ppv)
{
        return _Module.GetClassObject(rclsid, riid,
ppv);
}

////////////////////////////////////////////////////
//////////////////////
// DllRegisterServer - Adds entries to the system
registry

STDAPI DllRegisterServer(void)
{
        // registers object, typelib and all
interfaces in typelib
        return _Module.RegisterServer(TRUE);
}

////////////////////////////////////////////////////
//////////////////////
// DllUnregisterServer - Removes entries from the
system registry

STDAPI DllUnregisterServer(void)
{
        _Module.UnregisterServer();
        return S_OK;
}


static void WriteMessageToEventLog(LPTSTR lpszMsg)
{
    TCHAR   szMsg[256];
    HANDLE  hEventSource;
    LPTSTR  lpszStrings[2];

    // Use event logging to log the error.
    //
    hEventSource = RegisterEventSource(NULL,
TEXT("tpcc_com_all.dll"));

    _stprintf(szMsg, TEXT("Error in COM+ TPC-C
Component: "));
    lpszStrings[0] = szMsg;
    lpszStrings[1] = lpszMsg;

    if (hEventSource != NULL)
        {
        ReportEvent(hEventSource, // handle of event
source
            EVENTLOG_ERROR_TYPE,  // event type
            0,                    // event category
            0,                    // event ID
            NULL,                 // current user's
SID
            2,                    // strings in
lpszStrings
            0,                    // no bytes of raw
data
            (LPCTSTR *)lpszStrings,    // array of
error strings
            NULL);                // no raw data

        (VOID) DeregisterEventSource(hEventSource);
    }
}

inline void ReleaseInterface(IUnknown *pUnk)
{
        if (pUnk)
        {
                pUnk->Release();
                pUnk = NULL;
        }
}

/* FUNCTION: CCOMPONENT_ERR::ErrorText
 *
 */

char* CCOMPONENT_ERR::ErrorText(void)
{
        static SERRORMSG errorMsgs[] =
        {
                { ERR_MISSING_REGISTRY_ENTRIES,
        "Required entries missing from registry."
                                        },
                { ERR_LOADDLL_FAILED,
                "Load of DLL failed.  DLL="
```

```
                    },
                    { ERR_GETPROCADDR_FAILED,
          "Could not map proc in DLL.  GetProcAddr
error.  DLL="       },
                    { ERR_UNKNOWN_DB_PROTOCOL,
          "Unknown database protocol specified in
registry."                    },
                    { 0,
                                        ""



                              }
          };

          char szTmp[256];
          int i = 0;
          while (TRUE)
          {
                    if (errorMsgs[i].szMsg[0] == 0)
                    {
                              strcpy( szTmp, "Unknown
error number." );
                              break;
                    }
                    if (m_Error ==
errorMsgs[i].iError)
                    {
                              strcpy( szTmp,
errorMsgs[i].szMsg );
                              break;
                    }
                    i++;
          }

          if (m_szTextDetail)
                    strcat( szTmp, m_szTextDetail );
          if (m_SystemErr)
                    wsprintf( szTmp+strlen(szTmp), "
Error=%d", m_SystemErr );

          m_szErrorText = new char[strlen(szTmp)+1];
          strcpy( m_szErrorText, szTmp );
          return m_szErrorText;
}


CTPCC_Common::CTPCC_Common()
{
          m_pTxn = NULL;
          m_bCanBePooled = TRUE;
}

CTPCC_Common::~CTPCC_Common()
{
          // Pace connection close for VIA.
          //
          if (Reg.dwConnectDelay > 0)
          {
                    EnterCriticalSection(&hConnectCriticalSecti
on);

                              Sleep(Reg.dwConnectDelay);
                    }

          if (m_pTxn)
          {
                    delete m_pTxn;
          }

          if (Reg.dwConnectDelay > 0)
          {

          LeaveCriticalSection(&hConnectCriticalSecti
on);
          }
}

HRESULT CTPCC_Common::CallSetComplete()
{
          IObjectContext* pObjectContext = NULL;

          // get our object context
          HRESULT hr = CoGetObjectContext(
IID_IObjectContext, (void **)&pObjectContext );
          pObjectContext->SetComplete();
          ReleaseInterface(pObjectContext);
          return hr;
}

//
//        called by the ctor activator
//
STDMETHODIMP CTPCC_Common::Construct(IDispatch *
pUnk)
{
          // Code to access construction string, if
needed later...
          //        if (!pUnk)
          //                  return E_UNEXPECTED;
          //        IObjectConstructString * pString
= NULL;
          //        HRESULT hr = pUnk-
>QueryInterface(IID_IObjectConstructString, (void
**)&pString);
          //        pString->Release();

          try
          {
                    // Pace connection creation for
VIA.
                    //
                    if (Reg.dwConnectDelay > 0)
                    {

          EnterCriticalSection(&hConnectCriticalSecti
on);

          Sleep(Reg.dwConnectDelay);
                    }

                    if (Reg.eDB_Protocol == ODBC)
                              m_pTxn =
pCTPCC_ODBC_new(    Reg.szDbServer, Reg.szDbUser,
Reg.szDbPassword,


          szMyComputerName, Reg.szDbName,


          Reg.szSPPrefix,
Reg.bCallNoDuplicatesNewOrder );
                    else if (Reg.eDB_Protocol ==
DBLIB)
                              m_pTxn =
pCTPCC_DBLIB_new( Reg.szDbServer, Reg.szDbUser,
Reg.szDbPassword, szMyComputerName, Reg.szDbName );

                    if (Reg.dwConnectDelay > 0)
                    {

          LeaveCriticalSection(&hConnectCriticalSecti
on);
                    }
          }
          catch (CBaseErr *e)
          {
                    TCHAR szMsg[256];

                    _sntprintf(szMsg, sizeof(szMsg),
"%s error in CTPCC_Common::Construct, code %d: %s",
                                                  e-
>ErrorTypeStr(), e->ErrorNum(), e->ErrorText());
                    WriteMessageToEventLog( szMsg );
                    delete e;
                    return E_FAIL;
          }
          catch (...)
          {

          WriteMessageToEventLog(TEXT("Unhandled
exception in object ::Construct"));
                    return E_FAIL;
          }

          return S_OK;
}

HRESULT CTPCC_Common::NewOrder(VARIANT txn_in,
VARIANT* txn_out)
{
          PNEW_ORDER_DATA     pNewOrder;
          COM_DATA            *pData;
          try
          {
                    pData = (COM_DATA*)txn_in.parray-
>pvData;
```

```
                    pNewOrder = m_pTxn-
>BuffAddr_NewOrder();

                    memcpy(pNewOrder, &pData-
>u.NewOrder, sizeof(NEW_ORDER_DATA));

                    m_pTxn->NewOrder();           //
do the actual txn

                    VariantInit(txn_out);
                    txn_out->vt = VT_SAFEARRAY;
                    txn_out->parray =
SafeArrayCreateVector(VT_UI1,

                    txn_in.parray->rgsabound-
>cElements,

                    txn_in.parray->rgsabound-
>cElements);
                    pData = (COM_DATA*) txn_out-
>parray->pvData;

                    memcpy( &pData->u.NewOrder,
pNewOrder, sizeof(NEW_ORDER_DATA));

                    pData->retval = ERR_SUCCESS;
                    pData->error = 0;
                    return S_OK;
          }
          catch (CBaseErr *e)
          {
                    // check for lost database
connection; if yes, component is toast
                    if ( ((e->ErrorType() ==
ERR_TYPE_DBLIB) && (e->ErrorNum() == 10005)) ||
                              ((e->ErrorType() ==
ERR_TYPE_ODBC) && (e->ErrorNum() == 10054)) )
                              m_bCanBePooled = FALSE;

                    pData->retval = e->ErrorType();
                    pData->error = e->ErrorNum();
                    delete e;
                    return E_FAIL;
          }
          catch (...)
          {

          WriteMessageToEventLog(TEXT("Unhandled
exception."));
                    pData->retval = ERR_TYPE_LOGIC;
                    pData->error = 0;
                    m_bCanBePooled = FALSE;
                    return E_FAIL;
          }
}

HRESULT CTPCC_Common::Payment(VARIANT txn_in,
VARIANT* txn_out)
{
          PPAYMENT_DATA       pPayment;
          COM_DATA            *pData;

          try
          {
                    pData = (COM_DATA*)txn_in.parray-
>pvData;
                    pPayment = m_pTxn-
>BuffAddr_Payment();

                    memcpy(pPayment, &pData-
>u.Payment, sizeof(PAYMENT_DATA));

                    m_pTxn->Payment();            //
do the actual txn

                    VariantInit(txn_out);
                    txn_out->vt = VT_SAFEARRAY;
                    txn_out->parray =
SafeArrayCreateVector( VT_UI1,

                    txn_in.parray->rgsabound-
>cElements,

                    txn_in.parray->rgsabound-
>cElements);
                    pData = (COM_DATA*) txn_out-
>parray->pvData;

                    memcpy( &pData->u.Payment,
pPayment, sizeof(PAYMENT_DATA));

                    pData->retval = ERR_SUCCESS;
                    pData->error = 0;
                    return S_OK;
          }
          catch (CBaseErr *e)
          {
                    // check for lost database
connection; if yes, component is toast
                    if ( ((e->ErrorType() ==
ERR_TYPE_DBLIB) && (e->ErrorNum() == 10005)) ||
                              ((e->ErrorType() ==
ERR_TYPE_ODBC) && (e->ErrorNum() == 10054)) )
                              m_bCanBePooled = FALSE;

                    pData->retval = e->ErrorType();
                    pData->error = e->ErrorNum();
                    delete e;
                    return E_FAIL;
          }
          catch (...)
          {

          WriteMessageToEventLog(TEXT("Unhandled
exception."));
                    pData->retval = ERR_TYPE_LOGIC;
                    pData->error = 0;
                    m_bCanBePooled = FALSE;
                    return E_FAIL;
          }
}

HRESULT CTPCC_Common::StockLevel(VARIANT txn_in,
VARIANT* txn_out)
{
          PSTOCK_LEVEL_DATA   pStockLevel;
          COM_DATA                      *pData;

          try
          {
                    pData = (COM_DATA*)txn_in.parray-
>pvData;
                    pStockLevel = m_pTxn-
>BuffAddr_StockLevel();

                    memcpy(pStockLevel, &pData-
>u.StockLevel, sizeof(STOCK_LEVEL_DATA));

                    m_pTxn->StockLevel();

                    VariantInit(txn_out);
                    txn_out->vt = VT_SAFEARRAY;
                    txn_out->parray =
SafeArrayCreateVector( VT_UI1,

                    txn_in.parray->rgsabound-
>cElements,

                    txn_in.parray->rgsabound-
>cElements);
                    pData = (COM_DATA*)txn_out-
>parray->pvData;

                    memcpy( &pData->u.StockLevel,
pStockLevel, sizeof(STOCK_LEVEL_DATA));

                    pData->retval = ERR_SUCCESS;
                    pData->error = 0;
                    return S_OK;
          }
          catch (CBaseErr *e)
          {
                    // check for lost database
connection; if yes, component is toast
                    if ( ((e->ErrorType() ==
ERR_TYPE_DBLIB) && (e->ErrorNum() == 10005)) ||
                              ((e->ErrorType() ==
ERR_TYPE_ODBC) && (e->ErrorNum() == 10054)) )
                              m_bCanBePooled = FALSE;

                    pData->retval = e->ErrorType();
                    pData->error = e->ErrorNum();
                    delete e;
                    return E_FAIL;
          }
          catch (...)
          {

          WriteMessageToEventLog(TEXT("Unhandled
exception."));
                    pData->retval = ERR_TYPE_LOGIC;
                    pData->error = 0;
                    m_bCanBePooled = FALSE;
```

```
                return E_FAIL;
        }
}

HRESULT CTPCC_Common::OrderStatus(VARIANT txn_in,
VARIANT* txn_out)
{
        PORDER_STATUS_DATA  pOrderStatus;
        COM_DATA                    *pData;
        try
        {
                pData = (COM_DATA*)txn_in.parray-
>pvData;
                pOrderStatus = m_pTxn-
>BuffAddr_OrderStatus();

                memcpy(pOrderStatus, &pData-
>u.OrderStatus, sizeof(ORDER_STATUS_DATA));

                m_pTxn->OrderStatus();

                VariantInit(txn_out);
                txn_out->vt = VT_SAFEARRAY;
                txn_out->parray =
SafeArrayCreateVector( VT_UI1,

                txn_in.parray->rgsabound-
>cElements,

                txn_in.parray->rgsabound-
>cElements);
                pData = (COM_DATA*)txn_out-
>parray->pvData;

                memcpy( &pData->u.OrderStatus,
pOrderStatus, sizeof(ORDER_STATUS_DATA));

                pData->retval = ERR_SUCCESS;
                pData->error = 0;
                return S_OK;
        }
        catch (CBaseErr *e)
        {
                // check for lost database
connection; if yes, component is toast
                if ( ((e->ErrorType() ==
ERR_TYPE_DBLIB) && (e->ErrorNum() == 10005)) ||
                        ((e->ErrorType() ==
ERR_TYPE_ODBC) && (e->ErrorNum() == 10054)) )
                        m_bCanBePooled = FALSE;

                pData->retval = e->ErrorType();
                pData->error = e->ErrorNum();
                delete e;
                return E_FAIL;
        }
        catch (...)
        {

        WriteMessageToEventLog(TEXT("Unhandled
exception."));
                pData->retval = ERR_TYPE_LOGIC;
                pData->error = 0;
                m_bCanBePooled = FALSE;
                return E_FAIL;
        }
}
```

tpcc_com_all.h

```
#pragma warning( disable: 4049 )  /* more than 64k
source lines */

/* this ALWAYS GENERATED file contains the
definitions for the interfaces */


 /* File created by MIDL compiler version 6.00.0347
*/
/* at Fri Apr 15 14:48:53 2005
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf, W1, Zp8, env=Win32 (32b run)
    protocol : dce , ms_ext, c_ext
    error checks: allocation ref bounds_check enum
stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany),
__declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )


/* verify that the <rpcndr.h> version is high enough
to compile this file*/
#ifndef __REQUIRED_RPCNDR_H_VERSION__
#define __REQUIRED_RPCNDR_H_VERSION__ 440
#endif

#include "rpc.h"
#include "rpcndr.h"

#ifndef __tpcc_com_all_h__
#define __tpcc_com_all_h__

#if defined(_MSC_VER) && (_MSC_VER >= 1020)
#pragma once
#endif

/* Forward Declarations */

#ifndef __TPCC_FWD_DEFINED__
#define __TPCC_FWD_DEFINED__

#ifdef __cplusplus
typedef class TPCC TPCC;
#else
typedef struct TPCC TPCC;
#endif /* __cplusplus */

#endif    /* __TPCC_FWD_DEFINED__ */


#ifndef __NewOrder_FWD_DEFINED__
#define __NewOrder_FWD_DEFINED__

#ifdef __cplusplus
typedef class NewOrder NewOrder;
#else
typedef struct NewOrder NewOrder;
#endif /* __cplusplus */

#endif    /* __NewOrder_FWD_DEFINED__ */


#ifndef __OrderStatus_FWD_DEFINED__
#define __OrderStatus_FWD_DEFINED__

#ifdef __cplusplus
typedef class OrderStatus OrderStatus;
#else
typedef struct OrderStatus OrderStatus;
#endif /* __cplusplus */

#endif    /* __OrderStatus_FWD_DEFINED__ */


#ifndef __Payment_FWD_DEFINED__
#define __Payment_FWD_DEFINED__

#ifdef __cplusplus
typedef class Payment Payment;
#else
typedef struct Payment Payment;
#endif /* __cplusplus */

#endif    /* __Payment_FWD_DEFINED__ */


#ifndef __StockLevel_FWD_DEFINED__
#define __StockLevel_FWD_DEFINED__

#ifdef __cplusplus
typedef class StockLevel StockLevel;
#else
typedef struct StockLevel StockLevel;
#endif /* __cplusplus */

#endif    /* __StockLevel_FWD_DEFINED__ */


/* header files for imported files */
#include "oaidl.h"
#include "ocidl.h"
#include "tpcc_com_ps.h"

#ifdef __cplusplus
extern "C"{
#endif
```

```
void * __RPC_USER MIDL_user_allocate(size_t);
void __RPC_USER MIDL_user_free( void * );

/* interface __MIDL_itf_tpcc_com_all_0000 */
/* [local] */




extern RPC_IF_HANDLE
__MIDL_itf_tpcc_com_all_0000_v0_0_c_ifspec;
extern RPC_IF_HANDLE
__MIDL_itf_tpcc_com_all_0000_v0_0_s_ifspec;


#ifndef __TPCCLib_LIBRARY_DEFINED__
#define __TPCCLib_LIBRARY_DEFINED__

/* library TPCCLib */
/* [helpstring][version][uuid] */


EXTERN_C const IID LIBID_TPCCLib;

EXTERN_C const CLSID CLSID_TPCC;

#ifdef __cplusplus

class DECLSPEC_UUID("122A3128-2520-11D3-BA71-
00C04FBFE08B")
TPCC;
#endif

EXTERN_C const CLSID CLSID_NewOrder;

#ifdef __cplusplus

class DECLSPEC_UUID("975BAABF-84A7-11D2-BA47-
00C04FBFE08B")
NewOrder;
#endif

EXTERN_C const CLSID CLSID_OrderStatus;

#ifdef __cplusplus

class DECLSPEC_UUID("266836AD-A50D-11D2-BA4E-
00C04FBFE08B")
OrderStatus;
#endif

EXTERN_C const CLSID CLSID_Payment;

#ifdef __cplusplus

class DECLSPEC_UUID("CD02F7EF-A4FA-11D2-BA4E-
00C04FBFE08B")
Payment;
#endif

EXTERN_C const CLSID CLSID_StockLevel;

#ifdef __cplusplus

class DECLSPEC_UUID("2668369E-A50D-11D2-BA4E-
00C04FBFE08B")
StockLevel;
#endif
#endif /* __TPCCLib_LIBRARY_DEFINED__ */

/* Additional Prototypes for ALL interfaces */

/* end of Additional Prototypes */

#ifdef __cplusplus
}
#endif

#endif
```

tpcc_com_all.rc

```
//Microsoft Developer Studio generated resource
script.
//
#include "resource.h"

#define APSTUDIO_READONLY_SYMBOLS
////////////////////////////////////////////////////
//////////////////////
//
// Generated from the TEXTINCLUDE 2 resource.
//
#include "winres.h"

////////////////////////////////////////////////////
//////////////////////
#undef APSTUDIO_READONLY_SYMBOLS

////////////////////////////////////////////////////
//////////////////////
// English (U.S.) resources

#if !defined(AFX_RESOURCE_DLL) ||
defined(AFX_TARG_ENU)
#ifdef _WIN32
LANGUAGE LANG_ENGLISH, SUBLANG_ENGLISH_US
#pragma code_page(1252)
#endif //_WIN32

#ifdef APSTUDIO_INVOKED

////////////////////////////////////////////////////
//////////////////////
//
// TEXTINCLUDE
//

1 TEXTINCLUDE DISCARDABLE
BEGIN
    "resource.h\0"
END

2 TEXTINCLUDE DISCARDABLE
BEGIN
    "#include ""winres.h""\r\n"
    "\0"
END

3 TEXTINCLUDE DISCARDABLE
BEGIN
    "1 TYPELIB ""tpcc_com_all.tlb""\r\n"
    "\0"
END

#endif    // APSTUDIO_INVOKED


#ifndef _MAC
////////////////////////////////////////////////////
//////////////////////
//
// Version
//

VS_VERSION_INFO VERSIONINFO
 FILEVERSION 1,0,0,1
 PRODUCTVERSION 1,0,0,1
 FILEFLAGSMASK 0x3fL
#ifdef _DEBUG
 FILEFLAGS 0x1L
#else
 FILEFLAGS 0x0L
#endif
 FILEOS 0x4L
 FILETYPE 0x2L
 FILESUBTYPE 0x0L
BEGIN
    BLOCK "StringFileInfo"
    BEGIN
        BLOCK "040904B0"
        BEGIN
            VALUE "CompanyName", "\0"
            VALUE "FileDescription", "tpcc_com_all
Module\0"
            VALUE "FileVersion", "1, 0, 0, 1\0"
            VALUE "InternalName", "TPCCNEWORDER\0"
            VALUE "LegalCopyright", "Copyright
1997\0"
            VALUE "OriginalFilename",
"tpcc_com_all.DLL\0"
            VALUE "ProductName", "tpcc_com_all
Module\0"
```

```
            VALUE "ProductVersion", "1, 0, 0, 1\0"
            VALUE "OLESelfRegister", "\0"
        END
    END
    BLOCK "VarFileInfo"
    BEGIN
        VALUE "Translation", 0x409, 1200
    END
END

#endif    // !_MAC


/////////////////////////////////////////////////
//////////////////////
//
// REGISTRY
//

IDR_TPCC                REGISTRY DISCARDABLE
"tpcc_com_all.rgs"
IDR_NEWORDER            REGISTRY DISCARDABLE
"tpcc_com_no.rgs"
IDR_ORDERSTATUS         REGISTRY DISCARDABLE
"tpcc_com_os.rgs"
IDR_PAYMENT             REGISTRY DISCARDABLE
"tpcc_com_pay.rgs"
IDR_STOCKLEVEL          REGISTRY DISCARDABLE
"tpcc_com_sl.rgs"

/////////////////////////////////////////////////
//////////////////////
//
// String Table
//

STRINGTABLE DISCARDABLE
BEGIN
    IDS_PROJNAME            "tpcc_com_all"
END

#endif    // English (U.S.) resources
/////////////////////////////////////////////////
//////////////////////



#ifndef APSTUDIO_INVOKED
/////////////////////////////////////////////////
//////////////////////
//
// Generated from the TEXTINCLUDE 3 resource.
//
1 TYPELIB "tpcc_com_all.tlb"

/////////////////////////////////////////////////
//////////////////////
#endif    // not APSTUDIO_INVOKED
```

tpcc_com_all.rgs

```
HKCR
{
          TPCC.AllTxns.1 = s 'All Txns Class'
          {
                    CLSID = s '{122A3128-2520-11D3-
BA71-00C04FBFE08B}'
          }
          TPCC.AllTxns = s 'TPCC Class'
          {
                    CurVer = s 'TPCC.AllTxns.1'
          }
          NoRemove CLSID
          {
                    ForceRemove {122A3128-2520-11D3-
BA71-00C04FBFE08B} = s 'TPCC Class'
                    {
                              ProgID = s
'TPCC.AllTxns.1'

          VersionIndependentProgID = s 'TPCC.AllTxns'
                              InprocServer32 = s
'%MODULE%'
                              {
                                        val
ThreadingModel = s 'Both'
                              }
                    }
          }
}
```

tpcc_com_all_i.c

```
#pragma warning( disable: 4049 )  /* more than 64k
source lines */

/* this ALWAYS GENERATED file contains the IIDs and
CLSIDs */

/* link this file in with the server and any clients
*/


 /* File created by MIDL compiler version 6.00.0347
*/
/* at Fri Apr 15 14:48:53 2005
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf, W1, Zp8, env=Win32 (32b run)
    protocol : dce , ms_ext, c_ext
    error checks: allocation ref bounds_check enum
stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany),
__declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if !defined(_M_IA64) && !defined(_M_AMD64)

#ifdef __cplusplus
extern "C"{
#endif


#include <rpc.h>
#include <rpcndr.h>

#ifdef _MIDL_USE_GUIDDEF_

#ifndef INITGUID
#define INITGUID
#include <guiddef.h>
#undef INITGUID
#else
#include <guiddef.h>
#endif

#define
MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,
b7,b8) \

DEFINE_GUID(name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)

#else // !_MIDL_USE_GUIDDEF_

#ifndef __IID_DEFINED__
#define __IID_DEFINED__

typedef struct _IID
{
    unsigned long x;
    unsigned short s1;
    unsigned short s2;
    unsigned char  c[8];
} IID;

#endif // __IID_DEFINED__

#ifndef CLSID_DEFINED
#define CLSID_DEFINED
typedef IID CLSID;
#endif // CLSID_DEFINED

#define
MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,
b7,b8) \
        const type name =
{l,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}
```

```
#endif !_MIDL_USE_GUIDDEF_

MIDL_DEFINE_GUID(IID,
LIBID_TPCCLib,0x122A3117,0x2520,0x11D3,0xBA,0x71,0x00
,0xC0,0x4F,0xBF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_TPCC,0x122A3128,0x2520,0x11D3,0xBA,0x71,0x00,0x
C0,0x4F,0xBF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_NewOrder,0x975BAABF,0x84A7,0x11D2,0xBA,0x47,0x0
0,0xC0,0x4F,0xBF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_OrderStatus,0x266836AD,0xA50D,0x11D2,0xBA,0x4E,
0x00,0xC0,0x4F,0xBF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_Payment,0xCD02F7EF,0xA4FA,0x11D2,0xBA,0x4E,0x00
,0xC0,0x4F,0xBF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_StockLevel,0x2668369E,0xA50D,0x11D2,0xBA,0x4E,0
x00,0xC0,0x4F,0xBF,0xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



#endif /* !defined(_M_IA64) && !defined(_M_AMD64)*/


#pragma warning( disable: 4049 )  /* more than 64k
source lines */

/* this ALWAYS GENERATED file contains the IIDs and
CLSIDs */

/* link this file in with the server and any clients
*/


 /* File created by MIDL compiler version 6.00.0347
*/
/* at Fri Apr 15 14:48:53 2005
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf, W1, Zp8, env=Win64 (32b run,appending)
    protocol : dce , ms_ext, c_ext, robust
    error checks: allocation ref bounds_check enum
stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany),
__declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if defined(_M_IA64) || defined(_M_AMD64)

#ifdef __cplusplus
extern "C"{
#endif


#include <rpc.h>
#include <rpcndr.h>

#ifdef _MIDL_USE_GUIDDEF_

#ifndef INITGUID
#define INITGUID
#include <guiddef.h>
#undef INITGUID
#else
#include <guiddef.h>
#endif

#define
MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,
b7,b8) \

DEFINE_GUID(name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)

#else // !_MIDL_USE_GUIDDEF_

#ifndef __IID_DEFINED__
#define __IID_DEFINED__

typedef struct _IID
{
    unsigned long x;
    unsigned short s1;
    unsigned short s2;
    unsigned char  c[8];
} IID;

#endif // __IID_DEFINED__

#ifndef CLSID_DEFINED
#define CLSID_DEFINED
typedef IID CLSID;
#endif // CLSID_DEFINED

#define
MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,
b7,b8) \
        const type name =
{l,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}

#endif !_MIDL_USE_GUIDDEF_

MIDL_DEFINE_GUID(IID,
LIBID_TPCCLib,0x122A3117,0x2520,0x11D3,0xBA,0x71,0x00
,0xC0,0x4F,0xBF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_TPCC,0x122A3128,0x2520,0x11D3,0xBA,0x71,0x00,0x
C0,0x4F,0xBF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_NewOrder,0x975BAABF,0x84A7,0x11D2,0xBA,0x47,0x0
0,0xC0,0x4F,0xBF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_OrderStatus,0x266836AD,0xA50D,0x11D2,0xBA,0x4E,
0x00,0xC0,0x4F,0xBF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_Payment,0xCD02F7EF,0xA4FA,0x11D2,0xBA,0x4E,0x00
,0xC0,0x4F,0xBF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_StockLevel,0x2668369E,0xA50D,0x11D2,0xBA,0x4E,0
x00,0xC0,0x4F,0xBF,0xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



#endif /* defined(_M_IA64) || defined(_M_AMD64)*/
```

tpcc_com_no.rgs

```
HKCR
{
          TPCC.NewOrder.1 = s 'NewOrder Class'
          {
                    CLSID = s '{975BAABF-84A7-11D2-
BA47-00C04FBFE08B}'
          }
          TPCC.NewOrder = s 'NewOrder Class'
          {
                    CurVer = s 'TPCC.NewOrder.1'
          }
          NoRemove CLSID
          {
                    ForceRemove {975BAABF-84A7-11D2-
BA47-00C04FBFE08B} = s 'NewOrder Class'
```

```
                {
                        ProgID = s
'TPCC.NewOrder.1'

        VersionIndependentProgID = s
'TPCC.NewOrder'
                        InprocServer32 = s
'%MODULE%'
                        {
                                val
ThreadingModel = s 'Both'
                        }
                }
        }
}
```

tpcc_com_os.rgs

```
HKCR
{
        TPCC.OrderStatus.1 = s 'OrderStatus Class'
        {
                CLSID = s '{266836AD-A50D-11D2-
BA4E-00C04FBFE08B}'
        }
        TPCC.OrderStatus = s 'OrderStatus Class'
        {
                CurVer = s 'TPCC.OrderStatus.1'
        }
        NoRemove CLSID
        {
                ForceRemove {266836AD-A50D-11D2-
BA4E-00C04FBFE08B} = s 'OrderStatus Class'
                {
                        ProgID = s
'TPCC.OrderStatus.1'

        VersionIndependentProgID = s
'TPCC.OrderStatus'
                        InprocServer32 = s
'%MODULE%'
                        {
                                val
ThreadingModel = s 'Both'
                        }
                }
        }
}
```

tpcc_com_pay.rgs

```
HKCR
{
        TPCC.Payment.1 = s 'Payment Class'
        {
                CLSID = s '{CD02F7EF-A4FA-11D2-
BA4E-00C04FBFE08B}'
        }
        TPCC.Payment = s 'Payment Class'
        {
                CurVer = s 'TPCC.Payment.1'
        }
        NoRemove CLSID
        {
                ForceRemove {CD02F7EF-A4FA-11D2-
BA4E-00C04FBFE08B} = s 'Payment Class'
                {
                        ProgID = s
'TPCC.Payment.1'

        VersionIndependentProgID = s 'TPCC.Payment'
                        InprocServer32 = s
'%MODULE%'
                        {
                                val
ThreadingModel = s 'Both'
                        }
                }
        }
}
```

tpcc_com_ps.h

```
#pragma warning( disable: 4049 )  /* more than 64k
source lines */

/* this ALWAYS GENERATED file contains the
definitions for the interfaces */


 /* File created by MIDL compiler version 6.00.0347
*/
/* at Fri Apr 15 14:48:43 2005
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf, W1, Zp8, env=Win32 (32b run)
    protocol : dce , ms_ext, c_ext
    error checks: allocation ref bounds_check enum
stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany),
__declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )


/* verify that the <rpcndr.h> version is high enough
to compile this file*/
#ifndef __REQUIRED_RPCNDR_H_VERSION__
#define __REQUIRED_RPCNDR_H_VERSION__ 440
#endif

#include "rpc.h"
#include "rpcndr.h"

#ifndef __RPCNDR_H_VERSION__
#error this stub requires an updated version of
<rpcndr.h>
#endif // __RPCNDR_H_VERSION__

#ifndef COM_NO_WINDOWS_H
#include "windows.h"
#include "ole2.h"
#endif /*COM_NO_WINDOWS_H*/

#ifndef __tpcc_com_ps_h__
#define __tpcc_com_ps_h__

#if defined(_MSC_VER) && (_MSC_VER >= 1020)
#pragma once
#endif

/* Forward Declarations */

#ifndef __ITPCC_FWD_DEFINED__
#define __ITPCC_FWD_DEFINED__
typedef interface ITPCC ITPCC;
#endif    /* __ITPCC_FWD_DEFINED__ */


/* header files for imported files */
#include "oaidl.h"
#include "ocidl.h"

#ifdef __cplusplus
extern "C"{
#endif

void * __RPC_USER MIDL_user_allocate(size_t);
void __RPC_USER MIDL_user_free( void * );

/* interface __MIDL_itf_tpcc_com_ps_0000 */
/* [local] */



extern RPC_IF_HANDLE
__MIDL_itf_tpcc_com_ps_0000_v0_0_c_ifspec;
extern RPC_IF_HANDLE
__MIDL_itf_tpcc_com_ps_0000_v0_0_s_ifspec;

#ifndef __ITPCC_INTERFACE_DEFINED__
#define __ITPCC_INTERFACE_DEFINED__

/* interface ITPCC */
/* [unique][helpstring][uuid][oleautomation][object]
*/


EXTERN_C const IID IID_ITPCC;
```

```
#if defined(__cplusplus) && !defined(CINTERFACE)

    MIDL_INTERFACE("FEEE6AA2-84B1-11d2-BA47-
00C04FBFE08B")
    ITPCC : public IUnknown
    {
    public:
        virtual HRESULT __stdcall NewOrder(
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT *txn_out) = 0;

        virtual HRESULT __stdcall Payment(
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT *txn_out) = 0;

        virtual HRESULT __stdcall Delivery(
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT *txn_out) = 0;

        virtual HRESULT __stdcall StockLevel(
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT *txn_out) = 0;

        virtual HRESULT __stdcall OrderStatus(
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT *txn_out) = 0;

        virtual HRESULT __stdcall CallSetComplete(
void) = 0;

    };

#else     /* C style interface */

    typedef struct ITPCCVtbl
    {
        BEGIN_INTERFACE

        HRESULT ( STDMETHODCALLTYPE *QueryInterface
)(
            ITPCC * This,
            /* [in] */ REFIID riid,
            /* [iid_is][out] */ void **ppvObject);

        ULONG ( STDMETHODCALLTYPE *AddRef )(
            ITPCC * This);

        ULONG ( STDMETHODCALLTYPE *Release )(
            ITPCC * This);

        HRESULT ( __stdcall *NewOrder )(
            ITPCC * This,
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT *txn_out);

        HRESULT ( __stdcall *Payment )(
            ITPCC * This,
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT *txn_out);

        HRESULT ( __stdcall *Delivery )(
            ITPCC * This,
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT *txn_out);

        HRESULT ( __stdcall *StockLevel )(
            ITPCC * This,
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT *txn_out);

        HRESULT ( __stdcall *OrderStatus )(
            ITPCC * This,
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT *txn_out);

        HRESULT ( __stdcall *CallSetComplete )(
            ITPCC * This);

        END_INTERFACE
    } ITPCCVtbl;

    interface ITPCC
    {
        CONST_VTBL struct ITPCCVtbl *lpVtbl;
    };



#ifdef COBJMACROS


#define ITPCC_QueryInterface(This,riid,ppvObject) \
    (This)->lpVtbl ->
QueryInterface(This,riid,ppvObject)

#define ITPCC_AddRef(This)    \
    (This)->lpVtbl -> AddRef(This)

#define ITPCC_Release(This)   \
    (This)->lpVtbl -> Release(This)


#define ITPCC_NewOrder(This,txn_in,txn_out)       \
    (This)->lpVtbl -> NewOrder(This,txn_in,txn_out)

#define ITPCC_Payment(This,txn_in,txn_out)        \
    (This)->lpVtbl -> Payment(This,txn_in,txn_out)

#define ITPCC_Delivery(This,txn_in,txn_out)       \
    (This)->lpVtbl -> Delivery(This,txn_in,txn_out)

#define ITPCC_StockLevel(This,txn_in,txn_out)     \
    (This)->lpVtbl -> StockLevel(This,txn_in,txn_out)

#define ITPCC_OrderStatus(This,txn_in,txn_out)    \
    (This)->lpVtbl ->
OrderStatus(This,txn_in,txn_out)

#define ITPCC_CallSetComplete(This)     \
    (This)->lpVtbl -> CallSetComplete(This)

#endif /* COBJMACROS */


#endif    /* C style interface */



HRESULT __stdcall ITPCC_NewOrder_Proxy(
    ITPCC * This,
    /* [in] */ VARIANT txn_in,
    /* [out] */ VARIANT *txn_out);


void __RPC_STUB ITPCC_NewOrder_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_Payment_Proxy(
    ITPCC * This,
    /* [in] */ VARIANT txn_in,
    /* [out] */ VARIANT *txn_out);


void __RPC_STUB ITPCC_Payment_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_Delivery_Proxy(
    ITPCC * This,
    /* [in] */ VARIANT txn_in,
    /* [out] */ VARIANT *txn_out);


void __RPC_STUB ITPCC_Delivery_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_StockLevel_Proxy(
    ITPCC * This,
    /* [in] */ VARIANT txn_in,
    /* [out] */ VARIANT *txn_out);


void __RPC_STUB ITPCC_StockLevel_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_OrderStatus_Proxy(
    ITPCC * This,
    /* [in] */ VARIANT txn_in,
```

```
    /* [out] */ VARIANT *txn_out);


void __RPC_STUB ITPCC_OrderStatus_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_CallSetComplete_Proxy(
    ITPCC * This);


void __RPC_STUB ITPCC_CallSetComplete_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);



#endif    /* __ITPCC_INTERFACE_DEFINED__ */


/* Additional Prototypes for ALL interfaces */

unsigned long             __RPC_USER
VARIANT_UserSize(     unsigned long *, unsigned long
, VARIANT * );
unsigned char * __RPC_USER  VARIANT_UserMarshal(
unsigned long *, unsigned char *, VARIANT * );
unsigned char * __RPC_USER
VARIANT_UserUnmarshal(unsigned long *, unsigned char
*, VARIANT * );
void                      __RPC_USER
VARIANT_UserFree(     unsigned long *, VARIANT * );

/* end of Additional Prototypes */

#ifdef __cplusplus
}
#endif

#endif
```

tpcc_com_ps_i.c

```
#pragma warning( disable: 4049 )  /* more than 64k
source lines */

/* this ALWAYS GENERATED file contains the IIDs and
CLSIDs */

/* link this file in with the server and any clients
*/


 /* File created by MIDL compiler version 6.00.0347
*/
/* at Fri Apr 15 14:48:43 2005
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf, W1, Zp8, env=Win32 (32b run)
    protocol : dce , ms_ext, c_ext
    error checks: allocation ref bounds_check enum
stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany),
__declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if !defined(_M_IA64) && !defined(_M_AMD64)

#ifdef __cplusplus
extern "C"{
#endif


#include <rpc.h>
#include <rpcndr.h>

#ifdef _MIDL_USE_GUIDDEF_

#ifndef INITGUID
#define INITGUID
#include <guiddef.h>
#undef INITGUID
#else
#include <guiddef.h>
#endif

#define
MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,
b7,b8) \

DEFINE_GUID(name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)

#else // !_MIDL_USE_GUIDDEF_

#ifndef __IID_DEFINED__
#define __IID_DEFINED__

typedef struct _IID
{
    unsigned long x;
    unsigned short s1;
    unsigned short s2;
    unsigned char  c[8];
} IID;

#endif // __IID_DEFINED__

#ifndef CLSID_DEFINED
#define CLSID_DEFINED
typedef IID CLSID;
#endif // CLSID_DEFINED

#define
MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,
b7,b8) \
        const type name =
{l,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}

#endif !_MIDL_USE_GUIDDEF_

MIDL_DEFINE_GUID(IID,
IID_ITPCC,0xFEEE6AA2,0x84B1,0x11d2,0xBA,0x47,0x00,0xC
0,0x4F,0xBF,0xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



#endif /* !defined(_M_IA64) && !defined(_M_AMD64)*/


#pragma warning( disable: 4049 )  /* more than 64k
source lines */

/* this ALWAYS GENERATED file contains the IIDs and
CLSIDs */

/* link this file in with the server and any clients
*/


 /* File created by MIDL compiler version 6.00.0347
*/
/* at Fri Apr 15 14:48:43 2005
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf, W1, Zp8, env=Win64 (32b run,appending)
    protocol : dce , ms_ext, c_ext, robust
    error checks: allocation ref bounds_check enum
stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany),
__declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if defined(_M_IA64) || defined(_M_AMD64)

#ifdef __cplusplus
extern "C"{
#endif
```

```
#include <rpc.h>
#include <rpcndr.h>

#ifdef _MIDL_USE_GUIDDEF_

#ifndef INITGUID
#define INITGUID
#include <guiddef.h>
#undef INITGUID
#else
#include <guiddef.h>
#endif

#define
MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,
b7,b8) \

DEFINE_GUID(name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)

#else // !_MIDL_USE_GUIDDEF_

#ifndef __IID_DEFINED__
#define __IID_DEFINED__

typedef struct _IID
{
    unsigned long x;
    unsigned short s1;
    unsigned short s2;
    unsigned char  c[8];
} IID;

#endif // __IID_DEFINED__

#ifndef CLSID_DEFINED
#define CLSID_DEFINED
typedef IID CLSID;
#endif // CLSID_DEFINED

#define
MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,
b7,b8) \
        const type name =
{l,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}

#endif !_MIDL_USE_GUIDDEF_

MIDL_DEFINE_GUID(IID,
IID_ITPCC,0xFEEE6AA2,0x84B1,0x11d2,0xBA,0x47,0x00,0xC
0,0x4F,0xBF,0xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



#endif /* defined(_M_IA64) || defined(_M_AMD64)*/
```

tpcc_com_ps_p.c

```
#pragma warning( disable: 4049 )  /* more than 64k
source lines */

/* this ALWAYS GENERATED file contains the proxy stub
code */


 /* File created by MIDL compiler version 6.00.0347
*/
/* at Fri Apr 15 14:48:43 2005
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf, W1, Zp8, env=Win32 (32b run)
    protocol : dce , ms_ext, c_ext
    error checks: allocation ref bounds_check enum
stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany),
__declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if !defined(_M_IA64) && !defined(_M_AMD64)
#define USE_STUBLESS_PROXY


/* verify that the <rpcproxy.h> version is high
enough to compile this file*/
#ifndef __REDQ_RPCPROXY_H_VERSION__
#define __REQUIRED_RPCPROXY_H_VERSION__ 440
#endif


#include "rpcproxy.h"
#ifndef __RPCPROXY_H_VERSION__
#error this stub requires an updated version of
<rpcproxy.h>
#endif // __RPCPROXY_H_VERSION__


#include "tpcc_com_ps.h"

#define TYPE_FORMAT_STRING_SIZE   1023
#define PROC_FORMAT_STRING_SIZE   193
#define TRANSMIT_AS_TABLE_SIZE    0
#define WIRE_MARSHAL_TABLE_SIZE   1

typedef struct _MIDL_TYPE_FORMAT_STRING
    {
    short          Pad;
    unsigned char  Format[ TYPE_FORMAT_STRING_SIZE ];
    } MIDL_TYPE_FORMAT_STRING;

typedef struct _MIDL_PROC_FORMAT_STRING
    {
    short          Pad;
    unsigned char  Format[ PROC_FORMAT_STRING_SIZE ];
    } MIDL_PROC_FORMAT_STRING;


static RPC_SYNTAX_IDENTIFIER  _RpcTransferSyntax =
{{0x8A885D04,0x1CEB,0x11C9,{0x9F,0xE8,0x08,0x00,0x2B,
0x10,0x48,0x60}},{2,0}};


extern const MIDL_TYPE_FORMAT_STRING
__MIDL_TypeFormatString;
extern const MIDL_PROC_FORMAT_STRING
__MIDL_ProcFormatString;


extern const MIDL_STUB_DESC Object_StubDesc;


extern const MIDL_SERVER_INFO ITPCC_ServerInfo;
extern const MIDL_STUBLESS_PROXY_INFO
ITPCC_ProxyInfo;


extern const USER_MARSHAL_ROUTINE_QUADRUPLE
UserMarshalRoutines[ WIRE_MARSHAL_TABLE_SIZE ];

#if !defined(__RPC_WIN32__)
#error  Invalid build platform for this stub.
#endif

#if !(TARGET_IS_NT40_OR_LATER)
#error You need a Windows NT 4.0 or later to run this
stub because it uses these features:
#error   -Oif or -Oicf, [wire_marshal] or
[user_marshal] attribute.
#error However, your C/C++ compilation flags indicate
you intend to run this app on earlier systems.
#error This app will die there with the
RPC_X_WRONG_STUB_VERSION error.
#endif


static const MIDL_PROC_FORMAT_STRING
__MIDL_ProcFormatString =
    {
        0,
        {

          /* Procedure NewOrder */

                                0x33,               /*
FC_AUTO_HANDLE */
                                0x6c,               /*
Old Flags:  object, Oi2 */
/*  2 */  NdrFcLong( 0x0 ),   /* 0 */
/*  6 */  NdrFcShort( 0x3 ),  /* 3 */
/*  8 */  NdrFcShort( 0x1c ), /* x86 Stack
size/offset = 28 */
```

```
/* 10 */  NdrFcShort( 0x0 ),  /* 0 */
/* 12 */  NdrFcShort( 0x8 ),  /* 8 */
/* 14 */  0x7,                /* Oi2 Flags:  srv must
size, clt must size, has return, */
                               0x3,                /*
3 */

         /* Parameter txn_in */

/* 16 */  NdrFcShort( 0x8b ), /* Flags:  must size,
must free, in, by val, */
/* 18 */  NdrFcShort( 0x4 ),  /* x86 Stack
size/offset = 4 */
/* 20 */  NdrFcShort( 0x3e2 ),          /* Type
Offset=994 */

         /* Parameter txn_out */

/* 22 */  NdrFcShort( 0x4113 ),         /* Flags:
must size, must free, out, simple ref, srv alloc
size=16 */
/* 24 */  NdrFcShort( 0x14 ), /* x86 Stack
size/offset = 20 */
/* 26 */  NdrFcShort( 0x3f4 ),          /* Type
Offset=1012 */

         /* Return value */

/* 28 */  NdrFcShort( 0x70 ), /* Flags:  out, return,
base type, */
/* 30 */  NdrFcShort( 0x18 ), /* x86 Stack
size/offset = 24 */
/* 32 */  0x8,                /* FC_LONG */
                               0x0,                /*
0 */

         /* Procedure Payment */

/* 34 */  0x33,               /* FC_AUTO_HANDLE */
                               0x6c,               /*
Old Flags:  object, Oi2 */
/* 36 */  NdrFcLong( 0x0 ),   /* 0 */
/* 40 */  NdrFcShort( 0x4 ),  /* 4 */
/* 42 */  NdrFcShort( 0x1c ), /* x86 Stack
size/offset = 28 */
/* 44 */  NdrFcShort( 0x0 ),  /* 0 */
/* 46 */  NdrFcShort( 0x8 ),  /* 8 */
/* 48 */  0x7,                /* Oi2 Flags:  srv must
size, clt must size, has return, */
                               0x3,                /*
3 */

         /* Parameter txn_in */

/* 50 */  NdrFcShort( 0x8b ), /* Flags:  must size,
must free, in, by val, */
/* 52 */  NdrFcShort( 0x4 ),  /* x86 Stack
size/offset = 4 */
/* 54 */  NdrFcShort( 0x3e2 ),          /* Type
Offset=994 */

         /* Parameter txn_out */

/* 56 */  NdrFcShort( 0x4113 ),         /* Flags:
must size, must free, out, simple ref, srv alloc
size=16 */
/* 58 */  NdrFcShort( 0x14 ), /* x86 Stack
size/offset = 20 */
/* 60 */  NdrFcShort( 0x3f4 ),          /* Type
Offset=1012 */

         /* Return value */

/* 62 */  NdrFcShort( 0x70 ), /* Flags:  out, return,
base type, */
/* 64 */  NdrFcShort( 0x18 ), /* x86 Stack
size/offset = 24 */
/* 66 */  0x8,                /* FC_LONG */
                               0x0,                /*
0 */

         /* Procedure Delivery */

/* 68 */  0x33,               /* FC_AUTO_HANDLE */
                               0x6c,               /*
Old Flags:  object, Oi2 */
/* 70 */  NdrFcLong( 0x0 ),   /* 0 */
/* 74 */  NdrFcShort( 0x5 ),  /* 5 */
/* 76 */  NdrFcShort( 0x1c ), /* x86 Stack
size/offset = 28 */
/* 78 */  NdrFcShort( 0x0 ),  /* 0 */
/* 80 */  NdrFcShort( 0x8 ),  /* 8 */
/* 82 */  0x7,                /* Oi2 Flags:  srv must
size, clt must size, has return, */
                               0x3,                /*
3 */

         /* Parameter txn_in */

/* 84 */  NdrFcShort( 0x8b ), /* Flags:  must size,
must free, in, by val, */
/* 86 */  NdrFcShort( 0x4 ),  /* x86 Stack
size/offset = 4 */
/* 88 */  NdrFcShort( 0x3e2 ),          /* Type
Offset=994 */

         /* Parameter txn_out */

/* 90 */  NdrFcShort( 0x4113 ),         /* Flags:
must size, must free, out, simple ref, srv alloc
size=16 */
/* 92 */  NdrFcShort( 0x14 ), /* x86 Stack
size/offset = 20 */
/* 94 */  NdrFcShort( 0x3f4 ),          /* Type
Offset=1012 */

         /* Return value */

/* 96 */  NdrFcShort( 0x70 ), /* Flags:  out, return,
base type, */
/* 98 */  NdrFcShort( 0x18 ), /* x86 Stack
size/offset = 24 */
/* 100 */ 0x8,                /* FC_LONG */
                               0x0,                /*
0 */

         /* Procedure StockLevel */

/* 102 */ 0x33,               /* FC_AUTO_HANDLE */
                               0x6c,               /*
Old Flags:  object, Oi2 */
/* 104 */ NdrFcLong( 0x0 ),   /* 0 */
/* 108 */ NdrFcShort( 0x6 ),  /* 6 */
/* 110 */ NdrFcShort( 0x1c ), /* x86 Stack
size/offset = 28 */
/* 112 */ NdrFcShort( 0x0 ),  /* 0 */
/* 114 */ NdrFcShort( 0x8 ),  /* 8 */
/* 116 */ 0x7,                /* Oi2 Flags:  srv must
size, clt must size, has return, */
                               0x3,                /*
3 */

         /* Parameter txn_in */

/* 118 */ NdrFcShort( 0x8b ), /* Flags:  must size,
must free, in, by val, */
/* 120 */ NdrFcShort( 0x4 ),  /* x86 Stack
size/offset = 4 */
/* 122 */ NdrFcShort( 0x3e2 ),          /* Type
Offset=994 */

         /* Parameter txn_out */

/* 124 */ NdrFcShort( 0x4113 ),         /* Flags:
must size, must free, out, simple ref, srv alloc
size=16 */
/* 126 */ NdrFcShort( 0x14 ), /* x86 Stack
size/offset = 20 */
/* 128 */ NdrFcShort( 0x3f4 ),          /* Type
Offset=1012 */

         /* Return value */

/* 130 */ NdrFcShort( 0x70 ), /* Flags:  out, return,
base type, */
/* 132 */ NdrFcShort( 0x18 ), /* x86 Stack
size/offset = 24 */
/* 134 */ 0x8,                /* FC_LONG */
                               0x0,                /*
0 */

         /* Procedure OrderStatus */

/* 136 */ 0x33,               /* FC_AUTO_HANDLE */
                               0x6c,               /*
Old Flags:  object, Oi2 */
/* 138 */ NdrFcLong( 0x0 ),   /* 0 */
/* 142 */ NdrFcShort( 0x7 ),  /* 7 */
/* 144 */ NdrFcShort( 0x1c ), /* x86 Stack
size/offset = 28 */
/* 146 */ NdrFcShort( 0x0 ),  /* 0 */
/* 148 */ NdrFcShort( 0x8 ),  /* 8 */
```

```
/* 150 */ 0x7,              /* Oi2 Flags:  srv must
size, clt must size, has return, */
                            0x3,              /*
3 */

         /* Parameter txn_in */

/* 152 */ NdrFcShort( 0x8b ), /* Flags:  must size,
must free, in, by val, */
/* 154 */ NdrFcShort( 0x4 ),  /* x86 Stack
size/offset = 4 */
/* 156 */ NdrFcShort( 0x3e2 ),          /* Type
Offset=994 */

         /* Parameter txn_out */

/* 158 */ NdrFcShort( 0x4113 ),         /* Flags:
must size, must free, out, simple ref, srv alloc
size=16 */
/* 160 */ NdrFcShort( 0x14 ), /* x86 Stack
size/offset = 20 */
/* 162 */ NdrFcShort( 0x3f4 ),          /* Type
Offset=1012 */

         /* Return value */

/* 164 */ NdrFcShort( 0x70 ), /* Flags:  out, return,
base type, */
/* 166 */ NdrFcShort( 0x18 ), /* x86 Stack
size/offset = 24 */
/* 168 */ 0x8,              /* FC_LONG */
                            0x0,              /*
0 */

         /* Procedure CallSetComplete */

/* 170 */ 0x33,             /* FC_AUTO_HANDLE */
                            0x6c,             /*
Old Flags:  object, Oi2 */
/* 172 */ NdrFcLong( 0x0 ),   /* 0 */
/* 176 */ NdrFcShort( 0x8 ),  /* 8 */
/* 178 */ NdrFcShort( 0x8 ),  /* x86 Stack
size/offset = 8 */
/* 180 */ NdrFcShort( 0x0 ),  /* 0 */
/* 182 */ NdrFcShort( 0x8 ),  /* 8 */
/* 184 */ 0x4,              /* Oi2 Flags:  has
return, */
                            0x1,              /*
1 */

         /* Return value */

/* 186 */ NdrFcShort( 0x70 ), /* Flags:  out, return,
base type, */
/* 188 */ NdrFcShort( 0x4 ),  /* x86 Stack
size/offset = 4 */
/* 190 */ 0x8,              /* FC_LONG */
                            0x0,              /*
0 */

                            0x0
        }
    };

static const MIDL_TYPE_FORMAT_STRING
__MIDL_TypeFormatString =
    {
        0,
        {
                                NdrFcShort( 0x0 ),  /*
0 */
/*  2 */
                                0x12, 0x0,          /*
FC_UP */
/*  4 */  NdrFcShort( 0x3ca ),          /* Offset=
970 (974) */
/*  6 */
                                0x2b,               /*
FC_NON_ENCAPSULATED_UNION */
                                0x9,                /*
FC_ULONG */
/*  8 */  0x7,                /* Corr desc: FC_USHORT
*/
                                0x0,                /*
*/
/* 10 */  NdrFcShort( 0xfff8 ),         /* -8 */
/* 12 */  NdrFcShort( 0x2 ),  /* Offset= 2 (14) */
/* 14 */  NdrFcShort( 0x10 ), /* 16 */
/* 16 */  NdrFcShort( 0x2f ), /* 47 */
/* 18 */  NdrFcLong( 0x14 ),  /* 20 */
/* 22 */  NdrFcShort( 0x800b ),         /* Simple arm
type: FC_HYPER */
/* 24 */  NdrFcLong( 0x3 ),   /* 3 */
/* 28 */  NdrFcShort( 0x8008 ),         /* Simple arm
type: FC_LONG */
/* 30 */  NdrFcLong( 0x11 ),  /* 17 */
/* 34 */  NdrFcShort( 0x8001 ),         /* Simple arm
type: FC_BYTE */
/* 36 */  NdrFcLong( 0x2 ),   /* 2 */
/* 40 */  NdrFcShort( 0x8006 ),         /* Simple arm
type: FC_SHORT */
/* 42 */  NdrFcLong( 0x4 ),   /* 4 */
/* 46 */  NdrFcShort( 0x800a ),         /* Simple arm
type: FC_FLOAT */
/* 48 */  NdrFcLong( 0x5 ),   /* 5 */
/* 52 */  NdrFcShort( 0x800c ),         /* Simple arm
type: FC_DOUBLE */
/* 54 */  NdrFcLong( 0xb ),   /* 11 */
/* 58 */  NdrFcShort( 0x8006 ),         /* Simple arm
type: FC_SHORT */
/* 60 */  NdrFcLong( 0xa ),   /* 10 */
/* 64 */  NdrFcShort( 0x8008 ),         /* Simple arm
type: FC_LONG */
/* 66 */  NdrFcLong( 0x6 ),   /* 6 */
/* 70 */  NdrFcShort( 0xe8 ), /* Offset= 232 (302) */
/* 72 */  NdrFcLong( 0x7 ),   /* 7 */
/* 76 */  NdrFcShort( 0x800c ),         /* Simple arm
type: FC_DOUBLE */
/* 78 */  NdrFcLong( 0x8 ),   /* 8 */
/* 82 */  NdrFcShort( 0xe2 ), /* Offset= 226 (308) */
/* 84 */  NdrFcLong( 0xd ),   /* 13 */
/* 88 */  NdrFcShort( 0xf4 ), /* Offset= 244 (332) */
/* 90 */  NdrFcLong( 0x9 ),   /* 9 */
/* 94 */  NdrFcShort( 0x100 ),          /* Offset=
256 (350) */
/* 96 */  NdrFcLong( 0x2000 ),          /* 8192 */
/* 100 */ NdrFcShort( 0x10c ),          /* Offset=
268 (368) */
/* 102 */ NdrFcLong( 0x24 ),  /* 36 */
/* 106 */ NdrFcShort( 0x31a ),          /* Offset=
794 (900) */
/* 108 */ NdrFcLong( 0x4024 ),          /* 16420 */
/* 112 */ NdrFcShort( 0x314 ),          /* Offset=
788 (900) */
/* 114 */ NdrFcLong( 0x4011 ),          /* 16401 */
/* 118 */ NdrFcShort( 0x312 ),          /* Offset=
786 (904) */
/* 120 */ NdrFcLong( 0x4002 ),          /* 16386 */
/* 124 */ NdrFcShort( 0x310 ),          /* Offset=
784 (908) */
/* 126 */ NdrFcLong( 0x4003 ),          /* 16387 */
/* 130 */ NdrFcShort( 0x30e ),          /* Offset=
782 (912) */
/* 132 */ NdrFcLong( 0x4014 ),          /* 16404 */
/* 136 */ NdrFcShort( 0x30c ),          /* Offset=
780 (916) */
/* 138 */ NdrFcLong( 0x4004 ),          /* 16388 */
/* 142 */ NdrFcShort( 0x30a ),          /* Offset=
778 (920) */
/* 144 */ NdrFcLong( 0x4005 ),          /* 16389 */
/* 148 */ NdrFcShort( 0x308 ),          /* Offset=
776 (924) */
/* 150 */ NdrFcLong( 0x400b ),          /* 16395 */
/* 154 */ NdrFcShort( 0x2f2 ),          /* Offset=
754 (908) */
/* 156 */ NdrFcLong( 0x400a ),          /* 16394 */
/* 160 */ NdrFcShort( 0x2f0 ),          /* Offset=
752 (912) */
/* 162 */ NdrFcLong( 0x4006 ),          /* 16390 */
/* 166 */ NdrFcShort( 0x2fa ),          /* Offset=
762 (928) */
/* 168 */ NdrFcLong( 0x4007 ),          /* 16391 */
/* 172 */ NdrFcShort( 0x2f0 ),          /* Offset=
752 (924) */
/* 174 */ NdrFcLong( 0x4008 ),          /* 16392 */
/* 178 */ NdrFcShort( 0x2f2 ),          /* Offset=
754 (932) */
/* 180 */ NdrFcLong( 0x400d ),          /* 16397 */
/* 184 */ NdrFcShort( 0x2f0 ),          /* Offset=
752 (936) */
/* 186 */ NdrFcLong( 0x4009 ),          /* 16393 */
/* 190 */ NdrFcShort( 0x2ee ),          /* Offset=
750 (940) */
/* 192 */ NdrFcLong( 0x6000 ),          /* 24576 */
/* 196 */ NdrFcShort( 0x2ec ),          /* Offset=
748 (944) */
/* 198 */ NdrFcLong( 0x400c ),          /* 16396 */
/* 202 */ NdrFcShort( 0x2ea ),          /* Offset=
746 (948) */
/* 204 */ NdrFcLong( 0x10 ),  /* 16 */
/* 208 */ NdrFcShort( 0x8002 ),         /* Simple arm
type: FC_CHAR */
/* 210 */ NdrFcLong( 0x12 ),  /* 18 */
```

```
/* 214 */ NdrFcShort( 0x8006 ),         /* Simple arm
type: FC_SHORT */
/* 216 */ NdrFcLong( 0x13 ),  /* 19 */
/* 220 */ NdrFcShort( 0x8008 ),         /* Simple arm
type: FC_LONG */
/* 222 */ NdrFcLong( 0x15 ),  /* 21 */
/* 226 */ NdrFcShort( 0x800b ),         /* Simple arm
type: FC_HYPER */
/* 228 */ NdrFcLong( 0x16 ),  /* 22 */
/* 232 */ NdrFcShort( 0x8008 ),         /* Simple arm
type: FC_LONG */
/* 234 */ NdrFcLong( 0x17 ),  /* 23 */
/* 238 */ NdrFcShort( 0x8008 ),         /* Simple arm
type: FC_LONG */
/* 240 */ NdrFcLong( 0xe ),   /* 14 */
/* 244 */ NdrFcShort( 0x2c8 ),          /* Offset=
712 (956) */
/* 246 */ NdrFcLong( 0x400e ),          /* 16398 */
/* 250 */ NdrFcShort( 0x2cc ),          /* Offset=
716 (966) */
/* 252 */ NdrFcLong( 0x4010 ),          /* 16400 */
/* 256 */ NdrFcShort( 0x2ca ),          /* Offset=
714 (970) */
/* 258 */ NdrFcLong( 0x4012 ),          /* 16402 */
/* 262 */ NdrFcShort( 0x286 ),          /* Offset=
646 (908) */
/* 264 */ NdrFcLong( 0x4013 ),          /* 16403 */
/* 268 */ NdrFcShort( 0x284 ),          /* Offset=
644 (912) */
/* 270 */ NdrFcLong( 0x4015 ),          /* 16405 */
/* 274 */ NdrFcShort( 0x282 ),          /* Offset=
642 (916) */
/* 276 */ NdrFcLong( 0x4016 ),          /* 16406 */
/* 280 */ NdrFcShort( 0x278 ),          /* Offset=
632 (912) */
/* 282 */ NdrFcLong( 0x4017 ),          /* 16407 */
/* 286 */ NdrFcShort( 0x272 ),          /* Offset=
626 (912) */
/* 288 */ NdrFcLong( 0x0 ),   /* 0 */
/* 292 */ NdrFcShort( 0x0 ),  /* Offset= 0 (292) */
/* 294 */ NdrFcLong( 0x1 ),   /* 1 */
/* 298 */ NdrFcShort( 0x0 ),  /* Offset= 0 (298) */
/* 300 */ NdrFcShort( 0xffffffff ),     /* Offset= -1
(299) */
/* 302 */
                           0x15,                /*
FC_STRUCT */
                           0x7,                 /*
7 */
/* 304 */ NdrFcShort( 0x8 ),  /* 8 */
/* 306 */ 0xb,                /* FC_HYPER */
                           0x5b,                /*
FC_END */
/* 308 */
                           0x12, 0x0,           /*
FC_UP */
/* 310 */ NdrFcShort( 0xc ),  /* Offset= 12 (322) */
/* 312 */
                           0x1b,                /*
FC_CARRAY */
                           0x1,                 /*
1 */
/* 314 */ NdrFcShort( 0x2 ),  /* 2 */
/* 316 */ 0x9,                /* Corr desc: FC_ULONG
*/
                           0x0,                 /*
*/
/* 318 */ NdrFcShort( 0xfffc ),         /* -4 */
/* 320 */ 0x6,                /* FC_SHORT */
                           0x5b,                /*
FC_END */
/* 322 */
                           0x17,                /*
FC_CSTRUCT */
                           0x3,                 /*
3 */
/* 324 */ NdrFcShort( 0x8 ),  /* 8 */
/* 326 */ NdrFcShort( 0xfffffff2 ),     /* Offset= -
14 (312) */
/* 328 */ 0x8,                /* FC_LONG */
                           0x8,                 /*
FC_LONG */
/* 330 */ 0x5c,               /* FC_PAD */
                           0x5b,                /*
FC_END */
/* 332 */
                           0x2f,                /*
FC_IP */
                           0x5a,                /*
FC_CONSTANT_IID */
/* 334 */ NdrFcLong( 0x0 ),   /* 0 */
/* 338 */ NdrFcShort( 0x0 ),  /* 0 */
/* 340 */ NdrFcShort( 0x0 ),  /* 0 */
/* 342 */ 0xc0,               /* 192 */
                           0x0,                 /*
0 */
/* 344 */ 0x0,                /* 0 */
                           0x0,                 /*
0 */
/* 346 */ 0x0,                /* 0 */
                           0x0,                 /*
0 */
/* 348 */ 0x0,                /* 0 */
                           0x46,                /*
70 */
/* 350 */
                           0x2f,                /*
FC_IP */
                           0x5a,                /*
FC_CONSTANT_IID */
/* 352 */ NdrFcLong( 0x20400 ),         /* 132096 */
/* 356 */ NdrFcShort( 0x0 ),  /* 0 */
/* 358 */ NdrFcShort( 0x0 ),  /* 0 */
/* 360 */ 0xc0,               /* 192 */
                           0x0,                 /*
0 */
/* 362 */ 0x0,                /* 0 */
                           0x0,                 /*
0 */
/* 364 */ 0x0,                /* 0 */
                           0x0,                 /*
0 */
/* 366 */ 0x0,                /* 0 */
                           0x46,                /*
70 */
/* 368 */
                           0x12, 0x10,          /*
FC_UP [pointer_deref] */
/* 370 */ NdrFcShort( 0x2 ),  /* Offset= 2 (372) */
/* 372 */
                           0x12, 0x0,           /*
FC_UP */
/* 374 */ NdrFcShort( 0x1fc ),          /* Offset=
508 (882) */
/* 376 */
                           0x2a,                /*
FC_ENCAPSULATED_UNION */
                           0x49,                /*
73 */
/* 378 */ NdrFcShort( 0x18 ), /* 24 */
/* 380 */ NdrFcShort( 0xa ),  /* 10 */
/* 382 */ NdrFcLong( 0x8 ),   /* 8 */
/* 386 */ NdrFcShort( 0x58 ), /* Offset= 88 (474) */
/* 388 */ NdrFcLong( 0xd ),   /* 13 */
/* 392 */ NdrFcShort( 0x78 ), /* Offset= 120 (512) */
/* 394 */ NdrFcLong( 0x9 ),   /* 9 */
/* 398 */ NdrFcShort( 0x94 ), /* Offset= 148 (546) */
/* 400 */ NdrFcLong( 0xc ),   /* 12 */
/* 404 */ NdrFcShort( 0xbc ), /* Offset= 188 (592) */
/* 406 */ NdrFcLong( 0x24 ),  /* 36 */
/* 410 */ NdrFcShort( 0x114 ),          /* Offset=
276 (686) */
/* 412 */ NdrFcLong( 0x800d ),          /* 32781 */
/* 416 */ NdrFcShort( 0x130 ),          /* Offset=
304 (720) */
/* 418 */ NdrFcLong( 0x10 ),  /* 16 */
/* 422 */ NdrFcShort( 0x148 ),          /* Offset=
328 (750) */
/* 424 */ NdrFcLong( 0x2 ),   /* 2 */
/* 428 */ NdrFcShort( 0x160 ),          /* Offset=
352 (780) */
/* 430 */ NdrFcLong( 0x3 ),   /* 3 */
/* 434 */ NdrFcShort( 0x178 ),          /* Offset=
376 (810) */
/* 436 */ NdrFcLong( 0x14 ),  /* 20 */
/* 440 */ NdrFcShort( 0x190 ),          /* Offset=
400 (840) */
/* 442 */ NdrFcShort( 0xffffffff ),     /* Offset= -1
(441) */
/* 444 */
                           0x1b,                /*
FC_CARRAY */
                           0x3,                 /*
3 */
/* 446 */ NdrFcShort( 0x4 ),  /* 4 */
/* 448 */ 0x19,               /* Corr desc:  field
pointer, FC_ULONG */
                           0x0,                 /*
*/
/* 450 */ NdrFcShort( 0x0 ),  /* 0 */
/* 452 */
```

```
                        0x4b,               /*
FC_PP */
                        0x5c,               /*
FC_PAD */
/* 454 */
                        0x48,               /*
FC_VARIABLE_REPEAT */
                        0x49,               /*
FC_FIXED_OFFSET */
/* 456 */ NdrFcShort( 0x4 ),  /* 4 */
/* 458 */ NdrFcShort( 0x0 ),  /* 0 */
/* 460 */ NdrFcShort( 0x1 ),  /* 1 */
/* 462 */ NdrFcShort( 0x0 ),  /* 0 */
/* 464 */ NdrFcShort( 0x0 ),  /* 0 */
/* 466 */ 0x12, 0x0,          /* FC_UP */
/* 468 */ NdrFcShort( 0xffffff6e ),     /* Offset= -
146 (322) */
/* 470 */
                        0x5b,               /*
FC_END */

                        0x8,                /*
FC_LONG */
/* 472 */ 0x5c,               /* FC_PAD */
                        0x5b,               /*
FC_END */
/* 474 */
                        0x16,               /*
FC_PSTRUCT */
                        0x3,                /*
3 */
/* 476 */ NdrFcShort( 0x8 ),  /* 8 */
/* 478 */
                        0x4b,               /*
FC_PP */
                        0x5c,               /*
FC_PAD */
/* 480 */
                        0x46,               /*
FC_NO_REPEAT */
                        0x5c,               /*
FC_PAD */
/* 482 */ NdrFcShort( 0x4 ),  /* 4 */
/* 484 */ NdrFcShort( 0x4 ),  /* 4 */
/* 486 */ 0x11, 0x0,          /* FC_RP */
/* 488 */ NdrFcShort( 0xffffffd4 ),     /* Offset= -
44 (444) */
/* 490 */
                        0x5b,               /*
FC_END */

                        0x8,                /*
FC_LONG */
/* 492 */ 0x8,                /* FC_LONG */
                        0x5b,               /*
FC_END */
/* 494 */
                        0x21,               /*
FC_BOGUS_ARRAY */
                        0x3,                /*
3 */
/* 496 */ NdrFcShort( 0x0 ),  /* 0 */
/* 498 */ 0x19,               /* Corr desc:  field
pointer, FC_ULONG */
                        0x0,                /*
*/
/* 500 */ NdrFcShort( 0x0 ),  /* 0 */
/* 502 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 506 */ 0x4c,               /* FC_EMBEDDED_COMPLEX
*/
                        0x0,                /*
0 */
/* 508 */ NdrFcShort( 0xffffff50 ),     /* Offset= -
176 (332) */
/* 510 */ 0x5c,               /* FC_PAD */
                        0x5b,               /*
FC_END */
/* 512 */
                        0x1a,               /*
FC_BOGUS_STRUCT */
                        0x3,                /*
3 */
/* 514 */ NdrFcShort( 0x8 ),  /* 8 */
/* 516 */ NdrFcShort( 0x0 ),  /* 0 */
/* 518 */ NdrFcShort( 0x6 ),  /* Offset= 6 (524) */
/* 520 */ 0x8,                /* FC_LONG */
                        0x36,               /*
FC_POINTER */
/* 522 */ 0x5c,               /* FC_PAD */
                        0x5b,               /*
FC_END */
/* 524 */
                        0x11, 0x0,          /*
FC_RP */
/* 526 */ NdrFcShort( 0xffffffe0 ),     /* Offset= -
32 (494) */
/* 528 */
                        0x21,               /*
FC_BOGUS_ARRAY */
                        0x3,                /*
3 */
/* 530 */ NdrFcShort( 0x0 ),  /* 0 */
/* 532 */ 0x19,               /* Corr desc:  field
pointer, FC_ULONG */
                        0x0,                /*
*/
/* 534 */ NdrFcShort( 0x0 ),  /* 0 */
/* 536 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 540 */ 0x4c,               /* FC_EMBEDDED_COMPLEX
*/
                        0x0,                /*
0 */
/* 542 */ NdrFcShort( 0xffffff40 ),     /* Offset= -
192 (350) */
/* 544 */ 0x5c,               /* FC_PAD */
                        0x5b,               /*
FC_END */
/* 546 */
                        0x1a,               /*
FC_BOGUS_STRUCT */
                        0x3,                /*
3 */
/* 548 */ NdrFcShort( 0x8 ),  /* 8 */
/* 550 */ NdrFcShort( 0x0 ),  /* 0 */
/* 552 */ NdrFcShort( 0x6 ),  /* Offset= 6 (558) */
/* 554 */ 0x8,                /* FC_LONG */
                        0x36,               /*
FC_POINTER */
/* 556 */ 0x5c,               /* FC_PAD */
                        0x5b,               /*
FC_END */
/* 558 */
                        0x11, 0x0,          /*
FC_RP */
/* 560 */ NdrFcShort( 0xffffffe0 ),     /* Offset= -
32 (528) */
/* 562 */
                        0x1b,               /*
FC_CARRAY */
                        0x3,                /*
3 */
/* 564 */ NdrFcShort( 0x4 ),  /* 4 */
/* 566 */ 0x19,               /* Corr desc:  field
pointer, FC_ULONG */
                        0x0,                /*
*/
/* 568 */ NdrFcShort( 0x0 ),  /* 0 */
/* 570 */
                        0x4b,               /*
FC_PP */
                        0x5c,               /*
FC_PAD */
/* 572 */
                        0x48,               /*
FC_VARIABLE_REPEAT */
                        0x49,               /*
FC_FIXED_OFFSET */
/* 574 */ NdrFcShort( 0x4 ),  /* 4 */
/* 576 */ NdrFcShort( 0x0 ),  /* 0 */
/* 578 */ NdrFcShort( 0x1 ),  /* 1 */
/* 580 */ NdrFcShort( 0x0 ),  /* 0 */
/* 582 */ NdrFcShort( 0x0 ),  /* 0 */
/* 584 */ 0x12, 0x0,          /* FC_UP */
/* 586 */ NdrFcShort( 0x184 ),          /* Offset=
388 (974) */
/* 588 */
                        0x5b,               /*
FC_END */

                        0x8,                /*
FC_LONG */
/* 590 */ 0x5c,               /* FC_PAD */
                        0x5b,               /*
FC_END */
/* 592 */
                        0x1a,               /*
FC_BOGUS_STRUCT */
                        0x3,                /*
3 */
/* 594 */ NdrFcShort( 0x8 ),  /* 8 */
/* 596 */ NdrFcShort( 0x0 ),  /* 0 */
/* 598 */ NdrFcShort( 0x6 ),  /* Offset= 6 (604) */
/* 600 */ 0x8,                /* FC_LONG */
```

```
                            0x36,               /*
FC_POINTER */
/* 602 */ 0x5c,             /* FC_PAD */
                            0x5b,               /*
FC_END */
/* 604 */
                            0x11, 0x0,          /*
FC_RP */
/* 606 */ NdrFcShort( 0xffffffd4 ),     /* Offset= -
44 (562) */
/* 608 */
                            0x2f,               /*
FC_IP */
                            0x5a,               /*
FC_CONSTANT_IID */
/* 610 */ NdrFcLong( 0x2f ),  /* 47 */
/* 614 */ NdrFcShort( 0x0 ),  /* 0 */
/* 616 */ NdrFcShort( 0x0 ),  /* 0 */
/* 618 */ 0xc0,             /* 192 */
                            0x0,                /*
0 */
/* 620 */ 0x0,              /* 0 */
                            0x0,                /*
0 */
/* 622 */ 0x0,              /* 0 */
                            0x0,                /*
0 */
/* 624 */ 0x0,              /* 0 */
                            0x46,               /*
70 */
/* 626 */
                            0x1b,               /*
FC_CARRAY */
                            0x0,                /*
0 */
/* 628 */ NdrFcShort( 0x1 ),  /* 1 */
/* 630 */ 0x19,             /* Corr desc:  field
pointer, FC_ULONG */
                            0x0,                /*
*/
/* 632 */ NdrFcShort( 0x4 ),  /* 4 */
/* 634 */ 0x1,              /* FC_BYTE */
                            0x5b,               /*
FC_END */
/* 636 */
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 638 */ NdrFcShort( 0x10 ), /* 16 */
/* 640 */ NdrFcShort( 0x0 ),  /* 0 */
/* 642 */ NdrFcShort( 0xa ),  /* Offset= 10 (652) */
/* 644 */ 0x8,              /* FC_LONG */
                            0x8,                /*
FC_LONG */
/* 646 */ 0x4c,             /* FC_EMBEDDED_COMPLEX
*/
                            0x0,                /*
0 */
/* 648 */ NdrFcShort( 0xffffffd8 ),     /* Offset= -
40 (608) */
/* 650 */ 0x36,             /* FC_POINTER */
                            0x5b,               /*
FC_END */
/* 652 */
                            0x12, 0x0,          /*
FC_UP */
/* 654 */ NdrFcShort( 0xfffffe4 ),     /* Offset= -
28 (626) */
/* 656 */
                            0x1b,               /*
FC_CARRAY */
                            0x3,                /*
3 */
/* 658 */ NdrFcShort( 0x4 ),  /* 4 */
/* 660 */ 0x19,             /* Corr desc:  field
pointer, FC_ULONG */
                            0x0,                /*
*/
/* 662 */ NdrFcShort( 0x0 ),  /* 0 */
/* 664 */
                            0x4b,               /*
FC_PP */
                            0x5c,               /*
FC_PAD */
/* 666 */
                            0x48,               /*
FC_VARIABLE_REPEAT */
                            0x49,               /*
FC_FIXED_OFFSET */
/* 668 */ NdrFcShort( 0x4 ),  /* 4 */
/* 670 */ NdrFcShort( 0x0 ),  /* 0 */
/* 672 */ NdrFcShort( 0x1 ),  /* 1 */
/* 674 */ NdrFcShort( 0x0 ),  /* 0 */
/* 676 */ NdrFcShort( 0x0 ),  /* 0 */
/* 678 */ 0x12, 0x0,          /* FC_UP */
/* 680 */ NdrFcShort( 0xffffffd4 ),     /* Offset= -
44 (636) */
/* 682 */
                            0x5b,               /*
FC_END */
                            0x8,                /*
FC_LONG */
/* 684 */ 0x5c,             /* FC_PAD */
                            0x5b,               /*
FC_END */
/* 686 */
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 688 */ NdrFcShort( 0x8 ),  /* 8 */
/* 690 */ NdrFcShort( 0x0 ),  /* 0 */
/* 692 */ NdrFcShort( 0x6 ),  /* Offset= 6 (698) */
/* 694 */ 0x8,              /* FC_LONG */
                            0x36,               /*
FC_POINTER */
/* 696 */ 0x5c,             /* FC_PAD */
                            0x5b,               /*
FC_END */
/* 698 */
                            0x11, 0x0,          /*
FC_RP */
/* 700 */ NdrFcShort( 0xffffffd4 ),     /* Offset= -
44 (656) */
/* 702 */
                            0x1d,               /*
FC_SMFARRAY */
                            0x0,                /*
0 */
/* 704 */ NdrFcShort( 0x8 ),  /* 8 */
/* 706 */ 0x1,              /* FC_BYTE */
                            0x5b,               /*
FC_END */
/* 708 */
                            0x15,               /*
FC_STRUCT */
                            0x3,                /*
3 */
/* 710 */ NdrFcShort( 0x10 ), /* 16 */
/* 712 */ 0x8,              /* FC_LONG */
                            0x6,                /*
FC_SHORT */
/* 714 */ 0x6,              /* FC_SHORT */
                            0x4c,               /*
FC_EMBEDDED_COMPLEX */
/* 716 */ 0x0,              /* 0 */
                            NdrFcShort( 0xfffffff1
),        /* Offset= -15 (702) */
                            0x5b,               /*
FC_END */
/* 720 */
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 722 */ NdrFcShort( 0x18 ), /* 24 */
/* 724 */ NdrFcShort( 0x0 ),  /* 0 */
/* 726 */ NdrFcShort( 0xa ),  /* Offset= 10 (736) */
/* 728 */ 0x8,              /* FC_LONG */
                            0x36,               /*
FC_POINTER */
/* 730 */ 0x4c,             /* FC_EMBEDDED_COMPLEX
*/
                            0x0,                /*
0 */
/* 732 */ NdrFcShort( 0xfffffe8 ),     /* Offset= -
24 (708) */
/* 734 */ 0x5c,             /* FC_PAD */
                            0x5b,               /*
FC_END */
/* 736 */
                            0x11, 0x0,          /*
FC_RP */
/* 738 */ NdrFcShort( 0xffffff0c ),     /* Offset= -
244 (494) */
/* 740 */
                            0x1b,               /*
FC_CARRAY */
                            0x0,                /*
0 */
/* 742 */ NdrFcShort( 0x1 ),  /* 1 */
```

```
/* 744 */ 0x19,              /* Corr desc:  field
pointer, FC_ULONG */
                             0x0,               /*
*/
/* 746 */ NdrFcShort( 0x0 ),  /* 0 */
/* 748 */ 0x1,               /* FC_BYTE */
                             0x5b,              /*
FC_END */
/* 750 */
                             0x16,              /*
FC_PSTRUCT */
                             0x3,               /*
3 */
/* 752 */ NdrFcShort( 0x8 ),  /* 8 */
/* 754 */
                             0x4b,              /*
FC_PP */
                             0x5c,              /*
FC_PAD */
/* 756 */
                             0x46,              /*
FC_NO_REPEAT */
                             0x5c,              /*
FC_PAD */
/* 758 */ NdrFcShort( 0x4 ),  /* 4 */
/* 760 */ NdrFcShort( 0x4 ),  /* 4 */
/* 762 */ 0x12, 0x0,          /* FC_UP */
/* 764 */ NdrFcShort( 0xfffffff8 ),     /* Offset= -
24 (740) */
/* 766 */
                             0x5b,              /*
FC_END */

                             0x8,               /*
FC_LONG */
/* 768 */ 0x8,               /* FC_LONG */
                             0x5b,              /*
FC_END */
/* 770 */
                             0x1b,              /*
FC_CARRAY */
                             0x1,               /*
1 */
/* 772 */ NdrFcShort( 0x2 ),  /* 2 */
/* 774 */ 0x19,              /* Corr desc:  field
pointer, FC_ULONG */
                             0x0,               /*
*/
/* 776 */ NdrFcShort( 0x0 ),  /* 0 */
/* 778 */ 0x6,               /* FC_SHORT */
                             0x5b,              /*
FC_END */
/* 780 */
                             0x16,              /*
FC_PSTRUCT */
                             0x3,               /*
3 */
/* 782 */ NdrFcShort( 0x8 ),  /* 8 */
/* 784 */
                             0x4b,              /*
FC_PP */
                             0x5c,              /*
FC_PAD */
/* 786 */
                             0x46,              /*
FC_NO_REPEAT */
                             0x5c,              /*
FC_PAD */
/* 788 */ NdrFcShort( 0x4 ),  /* 4 */
/* 790 */ NdrFcShort( 0x4 ),  /* 4 */
/* 792 */ 0x12, 0x0,          /* FC_UP */
/* 794 */ NdrFcShort( 0xfffffff8 ),     /* Offset= -
24 (770) */
/* 796 */
                             0x5b,              /*
FC_END */

                             0x8,               /*
FC_LONG */
/* 798 */ 0x8,               /* FC_LONG */
                             0x5b,              /*
FC_END */
/* 800 */
                             0x1b,              /*
FC_CARRAY */
                             0x3,               /*
3 */
/* 802 */ NdrFcShort( 0x4 ),  /* 4 */
/* 804 */ 0x19,              /* Corr desc:  field
pointer, FC_ULONG */
                             0x0,               /*
*/
/* 806 */ NdrFcShort( 0x0 ),  /* 0 */
/* 808 */ 0x8,               /* FC_LONG */
                             0x5b,              /*
FC_END */
/* 810 */
                             0x16,              /*
FC_PSTRUCT */
                             0x3,               /*
3 */
/* 812 */ NdrFcShort( 0x8 ),  /* 8 */
/* 814 */
                             0x4b,              /*
FC_PP */
                             0x5c,              /*
FC_PAD */
/* 816 */
                             0x46,              /*
FC_NO_REPEAT */
                             0x5c,              /*
FC_PAD */
/* 818 */ NdrFcShort( 0x4 ),  /* 4 */
/* 820 */ NdrFcShort( 0x4 ),  /* 4 */
/* 822 */ 0x12, 0x0,          /* FC_UP */
/* 824 */ NdrFcShort( 0xfffffff8 ),     /* Offset= -
24 (800) */
/* 826 */
                             0x5b,              /*
FC_END */

                             0x8,               /*
FC_LONG */
/* 828 */ 0x8,               /* FC_LONG */
                             0x5b,              /*
FC_END */
/* 830 */
                             0x1b,              /*
FC_CARRAY */
                             0x7,               /*
7 */
/* 832 */ NdrFcShort( 0x8 ),  /* 8 */
/* 834 */ 0x19,              /* Corr desc:  field
pointer, FC_ULONG */
                             0x0,               /*
*/
/* 836 */ NdrFcShort( 0x0 ),  /* 0 */
/* 838 */ 0xb,               /* FC_HYPER */
                             0x5b,              /*
FC_END */
/* 840 */
                             0x16,              /*
FC_PSTRUCT */
                             0x3,               /*
3 */
/* 842 */ NdrFcShort( 0x8 ),  /* 8 */
/* 844 */
                             0x4b,              /*
FC_PP */
                             0x5c,              /*
FC_PAD */
/* 846 */
                             0x46,              /*
FC_NO_REPEAT */
                             0x5c,              /*
FC_PAD */
/* 848 */ NdrFcShort( 0x4 ),  /* 4 */
/* 850 */ NdrFcShort( 0x4 ),  /* 4 */
/* 852 */ 0x12, 0x0,          /* FC_UP */
/* 854 */ NdrFcShort( 0xfffffff8 ),     /* Offset= -
24 (830) */
/* 856 */
                             0x5b,              /*
FC_END */

                             0x8,               /*
FC_LONG */
/* 858 */ 0x8,               /* FC_LONG */
                             0x5b,              /*
FC_END */
/* 860 */
                             0x15,              /*
FC_STRUCT */
                             0x3,               /*
3 */
/* 862 */ NdrFcShort( 0x8 ),  /* 8 */
/* 864 */ 0x8,               /* FC_LONG */
                             0x8,               /*
FC_LONG */
/* 866 */ 0x5c,              /* FC_PAD */
                             0x5b,              /*
FC_END */
```

```
/* 868 */
                        0x1b,               /*
FC_CARRAY */
                        0x3,                /*
3 */
/* 870 */ NdrFcShort( 0x8 ),  /* 8 */
/* 872 */ 0x7,              /* Corr desc: FC_USHORT
*/
                        0x0,                /*
*/
/* 874 */ NdrFcShort( 0xffd8 ),        /* -40 */
/* 876 */ 0x4c,             /* FC_EMBEDDED_COMPLEX
*/
                        0x0,                /*
0 */
/* 878 */ NdrFcShort( 0xfffffffe ),    /* Offset= -
18 (860) */
/* 880 */ 0x5c,             /* FC_PAD */
                        0x5b,               /*
FC_END */
/* 882 */
                        0x1a,               /*
FC_BOGUS_STRUCT */
                        0x3,                /*
3 */
/* 884 */ NdrFcShort( 0x28 ), /* 40 */
/* 886 */ NdrFcShort( 0xfffffffe ),    /* Offset= -
18 (868) */
/* 888 */ NdrFcShort( 0x0 ),  /* Offset= 0 (888) */
/* 890 */ 0x6,              /* FC_SHORT */
                        0x6,                /*
FC_SHORT */
/* 892 */ 0x8,              /* FC_LONG */
                        0x8,                /*
FC_LONG */
/* 894 */ 0x4c,             /* FC_EMBEDDED_COMPLEX
*/
                        0x0,                /*
0 */
/* 896 */ NdrFcShort( 0xfffffdf8 ),    /* Offset= -
520 (376) */
/* 898 */ 0x5c,             /* FC_PAD */
                        0x5b,               /*
FC_END */
/* 900 */
                        0x12, 0x0,          /*
FC_UP */
/* 902 */ NdrFcShort( 0xffffef6 ),     /* Offset= -
266 (636) */
/* 904 */
                        0x12, 0x8,          /*
FC_UP [simple_pointer] */
/* 906 */ 0x1,              /* FC_BYTE */
                        0x5c,               /*
FC_PAD */
/* 908 */
                        0x12, 0x8,          /*
FC_UP [simple_pointer] */
/* 910 */ 0x6,              /* FC_SHORT */
                        0x5c,               /*
FC_PAD */
```

```
/* 912 */
                        0x12, 0x8,          /*
FC_UP [simple_pointer] */
/* 914 */ 0x8,              /* FC_LONG */
                        0x5c,               /*
FC_PAD */
/* 916 */
                        0x12, 0x8,          /*
FC_UP [simple_pointer] */
/* 918 */ 0xb,              /* FC_HYPER */
                        0x5c,               /*
FC_PAD */
/* 920 */
                        0x12, 0x8,          /*
FC_UP [simple_pointer] */
/* 922 */ 0xa,              /* FC_FLOAT */
                        0x5c,               /*
FC_PAD */
/* 924 */
                        0x12, 0x8,          /*
FC_UP [simple_pointer] */
/* 926 */ 0xc,              /* FC_DOUBLE */
                        0x5c,               /*
FC_PAD */
/* 928 */
                        0x12, 0x0,          /*
FC_UP */
/* 930 */ NdrFcShort( 0xfffffd8c ),    /* Offset= -
628 (302) */
/* 932 */
                        0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 934 */ NdrFcShort( 0xfffffd8e ),    /* Offset= -
626 (308) */
/* 936 */
                        0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 938 */ NdrFcShort( 0xfffffda2 ),    /* Offset= -
606 (332) */
/* 940 */
                        0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 942 */ NdrFcShort( 0xfffffdb0 ),    /* Offset= -
592 (350) */
/* 944 */
                        0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 946 */ NdrFcShort( 0xfffffdbe ),    /* Offset= -
578 (368) */
/* 948 */
                        0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 950 */ NdrFcShort( 0x2 ),  /* Offset= 2 (952) */
/* 952 */
                        0x12, 0x0,          /*
FC_UP */
/* 954 */ NdrFcShort( 0x14 ), /* Offset= 20 (974) */
/* 956 */
                        0x15,               /*
FC_STRUCT */
```

```
                        0x7,                /*
7 */
/* 958 */ NdrFcShort( 0x10 ), /* 16 */
/* 960 */ 0x6,              /* FC_SHORT */
                        0x1,                /*
FC_BYTE */
/* 962 */ 0x1,              /* FC_BYTE */
                        0x8,                /*
FC_LONG */
/* 964 */ 0xb,              /* FC_HYPER */
                        0x5b,               /*
FC_END */
/* 966 */
                        0x12, 0x0,          /*
FC_UP */
/* 968 */ NdrFcShort( 0xfffffff4 ),    /* Offset= -
12 (956) */
/* 970 */
                        0x12, 0x8,          /*
FC_UP [simple_pointer] */
/* 972 */ 0x2,              /* FC_CHAR */
                        0x5c,               /*
FC_PAD */
/* 974 */
                        0x1a,               /*
FC_BOGUS_STRUCT */
                        0x7,                /*
7 */
/* 976 */ NdrFcShort( 0x20 ), /* 32 */
/* 978 */ NdrFcShort( 0x0 ),  /* 0 */
/* 980 */ NdrFcShort( 0x0 ),  /* Offset= 0 (980) */
/* 982 */ 0x8,              /* FC_LONG */
                        0x8,                /*
FC_LONG */
/* 984 */ 0x6,              /* FC_SHORT */
                        0x6,                /*
FC_SHORT */
/* 986 */ 0x6,              /* FC_SHORT */
                        0x6,                /*
FC_SHORT */
/* 988 */ 0x4c,             /* FC_EMBEDDED_COMPLEX
*/
                        0x0,                /*
0 */
/* 990 */ NdrFcShort( 0xfffffc28 ),    /* Offset= -
984 (6) */
/* 992 */ 0x5c,             /* FC_PAD */
                        0x5b,               /*
FC_END */
/* 994 */ 0xb4,             /* FC_USER_MARSHAL */
                        0x83,               /*
131 */
/* 996 */ NdrFcShort( 0x0 ),  /* 0 */
/* 998 */ NdrFcShort( 0x10 ), /* 16 */
/* 1000 */          NdrFcShort( 0x0 ),  /* 0 */
/* 1002 */          NdrFcShort( 0xfffffc18 ),   /*
Offset= -1000 (2) */
/* 1004 */
                        0x11, 0x4,          /*
FC_RP [alloced_on_stack] */
```

```
/* 1006 */          NdrFcShort( 0x6 ),  /* Offset= 6
(1012) */
/* 1008 */
                            0x13, 0x0,          /*
FC_OP */
/* 1010 */          NdrFcShort( 0xffffffdc ),     /*
Offset= -36 (974) */
/* 1012 */          0xb4,               /*
FC_USER_MARSHAL */
                            0x83,               /*
131 */
/* 1014 */          NdrFcShort( 0x0 ),  /* 0 */
/* 1016 */          NdrFcShort( 0x10 ), /* 16 */
/* 1018 */          NdrFcShort( 0x0 ),  /* 0 */
/* 1020 */          NdrFcShort( 0xfffffff4 ),     /*
Offset= -12 (1008) */

                            0x0
        }
    };

static const USER_MARSHAL_ROUTINE_QUADRUPLE
UserMarshalRoutines[ WIRE_MARSHAL_TABLE_SIZE ] =
        {

            {
            VARIANT_UserSize
            ,VARIANT_UserMarshal
            ,VARIANT_UserUnmarshal
            ,VARIANT_UserFree
            }

        };



/* Standard interface: __MIDL_itf_tpcc_com_ps_0000,
ver. 0.0,

GUID={0x00000000,0x0000,0x0000,{0x00,0x00,0x00,0x00,0
x00,0x00,0x00,0x00}} */


/* Object interface: IUnknown, ver. 0.0,

GUID={0x00000000,0x0000,0x0000,{0xC0,0x00,0x00,0x00,0
x00,0x00,0x00,0x46}} */


/* Object interface: ITPCC, ver. 0.0,

GUID={0xFEEE6AA2,0x84B1,0x11d2,{0xBA,0x47,0x00,0xC0,0
x4F,0xBF,0xE0,0x8B}} */

#pragma code_seg(".orpc")
static const unsigned short
ITPCC_FormatStringOffsetTable[] =
    {
    0,
    34,
    68,
    102,
    136,
    170
    };

static const MIDL_STUBLESS_PROXY_INFO ITPCC_ProxyInfo
=
    {
    &Object_StubDesc,
    __MIDL_ProcFormatString.Format,
    &ITPCC_FormatStringOffsetTable[-3],
    0,
    0,
    0
    };


static const MIDL_SERVER_INFO ITPCC_ServerInfo =
    {
    &Object_StubDesc,
    0,
    __MIDL_ProcFormatString.Format,
    &ITPCC_FormatStringOffsetTable[-3],
    0,
    0,
    0,
    0};
CINTERFACE_PROXY_VTABLE(9) _ITPCCProxyVtbl =
{
    &ITPCC_ProxyInfo,
    &IID_ITPCC,
    IUnknown_QueryInterface_Proxy,
    IUnknown_AddRef_Proxy,
    IUnknown_Release_Proxy ,
    (void *) (INT_PTR) -1 /* ITPCC::NewOrder */ ,
    (void *) (INT_PTR) -1 /* ITPCC::Payment */ ,
    (void *) (INT_PTR) -1 /* ITPCC::Delivery */ ,
    (void *) (INT_PTR) -1 /* ITPCC::StockLevel */ ,
    (void *) (INT_PTR) -1 /* ITPCC::OrderStatus */ ,
    (void *) (INT_PTR) -1 /* ITPCC::CallSetComplete
*/
};

const CInterfaceStubVtbl _ITPCCStubVtbl =
{
    &IID_ITPCC,
    &ITPCC_ServerInfo,
    9,
    0, /* pure interpreted */
    CStdStubBuffer_METHODS
};

static const MIDL_STUB_DESC Object_StubDesc =
    {
    0,
    NdrOleAllocate,
    NdrOleFree,
    0,
    0,
    0,
    0,
    0,
    __MIDL_TypeFormatString.Format,
    1, /* -error bounds_check flag */
    0x20000, /* Ndr library version */
    0,
    0x600015b, /* MIDL Version 6.0.347 */
    0,
    UserMarshalRoutines,
    0,  /* notify & notify_flag routine table */
    0x1, /* MIDL flag */
    0, /* cs routines */
    0,   /* proxy/server info */
    0   /* Reserved5 */
    };

const CInterfaceProxyVtbl *
_tpcc_com_ps_ProxyVtblList[] =
{
    ( CInterfaceProxyVtbl *) &_ITPCCProxyVtbl,
    0
};

const CInterfaceStubVtbl *
_tpcc_com_ps_StubVtblList[] =
{
    ( CInterfaceStubVtbl *) &_ITPCCStubVtbl,
    0
};

PCInterfaceName const
_tpcc_com_ps_InterfaceNamesList[] =
{
    "ITPCC",
    0
};


#define _tpcc_com_ps_CHECK_IID(n)
          IID_GENERIC_CHECK_IID( _tpcc_com_ps, pIID,
n)

int __stdcall _tpcc_com_ps_IID_Lookup( const IID *
pIID, int * pIndex )
{

    if(!_tpcc_com_ps_CHECK_IID(0))
        {
        *pIndex = 0;
        return 1;
        }

    return 0;
}

const ExtendedProxyFileInfo tpcc_com_ps_ProxyFileInfo
=
{
    (PCInterfaceProxyVtblList *) &
_tpcc_com_ps_ProxyVtblList,
    (PCInterfaceStubVtblList *) &
_tpcc_com_ps_StubVtblList,
```

```
    (const PCInterfaceName * ) &
_tpcc_com_ps_InterfaceNamesList,
    0, // no delegation
    & _tpcc_com_ps_IID_Lookup,
    1,
    2,
    0, /* table of [async_uuid] interfaces */
    0, /* Filler1 */
    0, /* Filler2 */
    0  /* Filler3 */
};


#endif /* !defined(_M_IA64) && !defined(_M_AMD64)*/


#pragma warning( disable: 4049 )  /* more than 64k
source lines */

/* this ALWAYS GENERATED file contains the proxy stub
code */


 /* File created by MIDL compiler version 6.00.0347
*/
/* at Fri Apr 15 14:48:43 2005
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf, W1, Zp8, env=Win64 (32b run,appending)
    protocol : dce , ms_ext, c_ext, robust
    error checks: allocation ref bounds_check enum
stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany),
__declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if defined(_M_IA64) || defined(_M_AMD64)
#define USE_STUBLESS_PROXY


/* verify that the <rpcproxy.h> version is high
enough to compile this file*/
#ifndef __REDQ_RPCPROXY_H_VERSION__
#define __REQUIRED_RPCPROXY_H_VERSION__ 475
#endif


#include "rpcproxy.h"
#ifndef __RPCPROXY_H_VERSION__
#error this stub requires an updated version of
<rpcproxy.h>
#endif // __RPCPROXY_H_VERSION__


#include "tpcc_com_ps.h"

#define TYPE_FORMAT_STRING_SIZE   1003
#define PROC_FORMAT_STRING_SIZE   253
#define TRANSMIT_AS_TABLE_SIZE    0
#define WIRE_MARSHAL_TABLE_SIZE   1

typedef struct _MIDL_TYPE_FORMAT_STRING
    {
    short          Pad;
    unsigned char  Format[ TYPE_FORMAT_STRING_SIZE ];
    } MIDL_TYPE_FORMAT_STRING;

typedef struct _MIDL_PROC_FORMAT_STRING
    {
    short          Pad;
    unsigned char  Format[ PROC_FORMAT_STRING_SIZE ];
    } MIDL_PROC_FORMAT_STRING;


static RPC_SYNTAX_IDENTIFIER  _RpcTransferSyntax =
{{0x8A885D04,0x1CEB,0x11C9,{0x9F,0xE8,0x08,0x00,0x2B,
0x10,0x48,0x60}},{2,0}};


extern const MIDL_TYPE_FORMAT_STRING
__MIDL_TypeFormatString;
extern const MIDL_PROC_FORMAT_STRING
__MIDL_ProcFormatString;


extern const MIDL_STUB_DESC Object_StubDesc;


extern const MIDL_SERVER_INFO ITPCC_ServerInfo;
extern const MIDL_STUBLESS_PROXY_INFO
ITPCC_ProxyInfo;


extern const USER_MARSHAL_ROUTINE_QUADRUPLE
UserMarshalRoutines[ WIRE_MARSHAL_TABLE_SIZE ];

#if !defined(__RPC_WIN64__)
#error  Invalid build platform for this stub.
#endif

static const MIDL_PROC_FORMAT_STRING
__MIDL_ProcFormatString =
    {
        0,
        {

          /* Procedure NewOrder */

                                0x33,               /*
FC_AUTO_HANDLE */
                                0x6c,               /*
Old Flags:  object, Oi2 */
/*  2 */  NdrFcLong( 0x0 ),   /* 0 */
/*  6 */  NdrFcShort( 0x3 ),  /* 3 */
/*  8 */  NdrFcShort( 0x30 ), /* ia64 Stack
size/offset = 48 */
/* 10 */  NdrFcShort( 0x0 ),  /* 0 */
/* 12 */  NdrFcShort( 0x8 ),  /* 8 */
/* 14 */  0x47,               /* Oi2 Flags:  srv must
size, clt must size, has return, has ext, */
                                0x3,                /*
3 */
/* 16 */  0xa,                /* 10 */
                                0x7,                /*
Ext Flags:  new corr desc, clt corr check, srv corr
check, */
/* 18 */  NdrFcShort( 0x20 ), /* 32 */
/* 20 */  NdrFcShort( 0x20 ), /* 32 */
/* 22 */  NdrFcShort( 0x0 ),  /* 0 */
/* 24 */  NdrFcShort( 0x0 ),  /* 0 */

          /* Parameter txn_in */

/* 26 */  NdrFcShort( 0x8b ), /* Flags:  must size,
must free, in, by val, */
/* 28 */  NdrFcShort( 0x8 ),  /* ia64 Stack
size/offset = 8 */
/* 30 */  NdrFcShort( 0x3ce ),          /* Type
Offset=974 */

          /* Parameter txn_out */

/* 32 */  NdrFcShort( 0x6113 ),         /* Flags:
must size, must free, out, simple ref, srv alloc
size=24 */
/* 34 */  NdrFcShort( 0x20 ), /* ia64 Stack
size/offset = 32 */
/* 36 */  NdrFcShort( 0x3e0 ),          /* Type
Offset=992 */

          /* Return value */

/* 38 */  NdrFcShort( 0x70 ), /* Flags:  out, return,
base type, */
/* 40 */  NdrFcShort( 0x28 ), /* ia64 Stack
size/offset = 40 */
/* 42 */  0x8,                /* FC_LONG */
                                0x0,                /*
0 */

          /* Procedure Payment */

/* 44 */  0x33,               /* FC_AUTO_HANDLE */
                                0x6c,               /*
Old Flags:  object, Oi2 */
/* 46 */  NdrFcLong( 0x0 ),   /* 0 */
/* 50 */  NdrFcShort( 0x4 ),  /* 4 */
/* 52 */  NdrFcShort( 0x30 ), /* ia64 Stack
size/offset = 48 */
/* 54 */  NdrFcShort( 0x0 ),  /* 0 */
/* 56 */  NdrFcShort( 0x8 ),  /* 8 */
/* 58 */  0x47,               /* Oi2 Flags:  srv must
size, clt must size, has return, has ext, */
                                0x3,                /*
3 */
/* 60 */  0xa,                /* 10 */
                                0x7,                /*
Ext Flags:  new corr desc, clt corr check, srv corr
check, */
```

```
/* 62 */  NdrFcShort( 0x20 ), /* 32 */
/* 64 */  NdrFcShort( 0x20 ), /* 32 */
/* 66 */  NdrFcShort( 0x0 ),  /* 0 */
/* 68 */  NdrFcShort( 0x0 ),  /* 0 */

         /* Parameter txn_in */

/* 70 */  NdrFcShort( 0x8b ), /* Flags:  must size,
must free, in, by val, */
/* 72 */  NdrFcShort( 0x8 ),  /* ia64 Stack
size/offset = 8 */
/* 74 */  NdrFcShort( 0x3ce ),          /* Type
Offset=974 */

         /* Parameter txn_out */

/* 76 */  NdrFcShort( 0x6113 ),         /* Flags:
must size, must free, out, simple ref, srv alloc
size=24 */
/* 78 */  NdrFcShort( 0x20 ), /* ia64 Stack
size/offset = 32 */
/* 80 */  NdrFcShort( 0x3e0 ),          /* Type
Offset=992 */

         /* Return value */

/* 82 */  NdrFcShort( 0x70 ), /* Flags:  out, return,
base type, */
/* 84 */  NdrFcShort( 0x28 ), /* ia64 Stack
size/offset = 40 */
/* 86 */  0x8,                /* FC_LONG */
                               0x0,                /*
0 */

         /* Procedure Delivery */

/* 88 */  0x33,               /* FC_AUTO_HANDLE */
                               0x6c,               /*
Old Flags:  object, Oi2 */
/* 90 */  NdrFcLong( 0x0 ),   /* 0 */
/* 94 */  NdrFcShort( 0x5 ),  /* 5 */
/* 96 */  NdrFcShort( 0x30 ), /* ia64 Stack
size/offset = 48 */
/* 98 */  NdrFcShort( 0x0 ),  /* 0 */
/* 100 */ NdrFcShort( 0x8 ),  /* 8 */
/* 102 */ 0x47,               /* Oi2 Flags:  srv must
size, clt must size, has return, has ext, */
                               0x3,                /*
3 */
/* 104 */ 0xa,                /* 10 */
                               0x7,                /*
Ext Flags:  new corr desc, clt corr check, srv corr
check, */
/* 106 */ NdrFcShort( 0x20 ), /* 32 */
/* 108 */ NdrFcShort( 0x20 ), /* 32 */
/* 110 */ NdrFcShort( 0x0 ),  /* 0 */
/* 112 */ NdrFcShort( 0x0 ),  /* 0 */

         /* Parameter txn_in */

/* 114 */ NdrFcShort( 0x8b ), /* Flags:  must size,
must free, in, by val, */
/* 116 */ NdrFcShort( 0x8 ),  /* ia64 Stack
size/offset = 8 */
/* 118 */ NdrFcShort( 0x3ce ),          /* Type
Offset=974 */

         /* Parameter txn_out */

/* 120 */ NdrFcShort( 0x6113 ),         /* Flags:
must size, must free, out, simple ref, srv alloc
size=24 */
/* 122 */ NdrFcShort( 0x20 ), /* ia64 Stack
size/offset = 32 */
/* 124 */ NdrFcShort( 0x3e0 ),          /* Type
Offset=992 */

         /* Return value */

/* 126 */ NdrFcShort( 0x70 ), /* Flags:  out, return,
base type, */
/* 128 */ NdrFcShort( 0x28 ), /* ia64 Stack
size/offset = 40 */
/* 130 */ 0x8,                /* FC_LONG */
                               0x0,                /*
0 */

         /* Procedure StockLevel */

/* 132 */ 0x33,               /* FC_AUTO_HANDLE */
                               0x6c,               /*
Old Flags:  object, Oi2 */
/* 134 */ NdrFcLong( 0x0 ),   /* 0 */
/* 138 */ NdrFcShort( 0x6 ),  /* 6 */
/* 140 */ NdrFcShort( 0x30 ), /* ia64 Stack
size/offset = 48 */
/* 142 */ NdrFcShort( 0x0 ),  /* 0 */
/* 144 */ NdrFcShort( 0x8 ),  /* 8 */
/* 146 */ 0x47,               /* Oi2 Flags:  srv must
size, clt must size, has return, has ext, */
                               0x3,                /*
3 */
/* 148 */ 0xa,                /* 10 */
                               0x7,                /*
Ext Flags:  new corr desc, clt corr check, srv corr
check, */
/* 150 */ NdrFcShort( 0x20 ), /* 32 */
/* 152 */ NdrFcShort( 0x20 ), /* 32 */
/* 154 */ NdrFcShort( 0x0 ),  /* 0 */
/* 156 */ NdrFcShort( 0x0 ),  /* 0 */

         /* Parameter txn_in */

/* 158 */ NdrFcShort( 0x8b ), /* Flags:  must size,
must free, in, by val, */
/* 160 */ NdrFcShort( 0x8 ),  /* ia64 Stack
size/offset = 8 */
/* 162 */ NdrFcShort( 0x3ce ),          /* Type
Offset=974 */

         /* Parameter txn_out */

/* 164 */ NdrFcShort( 0x6113 ),         /* Flags:
must size, must free, out, simple ref, srv alloc
size=24 */
/* 166 */ NdrFcShort( 0x20 ), /* ia64 Stack
size/offset = 32 */
/* 168 */ NdrFcShort( 0x3e0 ),          /* Type
Offset=992 */

         /* Return value */

/* 170 */ NdrFcShort( 0x70 ), /* Flags:  out, return,
base type, */
/* 172 */ NdrFcShort( 0x28 ), /* ia64 Stack
size/offset = 40 */
/* 174 */ 0x8,                /* FC_LONG */
                               0x0,                /*
0 */

         /* Procedure OrderStatus */

/* 176 */ 0x33,               /* FC_AUTO_HANDLE */
                               0x6c,               /*
Old Flags:  object, Oi2 */
/* 178 */ NdrFcLong( 0x0 ),   /* 0 */
/* 182 */ NdrFcShort( 0x7 ),  /* 7 */
/* 184 */ NdrFcShort( 0x30 ), /* ia64 Stack
size/offset = 48 */
/* 186 */ NdrFcShort( 0x0 ),  /* 0 */
/* 188 */ NdrFcShort( 0x8 ),  /* 8 */
/* 190 */ 0x47,               /* Oi2 Flags:  srv must
size, clt must size, has return, has ext, */
                               0x3,                /*
3 */
/* 192 */ 0xa,                /* 10 */
                               0x7,                /*
Ext Flags:  new corr desc, clt corr check, srv corr
check, */
/* 194 */ NdrFcShort( 0x20 ), /* 32 */
/* 196 */ NdrFcShort( 0x20 ), /* 32 */
/* 198 */ NdrFcShort( 0x0 ),  /* 0 */
/* 200 */ NdrFcShort( 0x0 ),  /* 0 */

         /* Parameter txn_in */

/* 202 */ NdrFcShort( 0x8b ), /* Flags:  must size,
must free, in, by val, */
/* 204 */ NdrFcShort( 0x8 ),  /* ia64 Stack
size/offset = 8 */
/* 206 */ NdrFcShort( 0x3ce ),          /* Type
Offset=974 */

         /* Parameter txn_out */

/* 208 */ NdrFcShort( 0x6113 ),         /* Flags:
must size, must free, out, simple ref, srv alloc
size=24 */
/* 210 */ NdrFcShort( 0x20 ), /* ia64 Stack
size/offset = 32 */
/* 212 */ NdrFcShort( 0x3e0 ),          /* Type
Offset=992 */
```

```
        /* Return value */

/* 214 */ NdrFcShort( 0x70 ), /* Flags:  out, return,
base type, */
/* 216 */ NdrFcShort( 0x28 ), /* ia64 Stack
size/offset = 40 */
/* 218 */ 0x8,                /* FC_LONG */
                              0x0,                /*
0 */

        /* Procedure CallSetComplete */

/* 220 */ 0x33,               /* FC_AUTO_HANDLE */
                              0x6c,               /*
Old Flags:  object, Oi2 */
/* 222 */ NdrFcLong( 0x0 ),   /* 0 */
/* 226 */ NdrFcShort( 0x8 ),  /* 8 */
/* 228 */ NdrFcShort( 0x10 ), /* ia64 Stack
size/offset = 16 */
/* 230 */ NdrFcShort( 0x0 ),  /* 0 */
/* 232 */ NdrFcShort( 0x8 ),  /* 8 */
/* 234 */ 0x44,               /* Oi2 Flags:  has
return, has ext, */
                              0x1,                /*
1 */
/* 236 */ 0xa,                /* 10 */
                              0x1,                /*
Ext Flags:  new corr desc, */
/* 238 */ NdrFcShort( 0x0 ),  /* 0 */
/* 240 */ NdrFcShort( 0x0 ),  /* 0 */
/* 242 */ NdrFcShort( 0x0 ),  /* 0 */
/* 244 */ NdrFcShort( 0x0 ),  /* 0 */

        /* Return value */

/* 246 */ NdrFcShort( 0x70 ), /* Flags:  out, return,
base type, */
/* 248 */ NdrFcShort( 0x8 ),  /* ia64 Stack
size/offset = 8 */
/* 250 */ 0x8,                /* FC_LONG */
                              0x0,                /*
0 */

                              0x0
        }
    };

static const MIDL_TYPE_FORMAT_STRING
__MIDL_TypeFormatString =
    {
        0,
        {
                              NdrFcShort( 0x0 ),  /*
0 */
/*  2 */
                              0x12, 0x0,          /*
FC_UP */
/*  4 */  NdrFcShort( 0x3b6 ),          /* Offset=
950 (954) */
/*  6 */
                              0x2b,               /*
FC_NON_ENCAPSULATED_UNION */
                              0x9,                /*
FC_ULONG */
/*  8 */  0x7,                /* Corr desc: FC_USHORT
*/
                              0x0,                /*
*/
/* 10 */  NdrFcShort( 0xfff8 ),         /* -8 */
/* 12 */  NdrFcShort( 0x1 ),  /* Corr flags:  early,
*/
/* 14 */  NdrFcShort( 0x2 ),  /* Offset= 2 (16) */
/* 16 */  NdrFcShort( 0x10 ), /* 16 */
/* 18 */  NdrFcShort( 0x2f ), /* 47 */
/* 20 */  NdrFcLong( 0x14 ),  /* 20 */
/* 24 */  NdrFcShort( 0x800b ),         /* Simple arm
type: FC_HYPER */
/* 26 */  NdrFcLong( 0x3 ),   /* 3 */
/* 30 */  NdrFcShort( 0x8008 ),         /* Simple arm
type: FC_LONG */
/* 32 */  NdrFcLong( 0x11 ),  /* 17 */
/* 36 */  NdrFcShort( 0x8001 ),         /* Simple arm
type: FC_BYTE */
/* 38 */  NdrFcLong( 0x2 ),   /* 2 */
/* 42 */  NdrFcShort( 0x8006 ),         /* Simple arm
type: FC_SHORT */
/* 44 */  NdrFcLong( 0x4 ),   /* 4 */
/* 48 */  NdrFcShort( 0x800a ),         /* Simple arm
type: FC_FLOAT */
/* 50 */  NdrFcLong( 0x5 ),   /* 5 */
/* 54 */  NdrFcShort( 0x800c ),         /* Simple arm
type: FC_DOUBLE */
/* 56 */  NdrFcLong( 0xb ),   /* 11 */
/* 60 */  NdrFcShort( 0x8006 ),         /* Simple arm
type: FC_SHORT */
/* 62 */  NdrFcLong( 0xa ),   /* 10 */
/* 66 */  NdrFcShort( 0x8008 ),         /* Simple arm
type: FC_LONG */
/* 68 */  NdrFcLong( 0x6 ),   /* 6 */
/* 72 */  NdrFcShort( 0xe8 ), /* Offset= 232 (304) */
/* 74 */  NdrFcLong( 0x7 ),   /* 7 */
/* 78 */  NdrFcShort( 0x800c ),         /* Simple arm
type: FC_DOUBLE */
/* 80 */  NdrFcLong( 0x8 ),   /* 8 */
/* 84 */  NdrFcShort( 0xe2 ), /* Offset= 226 (310) */
/* 86 */  NdrFcLong( 0xd ),   /* 13 */
/* 90 */  NdrFcShort( 0xf6 ), /* Offset= 246 (336) */
/* 92 */  NdrFcLong( 0x9 ),   /* 9 */
/* 96 */  NdrFcShort( 0x102 ),          /* Offset=
258 (354) */
/* 98 */  NdrFcLong( 0x2000 ),          /* 8192 */
/* 102 */ NdrFcShort( 0x10e ),          /* Offset=
270 (372) */
/* 104 */ NdrFcLong( 0x24 ),  /* 36 */
/* 108 */ NdrFcShort( 0x304 ),          /* Offset=
772 (880) */
/* 110 */ NdrFcLong( 0x4024 ),          /* 16420 */
/* 114 */ NdrFcShort( 0x2fe ),          /* Offset=
766 (880) */
/* 116 */ NdrFcLong( 0x4011 ),          /* 16401 */
/* 120 */ NdrFcShort( 0x2fc ),          /* Offset=
764 (884) */
/* 122 */ NdrFcLong( 0x4002 ),          /* 16386 */
/* 126 */ NdrFcShort( 0x2fa ),          /* Offset=
762 (888) */
/* 128 */ NdrFcLong( 0x4003 ),          /* 16387 */
/* 132 */ NdrFcShort( 0x2f8 ),          /* Offset=
760 (892) */
/* 134 */ NdrFcLong( 0x4014 ),          /* 16404 */
/* 138 */ NdrFcShort( 0x2f6 ),          /* Offset=
758 (896) */
/* 140 */ NdrFcLong( 0x4004 ),          /* 16388 */
/* 144 */ NdrFcShort( 0x2f4 ),          /* Offset=
756 (900) */
/* 146 */ NdrFcLong( 0x4005 ),          /* 16389 */
/* 150 */ NdrFcShort( 0x2f2 ),          /* Offset=
754 (904) */
/* 152 */ NdrFcLong( 0x400b ),          /* 16395 */
/* 156 */ NdrFcShort( 0x2dc ),          /* Offset=
732 (888) */
/* 158 */ NdrFcLong( 0x400a ),          /* 16394 */
/* 162 */ NdrFcShort( 0x2da ),          /* Offset=
730 (892) */
/* 164 */ NdrFcLong( 0x4006 ),          /* 16390 */
/* 168 */ NdrFcShort( 0x2e4 ),          /* Offset=
740 (908) */
/* 170 */ NdrFcLong( 0x4007 ),          /* 16391 */
/* 174 */ NdrFcShort( 0x2da ),          /* Offset=
730 (904) */
/* 176 */ NdrFcLong( 0x4008 ),          /* 16392 */
/* 180 */ NdrFcShort( 0x2dc ),          /* Offset=
732 (912) */
/* 182 */ NdrFcLong( 0x400d ),          /* 16397 */
/* 186 */ NdrFcShort( 0x2da ),          /* Offset=
730 (916) */
/* 188 */ NdrFcLong( 0x4009 ),          /* 16393 */
/* 192 */ NdrFcShort( 0x2d8 ),          /* Offset=
728 (920) */
/* 194 */ NdrFcLong( 0x6000 ),          /* 24576 */
/* 198 */ NdrFcShort( 0x2d6 ),          /* Offset=
726 (924) */
/* 200 */ NdrFcLong( 0x400c ),          /* 16396 */
/* 204 */ NdrFcShort( 0x2d4 ),          /* Offset=
724 (928) */
/* 206 */ NdrFcLong( 0x10 ),  /* 16 */
/* 210 */ NdrFcShort( 0x8002 ),         /* Simple arm
type: FC_CHAR */
/* 212 */ NdrFcLong( 0x12 ),  /* 18 */
/* 216 */ NdrFcShort( 0x8006 ),         /* Simple arm
type: FC_SHORT */
/* 218 */ NdrFcLong( 0x13 ),  /* 19 */
/* 222 */ NdrFcShort( 0x8008 ),         /* Simple arm
type: FC_LONG */
/* 224 */ NdrFcLong( 0x15 ),  /* 21 */
/* 228 */ NdrFcShort( 0x800b ),         /* Simple arm
type: FC_HYPER */
/* 230 */ NdrFcLong( 0x16 ),  /* 22 */
/* 234 */ NdrFcShort( 0x8008 ),         /* Simple arm
type: FC_LONG */
/* 236 */ NdrFcLong( 0x17 ),  /* 23 */
```

```
/* 240 */ NdrFcShort( 0x8008 ),         /* Simple arm
type: FC_LONG */
/* 242 */ NdrFcLong( 0xe ),   /* 14 */
/* 246 */ NdrFcShort( 0x2b2 ),          /* Offset=
690 (936) */
/* 248 */ NdrFcLong( 0x400e ),          /* 16398 */
/* 252 */ NdrFcShort( 0x2b6 ),          /* Offset=
694 (946) */
/* 254 */ NdrFcLong( 0x4010 ),          /* 16400 */
/* 258 */ NdrFcShort( 0x2b4 ),          /* Offset=
692 (950) */
/* 260 */ NdrFcLong( 0x4012 ),          /* 16402 */
/* 264 */ NdrFcShort( 0x270 ),          /* Offset=
624 (888) */
/* 266 */ NdrFcLong( 0x4013 ),          /* 16403 */
/* 270 */ NdrFcShort( 0x26e ),          /* Offset=
622 (892) */
/* 272 */ NdrFcLong( 0x4015 ),          /* 16405 */
/* 276 */ NdrFcShort( 0x26c ),          /* Offset=
620 (896) */
/* 278 */ NdrFcLong( 0x4016 ),          /* 16406 */
/* 282 */ NdrFcShort( 0x262 ),          /* Offset=
610 (892) */
/* 284 */ NdrFcLong( 0x4017 ),          /* 16407 */
/* 288 */ NdrFcShort( 0x25c ),          /* Offset=
604 (892) */
/* 290 */ NdrFcLong( 0x0 ),   /* 0 */
/* 294 */ NdrFcShort( 0x0 ),  /* Offset= 0 (294) */
/* 296 */ NdrFcLong( 0x1 ),   /* 1 */
/* 300 */ NdrFcShort( 0x0 ),  /* Offset= 0 (300) */
/* 302 */ NdrFcShort( 0xffffffff ),     /* Offset= -1
(301) */
/* 304 */
                            0x15,               /*
FC_STRUCT */
                            0x7,                /*
7 */
/* 306 */ NdrFcShort( 0x8 ),  /* 8 */
/* 308 */ 0xb,                /* FC_HYPER */
                            0x5b,               /*
FC_END */
/* 310 */
                            0x12, 0x0,          /*
FC_UP */
/* 312 */ NdrFcShort( 0xe ),  /* Offset= 14 (326) */
/* 314 */
                            0x1b,               /*
FC_CARRAY */
                            0x1,                /*
1 */
/* 316 */ NdrFcShort( 0x2 ),  /* 2 */
/* 318 */ 0x9,                /* Corr desc: FC_ULONG
*/
                            0x0,                /*
*/
/* 320 */ NdrFcShort( 0xfffc ),         /* -4 */
/* 322 */ NdrFcShort( 0x1 ),  /* Corr flags:  early,
*/
/* 324 */ 0x6,                /* FC_SHORT */
                            0x5b,               /*
FC_END */
/* 326 */
                            0x17,               /*
FC_CSTRUCT */
                            0x3,                /*
3 */
/* 328 */ NdrFcShort( 0x8 ),  /* 8 */
/* 330 */ NdrFcShort( 0xfffffff0 ),     /* Offset= -
16 (314) */
/* 332 */ 0x8,                /* FC_LONG */
                            0x8,                /*
FC_LONG */
/* 334 */ 0x5c,               /* FC_PAD */
                            0x5b,               /*
FC_END */
/* 336 */
                            0x2f,               /*
FC_IP */
                            0x5a,               /*
FC_CONSTANT_IID */
/* 338 */ NdrFcLong( 0x0 ),   /* 0 */
/* 342 */ NdrFcShort( 0x0 ),  /* 0 */
/* 344 */ NdrFcShort( 0x0 ),  /* 0 */
/* 346 */ 0xc0,               /* 192 */
                            0x0,                /*
0 */
/* 348 */ 0x0,                /* 0 */
                            0x0,                /*
0 */
/* 350 */ 0x0,                /* 0 */
                            0x0,                /*
0 */
/* 352 */ 0x0,                /* 0 */
                            0x46,               /*
70 */
/* 354 */
                            0x2f,               /*
FC_IP */
                            0x5a,               /*
FC_CONSTANT_IID */
/* 356 */ NdrFcLong( 0x20400 ),         /* 132096 */
/* 360 */ NdrFcShort( 0x0 ),  /* 0 */
/* 362 */ NdrFcShort( 0x0 ),  /* 0 */
/* 364 */ 0xc0,               /* 192 */
                            0x0,                /*
0 */
/* 366 */ 0x0,                /* 0 */
                            0x0,                /*
0 */
/* 368 */ 0x0,                /* 0 */
                            0x0,                /*
0 */
/* 370 */ 0x0,                /* 0 */
                            0x46,               /*
70 */
/* 372 */
                            0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 374 */ NdrFcShort( 0x2 ),  /* Offset= 2 (376) */
/* 376 */
                            0x12, 0x0,          /*
FC_UP */
/* 378 */ NdrFcShort( 0x1e4 ),          /* Offset=
484 (862) */
/* 380 */
                            0x2a,               /*
FC_ENCAPSULATED_UNION */
                            0x89,               /*
137 */
/* 382 */ NdrFcShort( 0x20 ), /* 32 */
/* 384 */ NdrFcShort( 0xa ),  /* 10 */
/* 386 */ NdrFcLong( 0x8 ),   /* 8 */
/* 390 */ NdrFcShort( 0x50 ), /* Offset= 80 (470) */
/* 392 */ NdrFcLong( 0xd ),   /* 13 */
/* 396 */ NdrFcShort( 0x70 ), /* Offset= 112 (508) */
/* 398 */ NdrFcLong( 0x9 ),   /* 9 */
/* 402 */ NdrFcShort( 0x90 ), /* Offset= 144 (546) */
/* 404 */ NdrFcLong( 0xc ),   /* 12 */
/* 408 */ NdrFcShort( 0xb0 ), /* Offset= 176 (584) */
/* 410 */ NdrFcLong( 0x24 ),  /* 36 */
/* 414 */ NdrFcShort( 0x102 ),          /* Offset=
258 (672) */
/* 416 */ NdrFcLong( 0x800d ),          /* 32781 */
/* 420 */ NdrFcShort( 0x11e ),          /* Offset=
286 (706) */
/* 422 */ NdrFcLong( 0x10 ),  /* 16 */
/* 426 */ NdrFcShort( 0x138 ),          /* Offset=
312 (738) */
/* 428 */ NdrFcLong( 0x2 ),   /* 2 */
/* 432 */ NdrFcShort( 0x14e ),          /* Offset=
334 (766) */
/* 434 */ NdrFcLong( 0x3 ),   /* 3 */
/* 438 */ NdrFcShort( 0x164 ),          /* Offset=
356 (794) */
/* 440 */ NdrFcLong( 0x14 ),  /* 20 */
/* 444 */ NdrFcShort( 0x17a ),          /* Offset=
378 (822) */
/* 446 */ NdrFcShort( 0xffffffff ),     /* Offset= -1
(445) */
/* 448 */
                            0x21,               /*
FC_BOGUS_ARRAY */
                            0x3,                /*
3 */
/* 450 */ NdrFcShort( 0x0 ),  /* 0 */
/* 452 */ 0x19,               /* Corr desc:  field
pointer, FC_ULONG */
                            0x0,                /*
*/
/* 454 */ NdrFcShort( 0x0 ),  /* 0 */
/* 456 */ NdrFcShort( 0x1 ),  /* Corr flags:  early,
*/
/* 458 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 462 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 464 */
                            0x12, 0x0,          /*
FC_UP */
/* 466 */ NdrFcShort( 0xffffff74 ),     /* Offset= -
140 (326) */
/* 468 */ 0x5c,               /* FC_PAD */
                            0x5b,               /*
FC_END */
/* 470 */
```

```
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 472 */ NdrFcShort( 0x10 ), /* 16 */
/* 474 */ NdrFcShort( 0x0 ),  /* 0 */
/* 476 */ NdrFcShort( 0x6 ),  /* Offset= 6 (482) */
/* 478 */ 0x8,                /* FC_LONG */
                            0x40,               /*
FC_STRUCTPAD4 */
/* 480 */ 0x36,               /* FC_POINTER */
                            0x5b,               /*
FC_END */
/* 482 */
                            0x11, 0x0,          /*
FC_RP */
/* 484 */ NdrFcShort( 0xffffffdc ),     /* Offset= -
36 (448) */
/* 486 */
                            0x21,               /*
FC_BOGUS_ARRAY */
                            0x3,                /*
3 */
/* 488 */ NdrFcShort( 0x0 ),  /* 0 */
/* 490 */ 0x19,               /* Corr desc:  field
pointer, FC_ULONG */
                            0x0,                /*
*/
/* 492 */ NdrFcShort( 0x0 ),  /* 0 */
/* 494 */ NdrFcShort( 0x1 ),  /* Corr flags:  early,
*/
/* 496 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 500 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 502 */ 0x4c,               /* FC_EMBEDDED_COMPLEX
*/
                            0x0,                /*
0 */
/* 504 */ NdrFcShort( 0xffffff58 ),     /* Offset= -
168 (336) */
/* 506 */ 0x5c,               /* FC_PAD */
                            0x5b,               /*
FC_END */
/* 508 */
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 510 */ NdrFcShort( 0x10 ), /* 16 */
/* 512 */ NdrFcShort( 0x0 ),  /* 0 */
/* 514 */ NdrFcShort( 0x6 ),  /* Offset= 6 (520) */
/* 516 */ 0x8,                /* FC_LONG */
                            0x40,               /*
FC_STRUCTPAD4 */
/* 518 */ 0x36,               /* FC_POINTER */
                            0x5b,               /*
FC_END */
/* 520 */
                            0x11, 0x0,          /*
FC_RP */
/* 522 */ NdrFcShort( 0xffffffdc ),     /* Offset= -
36 (486) */
/* 524 */
                            0x21,               /*
FC_BOGUS_ARRAY */
                            0x3,                /*
3 */
/* 526 */ NdrFcShort( 0x0 ),  /* 0 */
/* 528 */ 0x19,               /* Corr desc:  field
pointer, FC_ULONG */
                            0x0,                /*
*/
/* 530 */ NdrFcShort( 0x0 ),  /* 0 */
/* 532 */ NdrFcShort( 0x1 ),  /* Corr flags:  early,
*/
/* 534 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 538 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 540 */ 0x4c,               /* FC_EMBEDDED_COMPLEX
*/
                            0x0,                /*
0 */
/* 542 */ NdrFcShort( 0xffffff44 ),     /* Offset= -
188 (354) */
/* 544 */ 0x5c,               /* FC_PAD */
                            0x5b,               /*
FC_END */
/* 546 */
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 548 */ NdrFcShort( 0x10 ), /* 16 */
/* 550 */ NdrFcShort( 0x0 ),  /* 0 */
/* 552 */ NdrFcShort( 0x6 ),  /* Offset= 6 (558) */
/* 554 */ 0x8,                /* FC_LONG */
                            0x40,               /*
FC_STRUCTPAD4 */
/* 556 */ 0x36,               /* FC_POINTER */
                            0x5b,               /*
FC_END */
/* 558 */
                            0x11, 0x0,          /*
FC_RP */
/* 560 */ NdrFcShort( 0xffffffdc ),     /* Offset= -
36 (524) */
/* 562 */
                            0x21,               /*
FC_BOGUS_ARRAY */
                            0x3,                /*
3 */
/* 564 */ NdrFcShort( 0x0 ),  /* 0 */
/* 566 */ 0x19,               /* Corr desc:  field
pointer, FC_ULONG */
                            0x0,                /*
*/
/* 568 */ NdrFcShort( 0x0 ),  /* 0 */
/* 570 */ NdrFcShort( 0x1 ),  /* Corr flags:  early,
*/
/* 572 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 576 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 578 */
                            0x12, 0x0,          /*
FC_UP */
/* 580 */ NdrFcShort( 0x176 ),          /* Offset=
374 (954) */
/* 582 */ 0x5c,               /* FC_PAD */
                            0x5b,               /*
FC_END */
/* 584 */
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 586 */ NdrFcShort( 0x10 ), /* 16 */
/* 588 */ NdrFcShort( 0x0 ),  /* 0 */
/* 590 */ NdrFcShort( 0x6 ),  /* Offset= 6 (596) */
/* 592 */ 0x8,                /* FC_LONG */
                            0x40,               /*
FC_STRUCTPAD4 */
/* 594 */ 0x36,               /* FC_POINTER */
                            0x5b,               /*
FC_END */
/* 596 */
                            0x11, 0x0,          /*
FC_RP */
/* 598 */ NdrFcShort( 0xffffffdc ),     /* Offset= -
36 (562) */
/* 600 */
                            0x2f,               /*
FC_IP */
                            0x5a,               /*
FC_CONSTANT_IID */
/* 602 */ NdrFcLong( 0x2f ),  /* 47 */
/* 606 */ NdrFcShort( 0x0 ),  /* 0 */
/* 608 */ NdrFcShort( 0x0 ),  /* 0 */
/* 610 */ 0xc0,               /* 192 */
                            0x0,                /*
0 */
/* 612 */ 0x0,                /* 0 */
                            0x0,                /*
0 */
/* 614 */ 0x0,                /* 0 */
                            0x0,                /*
0 */
/* 616 */ 0x0,                /* 0 */
                            0x46,               /*
70 */
/* 618 */
                            0x1b,               /*
FC_CARRAY */
                            0x0,                /*
0 */
/* 620 */ NdrFcShort( 0x1 ),  /* 1 */
/* 622 */ 0x19,               /* Corr desc:  field
pointer, FC_ULONG */
                            0x0,                /*
*/
/* 624 */ NdrFcShort( 0x4 ),  /* 4 */
/* 626 */ NdrFcShort( 0x1 ),  /* Corr flags:  early,
*/
/* 628 */ 0x1,                /* FC_BYTE */
                            0x5b,               /*
FC_END */
/* 630 */
```

```
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 632 */ NdrFcShort( 0x18 ), /* 24 */
/* 634 */ NdrFcShort( 0x0 ),  /* 0 */
/* 636 */ NdrFcShort( 0xa ),  /* Offset= 10 (646) */
/* 638 */ 0x8,                /* FC_LONG */
                            0x8,                /*
FC_LONG */
/* 640 */ 0x4c,               /* FC_EMBEDDED_COMPLEX
*/
                            0x0,                /*
0 */
/* 642 */ NdrFcShort( 0xffffffd6 ),     /* Offset= -
42 (600) */
/* 644 */ 0x36,               /* FC_POINTER */
                            0x5b,               /*
FC_END */
/* 646 */
                            0x12, 0x0,          /*
FC_UP */
/* 648 */ NdrFcShort( 0xfffffffe2 ),     /* Offset= -
30 (618) */
/* 650 */
                            0x21,               /*
FC_BOGUS_ARRAY */
                            0x3,                /*
3 */
/* 652 */ NdrFcShort( 0x0 ),  /* 0 */
/* 654 */ 0x19,               /* Corr desc:  field
pointer, FC_ULONG */
                            0x0,                /*
*/
/* 656 */ NdrFcShort( 0x0 ),  /* 0 */
/* 658 */ NdrFcShort( 0x1 ),  /* Corr flags:  early,
*/
/* 660 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 664 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 666 */
                            0x12, 0x0,          /*
FC_UP */
/* 668 */ NdrFcShort( 0xffffffda ),     /* Offset= -
38 (630) */
/* 670 */ 0x5c,               /* FC_PAD */
                            0x5b,               /*
FC_END */
/* 672 */
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 674 */ NdrFcShort( 0x10 ), /* 16 */
/* 676 */ NdrFcShort( 0x0 ),  /* 0 */
/* 678 */ NdrFcShort( 0x6 ),  /* Offset= 6 (684) */
/* 680 */ 0x8,                /* FC_LONG */
                            0x40,               /*
FC_STRUCTPAD4 */
/* 682 */ 0x36,               /* FC_POINTER */
                            0x5b,               /*
FC_END */
/* 684 */
                            0x11, 0x0,          /*
FC_RP */
/* 686 */ NdrFcShort( 0xffffffdc ),     /* Offset= -
36 (650) */
/* 688 */
                            0x1d,               /*
FC_SMFARRAY */
                            0x0,                /*
0 */
/* 690 */ NdrFcShort( 0x8 ),  /* 8 */
/* 692 */ 0x1,                /* FC_BYTE */
                            0x5b,               /*
FC_END */
/* 694 */
                            0x15,               /*
FC_STRUCT */
                            0x3,                /*
3 */
/* 696 */ NdrFcShort( 0x10 ), /* 16 */
/* 698 */ 0x8,                /* FC_LONG */
                            0x6,                /*
FC_SHORT */
/* 700 */ 0x6,                /* FC_SHORT */
                            0x4c,               /*
FC_EMBEDDED_COMPLEX */
/* 702 */ 0x0,                /* 0 */
                            NdrFcShort( 0xfffffff1
),        /* Offset= -15 (688) */
                            0x5b,               /*
FC_END */
/* 706 */
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 708 */ NdrFcShort( 0x20 ), /* 32 */
/* 710 */ NdrFcShort( 0x0 ),  /* 0 */
/* 712 */ NdrFcShort( 0xa ),  /* Offset= 10 (722) */
/* 714 */ 0x8,                /* FC_LONG */
                            0x40,               /*
FC_STRUCTPAD4 */
/* 716 */ 0x36,               /* FC_POINTER */
                            0x4c,               /*
FC_EMBEDDED_COMPLEX */
/* 718 */ 0x0,                /* 0 */
                            NdrFcShort( 0xfffffffe7
),        /* Offset= -25 (694) */
                            0x5b,               /*
FC_END */
/* 722 */
                            0x11, 0x0,          /*
FC_RP */
/* 724 */ NdrFcShort( 0xffffff12 ),     /* Offset= -
238 (486) */
/* 726 */
                            0x1b,               /*
FC_CARRAY */
                            0x0,                /*
0 */
/* 728 */ NdrFcShort( 0x1 ),  /* 1 */
/* 730 */ 0x19,               /* Corr desc:  field
pointer, FC_ULONG */
                            0x0,                /*
*/
/* 732 */ NdrFcShort( 0x0 ),  /* 0 */
/* 734 */ NdrFcShort( 0x1 ),  /* Corr flags:  early,
*/
/* 736 */ 0x1,                /* FC_BYTE */
                            0x5b,               /*
FC_END */
/* 738 */
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 740 */ NdrFcShort( 0x10 ), /* 16 */
/* 742 */ NdrFcShort( 0x0 ),  /* 0 */
/* 744 */ NdrFcShort( 0x6 ),  /* Offset= 6 (750) */
/* 746 */ 0x8,                /* FC_LONG */
                            0x40,               /*
FC_STRUCTPAD4 */
/* 748 */ 0x36,               /* FC_POINTER */
                            0x5b,               /*
FC_END */
/* 750 */
                            0x12, 0x0,          /*
FC_UP */
/* 752 */ NdrFcShort( 0xfffffff6 ),     /* Offset= -
26 (726) */
/* 754 */
                            0x1b,               /*
FC_CARRAY */
                            0x1,                /*
1 */
/* 756 */ NdrFcShort( 0x2 ),  /* 2 */
/* 758 */ 0x19,               /* Corr desc:  field
pointer, FC_ULONG */
                            0x0,                /*
*/
/* 760 */ NdrFcShort( 0x0 ),  /* 0 */
/* 762 */ NdrFcShort( 0x1 ),  /* Corr flags:  early,
*/
/* 764 */ 0x6,                /* FC_SHORT */
                            0x5b,               /*
FC_END */
/* 766 */
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 768 */ NdrFcShort( 0x10 ), /* 16 */
/* 770 */ NdrFcShort( 0x0 ),  /* 0 */
/* 772 */ NdrFcShort( 0x6 ),  /* Offset= 6 (778) */
/* 774 */ 0x8,                /* FC_LONG */
                            0x40,               /*
FC_STRUCTPAD4 */
/* 776 */ 0x36,               /* FC_POINTER */
                            0x5b,               /*
FC_END */
/* 778 */
```

```
                            0x12, 0x0,          /*
FC_UP */
/* 780 */ NdrFcShort( 0xfffffe6 ),     /* Offset= -
26 (754) */
/* 782 */
                            0x1b,               /*
FC_CARRAY */
                            0x3,                /*
3 */
/* 784 */ NdrFcShort( 0x4 ),  /* 4 */
/* 786 */ 0x19,               /* Corr desc:  field
pointer, FC_ULONG */
                            0x0,                /*
*/
/* 788 */ NdrFcShort( 0x0 ),  /* 0 */
/* 790 */ NdrFcShort( 0x1 ),  /* Corr flags:  early,
*/
/* 792 */ 0x8,                /* FC_LONG */
                            0x5b,               /*
FC_END */
/* 794 */
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 796 */ NdrFcShort( 0x10 ), /* 16 */
/* 798 */ NdrFcShort( 0x0 ),  /* 0 */
/* 800 */ NdrFcShort( 0x6 ),  /* Offset= 6 (806) */
/* 802 */ 0x8,                /* FC_LONG */
                            0x40,               /*
FC_STRUCTPAD4 */
/* 804 */ 0x36,               /* FC_POINTER */
                            0x5b,               /*
FC_END */
/* 806 */
                            0x12, 0x0,          /*
FC_UP */
/* 808 */ NdrFcShort( 0xfffffe6 ),     /* Offset= -
26 (782) */
/* 810 */
                            0x1b,               /*
FC_CARRAY */
                            0x7,                /*
7 */
/* 812 */ NdrFcShort( 0x8 ),  /* 8 */
/* 814 */ 0x19,               /* Corr desc:  field
pointer, FC_ULONG */
                            0x0,                /*
*/
/* 816 */ NdrFcShort( 0x0 ),  /* 0 */
/* 818 */ NdrFcShort( 0x1 ),  /* Corr flags:  early,
*/
/* 820 */ 0xb,                /* FC_HYPER */
                            0x5b,               /*
FC_END */
/* 822 */
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 824 */ NdrFcShort( 0x10 ), /* 16 */
/* 826 */ NdrFcShort( 0x0 ),  /* 0 */
/* 828 */ NdrFcShort( 0x6 ),  /* Offset= 6 (834) */
/* 830 */ 0x8,                /* FC_LONG */
                            0x40,               /*
FC_STRUCTPAD4 */
/* 832 */ 0x36,               /* FC_POINTER */
                            0x5b,               /*
FC_END */
/* 834 */
                            0x12, 0x0,          /*
FC_UP */
/* 836 */ NdrFcShort( 0xfffffe6 ),     /* Offset= -
26 (810) */
/* 838 */
                            0x15,               /*
FC_STRUCT */
                            0x3,                /*
3 */
/* 840 */ NdrFcShort( 0x8 ),  /* 8 */
/* 842 */ 0x8,                /* FC_LONG */
                            0x8,                /*
FC_LONG */
/* 844 */ 0x5c,               /* FC_PAD */
                            0x5b,               /*
FC_END */
/* 846 */
                            0x1b,               /*
FC_CARRAY */
                            0x3,                /*
3 */
/* 848 */ NdrFcShort( 0x8 ),  /* 8 */
/* 850 */ 0x7,                /* Corr desc: FC_USHORT
*/
                            0x0,                /*
*/
/* 852 */ NdrFcShort( 0xffc8 ),        /* -56 */
/* 854 */ NdrFcShort( 0x1 ),  /* Corr flags:  early,
*/
/* 856 */ 0x4c,               /* FC_EMBEDDED_COMPLEX
*/
                            0x0,                /*
0 */
/* 858 */ NdrFcShort( 0xfffffec ),     /* Offset= -
20 (838) */
/* 860 */ 0x5c,               /* FC_PAD */
                            0x5b,               /*
FC_END */
/* 862 */
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x3,                /*
3 */
/* 864 */ NdrFcShort( 0x38 ), /* 56 */
/* 866 */ NdrFcShort( 0xfffffec ),     /* Offset= -
20 (846) */
/* 868 */ NdrFcShort( 0x0 ),  /* Offset= 0 (868) */
/* 870 */ 0x6,                /* FC_SHORT */
                            0x6,                /*
FC_SHORT */
/* 872 */ 0x8,                /* FC_LONG */
                            0x8,                /*
FC_LONG */
/* 874 */ 0x40,               /* FC_STRUCTPAD4 */
                            0x4c,               /*
FC_EMBEDDED_COMPLEX */
/* 876 */ 0x0,                /* 0 */
                            NdrFcShort( 0xfffffe0f
),        /* Offset= -497 (380) */
                            0x5b,               /*
FC_END */
/* 880 */
                            0x12, 0x0,          /*
FC_UP */
/* 882 */ NdrFcShort( 0xffffff04 ),     /* Offset= -
252 (630) */
/* 884 */
                            0x12, 0x8,          /*
FC_UP [simple_pointer] */
/* 886 */ 0x1,                /* FC_BYTE */
                            0x5c,               /*
FC_PAD */
/* 888 */
                            0x12, 0x8,          /*
FC_UP [simple_pointer] */
/* 890 */ 0x6,                /* FC_SHORT */
                            0x5c,               /*
FC_PAD */
/* 892 */
                            0x12, 0x8,          /*
FC_UP [simple_pointer] */
/* 894 */ 0x8,                /* FC_LONG */
                            0x5c,               /*
FC_PAD */
/* 896 */
                            0x12, 0x8,          /*
FC_UP [simple_pointer] */
/* 898 */ 0xb,                /* FC_HYPER */
                            0x5c,               /*
FC_PAD */
/* 900 */
                            0x12, 0x8,          /*
FC_UP [simple_pointer] */
/* 902 */ 0xa,                /* FC_FLOAT */
                            0x5c,               /*
FC_PAD */
/* 904 */
                            0x12, 0x8,          /*
FC_UP [simple_pointer] */
/* 906 */ 0xc,                /* FC_DOUBLE */
                            0x5c,               /*
FC_PAD */
/* 908 */
                            0x12, 0x0,          /*
FC_UP */
/* 910 */ NdrFcShort( 0xfffffda2 ),     /* Offset= -
606 (304) */
/* 912 */
                            0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 914 */ NdrFcShort( 0xfffffda4 ),     /* Offset= -
604 (310) */
```

```
/* 916 */
                            0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 918 */ NdrFcShort( 0xfffffdba ),     /* Offset= -
582 (336) */
/* 920 */
                            0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 922 */ NdrFcShort( 0xfffffdc8 ),     /* Offset= -
568 (354) */
/* 924 */
                            0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 926 */ NdrFcShort( 0xfffffdd6 ),     /* Offset= -
554 (372) */
/* 928 */
                            0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 930 */ NdrFcShort( 0x2 ),  /* Offset= 2 (932) */
/* 932 */
                            0x12, 0x0,          /*
FC_UP */
/* 934 */ NdrFcShort( 0x14 ), /* Offset= 20 (954) */
/* 936 */
                            0x15,               /*
FC_STRUCT */
                            0x7,                /*
7 */
/* 938 */ NdrFcShort( 0x10 ), /* 16 */
/* 940 */ 0x6,                /* FC_SHORT */
                            0x1,                /*
FC_BYTE */
/* 942 */ 0x1,                /* FC_BYTE */
                            0x8,                /*
FC_LONG */
/* 944 */ 0xb,                /* FC_HYPER */
                            0x5b,               /*
FC_END */
/* 946 */
                            0x12, 0x0,          /*
FC_UP */
/* 948 */ NdrFcShort( 0xfffffff4 ),     /* Offset= -
12 (936) */
/* 950 */
                            0x12, 0x8,          /*
FC_UP [simple_pointer] */
/* 952 */ 0x2,                /* FC_CHAR */
                            0x5c,               /*
FC_PAD */
/* 954 */
                            0x1a,               /*
FC_BOGUS_STRUCT */
                            0x7,                /*
7 */
/* 956 */ NdrFcShort( 0x20 ), /* 32 */
/* 958 */ NdrFcShort( 0x0 ),  /* 0 */
/* 960 */ NdrFcShort( 0x0 ),  /* Offset= 0 (960) */
/* 962 */ 0x8,                /* FC_LONG */
                            0x8,                /*
FC_LONG */
/* 964 */ 0x6,                /* FC_SHORT */
                            0x6,                /*
FC_SHORT */
/* 966 */ 0x6,                /* FC_SHORT */
                            0x6,                /*
FC_SHORT */
/* 968 */ 0x4c,               /* FC_EMBEDDED_COMPLEX
*/
                            0x0,                /*
0 */
/* 970 */ NdrFcShort( 0xfffffc3c ),     /* Offset= -
964 (6) */
/* 972 */ 0x5c,               /* FC_PAD */
                            0x5b,               /*
FC_END */
/* 974 */ 0xb4,               /* FC_USER_MARSHAL */
                            0x83,               /*
131 */
/* 976 */ NdrFcShort( 0x0 ),  /* 0 */
/* 978 */ NdrFcShort( 0x18 ), /* 24 */
/* 980 */ NdrFcShort( 0x0 ),  /* 0 */
/* 982 */ NdrFcShort( 0xfffffc2c ),     /* Offset= -
980 (2) */
/* 984 */
                            0x11, 0x4,          /*
FC_RP [alloced_on_stack] */
/* 986 */ NdrFcShort( 0x6 ),  /* Offset= 6 (992) */
/* 988 */
                            0x13, 0x0,          /*
FC_OP */
/* 990 */ NdrFcShort( 0xfffffdc ),      /* Offset= -
36 (954) */
/* 992 */ 0xb4,               /* FC_USER_MARSHAL */
                            0x83,               /*
131 */
/* 994 */ NdrFcShort( 0x0 ),  /* 0 */
/* 996 */ NdrFcShort( 0x18 ), /* 24 */
/* 998 */ NdrFcShort( 0x0 ),  /* 0 */
/* 1000 */          NdrFcShort( 0xffffffc4 ),     /*
Offset= -12 (988) */

                            0x0
        }
    };

static const USER_MARSHAL_ROUTINE_QUADRUPLE
UserMarshalRoutines[ WIRE_MARSHAL_TABLE_SIZE ] =
        {

            {
            VARIANT_UserSize
            ,VARIANT_UserMarshal
            ,VARIANT_UserUnmarshal
            ,VARIANT_UserFree
            }

        };



/* Standard interface: __MIDL_itf_tpcc_com_ps_0000,
ver. 0.0,
GUID={0x00000000,0x0000,0x0000,{0x00,0x00,0x00,0x00,0
x00,0x00,0x00,0x00}} */


/* Object interface: IUnknown, ver. 0.0,
GUID={0x00000000,0x0000,0x0000,{0xC0,0x00,0x00,0x00,0
x00,0x00,0x00,0x46}} */


/* Object interface: ITPCC, ver. 0.0,
GUID={0xFEEE6AA2,0x84B1,0x11d2,{0xBA,0x47,0x00,0xC0,0
x4F,0xBF,0xE0,0x8B}} */

#pragma code_seg(".orpc")
static const unsigned short
ITPCC_FormatStringOffsetTable[] =
    {
    0,
    44,
    88,
    132,
    176,
    220
    };

static const MIDL_STUBLESS_PROXY_INFO ITPCC_ProxyInfo
=
    {
    &Object_StubDesc,
    __MIDL_ProcFormatString.Format,
    &ITPCC_FormatStringOffsetTable[-3],
    0,
    0,
    0
    };


static const MIDL_SERVER_INFO ITPCC_ServerInfo =
    {
    &Object_StubDesc,
    0,
    __MIDL_ProcFormatString.Format,
    &ITPCC_FormatStringOffsetTable[-3],
    0,
    0,
    0,
    0};
CINTERFACE_PROXY_VTABLE(9) _ITPCCProxyVtbl =
{
    &ITPCC_ProxyInfo,
    &IID_ITPCC,
    IUnknown_QueryInterface_Proxy,
    IUnknown_AddRef_Proxy,
    IUnknown_Release_Proxy ,
    (void *) (INT_PTR) -1 /* ITPCC::NewOrder */ ,
    (void *) (INT_PTR) -1 /* ITPCC::Payment */ ,
    (void *) (INT_PTR) -1 /* ITPCC::Delivery */ ,
    (void *) (INT_PTR) -1 /* ITPCC::StockLevel */ ,
```

```
    (void *) (INT_PTR) -1 /* ITPCC::OrderStatus */ ,
    (void *) (INT_PTR) -1 /* ITPCC::CallSetComplete
*/
};

const CInterfaceStubVtbl _ITPCCStubVtbl =
{
    &IID_ITPCC,
    &ITPCC_ServerInfo,
    9,
    0, /* pure interpreted */
    CStdStubBuffer_METHODS
};

static const MIDL_STUB_DESC Object_StubDesc =
    {
    0,
    NdrOleAllocate,
    NdrOleFree,
    0,
    0,
    0,
    0,
    0,
    __MIDL_TypeFormatString.Format,
    1, /* -error bounds_check flag */
    0x50002, /* Ndr library version */
    0,
    0x600015b, /* MIDL Version 6.0.347 */
    0,
    UserMarshalRoutines,
    0,  /* notify & notify_flag routine table */
    0x1, /* MIDL flag */
    0, /* cs routines */
    0,   /* proxy/server info */
    0   /* Reserved5 */
    };

const CInterfaceProxyVtbl *
_tpcc_com_ps_ProxyVtblList[] =
{
    ( CInterfaceProxyVtbl *) &_ITPCCProxyVtbl,
    0
};

const CInterfaceStubVtbl *
_tpcc_com_ps_StubVtblList[] =
{
    ( CInterfaceStubVtbl *) &_ITPCCStubVtbl,
    0
};

PCInterfaceName const
_tpcc_com_ps_InterfaceNamesList[] =
{
    "ITPCC",
    0
};

#define _tpcc_com_ps_CHECK_IID(n)
          IID_GENERIC_CHECK_IID( _tpcc_com_ps, pIID,
n)

int __stdcall _tpcc_com_ps_IID_Lookup( const IID *
pIID, int * pIndex )
{

    if(!_tpcc_com_ps_CHECK_IID(0))
        {
        *pIndex = 0;
        return 1;
        }

    return 0;
}

const ExtendedProxyFileInfo tpcc_com_ps_ProxyFileInfo
=
{
    (PCInterfaceProxyVtblList *) &
_tpcc_com_ps_ProxyVtblList,
    (PCInterfaceStubVtblList *) &
_tpcc_com_ps_StubVtblList,
    (const PCInterfaceName * ) &
_tpcc_com_ps_InterfaceNamesList,
    0, // no delegation
    & _tpcc_com_ps_IID_Lookup,
    1,
    2,
    0, /* table of [async_uuid] interfaces */
    0, /* Filler1 */
    0, /* Filler2 */
    0  /* Filler3 */
};


#endif /* defined(_M_IA64) || defined(_M_AMD64)*/
```

tpcc_com_sl.rgs

```
HKCR
{
          TPCC.StockLevel.1 = s 'StockLevel Class'
          {
                    CLSID = s '{2668369E-A50D-11D2-
BA4E-00C04FBFE08B}'
          }
          TPCC.StockLevel = s 'StockLevel Class'
          {
                    CurVer = s 'TPCC.StockLevel.1'
          }
          NoRemove CLSID
          {
                    ForceRemove {2668369E-A50D-11D2-
BA4E-00C04FBFE08B} = s 'StockLevel Class'
                    {
                              ProgID = s
'TPCC.StockLevel.1'

          VersionIndependentProgID = s
'TPCC.StockLevel'
                              InprocServer32 = s
'%MODULE%'
                              {
                                        val
ThreadingModel = s 'Both'
                              }
                    }
          }
}
```

tpcc_dblib.cpp

```
/*        FILE:                TPCC_DBLIB.CPP
 *                                        Microsoft
TPC-C Kit Ver. 4.42.000
 *                                        Copyright
Microsoft, 2002
 *             All Rights Reserved
 *
 *                                        Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *        PURPOSE:  Implements dblib calls for TPC-C
txns.
 *        Contact:  Charles Levine
(clevine@microsoft.com)
 *
 *  Change history:
 *                  4.42.000 - changed w_id fields
from short to long to support >32K warehouses
 *                  4.20.000 - updated rev number to
match kit
 *                  4.10.001 - not deleting error
class in catch handler on deadlock retry;
 *                                             not a
functional bug, but a memory leak
 *                                              - had to
tweak some declarations to compile with latest SDK;
no functional change
 */

#include <windows.h>
#include <stdio.h>
#include <assert.h>

#define DBNTWIN32
#include <sqlfront.h>
#include <sqldb.h>

#ifdef ICECAP
#include <icapexp.h>
#endif
```

```
// need to declare functions for export
#define DllDecl  __declspec( dllexport )

#include "..\..\common\src\error.h"
#include "..\..\common\src\trans.h"
#include "..\..\common\src\txn_base.h"
#include "tpcc_dblib.h"

#define   DEFCLPACKSIZE
          4096

// version string; must match return value from
tpcc_version stored proc
const char          sVersion[] = "4.20.000";

const                         iMaxRetries = 10;
          // how many retries on deadlock
static    long      iConnectionCount = 0;  // number
of current dblib connections

const int iErrOleDbProvider = 7312;
const char sErrTimeoutExpired[] = "Timeout expired";

BOOL APIENTRY DllMain(HMODULE hModule, DWORD
ul_reason_for_call, LPVOID lpReserved)
{
          switch( ul_reason_for_call )
          {
                    case DLL_PROCESS_ATTACH:

          DisableThreadLibraryCalls(hModule);
                              dbinit();           //
initialize dblib
                              break;

                    case DLL_PROCESS_DETACH:
                              dbexit();           //
close all dblib structures/connections
                              break;

                    default:
                              /* nothing */;
          }
          return TRUE;
}


int err_handler(DBPROCESS *dbproc, int severity, int
dberr, int oserr, LPCSTR dberrstr, LPCSTR oserrstr)
{
          CTPCC_DBLIB
          *pConn;

          assert(dbproc != NULL);
          pConn =
(CTPCC_DBLIB*)dbgetuserdata(dbproc);

          if (pConn != NULL)
          {
                    pConn->SetDbLibError( severity,
dberr, oserr, dberrstr, oserrstr );
          }
          return INT_CANCEL;
}

/* FUNCTION: int msg_handler(DBPROCESS *dbproc, DBINT
msgno, int msgstate, int severity, char *msgtext)
 *
 * PURPOSE:         This function handles DB-Library
SQL Server error messages
 *
 * ARGUMENTS:       DBPROCESS           *dbproc
                    DBPROCESS id pointer
 *                                      DBINT
                    msgno
          message number
 *                                      int
                                  msgstate
          message state
 *                                      int
                                  severity
          message severity
 *                                      char
                    *msgtext            printable
message description
 *
 * RETURNS:                 int
                    INT_CONTINUE        continue if
error is SQLETIME else INT_CANCEL action
 *                                  INT_CANCEL
          cancel operation
 *
 * COMMENTS:        This function also sets the dead
lock dbproc variable if necessary.
 *
 */

// typedef INT (SQLAPI *DBMSGHANDLE_PROC)(PDBPROCESS,
DBINT, INT, INT, LPCSTR, LPCSTR, LPCSTR,
DBUSMALLINT);

int msg_handler(DBPROCESS *dbproc, DBINT msgno, int
msgstate, int severity,
                                        LPCSTR
msgtext, LPCSTR srvname, LPCSTR procname, DBUSMALLINT
line)
{
          CTPCC_DBLIB
          *pConn;

          assert(dbproc != NULL);
          pConn =
(CTPCC_DBLIB*)dbgetuserdata(dbproc);

          if (pConn != NULL)
          {
                    pConn->SetSqlError( msgno,
msgstate, severity, msgtext );
          }

          return 0;
}

/* FUNCTION: void UtilStrCpy(char * pDest, char *
pSrc, int n)
 *
 * PURPOSE:         This function copies n characters
from string pSrc to pDst and places a
 *                          null character at the
end of the destination string.
 *
 * ARGUMENTS:       char
          *pDest    destination string pointer
 *                                      char
                    *pSrc     source string pointer
 *                                      int
                                  n
          number of characters to copy
 *
 * RETURNS:                 None
 *
 * COMMENTS:        Unlike strncpy this function
ensures that the result string is
 *                                  always null
terminated.
 *
 */

inline static void UtilStrCpy(char * pDest, const
BYTE * pSrc, int n)
{
    strncpy(pDest, (char *)pSrc, n);
    pDest[n] = '\0';

          return;
}

/* FUNCTION: CTPCC_DBLIB_ERR::ErrorText
 *
 */

char* CTPCC_DBLIB_ERR::ErrorText(void)
{
          int i;

          static SERRORMSG errorMsgs[] =
          {
                    { ERR_WRONG_SP_VERSION,
          "Wrong version of stored procs on database
server"   },
                    { ERR_INVALID_CUST,
          "Invalid Customer id,name."
                                                  },
                    { ERR_NO_SUCH_ORDER,
          "No orders found for customer."
                                                  },
                    { ERR_RETRIED_TRANS,
          "Retries before transaction succeeded."
                              },
                    { 0,
                              ""
```

```
        }
        };

        static char szNotFound[] = "Unknown error
number.";

        for(i=0; errorMsgs[i].szMsg[0]; i++)
        {
                if ( m_errno ==
errorMsgs[i].iError )
                        break;
        }
        if ( !errorMsgs[i].szMsg[0] )
                return szNotFound;
        else
                return errorMsgs[i].szMsg;
}

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_DBLIB* CTPCC_DBLIB_new(
        LPCSTR szServer,              // name of
SQL server
        LPCSTR szUser,                          //
user name for login
        LPCSTR szPassword,            // password
for login
        LPCSTR szHost,                          //
workstation name; shows up in sp_who; max 30 chars,
only first 10 kept by SQL Server
        LPCSTR szDatabase )           // name of
database to use
{
        return new CTPCC_DBLIB( szServer, szUser,
szPassword, szHost, szDatabase );
}


CTPCC_DBLIB::CTPCC_DBLIB (
        LPCSTR szServer,              // name of
SQL server
        LPCSTR szUser,                          //
user name for login
        LPCSTR szPassword,            // password
for login
        LPCSTR szHost,                          //
workstation name; shows up in sp_who; max 30 chars,
only first 10 kept by SQL Server
        LPCSTR szDatabase )           // name of
database to use
{
        LOGINREC  *login;
        const BYTE          *pData;

        // initialization
        m_dbproc = NULL;
        m_DbLibErr = (CDBLIBERR*)NULL;
        m_SqlErr = (CSQLERR*)NULL;

        m_MaxRetries = 10;            // how many
retries on deadlock

        // increase max number of connections if
getting close
        if ( dbgetmaxprocs() < (iConnectionCount+5)
)
        {
                if (
dbsetmaxprocs(iConnectionCount+10) == FAIL )

        ThrowError(CDBLIBERR::eDbSetMaxProcs);
        }

        // allocate a login structure
        login = dblogin();
        if (login == NULL)
                ThrowError(CDBLIBERR::eLogin);
        InterlockedIncrement( &iConnectionCount );

        // register error and message handler
functions
        if (dbprocerrhandle(login, err_handler) ==
NULL)

        ThrowError(CDBLIBERR::eDbProcHandler);

        if (dbprocmsghandle(login, msg_handler) ==
NULL)

        ThrowError(CDBLIBERR::eDbProcHandler);


        DBSETLUSER(login, szUser);
        DBSETLPWD(login, szPassword);
        DBSETLHOST(login, szHost);
        DBSETLPACKET(login, (unsigned
short)DEFCLPACKSIZE);
        DBSETLVERSION(login, DBVER60);
        // use dblib ver 6.0 client behavior

        // set time to wait for login
        if (dbsetlogintime(60) == FAIL)
                ThrowError(CDBLIBERR::eDbSet);

        // set time to wait for statement execution
        if (dbsettime(180) == FAIL)
                ThrowError(CDBLIBERR::eDbSet);

        m_dbproc = dbopen(login, szServer);

        // deallocate login structure before
checking for success
        dbfreelogin( login );

        if (m_dbproc == NULL)
                ThrowError(CDBLIBERR::eDbOpen);

        // save address of class instance so that
the message and error handler
        // can get to data.
        dbsetuserdata(m_dbproc, (LPVOID)this);

        // Use the the right database
        if (dbuse(m_dbproc, szDatabase) == FAIL)
                ThrowError(CDBLIBERR::eDbUse);

        dbcmd(m_dbproc, "set nocount on ");
                // do not return row counts
        dbcmd(m_dbproc, "set XACT_ABORT ON");
        // rollback transaction on abort

        if (dbsqlexec(m_dbproc) == FAIL)

        ThrowError(CDBLIBERR::eDbSqlExec);

        DiscardNextResults(2);

        // verify that version of stored procs on
server is correct
        dbrpcinit(m_dbproc, "tpcc_version", 0);

        if (dbrpcexec(m_dbproc) == FAIL)

        ThrowError(CDBLIBERR::eDbRpcExec);

        if (dbresults(m_dbproc) != SUCCEED)

        ThrowError(CDBLIBERR::eDbResults);

        if (dbnextrow(m_dbproc) != REG_ROW)

        ThrowError(CDBLIBERR::eDbNextRow);

        char szSrvVersion[16];
        pData=dbdata(m_dbproc, 1);
        if (pData)
                UtilStrCpy(szSrvVersion, pData,
dbdatlen(m_dbproc, 1));
        else
                szSrvVersion[0]=0;
        if (strcmp(szSrvVersion,sVersion))
                throw new CTPCC_DBLIB_ERR(
CTPCC_DBLIB_ERR::ERR_WRONG_SP_VERSION );


        DiscardNextRows(0);
        DiscardNextResults(0);
}


CTPCC_DBLIB::~CTPCC_DBLIB( void )
{
        // close db connection and deallocate
resources
        dbclose(m_dbproc);
        InterlockedDecrement( &iConnectionCount );
        if (m_DbLibErr != NULL)
                delete m_DbLibErr;
        if (m_SqlErr != NULL)
                delete m_SqlErr;
}
```

```
void CTPCC_DBLIB::SetDbLibError(int severity, int
dberr, int oserr, LPCSTR dberrstr, LPCSTR oserrstr)
{
          delete m_DbLibErr;
          m_DbLibErr = new
CDBLIBERR(CDBLIBERR::eUnknown, severity, dberr,
oserr);

          if (dberrstr != NULL)
          {
                    m_DbLibErr->m_dberrstr = new
char[ strlen(dberrstr)+1 ];
                    strcpy( m_DbLibErr->m_dberrstr,
dberrstr );
          }

          if (oserrstr != NULL)
          {
                    m_DbLibErr->m_oserrstr = new
char[ strlen(oserrstr)+1 ];
                    strcpy( m_DbLibErr->m_oserrstr,
oserrstr );
          }

}

void CTPCC_DBLIB::SetSqlError( int /*DBINT*/ msgno,
int msgstate, int severity, LPCSTR msgtext )
{
          if (m_SqlErr == NULL)
                    m_SqlErr = new CSQLERR();

          m_SqlErr->m_msgno = msgno;
          m_SqlErr->m_msgstate = msgstate;
          m_SqlErr->m_severity = severity;

          delete [] m_SqlErr->m_msgtext;
          if (msgtext != NULL)
          {
                    m_SqlErr->m_msgtext = new char[
strlen(msgtext)+1 ];
                    strcpy( m_SqlErr->m_msgtext,
msgtext );
          }
}

void CTPCC_DBLIB::ThrowError( CDBLIBERR::ACTION
eAction )
{
          // discard anything still in return buffer
          DiscardNextRows(-1);
          DiscardNextResults(-1);

          // check for SQL Server error first;  if
yes, throw it and ignore any DBLib error.
          if (m_SqlErr != NULL)
          {
                    CSQLERR             *pSqlErr;
                    pSqlErr = m_SqlErr;
                    m_SqlErr = NULL;    // clear our
pointer to instance; catch handler will delete
                    throw pSqlErr;
          }

          CDBLIBERR *pDbLibErr;
          if (m_DbLibErr == NULL)
                    // this case isn't expected to
happen, since it means that an error was returned
                    // but the error handlers were
not called.
                    pDbLibErr = new
CDBLIBERR(eAction);
          else
          {
                    pDbLibErr = m_DbLibErr;
                    pDbLibErr->m_eAction = eAction;
                    m_DbLibErr = NULL;           //
clear our pointer to instance; catch handler will
delete
          }

          throw pDbLibErr;
}

// Read and discard rows until no more.  Throw an
exception if number of rows read doesn't
// match number of rows expected.  The row count will
be ignored if the expected count value
// passed in is negative.  A typical use of this
routine is to verify that there are no more
// rows to be read.
void CTPCC_DBLIB::DiscardNextRows(int iExpectedCount)
{
          int                 iRowsRead = 0;
          RETCODE   rc;

          while (TRUE)
          {
                    rc = dbnextrow(m_dbproc);
                    if (rc == NO_MORE_ROWS)
                              break;
                    if (rc == FAIL)
                    {
                              if (iExpectedCount >=
0)

          ThrowError(CDBLIBERR::eDbNextRow);
                              else
                                        break;
                    }
                    iRowsRead++;
          }

          if ((iExpectedCount >= 0) &&
                    (iExpectedCount != iRowsRead))

          ThrowError(CDBLIBERR::eWrongRowCount);
}

// Read and discard results until no more.  Throw an
exception if number of result sets read doesn't
// match number expected.  The result set count will
be ignored if the expected count value
// passed in is negative.  A typical use of this
routine is to verify that there are no more
// result sets to be read.
void CTPCC_DBLIB::DiscardNextResults(int
iExpectedCount)
{
          int                 iResultsRead = 0;
          RETCODE   rc;

          while (TRUE)
          {
                    rc = dbresults(m_dbproc);
                    if (rc == NO_MORE_RESULTS)
                              break;
                    if (rc == FAIL)
                    {
                              if (iExpectedCount >=
0)

          ThrowError(CDBLIBERR::eDbResults);
                              else
                                        break;
                    }

                    DiscardNextRows(-1);
                    iResultsRead++;
          }

          if ((iExpectedCount >= 0) &&
                    (iExpectedCount != iResultsRead))

          ThrowError(CDBLIBERR::eWrongRowCount);
}

void CTPCC_DBLIB::StockLevel()
{
          int                           iTryCount =
0;
          const BYTE          *pData;

          ResetError();

          while (TRUE)
          {
                    try
                    {
                              dbrpcinit(m_dbproc,
"tpcc_stocklevel", 0);

                              dbrpcparam(m_dbproc,
NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.StockLevel.w_id);                // @w_id int
                              dbrpcparam(m_dbproc,
NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.StockLevel.d_id);                // @d_id
tinyint
                              dbrpcparam(m_dbproc,
NULL, 0, SQLINT2, -1, -1, (BYTE *)
```

```
&m_txn.StockLevel.threshold);   // @threshhold
smallint

                              if (dbrpcexec(m_dbproc)
== FAIL)

          ThrowError(CDBLIBERR::eDbRpcExec);

                              if (dbresults(m_dbproc)
!= SUCCEED)

          ThrowError(CDBLIBERR::eDbResults);

                              if (dbnextrow(m_dbproc)
!= REG_ROW)

          ThrowError(CDBLIBERR::eDbNextRow);

                              if
(pData=dbdata(m_dbproc, 1))

          m_txn.StockLevel.low_stock = *((long *)
pData);

                              DiscardNextRows(0);
                              DiscardNextResults(0);


          m_txn.StockLevel.exec_status_code = eOK;
                              return;
                    }
                    catch (CSQLERR *e)
                    {
                              if ((e->m_msgno == 1205
||
                                        (e->m_msgno
== iErrOleDbProvider &&
                                        strstr(e-
>m_msgtext, sErrTimeoutExpired) != NULL)) &&
                                        (++iTryCount
<= iMaxRetries))
                              {
                                        // hit
deadlock; backoff for increasingly longer period
                                        delete e;
                                        Sleep(10 *
iTryCount);
                              }
                              else
                                        throw;
                    }
          }         // while (TRUE)

          //if (iTryCount)
          //        throw new
CTPCC_DBLIB_ERR(CTPCC_DBLIB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}


void CTPCC_DBLIB::NewOrder()
{
          int                             i;
          DBINT                commit_flag;
          DBDATETIME           datetime;
          DBDATEREC daterec;

          int                             iTryCount =
0;
          const BYTE           *pData;

          ResetError();

          while (TRUE)
          {
                    try
                    {
                              dbrpcinit(m_dbproc,
"tpcc_neworder", 0);

                              dbrpcparam(m_dbproc,
NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.NewOrder.w_id);
                              dbrpcparam(m_dbproc,
NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.NewOrder.d_id);
                              dbrpcparam(m_dbproc,
NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.NewOrder.c_id);
                              dbrpcparam(m_dbproc,
NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.NewOrder.o_ol_cnt);

                              // check whether any
order lines are for a remote warehouse

          m_txn.NewOrder.o_all_local = 1;
                              for (i = 0; i <
m_txn.NewOrder.o_ol_cnt; i++)
                              {
                                        if
(m_txn.NewOrder.OL[i].ol_supply_w_id !=
m_txn.NewOrder.w_id)
                                        {

          m_txn.NewOrder.o_all_local = 0;  // at
least one remote warehouse

          break;
                                        }
                              }
                              dbrpcparam(m_dbproc,
NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.NewOrder.o_all_local);

                              for (i = 0; i <
m_txn.NewOrder.o_ol_cnt; i++)
                              {

          dbrpcparam(m_dbproc, NULL, 0, SQLINT4, -1,
-1, (BYTE *) &m_txn.NewOrder.OL[i].ol_i_id);

          dbrpcparam(m_dbproc, NULL, 0, SQLINT4, -1,
-1, (BYTE *) &m_txn.NewOrder.OL[i].ol_supply_w_id);

          dbrpcparam(m_dbproc, NULL, 0, SQLINT2, -1,
-1, (BYTE *) &m_txn.NewOrder.OL[i].ol_quantity);
                              }

                              if (dbrpcexec(m_dbproc)
== FAIL)

          ThrowError(CDBLIBERR::eDbRpcExec);


                              // Get order line
results

          m_txn.NewOrder.total_amount = 0;
                              for (i = 0;
i<m_txn.NewOrder.o_ol_cnt; i++)
                              {
                                        if
(dbresults(m_dbproc) != SUCCEED)

          ThrowError(CDBLIBERR::eDbResults);

                                        if
(dbnumcols(m_dbproc) != 5)

          ThrowError(CDBLIBERR::eWrongNumCols);

                                        if
(dbnextrow(m_dbproc) != REG_ROW)

          ThrowError(CDBLIBERR::eDbNextRow);


          if(pData=dbdata(m_dbproc, 1))

          UtilStrCpy(m_txn.NewOrder.OL[i].ol_i_name,
pData, dbdatlen(m_dbproc, 1));

          if(pData=dbdata(m_dbproc, 2))

          m_txn.NewOrder.OL[i].ol_stock =
(*(DBSMALLINT *) pData);

          if(pData=dbdata(m_dbproc, 3))

          UtilStrCpy(m_txn.NewOrder.OL[i].ol_brand_ge
neric, pData, dbdatlen(m_dbproc, 3));

          if(pData=dbdata(m_dbproc, 4))

          dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,4),

          SQLFLT8, (BYTE
*)&m_txn.NewOrder.OL[i].ol_i_price, 8);

          if(pData=dbdata(m_dbproc, 5))
```

```
        dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,5),

        SQLFLT8, (BYTE
*)&m_txn.NewOrder.OL[i].ol_amount, 8);


        m_txn.NewOrder.total_amount =
m_txn.NewOrder.total_amount +
m_txn.NewOrder.OL[i].ol_amount;


        DiscardNextRows(0);
                        }


                        // get remaining values
for w_tax, d_tax, o_id, c_last, c_discount, c_credit,
o_entry_d, commit_flag
                        if (dbresults(m_dbproc)
!= SUCCEED)

        ThrowError(CDBLIBERR::eDbResults);

                        if (dbnextrow(m_dbproc)
!= REG_ROW)

        ThrowError(CDBLIBERR::eDbNextRow);

                        if (dbnumcols(m_dbproc)
!= 8)

        ThrowError(CDBLIBERR::eWrongNumCols);

                        if
(pData=dbdata(m_dbproc, 1))




        dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,1), SQLFLT8, (BYTE
*)&m_txn.NewOrder.w_tax, 8);
                        if
(pData=dbdata(m_dbproc, 2))


        dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,2), SQLFLT8, (BYTE
*)&m_txn.NewOrder.d_tax, 8);
                        if
(pData=dbdata(m_dbproc, 3))

        m_txn.NewOrder.o_id = (*(DBINT *) pData);
                        if
(pData=dbdata(m_dbproc, 4))

        UtilStrCpy(m_txn.NewOrder.c_last, pData,
dbdatlen(m_dbproc, 4));
                        if
(pData=dbdata(m_dbproc, 5))

        dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,5), SQLFLT8, (BYTE
*)&m_txn.NewOrder.c_discount, 8);
                        if
(pData=dbdata(m_dbproc, 6))

        UtilStrCpy(m_txn.NewOrder.c_credit, pData,
dbdatlen(m_dbproc, 6));
                        if
(pData=dbdata(m_dbproc, 7))
                        {
                                datetime =
*((DBDATETIME *) pData);

        dbdatecrack(m_dbproc, &daterec, &datetime);

        m_txn.NewOrder.o_entry_d.year   =
daterec.year;

        m_txn.NewOrder.o_entry_d.month  =
daterec.month;

        m_txn.NewOrder.o_entry_d.day    =
daterec.day;

        m_txn.NewOrder.o_entry_d.hour   =
daterec.hour;

        m_txn.NewOrder.o_entry_d.minute =
daterec.minute;

        m_txn.NewOrder.o_entry_d.second =
daterec.second;
                        }
                        if
(pData=dbdata(m_dbproc, 8))
                                commit_flag =
(*(DBTINYINT *) pData);

                        DiscardNextRows(0);
                        DiscardNextResults(0);


                        if (commit_flag == 1)
                        {

        m_txn.NewOrder.total_amount *= ((1 +
m_txn.NewOrder.w_tax + m_txn.NewOrder.d_tax) * (1 -
m_txn.NewOrder.c_discount));

        m_txn.NewOrder.exec_status_code = eOK;
                        }
                        else

        m_txn.NewOrder.exec_status_code =
eInvalidItem;

                        return;
                }
                catch (CSQLERR *e)
                {
                        if ((e->m_msgno == 1205
||
                                (e->m_msgno
== iErrOleDbProvider &&
                                strstr(e-
>m_msgtext, sErrTimeoutExpired) != NULL)) &&
                                (++iTryCount
<= iMaxRetries))
                        {
                                // hit
deadlock; backoff for increasingly longer period
                                delete e;
                                Sleep(10 *
iTryCount);
                        }
                        else
                                throw;
                }
        }       // while (TRUE)

//      if (iTryCount)
//              throw new
CTPCC_DBLIB_ERR(CTPCC_DBLIB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}


void CTPCC_DBLIB::Payment()
{
        DBDATETIME          datetime;
        DBDATEREC daterec;

        int                         iTryCount =
0;
        const BYTE          *pData;

        ResetError();

        while (TRUE)
        {
                try
                {
                        dbrpcinit(m_dbproc,
"tpcc_payment", 0);

                        dbrpcparam(m_dbproc,
NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.Payment.w_id);
                        dbrpcparam(m_dbproc,
NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.Payment.c_w_id);
```

```
                        dbrpcparam(m_dbproc,
NULL, 0, SQLFLT8, -1, -1, (BYTE *)
&m_txn.Payment.h_amount);
                        dbrpcparam(m_dbproc,
NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.Payment.d_id);
                        dbrpcparam(m_dbproc,
NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.Payment.c_d_id);
                        dbrpcparam(m_dbproc,
NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.Payment.c_id);

                        // if customer id is
zero, then payment is by name
                        if (m_txn.Payment.c_id
== 0)

          dbrpcparam(m_dbproc, NULL, 0, SQLCHAR, -1,
strlen(m_txn.Payment.c_last), (unsigned char
*)m_txn.Payment.c_last);

                        if (dbrpcexec(m_dbproc)
== FAIL)

          ThrowError(CDBLIBERR::eDbRpcExec);

                        if (dbresults(m_dbproc)
!= SUCCEED)

          ThrowError(CDBLIBERR::eDbResults);

                        if (dbnextrow(m_dbproc)
!= REG_ROW)

          ThrowError(CDBLIBERR::eDbNextRow);

                        if (dbnumcols(m_dbproc)
!= 27)

          ThrowError(CDBLIBERR::eWrongNumCols);

                        if
(pData=dbdata(m_dbproc, 1))

          m_txn.Payment.c_id = *((DBINT *) pData);
                        if
(pData=dbdata(m_dbproc, 2))

          UtilStrCpy(m_txn.Payment.c_last, pData,
dbdatlen(m_dbproc, 2));
                        if
(pData=dbdata(m_dbproc, 3))
                        {
                                datetime =
*((DBDATETIME *) pData);

          dbdatecrack(m_dbproc, &daterec, &datetime);

          m_txn.Payment.h_date.year   = daterec.year;

          m_txn.Payment.h_date.month  =
daterec.month;

          m_txn.Payment.h_date.day    = daterec.day;

          m_txn.Payment.h_date.hour   = daterec.hour;

          m_txn.Payment.h_date.minute =
daterec.minute;

          m_txn.Payment.h_date.second =
daterec.second;
                        }
                        if
(pData=dbdata(m_dbproc, 4))

          UtilStrCpy(m_txn.Payment.w_street_1, pData,
dbdatlen(m_dbproc, 4));
                        if
(pData=dbdata(m_dbproc, 5))

          UtilStrCpy(m_txn.Payment.w_street_2, pData,
dbdatlen(m_dbproc, 5));
                        if
(pData=dbdata(m_dbproc, 6))

          UtilStrCpy(m_txn.Payment.w_city, pData,
dbdatlen(m_dbproc, 6));
                        if
(pData=dbdata(m_dbproc, 7))

          UtilStrCpy(m_txn.Payment.w_state, pData,
dbdatlen(m_dbproc, 7));
                        if
(pData=dbdata(m_dbproc, 8))

          UtilStrCpy(m_txn.Payment.w_zip, pData,
dbdatlen(m_dbproc, 8));
                        if
(pData=dbdata(m_dbproc, 9))

          UtilStrCpy(m_txn.Payment.d_street_1, pData,
dbdatlen(m_dbproc, 9));
                        if
(pData=dbdata(m_dbproc, 10))

          UtilStrCpy(m_txn.Payment.d_street_2, pData,
dbdatlen(m_dbproc, 10));
                        if
(pData=dbdata(m_dbproc, 11))

          UtilStrCpy(m_txn.Payment.d_city, pData,
dbdatlen(m_dbproc, 11));
                        if
(pData=dbdata(m_dbproc, 12))

          UtilStrCpy(m_txn.Payment.d_state, pData,
dbdatlen(m_dbproc, 12));
                        if
(pData=dbdata(m_dbproc, 13))

          UtilStrCpy(m_txn.Payment.d_zip, pData,
dbdatlen(m_dbproc, 13));
                        if
(pData=dbdata(m_dbproc, 14))

          UtilStrCpy(m_txn.Payment.c_first, pData,
dbdatlen(m_dbproc, 14));
                        if
(pData=dbdata(m_dbproc, 15))

          UtilStrCpy(m_txn.Payment.c_middle, pData,
dbdatlen(m_dbproc, 15));
                        if
(pData=dbdata(m_dbproc, 16))

          UtilStrCpy(m_txn.Payment.c_street_1, pData,
dbdatlen(m_dbproc, 16));
                        if
(pData=dbdata(m_dbproc, 17))

          UtilStrCpy(m_txn.Payment.c_street_2, pData,
dbdatlen(m_dbproc, 17));
                        if
(pData=dbdata(m_dbproc, 18))

          UtilStrCpy(m_txn.Payment.c_city, pData,
dbdatlen(m_dbproc, 18));
                        if
(pData=dbdata(m_dbproc, 19))

          UtilStrCpy(m_txn.Payment.c_state, pData,
dbdatlen(m_dbproc, 19));
                        if
(pData=dbdata(m_dbproc, 20))

          UtilStrCpy(m_txn.Payment.c_zip, pData,
dbdatlen(m_dbproc, 20));
                        if
(pData=dbdata(m_dbproc, 21))

          UtilStrCpy(m_txn.Payment.c_phone, pData,
dbdatlen(m_dbproc, 21));
                        if
(pData=dbdata(m_dbproc, 22))
                        {
                                datetime =
*((DBDATETIME *) pData);

          dbdatecrack(m_dbproc, &daterec, &datetime);

          m_txn.Payment.c_since.year   =
daterec.year;

          m_txn.Payment.c_since.month  =
daterec.month;

          m_txn.Payment.c_since.day    = daterec.day;

          m_txn.Payment.c_since.hour   =
daterec.hour;
```

```
        m_txn.Payment.c_since.minute =
dateрec.minute;

        m_txn.Payment.c_since.second =
dateрec.second;
                        }

        if(pData=dbdata(m_dbproc, 23))

        UtilStrCpy(m_txn.Payment.c_credit, pData,
dbdatlen(m_dbproc, 23));

        if(pData=dbdata(m_dbproc, 24))

        dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,24), SQLFLT8, (BYTE
*)&m_txn.Payment.c_credit_lim, 8);

        if(pData=dbdata(m_dbproc, 25))

        dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,25), SQLFLT8, (BYTE
*)&m_txn.Payment.c_discount, 8);

        if(pData=dbdata(m_dbproc, 26))

        dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,26), SQLFLT8, (BYTE
*)&m_txn.Payment.c_balance, 8);

        if(pData=dbdata(m_dbproc, 27))

        UtilStrCpy(m_txn.Payment.c_data, pData,
dbdatlen(m_dbproc, 27));

                        DiscardNextRows(0);
                        DiscardNextResults(0);


                        if (m_txn.Payment.c_id
== 0)
                                throw new
CTPCC_DBLIB_ERR( CTPCC_DBLIB_ERR::ERR_INVALID_CUST );
                        else

        m_txn.Payment.exec_status_code = eOK;

                        return;
                }
                catch (CSQLERR *e)
                {
                        if ((e->m_msgno == 1205
||
                                (e->m_msgno
== iErrOleDbProvider &&
                                strstr(e-
>m_msgtext, sErrTimeoutExpired) != NULL)) &&
                                (++iTryCount
<= iMaxRetries))
                        {
                                // hit
deadlock; backoff for increasingly longer period
                                delete e;
                                Sleep(10 *
iTryCount);
                        }
                        else
                                throw;
                }
        }       // while (TRUE)

//      if (iTryCount)
//              throw new
CTPCC_DBLIB_ERR(CTPCC_DBLIB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}



void CTPCC_DBLIB::OrderStatus()
{
        int                     i;
        DBDATETIME          datetime;
        DBDATEREC daterec;

        int                     iTryCount =
0;
        RETCODE             rc;
        const BYTE          *pData;

        ResetError();

        while (TRUE)
        {
                try
                {
                        dbrpcinit(m_dbproc,
"tpcc_orderstatus", 0);

                        dbrpcparam(m_dbproc,
NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.OrderStatus.w_id);
                        dbrpcparam(m_dbproc,
NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.OrderStatus.d_id);
                        dbrpcparam(m_dbproc,
NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.OrderStatus.c_id);

                        // if customer id is
zero, then order status is by name
                        if
(m_txn.OrderStatus.c_id == 0)

        dbrpcparam(m_dbproc, NULL, 0, SQLCHAR, -1,
strlen(m_txn.OrderStatus.c_last), (unsigned char
*)m_txn.OrderStatus.c_last);


                        if (dbrpcexec(m_dbproc)
== FAIL)
        ThrowError(CDBLIBERR::eDbRpcExec);

                        // Get order lines
                        if (dbresults(m_dbproc)
!= SUCCEED)
                        {
                                if
((m_DbLibErr == NULL) && (m_SqlErr == NULL))

        throw new CTPCC_DBLIB_ERR(
CTPCC_DBLIB_ERR::ERR_NO_SUCH_ORDER );
                                else

        ThrowError(CDBLIBERR::eDbResults);
                        }

                        if (dbnumcols(m_dbproc)
!= 5)

        ThrowError(CDBLIBERR::eWrongNumCols);

                        i = 0;
                        while (TRUE)
                        {
                                rc =
dbnextrow(m_dbproc);
                                if (rc ==
NO_MORE_ROWS)

        break;
                                if (rc !=
REG_ROW)

        ThrowError(CDBLIBERR::eDbNextRow);


        if(pData=dbdata(m_dbproc, 1))

        m_txn.OrderStatus.OL[i].ol_supply_w_id =
(*(DBSMALLINT *) pData);

        if(pData=dbdata(m_dbproc, 2))

        m_txn.OrderStatus.OL[i].ol_i_id = (*(DBINT
*) pData);

        if(pData=dbdata(m_dbproc, 3))

        m_txn.OrderStatus.OL[i].ol_quantity =
(*(DBSMALLINT *) pData);

        if(pData=dbdata(m_dbproc, 4))

        dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,4),

                SQLFLT8, (BYTE
*)&m_txn.OrderStatus.OL[i].ol_amount, 8);

        if(pData=dbdata(m_dbproc, 5))
```

```
                                        {

          datetime = *((DBDATETIME *) pData);

          dbdatecrack(m_dbproc, &daterec, &datetime);

          m_txn.OrderStatus.OL[i].ol_delivery_d.year
= daterec.year;

          m_txn.OrderStatus.OL[i].ol_delivery_d.month
= daterec.month;

          m_txn.OrderStatus.OL[i].ol_delivery_d.day
= daterec.day;

          m_txn.OrderStatus.OL[i].ol_delivery_d.hour
= daterec.hour;

          m_txn.OrderStatus.OL[i].ol_delivery_d.minut
e = daterec.minute;

          m_txn.OrderStatus.OL[i].ol_delivery_d.secon
d = daterec.second;
                                        }
                                        i++;
                               }

          m_txn.OrderStatus.o_ol_cnt = i;


                               if (dbresults(m_dbproc)
!= SUCCEED)

          ThrowError(CDBLIBERR::eDbResults);

                               if (dbnextrow(m_dbproc)
!= REG_ROW)

          ThrowError(CDBLIBERR::eDbNextRow);

                               if (dbnumcols(m_dbproc)
!= 8)

          ThrowError(CDBLIBERR::eWrongNumCols);


          if(pData=dbdata(m_dbproc, 1))

          m_txn.OrderStatus.c_id = (*(DBINT *)
pData);

          if(pData=dbdata(m_dbproc, 2))

          UtilStrCpy(m_txn.OrderStatus.c_last, pData,
dbdatlen(m_dbproc,2));

          if(pData=dbdata(m_dbproc, 3))

          UtilStrCpy(m_txn.OrderStatus.c_first,
pData, dbdatlen(m_dbproc,3));

          if(pData=dbdata(m_dbproc, 4))

          UtilStrCpy(m_txn.OrderStatus.c_middle,
pData, dbdatlen(m_dbproc, 4));

          if(pData=dbdata(m_dbproc, 5))
                                        {
                                                  datetime =
*((DBDATETIME *) pData);

          dbdatecrack(m_dbproc, &daterec, &datetime);

          m_txn.OrderStatus.o_entry_d.year   =
daterec.year;

          m_txn.OrderStatus.o_entry_d.month  =
daterec.month;

          m_txn.OrderStatus.o_entry_d.day    =
daterec.day;

          m_txn.OrderStatus.o_entry_d.hour   =
daterec.hour;

          m_txn.OrderStatus.o_entry_d.minute =
daterec.minute;

          m_txn.OrderStatus.o_entry_d.second =
daterec.second;
                                        }

          if(pData=dbdata(m_dbproc, 6))

          m_txn.OrderStatus.o_carrier_id =
(*(DBSMALLINT *) pData);

          if(pData=dbdata(m_dbproc, 7))

          dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,7),

            SQLFLT8, (BYTE
*)&m_txn.OrderStatus.c_balance, 8);

          if(pData=dbdata(m_dbproc, 8))

          m_txn.OrderStatus.o_id = (*(DBINT *)
pData);

                                        DiscardNextRows(0);
                                        DiscardNextResults(0);


                                        if
(m_txn.OrderStatus.o_ol_cnt == 0)
                                                  throw new
CTPCC_DBLIB_ERR( CTPCC_DBLIB_ERR::ERR_NO_SUCH_ORDER
);
                                        else if
(m_txn.OrderStatus.c_id == 0 &&
m_txn.OrderStatus.c_last[0] == 0)
                                                  throw new
CTPCC_DBLIB_ERR( CTPCC_DBLIB_ERR::ERR_INVALID_CUST );
                                        else

          m_txn.OrderStatus.exec_status_code = eOK;

                                        return;
                               }
                               catch (CSQLERR *e)
                               {
                                        if ((e->m_msgno == 1205
||
                                                  (e->m_msgno
== iErrOleDbProvider &&
                                                  strstr(e-
>m_msgtext, sErrTimeoutExpired) != NULL)) &&
                                                  (++iTryCount
<= iMaxRetries))
                                        {
                                                  // hit
deadlock; backoff for increasingly longer period
                                                  delete e;
                                                  Sleep(10 *
iTryCount);
                                        }
                                        else
                                                  throw;
                               }
          }         // while (TRUE)

//        if (iTryCount)
//                  throw new
CTPCC_DBLIB_ERR(CTPCC_DBLIB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}


void CTPCC_DBLIB::Delivery()
{
          int                       i;
          int                       iTryCount =
0;
          const BYTE          *pData;

          ResetError();

          while (TRUE)
          {
                    try
                    {
                                        dbrpcinit(m_dbproc,
"tpcc_delivery", 0);

                                        dbrpcparam(m_dbproc,
NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.Delivery.w_id);
```

```
                        dbrpcparam(m_dbproc,
NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.Delivery.o_carrier_id);

                        if (dbrpcexec(m_dbproc)
== FAIL)

          ThrowError(CDBLIBERR::eDbRpcExec);

                        if (dbresults(m_dbproc)
!= SUCCEED)

          ThrowError(CDBLIBERR::eDbResults);

                        if (dbnextrow(m_dbproc)
!= REG_ROW)

          ThrowError(CDBLIBERR::eDbNextRow);

                        if (dbnumcols(m_dbproc)
!= 10)

          ThrowError(CDBLIBERR::eWrongNumCols);

                        for (i=0; i<10; i++)
                        {
                                  if (pData =
dbdata(m_dbproc, i+1))

          m_txn.Delivery.o_id[i] = *((DBINT *)pData);
                        }

                        DiscardNextRows(0);
                        DiscardNextResults(0);


          m_txn.Delivery.exec_status_code = eOK;
                        return;
                }
                catch (CSQLERR *e)
                {
                        if ((e->m_msgno == 1205
||
                                  (e->m_msgno
== iErrOleDbProvider &&
                                  strstr(e-
>m_msgtext, sErrTimeoutExpired) != NULL)) &&
                                  (++iTryCount
<= iMaxRetries))
                        {
                                  // hit
deadlock; backoff for increasingly longer period
                                  delete e;
                                  Sleep(10 *
iTryCount);
                        }
                        else
                                  throw;
                }
          }         // while (TRUE)
```

```
//        if (iTryCount)
//                  throw new
CTPCC_DBLIB_ERR(CTPCC_DBLIB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}

void CTPCC_DBLIB::ResetError()
{
          if (m_DbLibErr != NULL)
          {
                    delete m_DbLibErr;
                    m_DbLibErr = (CDBLIBERR*)NULL;
          }

          if (m_SqlErr != NULL)
          {
                    delete m_SqlErr;
                    m_SqlErr = (CSQLERR*)NULL;
          }
          return;
}
```

tpcc_dblib.h

```
/*        FILE:               TPCC_DBLIB.H
 *                                        Microsoft
TPC-C Kit Ver. 4.20.000
 *                                        Copyright
Microsoft, 1999
 *             All Rights Reserved
 *
 *                                        Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *        PURPOSE:  Header file for TPC-C txn class
implementation.
 *
 *  Change history:
 *                  4.20.000 - updated rev number to
match kit
 */
#pragma once

#ifndef PDBPROCESS
#define DBPROCESS void   // dbprocess structure type
typedef DBPROCESS * PDBPROCESS;
#endif

// need to declare functions for import, unless
define has already been created
// by the DLL's .cpp module for export.
#ifndef DllDecl
#define DllDecl  __declspec( dllimport )
#endif

class CSQLERR : public CBaseErr
{
          public:
                    CSQLERR(void)
                    {
                              m_msgno = 0;
                              m_msgstate = 0;
                              m_severity = 0;
                              m_msgtext = NULL;
                    };

                    ~CSQLERR()
                    {
                              delete [] m_msgtext;
                    };

                    int                 m_msgno;
                    int                 m_msgstate;
                    int                 m_severity;
                    char   *m_msgtext;

                    int                 ErrorType()
{return ERR_TYPE_SQL;};
                    char*     ErrorTypeStr() { return
"SQL"; }
                    int                 ErrorNum()
{return m_msgno;};
                    char*     ErrorText() {return
m_msgtext;};

};

class CDBLIBERR : public CBaseErr
{
          public:
                    enum ACTION
                    {
                              eNone,
                              eUnknown,
                              eLogin,
                    // error from dblogin
                              eDbOpen,
          // error from dbopen
                              eDbUse,
                    // error from dbuse
                              eDbSqlExec,
                    // error from dbsqlexec
                              eDbSet,
                    // error from one of the dbset*
routines
                              eDbNextRow,
                    // error from dbnextrow
                              eWrongRowCount,
          // more or less rows returned than expected
                              eWrongNumCols,
          // more or less columns returned than
expected
                              eDbResults,
                    // error from dbresults
                              eDbRpcExec,
                    // error from dbrpcexec
                              eDbSetMaxProcs,
          // error from dbsetmaxprocs
```

```
                        eDbProcHandler
        // error from either dbprocerrhandle or
dbprocmsghandle
                };

                CDBLIBERR(ACTION eAction, int
severity = 0, int dberror = 0, int oserr = 0)
                {
                        m_eAction = eAction;
                        m_severity = severity;
                        m_dberror = dberror;
                        m_oserr = oserr;

                        m_dberrstr = NULL;
                        m_oserrstr = NULL;
                };

                ~CDBLIBERR()
                {
                        delete [] m_dberrstr;
                        delete [] m_oserrstr;
                };

                ACTION    m_eAction;
                int                m_severity;
                int                m_dberror;
                int                m_oserr;
                char   *m_dberrstr;
                char   *m_oserrstr;

                int                ErrorType()
{return ERR_TYPE_DBLIB;};
                char*     ErrorTypeStr() { return
"DBLIB"; }
                int                ErrorNum()
{return m_dberror;};
                char*     ErrorText() {return
m_dberrstr;};
                int                ErrorAction()
{ return (int)m_eAction; }

};

class CTPCC_DBLIB_ERR : public CBaseErr
{
        public:
                enum CTPCC_DBLIB_ERRS
                {
                        ERR_WRONG_SP_VERSION =
1,        // "Wrong version of stored procs on
database server"
                        ERR_INVALID_CUST,
                // "Invalid Customer id,name."
                        ERR_NO_SUCH_ORDER,
                // "No orders found for
customer."
                        ERR_RETRIED_TRANS,
                // "Retries before transaction
succeeded."
                };
```

```
                CTPCC_DBLIB_ERR( int iErr ) {
m_errno = iErr; m_iTryCount = 0; };

                CTPCC_DBLIB_ERR( int iErr, int
iTryCount ) { m_errno = iErr; m_iTryCount =
iTryCount; };

                int                m_errno;
                int                m_iTryCount;

                int                ErrorType()
{return ERR_TYPE_TPCC_DBLIB;};
                char*     ErrorTypeStr() { return
"TPCC DBLIB"; }
                int                ErrorNum()
{return m_errno;};

                char*     ErrorText();
};

class DllDecl CTPCC_DBLIB : public CTPCC_BASE
{
        private:
                // declare variables and private
functions here...
                PDBPROCESS         m_dbproc;
                CDBLIBERR *m_DbLibErr;
        // not allocated until needed (maybe never)
                CSQLERR            *m_SqlErr;
                        // not allocated until
needed (maybe never)
                int
        m_MaxRetries;              // retry
count on deadlock

                void DiscardNextRows(int
iExpectedCount);
                void DiscardNextResults(int
iExpectedCount);
                void ThrowError(
CDBLIBERR::ACTION eAction );
                void ResetError();

                union
                {
                        NEW_ORDER_DATA
        NewOrder;
                        PAYMENT_DATA
        Payment;
                        DELIVERY_DATA
        Delivery;
                        STOCK_LEVEL_DATA
        StockLevel;
                        ORDER_STATUS_DATA
        OrderStatus;
                }
        m_txn;

        public:
```

```
                CTPCC_DBLIB(LPCSTR szServer,
LPCSTR szUser, LPCSTR szPassword, LPCSTR szHost,
LPCSTR szDatabase );
                ~CTPCC_DBLIB(void);

                inline PNEW_ORDER_DATA
        BuffAddr_NewOrder()        { return
&m_txn.NewOrder;    };
                inline PPAYMENT_DATA
        BuffAddr_Payment()         { return
&m_txn.Payment;     };
                inline PDELIVERY_DATA
        BuffAddr_Delivery()        { return
&m_txn.Delivery;    };
                inline PSTOCK_LEVEL_DATA
        BuffAddr_StockLevel()      { return
&m_txn.StockLevel;  };
                inline PORDER_STATUS_DATA
        BuffAddr_OrderStatus()     { return
&m_txn.OrderStatus; };

                void NewOrder                ();
                void Payment                 ();
                void Delivery                ();
                void StockLevel              ();
                void OrderStatus    ();


                // these are public because they
must be called from the dblib err_handler and
msg_hangler
                // outside of the class
                void SetDbLibError(int severity,
int dberr, int oserr, LPCSTR dberrstr, LPCSTR
oserrstr);
                void SetSqlError( int msgno, int
msgstate, int severity, LPCSTR msgtext );

};

extern "C" DllDecl CTPCC_DBLIB* CTPCC_DBLIB_new
          ( LPCSTR szServer, LPCSTR szUser, LPCSTR
szPassword, LPCSTR szHost, LPCSTR szDatabase );

typedef CTPCC_DBLIB* (TYPE_CTPCC_DBLIB)(LPCSTR,
LPCSTR, LPCSTR, LPCSTR, LPCSTR);
```

tpcc_enc.cpp

```
// ctpcc_enc.cpp: implementation of the CTPCC_ENCINA
class.
//
//////////////////////////////////////////////////////
//////////////////

#include <windows.h>
#include <process.h>
#include <stdio.h>
#include <stdarg.h>
#include <malloc.h>
```

```
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include <sys\timeb.h>
#include <io.h>

#ifdef ICECAP
#include <icapexp.h>
#endif

// need to declare functions for export
#define DllDecl  __declspec( dllexport )

#include "..\..\common\src\trans.h"
//tpckit transaction header contains definitions of
structures specific to TPC-C
#include "..\..\common\src\error.h"
#include "..\..\common\src\txn_base.h"
#include "tpcc_enc.h"
#include "..\include\tpcc_type.h"
#include "mon_client.h"
#include "client_utils.h"

static CRITICAL_SECTION         TpCriticalSection;
extern "C" char *errFile;

BOOL APIENTRY DllMain(HANDLE hModule, DWORD
ul_reason_for_call, LPVOID lpReserved)
{

        switch( ul_reason_for_call )
        {
                case DLL_PROCESS_ATTACH:


DisableThreadLibraryCalls(hModule);

InitializeCriticalSection(&TpCriticalSection);
                        break;

                case DLL_PROCESS_DETACH:

DeleteCriticalSection(&TpCriticalSection);
                        break;

                default:
                        /* nothing */;
        }
        return TRUE;
}

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_ENCINA*
CTPCC_ENCINA_new()
{
         return new CTPCC_ENCINA();
}

// wrapper routine for enroll_client
__declspec(dllexport) CTPCC_ENCINA*
CTPCC_ENCINA_post_init()
{
          enroll_client();
          return NULL;
}

// constructor and destructor
CTPCC_ENCINA::CTPCC_ENCINA()
{
          //        Add initialization of ENCINA
Structures if any
          m_txn = (ENC_DATA
*)malloc(sizeof(ENC_DATA));
          if (m_txn == NULL)
                    throw new
CENCERR(ERR_TYPE_MEMORY, ERR_FATAL_LEVEL);
}

CTPCC_ENCINA::~CTPCC_ENCINA()
{
          // free the data structure allocated with
tpalloc
          free((char *)m_txn);
}

void CTPCC_ENCINA::NewOrder()
{

          // question: if we need to prepare the
data?
    if (send_new_order(sizeof(ENC_DATA), (unsigned
char *)m_txn) == TRPC_ERROR)
                    throw new CENCERR(TRPC_ERROR);

    if ( m_txn->ErrorType != ERR_SUCCESS )
                    throw new CENCERR( m_txn-
>ErrorType, m_txn->error );
}

void CTPCC_ENCINA::Payment()
{
    if (send_payment(sizeof(ENC_DATA), (unsigned char
*)m_txn) == TRPC_ERROR)
                    throw new CENCERR(TRPC_ERROR);

    if ( m_txn->ErrorType != ERR_SUCCESS )
                    throw new CENCERR( m_txn-
>ErrorType, m_txn->error );
}

void CTPCC_ENCINA::Delivery()
{

          // Note: Delivery txn code in the tuxedo
server does not implement logging of the delivery
          //       txn results, so cannot be used as
is to run an auditable TPC-C result.  For that
          //       reason, delivery txns should not
be done via Tuxedo.
          //       The code is included for
completeness.
          //m_txn->u.Delivery.exec_status_code =
eDeliveryFailed;
          //return;

          // Note: If we use the delivery thread in
tpcc.dll, it is not possible to get to this
          //       point for delivery txns. But if we
use Encina delivery server, the code is
          //       needed. It is suggested using the
delivery thread in tpcc.dll since it is
          //       convenient and provides best
performance.
          GetLocalTime(&m_txn-
>u.Delivery.queue_time);

    if (send_delivery(sizeof(ENC_DATA), (unsigned
char *)m_txn) == TRPC_ERROR)
                    m_txn-
>u.Delivery.exec_status_code = eDeliveryFailed;
    else
                    m_txn-
>u.Delivery.exec_status_code = eOK;
}

void CTPCC_ENCINA::StockLevel()
{

    if (send_stock_level(sizeof(ENC_DATA), (unsigned
char *)m_txn) == TRPC_ERROR)
                    throw new CENCERR(TRPC_ERROR);

    if ( m_txn->ErrorType != ERR_SUCCESS )
                    throw new CENCERR( m_txn-
>ErrorType, m_txn->error );
}

void CTPCC_ENCINA::OrderStatus()
{

    if (send_order_status(sizeof(ENC_DATA), (unsigned
char *)m_txn) == TRPC_ERROR)
                    throw new CENCERR(TRPC_ERROR);

    if ( m_txn->ErrorType != ERR_SUCCESS )
                    throw new CENCERR( m_txn-
>ErrorType, m_txn->error );
}

char *CENCERR::ErrorText()
{
          if (m_iErrorType == TRPC_ERROR)
          {
                    sprintf( m_szErrorText, "Error:
ENCINA TRPC error (see log file %s for details)",
errFile);
          }
          else
                    sprintf( m_szErrorText, "Error:
Class %d, error # %d", m_iErrorType, m_iError );
          return m_szErrorText;
};
```

tpcc_enc.h

```
/*        FILE:                 TPCC_ENCINA.H
 *                                        Microsoft
TPC-C Kit Ver. 4.10.000
 *                                        not yet
audited
 *
 *        PURPOSE:  Header file for TPC-C Encina
class implementation.
 *                                        Copyright
Microsoft, 1999
 *              All Rights Reserved
 *
 */

#if !defined(_TPCC_ENCINA_H_)
#define _TPCC_ENCINA_H_

#pragma once

// need to declare functions for import, unless
define has already been created
// by the DLL's .cpp module for export.
#ifndef DllDecl
#define DllDecl  __declspec( dllimport )
#endif

class CTPCC_ENCINA : public CTPCC_BASE
{
          private:
                    struct ENC_DATA
                    {
                              int
                              ErrorType;
                              int
                              error;

                              union
                              {

          NEW_ORDER_DATA                NewOrder;
                                        PAYMENT_DATA
                    Payment;
                                        DELIVERY_DATA
                    Delivery;

          STOCK_LEVEL_DATA    StockLevel;

          ORDER_STATUS_DATA   OrderStatus;
                              } u;
                    } *m_txn;

          public:

                    CTPCC_ENCINA();
                    virtual ~CTPCC_ENCINA();
                              inline PNEW_ORDER_DATA
                    BuffAddr_NewOrder()           { return
&m_txn->u.NewOrder;    };
                              inline PPAYMENT_DATA
                    BuffAddr_Payment()            { return
&m_txn->u.Payment;     };
                              inline PDELIVERY_DATA
                    BuffAddr_Delivery()           { return
&m_txn->u.Delivery;    };
                              inline PSTOCK_LEVEL_DATA
                    BuffAddr_StockLevel()         { return
&m_txn->u.StockLevel;  };
                              inline PORDER_STATUS_DATA
                    BuffAddr_OrderStatus()        { return
&m_txn->u.OrderStatus; };

                              void NewOrder                 ();
                              void Payment                  ();
                              void Delivery                 ();
                              void StockLevel               ();
                              void OrderStatus    ();
};


class CENCERR : public CBaseErr
{

          private:
                              char      m_szErrorText[64];
          public:
                              int                 m_errno;
                    //
                              int                 m_iErrorType;
// match ErrorType in CTPCC_ENCINA
                              int                 m_iError;
          // machine error in CTPCC_ENCINA

                              // use this interface for genuine
Encina errors
                              CENCERR( int iErr )
                              {
                                        m_errno = iErr;     //
ENCINA error
                                        m_iErrorType =
ERR_TYPE_ENCINA;
                                        m_iError = 0;       //
only meaningful if m_errno == TPEOS
                              };

                              // use this interface to
impersonate a non-Encina error type
                              CENCERR( int iErrorType, int
iError )
                              {
                                        m_iErrorType =
iErrorType;
                                        m_iError = iError;
                                        m_errno = iError;   //
???
                              }
                              // A CENCERR class can
impersonate another class, which happens if the error
                              // was not actually a Tuxedo
error, but was simply transmitted back via Tuxedo.
                              int ErrorType()
                              {
                                        return m_iErrorType;
                              }

                              int ErrorNum() {return m_errno;};
                              char *ErrorText();
};

// wrapper routine for class constructor:
extern "C" __declspec(dllexport) CTPCC_ENCINA*
CTPCC_ENCINA_new();
extern "C" __declspec(dllexport) CTPCC_ENCINA*
CTPCC_ENCINA_post_init();

typedef CTPCC_ENCINA* (TYPE_CTPCC_ENCINA)();

#endif // !defined(_TPCC_ENCINA_H_)
```

tpcc_odbc.cpp

```
/*        FILE:                 TPCC_ODBC.CPP
 *                                        Microsoft
TPC-C Kit Ver. 4.42.000
 *                                        Copyright
Microsoft, 2002
 *              All Rights Reserved
 *
 *                                        Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *        PURPOSE:  Implements ODBC calls for TPC-C
txns.
 *        Contact:  Charles Levine
(clevine@microsoft.com)
 *
 *  Change history:
 *                  4.42.000 - changed w_id fields
from short to long to support >32K warehouses
 *                  4.20.000 - updated rev number to
match kit
 *                  4.10.001 - not deleting error
class in catch handler on deadlock retry;
 *                                                  not a
functional bug, but a memory leak
 */

#include <windows.h>
#include <stdio.h>
#include <assert.h>

#define DBNTWIN32
#include <sqltypes.h>
#include <sql.h>
#include <sqlext.h>
```

```
//#define COMPILE_FOR_SNAC    // define that to
compile for SQL Native Client; comment out to use
MDAC

#ifndef COMPILE_FOR_SNAC
#include <odbcss.h>
#else
// Compile for SNAC
#include <sqlncli.h>
#endif

#ifdef ICECAP
#include <icapexp.h>
#endif

// need to declare functions for export
#define DllDecl  __declspec( dllexport )

#include "..\..\common\src\error.h"
#include "..\..\common\src\trans.h"
#include "..\..\common\src\txn_base.h"
#include "tpcc_odbc.h"

// version string; must match return value from
tpcc_version stored proc
const char          sVersion[] = "4.20.000";

const iMaxRetries = 10;                 // how many
retries on deadlock

const int iErrOleDbProvider = 7312;
const char sErrTimeoutExpired[] = "Timeout expired";

static SQLHENV henv = SQL_NULL_HENV;
                    // ODBC environment handle

BOOL APIENTRY DllMain(HMODULE hModule, DWORD
ul_reason_for_call, LPVOID lpReserved)
{
          switch( ul_reason_for_call )
          {
                    case DLL_PROCESS_ATTACH:

          DisableThreadLibraryCalls(hModule);
                              if (
SQLAllocHandleStd(SQL_HANDLE_ENV, SQL_NULL_HANDLE,
&henv) != SQL_SUCCESS )
                                        return FALSE;
                              break;

                    case DLL_PROCESS_DETACH:
                              if (henv != NULL)

          SQLFreeEnv(henv);
                              break;

                    default:
                              /* nothing */;
          }
          return TRUE;
}

/* FUNCTION: CTPCC_ODBC_ERR::ErrorText
 *
 */

char* CTPCC_ODBC_ERR::ErrorText(void)
{
          int i;

          static SERRORMSG errorMsgs[] =
          {
                    { ERR_WRONG_SP_VERSION,
          "Wrong version of stored procs on database
server"   },
                    { ERR_INVALID_CUST,
          "Invalid Customer id,name."
                                                  },
                    { ERR_NO_SUCH_ORDER,
          "No orders found for customer."
                                                  },
                    { ERR_RETRIED_TRANS,
          "Retries before transaction succeeded."
                              },
                    { 0,
                              ""



          }
          };

          static char szNotFound[] = "Unknown error
number.";

          for(i=0; errorMsgs[i].szMsg[0]; i++)
          {
                    if ( m_errno ==
errorMsgs[i].iError )
                              break;
          }
          if ( !errorMsgs[i].szMsg[0] )
                    return szNotFound;
          else
                    return errorMsgs[i].szMsg;
}

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_ODBC* CTPCC_ODBC_new(
          LPCSTR szServer,              // name of
SQL server
          LPCSTR szUser,                          //
user name for login
          LPCSTR szPassword,            // password
for login
          LPCSTR szHost,                          //
not used
          LPCSTR szDatabase,            // name of
database to use
          LPCWSTR szSPPrefix,           // prefix to
append to the stored procedure names
          BOOL bCallNoDuplicatesNewOrder ) // whether
to check for non-duplicate items in NewOrder and call
a new SP
{
          return new CTPCC_ODBC( szServer, szUser,
szPassword, szHost, szDatabase, szSPPrefix,
bCallNoDuplicatesNewOrder );
}


CTPCC_ODBC::CTPCC_ODBC (
          LPCSTR szServer,
          // name of SQL server
          LPCSTR szUser,
                    // user name for login
          LPCSTR szPassword,
          // password for login
          LPCSTR szHost,
                    // not used
          LPCSTR szDatabase,
          // name of database to use
          LPCWSTR szSPPrefix,
          // prefix to append to the stored procedure
names
          BOOL      bCallNoDuplicatesNewOrder //
whether to check for non-duplicate items in NewOrder
and call a new SP
          )
:
m_bCallNoDuplicatesNewOrder(bCallNoDuplicatesNewOrder
)
{
          RETCODE             rc;

          // initialization
          m_hdbc = SQL_NULL_HDBC;
          m_hstmt = SQL_NULL_HSTMT;

          m_hstmtNewOrder = SQL_NULL_HSTMT;
          m_hstmtPayment = SQL_NULL_HSTMT;
          m_hstmtDelivery = SQL_NULL_HSTMT;
          m_hstmtOrderStatus = SQL_NULL_HSTMT;
          m_hstmtStockLevel = SQL_NULL_HSTMT;

          m_descNewOrderCols1 = SQL_NULL_HDESC;
          m_descNewOrderCols2 = SQL_NULL_HDESC;
          m_descOrderStatusCols1 = SQL_NULL_HDESC;
          m_descOrderStatusCols2 = SQL_NULL_HDESC;

          wcsncpy(m_szSPPrefix, szSPPrefix,
sizeof(m_szSPPrefix)/sizeof(m_szSPPrefix[0]));


          if ( SQLAllocHandle(SQL_HANDLE_DBC, henv,
&m_hdbc) != SQL_SUCCESS )

          ThrowError(CODBCERR::eAllocHandle);

          if ( SQLSetConnectOption(m_hdbc,
SQL_PACKET_SIZE, 4096) != SQL_SUCCESS )
```

```
        ThrowError(CODBCERR::eConnOption);

        {
                char
        szConnectStr[256];
                char
        szOutStr[1024];
                SQLSMALLINT
        iOutStrLen;

#ifndef COMPILE_FOR_SNAC
                sprintf( szConnectStr,
"DRIVER=SQL
Server;SERVER=%s;UID=%s;PWD=%s;DATABASE=%s",
                        szServer, szUser,
szPassword, szDatabase );
#else
                // Compile for SNAC
                sprintf( szConnectStr,
"DRIVER=SQL Native
Client;SERVER=%s;UID=%s;PWD=%s;DATABASE=%s",
                        szServer, szUser,
szPassword, szDatabase );
#endif
                rc = SQLDriverConnect(m_hdbc,
NULL, (SQLCHAR*)szConnectStr, sizeof(szConnectStr),
                        (SQLCHAR*)szOutStr,
sizeof(szOutStr), &iOutStrLen, SQL_DRIVER_NOPROMPT );

                if (rc != SQL_SUCCESS && rc !=
SQL_SUCCESS_WITH_INFO)

        ThrowError(CODBCERR::eConnect);
        }

        if (SQLAllocHandle(SQL_HANDLE_STMT, m_hdbc,
&m_hstmt) != SQL_SUCCESS)

        ThrowError(CODBCERR::eAllocHandle);

        {
                char                buffer[128];

                // set some options affecting
connection behavior
                strcpy(buffer, "set nocount on
set XACT_ABORT ON");
                rc = SQLExecDirect(m_hstmt,
(unsigned char *)buffer, SQL_NTS);
                if (rc != SQL_SUCCESS && rc !=
SQL_SUCCESS_WITH_INFO)

        ThrowError(CODBCERR::eExecDirect);

                // verify that version of stored
procs on server is correct
                char db_sp_version[10];
                strcpy(buffer, "{call
tpcc_version}");
                rc = SQLExecDirect(m_hstmt,
(unsigned char *)buffer, SQL_NTS);
                if (rc != SQL_SUCCESS && rc !=
SQL_SUCCESS_WITH_INFO)

        ThrowError(CODBCERR::eExecDirect);
                if ( SQLBindCol(m_hstmt, 1,
SQL_C_CHAR, &db_sp_version, sizeof(db_sp_version),
NULL) != SQL_SUCCESS )

        ThrowError(CODBCERR::eBindCol);
                if ( SQLFetch(m_hstmt) ==
SQL_ERROR )

        ThrowError(CODBCERR::eFetch);
                if
(strcmp(db_sp_version,sVersion))
                        throw new
CTPCC_ODBC_ERR( CTPCC_ODBC_ERR::ERR_WRONG_SP_VERSION
);

                SQLFreeHandle(SQL_HANDLE_STMT,
m_hstmt);
        }

        // Bind parameters for each of the
transactions
        InitNewOrderParams();
        InitPaymentParams();
        InitOrderStatusParams();
        InitDeliveryParams();
        InitStockLevelParams();
}

CTPCC_ODBC::~CTPCC_ODBC( void )
{
        // note: descriptors are automatically
released when the connection is dropped
        SQLFreeHandle(SQL_HANDLE_STMT,
m_hstmtNewOrder);
        SQLFreeHandle(SQL_HANDLE_STMT,
m_hstmtPayment);
        SQLFreeHandle(SQL_HANDLE_STMT,
m_hstmtDelivery);
        SQLFreeHandle(SQL_HANDLE_STMT,
m_hstmtOrderStatus);
        SQLFreeHandle(SQL_HANDLE_STMT,
m_hstmtStockLevel);

        SQLDisconnect(m_hdbc);
        SQLFreeHandle(SQL_HANDLE_DBC, m_hdbc);
}

void CTPCC_ODBC::ThrowError( CODBCERR::ACTION eAction
)
{
        RETCODE             rc;
        SDWORD              lNativeError;
        char                szState[6];
        char
        szMsg[SQL_MAX_MESSAGE_LENGTH];
        char
        szTmp[6*SQL_MAX_MESSAGE_LENGTH];
        CODBCERR   *pODBCErr;
        // not allocated until needed (maybe never)

        pODBCErr = new CODBCERR();

        pODBCErr->m_NativeError = 0;
        pODBCErr->m_eAction = eAction;
        pODBCErr->m_bDeadLock = FALSE;

        szTmp[0] = 0;
        while (TRUE)
        {
                rc = SQLError(henv, m_hdbc,
m_hstmt, (BYTE *)&szState, &lNativeError,

(BYTE *)&szMsg, sizeof(szMsg), NULL);
                if (rc == SQL_NO_DATA)
                        break;

                // check for deadlock
                if (lNativeError == 1205 ||
(lNativeError == iErrOleDbProvider &&
                        strstr(szMsg,
sErrTimeoutExpired) != NULL))
                        pODBCErr->m_bDeadLock =
TRUE;

                // capture the (first) database
error
                if (pODBCErr->m_NativeError == 0
&& lNativeError != 0)
                        pODBCErr->m_NativeError
= lNativeError;

                // quit if there isn't enough
room to concatenate error text
                if ( (strlen(szMsg) + 2) >
(sizeof(szTmp) - strlen(szTmp)) )
                        break;

                // include line break after first
error msg
                if (szTmp[0] != 0)
                        strcat( szTmp, "\n");
                strcat( szTmp, szMsg );
        }

        if (pODBCErr->m_odbcerrstr != NULL)
        {
                delete [] pODBCErr->m_odbcerrstr;
                pODBCErr->m_odbcerrstr = NULL;
        }

        if (strlen(szTmp) > 0)
        {
                pODBCErr->m_odbcerrstr = new
char[ strlen(szTmp)+1 ];
                strcpy( pODBCErr->m_odbcerrstr,
szTmp );
```

```
        }

        SQLFreeStmt(m_hstmt, SQL_CLOSE);
        throw pODBCErr;
}

void CTPCC_ODBC::InitStockLevelParams()
{
        if (   SQLAllocHandle(SQL_HANDLE_STMT,
m_hdbc, &m_hstmtStockLevel) != SQL_SUCCESS )

        ThrowError(CODBCERR::eAllocHandle);

        m_hstmt = m_hstmtStockLevel;

        int i = 0;
        if (   SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.StockLevel.w_id, 0, NULL) != SQL_SUCCESS
                || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.StockLevel.d_id, 0, NULL) != SQL_SUCCESS
                || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SSHORT, SQL_SMALLINT, 0, 0,
&m_txn.StockLevel.threshold, 0, NULL) != SQL_SUCCESS
                )
                ThrowError(CODBCERR::eBindParam);

        if ( SQLBindCol(m_hstmt, 1, SQL_C_SLONG,
&m_txn.StockLevel.low_stock, 0, NULL) != SQL_SUCCESS
)
                ThrowError(CODBCERR::eBindCol);

        //Compose Stock Level statement
        _snwprintf(m_szStockLevelCommand,
sizeof(m_szStockLevelCommand)/sizeof(m_szStockLevelCo
mmand[0]),
                L"{call %stpcc_stocklevel
(?,?,?)}", m_szSPPrefix);
}

void CTPCC_ODBC::StockLevel()
{
        RETCODE             rc;
        int                         iTryCount =
0;

        m_hstmt = m_hstmtStockLevel;

        while (TRUE)
        {
                try
                {
                        rc =
SQLExecDirectW(m_hstmt, m_szStockLevelCommand,
SQL_NTS);
                        if (rc != SQL_SUCCESS
&& rc != SQL_SUCCESS_WITH_INFO)

        ThrowError(CODBCERR::eExecDirect);
                        if ( SQLFetch(m_hstmt)
== SQL_ERROR )

        ThrowError(CODBCERR::eFetch);

                        SQLFreeStmt(m_hstmt,
SQL_CLOSE);


        m_txn.StockLevel.exec_status_code = eOK;
                        break;
                }
                catch (CODBCERR *e)
                {
                        if ((!e->m_bDeadLock)
|| (++iTryCount > iMaxRetries))
                                throw;

                        // hit deadlock;
backoff for increasingly longer period
                        delete e;
                        Sleep(10 * iTryCount);
                }
        }

//      if (iTryCount)
//              throw new
CTPCC_ODBC_ERR(CTPCC_ODBC_ERR::ERR_RETRIED_TRANS,
iTryCount);
}

void CTPCC_ODBC::InitNewOrderParams()
{
        if (   SQLAllocHandle(SQL_HANDLE_STMT,
m_hdbc, &m_hstmtNewOrder) != SQL_SUCCESS
                ||
SQLAllocHandle(SQL_HANDLE_STMT, m_hdbc,
&m_hstmtNewOrderNoDuplicates) != SQL_SUCCESS
                ||
SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc,
&m_descNewOrderCols1) != SQL_SUCCESS
                ||
SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc,
&m_descNewOrderCols2) != SQL_SUCCESS
                ||
SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc,
&m_descNewOrderNoDuplicatesCols1) != SQL_SUCCESS
                ||
SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc,
&m_descNewOrderNoDuplicatesCols2) != SQL_SUCCESS
                )

        ThrowError(CODBCERR::eAllocHandle);

        m_hstmt = m_hstmtNewOrder;

        if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC, m_descNewOrderCols1,
SQL_IS_POINTER ) != SQL_SUCCESS )

        ThrowError(CODBCERR::eSetStmtAttr);
        int i = 0;
        if (   SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.NewOrder.w_id, 0, NULL) != SQL_SUCCESS
                || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.NewOrder.d_id, 0, NULL) != SQL_SUCCESS
                || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.NewOrder.c_id, 0, NULL) != SQL_SUCCESS
                || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.NewOrder.o_ol_cnt, 0, NULL) != SQL_SUCCESS
                || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.NewOrder.o_all_local, 0, NULL) != SQL_SUCCESS
                )
                ThrowError(CODBCERR::eBindParam);

        for (int j=0; j<MAX_OL_NEW_ORDER_ITEMS;
j++)
        {
                if (   SQLBindParameter(m_hstmt,
++i, SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.NewOrder.OL[j].ol_i_id, 0, NULL) !=
SQL_SUCCESS
                        ||
SQLBindParameter(m_hstmt, ++i, SQL_PARAM_INPUT,
SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.NewOrder.OL[j].ol_supply_w_id, 0, NULL) !=
SQL_SUCCESS
                        ||
SQLBindParameter(m_hstmt, ++i, SQL_PARAM_INPUT,
SQL_C_SSHORT, SQL_SMALLINT, 0, 0,
&m_txn.NewOrder.OL[j].ol_quantity, 0, NULL) !=
SQL_SUCCESS
                        )

        ThrowError(CODBCERR::eBindParam);
        }

        // set the bind offset pointer
        if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_ROW_BIND_OFFSET_PTR, &m_BindOffset,
SQL_IS_POINTER ) != SQL_SUCCESS )

        ThrowError(CODBCERR::eSetStmtAttr);

        i = 0;
        if (   SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.NewOrder.OL[0].ol_i_name,
sizeof(m_txn.NewOrder.OL[0].ol_i_name), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_SSHORT, &m_txn.NewOrder.OL[0].ol_stock, 0,
NULL) != SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,   &m_txn.NewOrder.OL[0].ol_brand_generic,
sizeof(m_txn.NewOrder.OL[0].ol_brand_generic), NULL)
!= SQL_SUCCESS
```

```
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE, &m_txn.NewOrder.OL[0].ol_i_price, 0,
NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE, &m_txn.NewOrder.OL[0].ol_amount, 0,
NULL) != SQL_SUCCESS
                    )
                    ThrowError(CODBCERR::eBindCol);

          // associate the column bindings for the
second result set
          if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC, m_descNewOrderCols2,
SQL_IS_POINTER ) != SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

          i = 0;
          if (   SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE,    &m_txn.NewOrder.w_tax, 0, NULL) !=
SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE,    &m_txn.NewOrder.d_tax, 0, NULL) !=
SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_SLONG,     &m_txn.NewOrder.o_id, 0, NULL) !=
SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.NewOrder.c_last,
sizeof(m_txn.NewOrder.c_last), NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE,    &m_txn.NewOrder.c_discount, 0, NULL)
!= SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.NewOrder.c_credit,
sizeof(m_txn.NewOrder.c_credit), NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_TYPE_TIMESTAMP, &m_txn.NewOrder.o_entry_d, 0,
NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_SLONG,     &m_no_commit_flag, 0, NULL) !=
SQL_SUCCESS
               )
                    ThrowError(CODBCERR::eBindCol);

          //Compose the New Order statement
          _snwprintf(m_szNewOrderCommand,
sizeof(m_szNewOrderCommand)/sizeof(m_szNewOrderComman
d[0]),
                       // 0         1         2
                       //
012345678901234567890123456789
                              L"{call
%stpcc_neworder(?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?
,?,?,?,?,?,?,"

          L"?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?
,?,?,?,?)}", m_szSPPrefix);

          m_iBeginNewOrderVariablePart = 29 +
wcslen(m_szSPPrefix);         // fixed part + prefix
part

          ////////////////////////////////////////
////////////////////////////////////////
          //
          //        Now initialize New Order that
works on no duplicate (w_id,i_id) pairs
          //        and returns one result set for
lineitem details.
          //
          //
          m_hstmt = m_hstmtNewOrderNoDuplicates;

          if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC,
m_descNewOrderNoDuplicatesCols1, SQL_IS_POINTER ) !=
SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

          i = 0;
          if (   SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.NewOrder.w_id, 0, NULL) != SQL_SUCCESS
                    || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.NewOrder.d_id, 0, NULL) != SQL_SUCCESS
                    || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.NewOrder.c_id, 0, NULL) != SQL_SUCCESS
                    || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.NewOrder.o_ol_cnt, 0, NULL) != SQL_SUCCESS
                    || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.NewOrder.o_all_local, 0, NULL) != SQL_SUCCESS
                    )
                    ThrowError(CODBCERR::eBindParam);

          for (int j=0; j<MAX_OL_NEW_ORDER_ITEMS;
j++)
          {
                    if (   SQLBindParameter(m_hstmt,
++i, SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.NewOrder.OL[j].ol_i_id, 0, NULL) !=
SQL_SUCCESS
                              ||
SQLBindParameter(m_hstmt, ++i, SQL_PARAM_INPUT,
SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.NewOrder.OL[j].ol_supply_w_id, 0, NULL) !=
SQL_SUCCESS
                              ||
SQLBindParameter(m_hstmt, ++i, SQL_PARAM_INPUT,
SQL_C_SSHORT, SQL_SMALLINT, 0, 0,
&m_txn.NewOrder.OL[j].ol_quantity, 0, NULL) !=
SQL_SUCCESS
                              )

          ThrowError(CODBCERR::eBindParam);

          }

          // set row-wise binding
          if (   SQLSetStmtAttrW(m_hstmt,
SQL_ATTR_ROW_BIND_TYPE,
(SQLPOINTER)sizeof(m_txn.NewOrder.OL[0]),
SQL_IS_UINTEGER) != SQL_SUCCESS
                    || SQLSetStmtAttrW(m_hstmt,
SQL_ATTR_ROWS_FETCHED_PTR, &m_RowsFetched, 0) !=
SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

          i = 0;
          if (   SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.NewOrder.OL[0].ol_i_name,
sizeof(m_txn.NewOrder.OL[0].ol_i_name), NULL) !=
SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_SSHORT, &m_txn.NewOrder.OL[0].ol_stock, 0,
NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,   &m_txn.NewOrder.OL[0].ol_brand_generic,
sizeof(m_txn.NewOrder.OL[0].ol_brand_generic), NULL)
!= SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE, &m_txn.NewOrder.OL[0].ol_i_price, 0,
NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE, &m_txn.NewOrder.OL[0].ol_amount, 0,
NULL) != SQL_SUCCESS
                    )
                    ThrowError(CODBCERR::eBindCol);

          // associate the column bindings for the
second result set
          if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC,
m_descNewOrderNoDuplicatesCols2, SQL_IS_POINTER ) !=
SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

          i = 0;
          if (   SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE,    &m_txn.NewOrder.w_tax, 0, NULL) !=
SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE,    &m_txn.NewOrder.d_tax, 0, NULL) !=
SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_SLONG,     &m_txn.NewOrder.o_id, 0, NULL) !=
SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.NewOrder.c_last,
sizeof(m_txn.NewOrder.c_last), NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE,    &m_txn.NewOrder.c_discount, 0, NULL)
!= SQL_SUCCESS
```

```
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,     &m_txn.NewOrder.c_credit,
sizeof(m_txn.NewOrder.c_credit), NULL) != SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_TYPE_TIMESTAMP, &m_txn.NewOrder.o_entry_d, 0,
NULL) != SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_SLONG,    &m_no_commit_flag, 0, NULL) !=
SQL_SUCCESS
            )
                ThrowError(CODBCERR::eBindCol);

        //Compose the New Order statement
        _snwprintf(m_szNewOrderNoDuplicatesCommand,
sizeof(m_szNewOrderNoDuplicatesCommand)/sizeof(m_szNe
wOrderNoDuplicatesCommand[0]),
                        L"{call
%stpcc_neworder_new(?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?
,?,?,?,?,?,?,?,?,"

        L"?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?
,?,?,?,?)}", m_szSPPrefix);

        m_iBeginNewOrderNoDuplicatesVariablePart =
33 + wcslen(m_szSPPrefix);    // fixed part + prefix
part
}

//
//      Returns true if there are duplicate
(warehouse_id, item_id)
//      lineitem pairs in New Order input
parameters.
//
bool CTPCC_ODBC::DuplicatesInNewOrder()
{
        int i, j;

        for (i = 0; i < m_txn.NewOrder.o_ol_cnt;
++i)
        {
                for (j = i+1; j<
m_txn.NewOrder.o_ol_cnt; ++j)
                {
                        if
(m_txn.NewOrder.OL[i].ol_i_id ==
m_txn.NewOrder.OL[j].ol_i_id)
                        {
                                return true;
                        }
                }
        }

        return false;
}

void CTPCC_ODBC::NewOrder()
{
        if (m_bCallNoDuplicatesNewOrder)
        {
                if (DuplicatesInNewOrder())
                {
                        NewOrderDuplicates();
                }
                else
                {
                        NewOrderNoDuplicates();
                }
        }
        else
        {
                NewOrderDuplicates();
        }
}

void CTPCC_ODBC::NewOrderDuplicates()
{
        int
        i;
        RETCODE                                 rc;
        int
        iTryCount = 0;

                                                //
0       1       2

                                                //
01234567890123456789012345678 9
        wchar_t
        szSqlTemplate[iMAX_SP_NAME_LEN];

                                                //= L"{call
tpcc_neworder(?,?,?,?,?,"

                                                //
L"?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,"

                                                //
L"?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,"

                                                //
L"?,?,?,?,?,?,?,?,?,?,?,?,?,?)}";

        m_hstmt = m_hstmtNewOrder;

        // associate the parameter and column
bindings for this transaction
        if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC, m_descNewOrderCols1,
SQL_IS_POINTER ) != SQL_SUCCESS )

        ThrowError(CODBCERR::eSetStmtAttr);

        // clip statement buffer based on number of
parameters
        // fixed part is 29 chars and variable part
is 6 chars per line item
        wcscpy(szSqlTemplate, m_szNewOrderCommand);
        i = m_iBeginNewOrderVariablePart +
m_txn.NewOrder.o_ol_cnt*6;
        wcscpy( &szSqlTemplate[i], L")}" );

        // check whether any order lines are for a
remote warehouse
        m_txn.NewOrder.o_all_local = 1;
        for (i = 0; i < m_txn.NewOrder.o_ol_cnt;
i++)
        {
                if
(m_txn.NewOrder.OL[i].ol_supply_w_id !=
m_txn.NewOrder.w_id)
                {

        m_txn.NewOrder.o_all_local = 0;  // at
least one remote warehouse
                        break;
                }
        }

        while (TRUE)
        {
                try
                {
                        m_BindOffset = 0;
                        rc =
SQLExecDirectW(m_hstmt, szSqlTemplate, SQL_NTS);
                        if (rc != SQL_SUCCESS
&& rc != SQL_SUCCESS_WITH_INFO)

        ThrowError(CODBCERR::eExecDirect);

                        // Get order line
results

        m_txn.NewOrder.total_amount = 0;
                        for (i = 0;
i<m_txn.NewOrder.o_ol_cnt; i++)
                        {
                                // set the
bind offset value...
                                m_BindOffset
= i * sizeof(m_txn.NewOrder.OL[0]);

                                if (
SQLFetch(m_hstmt) == SQL_ERROR)

        ThrowError(CODBCERR::eFetch);

                                // move to
the next resultset
                                if (
SQLMoreResults(m_hstmt) == SQL_ERROR )

        ThrowError(CODBCERR::eMoreResults);


        m_txn.NewOrder.total_amount +=
m_txn.NewOrder.OL[i].ol_amount;
                        }

                        // associate the column
bindings for the second result set
```

```
                        if ( SQLSetStmtAttrW(
m_hstmt, SQL_ATTR_APP_ROW_DESC, m_descNewOrderCols2,
SQL_IS_POINTER ) != SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

                        if ( SQLFetch(m_hstmt)
== SQL_ERROR)

          ThrowError(CODBCERR::eFetch);

                        SQLFreeStmt(m_hstmt,
SQL_CLOSE);

                        if (m_no_commit_flag ==
1)
                        {

          m_txn.NewOrder.total_amount *= ((1 +
m_txn.NewOrder.w_tax + m_txn.NewOrder.d_tax) * (1 -
m_txn.NewOrder.c_discount));

          m_txn.NewOrder.exec_status_code = eOK;
                        }
                        else

          m_txn.NewOrder.exec_status_code =
eInvalidItem;

                        break;
                    }
                    catch (CODBCERR *e)
                    {
                        if ((!e->m_bDeadLock)
|| (++iTryCount > iMaxRetries))
                            throw;

                        // hit deadlock;
backoff for increasingly longer period
                        delete e;
                        Sleep(10 * iTryCount);
                    }
          }

//        if (iTryCount)
//            throw new
CTPCC_ODBC_ERR(CTPCC_ODBC_ERR::ERR_RETRIED_TRANS,
iTryCount);
}

//
//        No lineitem duplicates optimized version.
//
void CTPCC_ODBC::NewOrderNoDuplicates()
{
          int
          i;
          RETCODE                                rc;
          int
          iTryCount = 0;

                                                  //
0         1         2         3

                                                  //
01234567890123456789012345678901234567890123
          wchar_t
          szSqlTemplate[iMAX_SP_NAME_LEN];

                                                  //= L"{call
tpcc_neworder_new(?,?,?,?,?,?,"

                                                  //
L"?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,"

                                                  //
L"?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,"

                                                  //
L"?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,?)}";

          m_hstmt = m_hstmtNewOrderNoDuplicates;

          // associate the parameter and column
bindings for this transaction
          if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC,
m_descNewOrderNoDuplicatesCols1, SQL_IS_POINTER ) !=
SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

          // clip statement buffer based on number of
parameters
          // fixed part is 33 chars and variable part
is 6 chars per line item
          wcscpy(szSqlTemplate,
m_szNewOrderNoDuplicatesCommand);
          i =
m_iBeginNewOrderNoDuplicatesVariablePart +
m_txn.NewOrder.o_ol_cnt*6;
          wcscpy( &szSqlTemplate[i], L")}" );

          // check whether any order lines are for a
remote warehouse
          m_txn.NewOrder.o_all_local = 1;
          for (i = 0; i < m_txn.NewOrder.o_ol_cnt;
i++)
          {
                    if
(m_txn.NewOrder.OL[i].ol_supply_w_id !=
m_txn.NewOrder.w_id)
                    {

          m_txn.NewOrder.o_all_local = 0;  // at
least one remote warehouse
                              break;
                    }
          }

          while (TRUE)
          {
                    try
                    {
                              // configure block
cursor
                              if (
SQLSetStmtAttrW(m_hstmt, SQL_ATTR_ROW_ARRAY_SIZE,
(SQLPOINTER)1, 0) != SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

                              rc =
SQLExecDirectW(m_hstmt, szSqlTemplate, SQL_NTS);
                              if (rc != SQL_SUCCESS
&& rc != SQL_SUCCESS_WITH_INFO)

          ThrowError(CODBCERR::eExecDirect);

                              // configure block
cursor
                              if
(SQLSetStmtAttrW(m_hstmt, SQL_ATTR_ROW_ARRAY_SIZE,
(SQLPOINTER)MAX_OL_NEW_ORDER_ITEMS, 0) !=
SQL_SUCCESS)

          ThrowError(CODBCERR::eSetStmtAttr);

                              // Get order line
results
                              if ( SQLFetch(m_hstmt)
== SQL_ERROR)

          ThrowError(CODBCERR::eFetch);



          m_txn.NewOrder.total_amount = 0;
                              for (i = 0;
i<m_txn.NewOrder.o_ol_cnt; i++)
                              {


          m_txn.NewOrder.total_amount +=
m_txn.NewOrder.OL[i].ol_amount;
                              }

                              // associate the column
bindings for the second result set
                              if ( SQLSetStmtAttrW(
m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descNewOrderNoDuplicatesCols2, SQL_IS_POINTER ) !=
SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

                              // move to the next
resultset
                              if (
SQLMoreResults(m_hstmt) == SQL_ERROR )

          ThrowError(CODBCERR::eMoreResults);
```

```
                        if ( SQLFetch(m_hstmt)
== SQL_ERROR)

          ThrowError(CODBCERR::eFetch);

                        SQLFreeStmt(m_hstmt,
SQL_CLOSE);

                        if (m_no_commit_flag ==
1)
                        {

          m_txn.NewOrder.total_amount *= ((1 +
m_txn.NewOrder.w_tax + m_txn.NewOrder.d_tax) * (1 -
m_txn.NewOrder.c_discount));

          m_txn.NewOrder.exec_status_code = eOK;
                        }
                        else

          m_txn.NewOrder.exec_status_code =
eInvalidItem;

                        break;
                }
                catch (CODBCERR *e)
                {
                        if ((!e->m_bDeadLock)
|| (++iTryCount > iMaxRetries))
                                throw;

                        // hit deadlock;
backoff for increasingly longer period
                        delete e;
                        Sleep(10 * iTryCount);
                }
          }

//        if (iTryCount)
//                throw new
CTPCC_ODBC_ERR(CTPCC_ODBC_ERR::ERR_RETRIED_TRANS,
iTryCount);
}

void CTPCC_ODBC::InitPaymentParams()
{
          if (   SQLAllocHandle(SQL_HANDLE_STMT,
m_hdbc, &m_hstmtPayment) != SQL_SUCCESS )

          ThrowError(CODBCERR::eAllocHandle);

          m_hstmt = m_hstmtPayment;

          int i = 0;
          if (   SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.Payment.w_id, 0, NULL) != SQL_SUCCESS
                || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.Payment.c_w_id, 0, NULL) != SQL_SUCCESS
                || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_DOUBLE, SQL_NUMERIC, 6, 2,
&m_txn.Payment.h_amount, 0, NULL) != SQL_SUCCESS
                || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.Payment.d_id, 0, NULL) != SQL_SUCCESS
                || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.Payment.c_d_id, 0, NULL) != SQL_SUCCESS
                || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.Payment.c_id, 0, NULL) != SQL_SUCCESS
                || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_CHAR, SQL_CHAR,
sizeof(m_txn.Payment.c_last), 0,
&m_txn.Payment.c_last, sizeof(m_txn.Payment.c_last),
NULL) != SQL_SUCCESS
                )
                ThrowError(CODBCERR::eBindParam);

          i = 0;
          if (   SQLBindCol(m_hstmt, ++i,
SQL_C_SLONG,     &m_txn.Payment.c_id,            0,
NULL) != SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.c_last,
          sizeof(m_txn.Payment.c_last), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_TYPE_TIMESTAMP, &m_txn.Payment.h_date,
          0, NULL) != SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.w_street_1,
          sizeof(m_txn.Payment.w_street_1), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.w_street_2,
          sizeof(m_txn.Payment.w_street_2), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.w_city,
          sizeof(m_txn.Payment.w_city), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.w_state,
          sizeof(m_txn.Payment.w_state), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.w_zip,
          sizeof(m_txn.Payment.w_zip), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.d_street_1,
          sizeof(m_txn.Payment.d_street_1), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.d_street_2,
          sizeof(m_txn.Payment.d_street_2), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.d_city,
          sizeof(m_txn.Payment.d_city), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.d_state,
          sizeof(m_txn.Payment.d_state), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.d_zip,
          sizeof(m_txn.Payment.d_zip), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.c_first,
          sizeof(m_txn.Payment.c_first), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.c_middle,
          sizeof(m_txn.Payment.c_middle), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.c_street_1,
          sizeof(m_txn.Payment.c_street_1), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.c_street_2,
          sizeof(m_txn.Payment.c_street_2), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.c_city,
          sizeof(m_txn.Payment.c_city), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.c_state,
          sizeof(m_txn.Payment.c_state), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.c_zip,
          sizeof(m_txn.Payment.c_zip), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.c_phone,
          sizeof(m_txn.Payment.c_phone), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_TYPE_TIMESTAMP, &m_txn.Payment.c_since,
          0, NULL) != SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.c_credit,
          sizeof(m_txn.Payment.c_credit), NULL) !=
SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE,    &m_txn.Payment.c_credit_lim,0, NULL)
!= SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE,    &m_txn.Payment.c_discount,       0,
NULL) != SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE,    &m_txn.Payment.c_balance,        0,
NULL) != SQL_SUCCESS
                || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR,      &m_txn.Payment.c_data,
```

```
        sizeof(m_txn.Payment.c_data), NULL) !=
SQL_SUCCESS
                    )
                    ThrowError(CODBCERR::eBindCol);

          //Compose Payment statement
          _snwprintf(m_szPaymentCommand,
sizeof(m_szPaymentCommand)/sizeof(m_szPaymentCommand[
0]),
                    L"{call %stpcc_payment
(?,?,?,?,?,?,?,?)}", m_szSPPrefix);
}

void CTPCC_ODBC::Payment()
{
          RETCODE             rc;
          int                           iTryCount =
0;

          m_hstmt = m_hstmtPayment;

          if (m_txn.Payment.c_id != 0)
                    m_txn.Payment.c_last[0] = 0;

          while (TRUE)
          {
                    try
                    {
                              rc =
SQLExecDirectW(m_hstmt, m_szPaymentCommand, SQL_NTS);
                              if (rc != SQL_SUCCESS
&& rc != SQL_SUCCESS_WITH_INFO)

          ThrowError(CODBCERR::eExecDirect);

                              if ( SQLFetch(m_hstmt)
== SQL_ERROR)

          ThrowError(CODBCERR::eFetch);

                              SQLFreeStmt(m_hstmt,
SQL_CLOSE);

                              if (m_txn.Payment.c_id
== 0)
                                        throw new
CTPCC_ODBC_ERR( CTPCC_ODBC_ERR::ERR_INVALID_CUST );
                              else

          m_txn.Payment.exec_status_code = eOK;

                              break;
                    }
                    catch (CODBCERR *e)
                    {
                              if ((!e->m_bDeadLock)
|| (++iTryCount > iMaxRetries))
                                        throw;

                              // hit deadlock;
backoff for increasingly longer period
                              delete e;
                              Sleep(10 * iTryCount);
                    }
          }

//        if (iTryCount)
//                  throw new
CTPCC_ODBC_ERR(CTPCC_ODBC_ERR::ERR_RETRIED_TRANS,
iTryCount);
}

void CTPCC_ODBC::InitOrderStatusParams()
{
          if (   SQLAllocHandle(SQL_HANDLE_STMT,
m_hdbc, &m_hstmtOrderStatus) != SQL_SUCCESS
                    ||
SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc,
&m_descOrderStatusCols1) != SQL_SUCCESS
                    ||
SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc,
&m_descOrderStatusCols2) != SQL_SUCCESS
                    )

          ThrowError(CODBCERR::eAllocHandle);

          m_hstmt = m_hstmtOrderStatus;

          if (   SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC, m_descOrderStatusCols1,
SQL_IS_POINTER ) != SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

          int i = 0;
          if (   SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.OrderStatus.w_id, 0, NULL) != SQL_SUCCESS
                    || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.OrderStatus.d_id, 0, NULL) != SQL_SUCCESS
                    || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.OrderStatus.c_id, 0, NULL) != SQL_SUCCESS
                    || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_CHAR, SQL_CHAR,
sizeof(m_txn.OrderStatus.c_last), 0,
&m_txn.OrderStatus.c_last,
sizeof(m_txn.OrderStatus.c_last), NULL) !=
SQL_SUCCESS
                    )
                    ThrowError(CODBCERR::eBindParam);

          // configure block cursor
          if (   SQLSetStmtAttrW(m_hstmt,
SQL_ATTR_ROW_BIND_TYPE,
(SQLPOINTER)sizeof(m_txn.OrderStatus.OL[0]), 0) !=
SQL_SUCCESS
                    || SQLSetStmtAttrW(m_hstmt,
SQL_ATTR_ROWS_FETCHED_PTR, &m_RowsFetched, 0) !=
SQL_SUCCESS
                    )

          ThrowError(CODBCERR::eSetStmtAttr);

          i = 0;
          if (   SQLBindCol(m_hstmt, ++i,
SQL_C_SLONG, &m_txn.OrderStatus.OL[0].ol_supply_w_id,
0, NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_SLONG, &m_txn.OrderStatus.OL[0].ol_i_id, 0,
NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_SSHORT, &m_txn.OrderStatus.OL[0].ol_quantity,
0, NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE, &m_txn.OrderStatus.OL[0].ol_amount, 0,
NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_TYPE_TIMESTAMP,
&m_txn.OrderStatus.OL[0].ol_delivery_d, 0, NULL) !=
SQL_SUCCESS
                    )
                    ThrowError(CODBCERR::eBindCol);


          if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC, m_descOrderStatusCols2,
SQL_IS_POINTER ) != SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

          i = 0;
          if (   SQLBindCol(m_hstmt, ++i,
SQL_C_SLONG, &m_txn.OrderStatus.c_id, 0, NULL) !=
SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.OrderStatus.c_last,
sizeof(m_txn.OrderStatus.c_last), NULL) !=
SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.OrderStatus.c_first,
sizeof(m_txn.OrderStatus.c_first), NULL) !=
SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.OrderStatus.c_middle,
sizeof(m_txn.OrderStatus.c_middle), NULL) !=
SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_TYPE_TIMESTAMP, &m_txn.OrderStatus.o_entry_d,
0, NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_SSHORT, &m_txn.OrderStatus.o_carrier_id, 0,
NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE, &m_txn.OrderStatus.c_balance, 0, NULL)
!= SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i,
SQL_C_SLONG, &m_txn.OrderStatus.o_id, 0, NULL) !=
SQL_SUCCESS
                    )
                    ThrowError(CODBCERR::eBindCol);
```

```
          //Compose Order Status statement
          _snwprintf(m_szOrderStatusCommand,
sizeof(m_szOrderStatusCommand)/sizeof(m_szOrderStatus
Command[0]),
                    L"{call %stpcc_orderstatus
(?,?,?,?)}", m_szSPPrefix);
}

void CTPCC_ODBC::OrderStatus()
{
          int
                    iTryCount = 0;
          RETCODE
          rc;

          m_hstmt = m_hstmtOrderStatus;

          if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC, m_descOrderStatusCols1,
SQL_IS_POINTER ) != SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

          if (m_txn.OrderStatus.c_id != 0)
                    m_txn.OrderStatus.c_last[0] = 0;

          while (TRUE)
          {
                    try
                    {
                              // configure block
cursor
                              if (
SQLSetStmtAttrW(m_hstmt, SQL_ATTR_ROW_ARRAY_SIZE,
(SQLPOINTER)1, 0) != SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

                              rc =
SQLExecDirectW(m_hstmt, m_szOrderStatusCommand,
SQL_NTS);
                              if ( ((rc ==
SQL_SUCCESS_WITH_INFO) && (m_RowsFetched != 0)) ||
(rc == SQL_ERROR) )

          ThrowError(CODBCERR::eExecDirect);

                              // configure block
cursor
                              if (
SQLSetStmtAttrW(m_hstmt, SQL_ATTR_ROW_ARRAY_SIZE,
(SQLPOINTER)MAX_OL_ORDER_STATUS_ITEMS, 0) !=
SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

                              rc = SQLFetchScroll(
m_hstmt, SQL_FETCH_NEXT, 0 );
                              if ( ((rc ==
SQL_SUCCESS_WITH_INFO) && (m_RowsFetched != 0)) ||
(rc == SQL_ERROR) )

          ThrowError(CODBCERR::eFetchScroll);


          m_txn.OrderStatus.o_ol_cnt =
(short)m_RowsFetched;

                              if
(m_txn.OrderStatus.o_ol_cnt != 0)
                              {
                                        if (
SQLSetStmtAttrW( m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descOrderStatusCols2, SQL_IS_POINTER ) !=
SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

                                        if (
SQLMoreResults(m_hstmt) == SQL_ERROR )

          ThrowError(CODBCERR::eMoreResults);

                                        if ( (rc =
SQLFetch(m_hstmt)) == SQL_ERROR)

          ThrowError(CODBCERR::eFetch);
                              }

                              SQLFreeStmt(m_hstmt,
SQL_CLOSE);

                              if
(m_txn.OrderStatus.o_ol_cnt == 0)
                                        throw new
CTPCC_ODBC_ERR( CTPCC_ODBC_ERR::ERR_NO_SUCH_ORDER );
                              else if
(m_txn.OrderStatus.c_id == 0 &&
m_txn.OrderStatus.c_last[0] == 0)
                                        throw new
CTPCC_ODBC_ERR( CTPCC_ODBC_ERR::ERR_INVALID_CUST );
                              else

          m_txn.OrderStatus.exec_status_code = eOK;

                              break;
                    }
                    catch (CODBCERR *e)
                    {
                              if ((!e->m_bDeadLock)
|| (++iTryCount > iMaxRetries))
                                        throw;

                              // hit deadlock;
backoff for increasingly longer period
                              delete e;
                              Sleep(10 * iTryCount);
                    }
          }

//        if (iTryCount)
//                  throw new
CTPCC_ODBC_ERR(CTPCC_ODBC_ERR::ERR_RETRIED_TRANS,
iTryCount);
}

void CTPCC_ODBC::InitDeliveryParams()
{
          if (   SQLAllocHandle(SQL_HANDLE_STMT,
m_hdbc, &m_hstmtDelivery) != SQL_SUCCESS )

          ThrowError(CODBCERR::eAllocHandle);

          m_hstmt = m_hstmtDelivery;

          int i = 0;
          if (   SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.Delivery.w_id, 0, NULL) != SQL_SUCCESS
                    || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SSHORT, SQL_SMALLINT, 0, 0,
&m_txn.Delivery.o_carrier_id, 0, NULL) != SQL_SUCCESS
                    )
                    ThrowError(CODBCERR::eBindParam);

          for (i=0;i<10;i++)
          {
                    if ( SQLBindCol(m_hstmt,
(UWORD)(i+1), SQL_C_SLONG, &m_txn.Delivery.o_id[i],
0, NULL) != SQL_SUCCESS )

          ThrowError(CODBCERR::eBindCol);
          }

          //Compose Delivery statement
          _snwprintf(m_szDeliveryCommand,
sizeof(m_szDeliveryCommand)/sizeof(m_szDeliveryComman
d[0]),
                    L"{call %stpcc_delivery (?,?)}",
m_szSPPrefix);
}

void CTPCC_ODBC::Delivery()
{
          RETCODE             rc;
          int                           iTryCount =
0;

          m_hstmt = m_hstmtDelivery;

          while (TRUE)
          {
                    try
                    {
                              rc =
SQLExecDirectW(m_hstmt, m_szDeliveryCommand,
SQL_NTS);
                              if (rc != SQL_SUCCESS
&& rc != SQL_SUCCESS_WITH_INFO)

          ThrowError(CODBCERR::eExecDirect);
```

```
                              if ( SQLFetch(m_hstmt)
== SQL_ERROR )

          ThrowError(CODBCERR::eFetch);

                              SQLFreeStmt(m_hstmt,
SQL_CLOSE);

          m_txn.Delivery.exec_status_code = eOK;
                              break;
                    }
                    catch (CODBCERR *e)
                    {
                              if ((!e->m_bDeadLock)
|| (++iTryCount > iMaxRetries))
                                        throw;

                              // hit deadlock;
backoff for increasingly longer period
                              delete e;
                              Sleep(10 * iTryCount);
                    }
          }

//        if (iTryCount)
//                  throw new
CTPCC_ODBC_ERR(CTPCC_ODBC_ERR::ERR_RETRIED_TRANS,
iTryCount);
}
```

tpcc_odbc.h

```
/*        FILE:               TPCC_ODBC.H
 *                                  Microsoft
TPC-C Kit Ver. 4.20.000
 *                                  Copyright
Microsoft, 1999
 *              All Rights Reserved
 *
 *                                  Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *        PURPOSE:  Header file for TPC-C txn class
implementation.
 *
 *  Change history:
 *                4.20.000 - updated rev number to
match kit
 */
#pragma once

// need to declare functions for import, unless
define has already been created
// by the DLL's .cpp module for export.
#ifndef DllDecl
#define DllDecl  __declspec( dllimport )
#endif

#define iMAX_SP_NAME_LEN 256  //maximum length of a
stored procedure name with parameters

class CODBCERR : public CBaseErr
{
          public:
                    enum ACTION
                    {
                              eNone,
                              eUnknown,
                              eAllocConn,
                    // error from SQLAllocConnect
                              eAllocHandle,
          // error from SQLAllocHandle
                              eConnOption,
          // error from SQLSetConnectOption
                              eConnect,
          // error from SQLConnect
                              eAllocStmt,
                     // error from SQLAllocStmt
                              eExecDirect,
          // error from SQLExecDirect
                              eBindParam,
                     // error from SQLBindParameter
                              eBindCol,
          // error from SQLBindCol
                              eFetch,
                     // error from SQLFetch
                              eFetchScroll,
          // error from SQLFetchScroll
                              eMoreResults,
          // error from SQLMoreResults
                              ePrepare,
          // error from SQLPrepare
                              eExecute,
          // error from SQLExecute
                              eSetEnvAttr,
          // error from SQLSetEnvAttr
                              eSetStmtAttr
          // error from SQLSetStmtAttr
                    };

                    CODBCERR(void)
                    {
                              m_eAction = eNone;
                              m_NativeError = 0;
                              m_bDeadLock = FALSE;
                              m_odbcerrstr = NULL;
                    };

                    ~CODBCERR()
                    {
                              if (m_odbcerrstr !=
NULL)
                                        delete []
m_odbcerrstr;
                    };

                    ACTION    m_eAction;
                    int
          m_NativeError;
                    BOOL      m_bDeadLock;
                    char   *m_odbcerrstr;

                    int                 ErrorType()
{return ERR_TYPE_ODBC;};
                    char*     ErrorTypeStr() { return
"ODBC"; }
                    int                 ErrorNum()
{return m_NativeError;};
                    char*     ErrorText() {return
m_odbcerrstr;};
                    int                 ErrorAction()
{ return (int)m_eAction; }
};

class CTPCC_ODBC_ERR : public CBaseErr
{
          public:
                    enum TPCC_ODBC_ERRS
                    {
                              ERR_WRONG_SP_VERSION =
1,        // "Wrong version of stored procs on
database server"
                              ERR_INVALID_CUST,
                    // "Invalid Customer id,name."
                              ERR_NO_SUCH_ORDER,
                    // "No orders found for
customer."
                              ERR_RETRIED_TRANS,
                    // "Retries before transaction
succeeded."
                    };

                    CTPCC_ODBC_ERR( int iErr ) {
m_errno = iErr; m_iTryCount = 0; };

                    CTPCC_ODBC_ERR( int iErr, int
iTryCount ) { m_errno = iErr; m_iTryCount =
iTryCount; };

                    int                 m_errno;
                    int                 m_iTryCount;

                    int                 ErrorType()
{return ERR_TYPE_TPCC_ODBC;};
                    char*     ErrorTypeStr() { return
"TPCC ODBC"; }
                    int                 ErrorNum()
{return m_errno;};

                    char*     ErrorText();
};

class DllDecl CTPCC_ODBC : public CTPCC_BASE
{
          private:
                    // declare variables and private
functions here...
                    BOOL                m_bDeadlock;
                    // transaction was selected as
deadlock victim
```

```
                int
        m_MaxRetries;                // retry
count on deadlock

                SQLHENV              m_henv;
                            // ODBC environment
handle
                SQLHDBC              m_hdbc;
                SQLHSTMT  m_hstmt;
        // the current hstmt

                SQLHSTMT  m_hstmtNewOrder;
                SQLHSTMT
        m_hstmtNewOrderNoDuplicates;  // NewOrder
with one result set for lineitem details
                SQLHSTMT  m_hstmtPayment;
                SQLHSTMT  m_hstmtDelivery;
                SQLHSTMT  m_hstmtOrderStatus;
                SQLHSTMT  m_hstmtStockLevel;

                SQLHDESC  m_descNewOrderCols1;
                SQLHDESC  m_descNewOrderCols2;
                SQLHDESC
        m_descNewOrderNoDuplicatesCols1;        //
NewOrder with one result set for lineitem details
                SQLHDESC
        m_descNewOrderNoDuplicatesCols2;        //
NewOrder with one result set for lineitem details
                SQLHDESC  m_descOrderStatusCols1;
                SQLHDESC  m_descOrderStatusCols2;

                wchar_t
        m_szSPPrefix[32];   // stored procedures
prefix

                wchar_t
        m_szNewOrderCommand[iMAX_SP_NAME_LEN];
                wchar_t
        m_szNewOrderNoDuplicatesCommand[iMAX_SP_NAM
E_LEN];
                int
        m_iBeginNewOrderVariablePart; // begining
of the variable part in NewOrder statement
                int
        m_iBeginNewOrderNoDuplicatesVariablePart;
        // begining of the variable part in
NewOrder statement
                wchar_t
        m_szPaymentCommand[iMAX_SP_NAME_LEN];
                wchar_t
        m_szDeliveryCommand[iMAX_SP_NAME_LEN];
                wchar_t
        m_szOrderStatusCommand[iMAX_SP_NAME_LEN];
                wchar_t
        m_szStockLevelCommand[iMAX_SP_NAME_LEN];

                // new-order specific fields
                SQLUINTEGER          m_BindOffset;
                SQLUINTEGER
        m_RowsFetched;
                int
        m_no_commit_flag;

                // tpcc_neworder_new flag
                BOOL
        m_bCallNoDuplicatesNewOrder;

                void ThrowError( CODBCERR::ACTION
eAction );

                void InitNewOrderParams();
                void InitPaymentParams();
                void InitDeliveryParams();
                void InitStockLevelParams();
                void InitOrderStatusParams();

                union
                {
                        NEW_ORDER_DATA
        NewOrder;
                        PAYMENT_DATA
        Payment;
                        DELIVERY_DATA
        Delivery;
                        STOCK_LEVEL_DATA
        StockLevel;
                        ORDER_STATUS_DATA
        OrderStatus;
                }
        m_txn;

                bool DuplicatesInNewOrder();
                void NewOrderDuplicates();
                void NewOrderNoDuplicates();

        public:
                CTPCC_ODBC(          LPCSTR
szServer, LPCSTR szUser, LPCSTR szPassword,

        LPCSTR szHost, LPCSTR szDatabase,

        LPCWSTR szSPPrefix, BOOL
bCallNoDuplicatesNewOrder);
                ~CTPCC_ODBC(void);

                inline PNEW_ORDER_DATA
        BuffAddr_NewOrder()          { return
&m_txn.NewOrder;    };
                inline PPAYMENT_DATA
        BuffAddr_Payment()           { return
&m_txn.Payment;     };
                inline PDELIVERY_DATA
        BuffAddr_Delivery()          { return
&m_txn.Delivery;    };
                inline PSTOCK_LEVEL_DATA
        BuffAddr_StockLevel()        { return
&m_txn.StockLevel;  };
                inline PORDER_STATUS_DATA
        BuffAddr_OrderStatus()       { return
&m_txn.OrderStatus; };
                void NewOrder                ();
                void Payment                 ();
                void Delivery                ();
                void StockLevel              ();
                void OrderStatus    ();

};


// wrapper routine for class constructor
extern "C" DllDecl CTPCC_ODBC* CTPCC_ODBC_new
        (          LPCSTR szServer, LPCSTR szUser,
LPCSTR szPassword,
                LPCSTR szHost, LPCSTR szDatabase,
                LPCWSTR szSPPrefix, BOOL
bCallNoDuplicatesNewOrder );

typedef CTPCC_ODBC* (TYPE_CTPCC_ODBC)(LPCSTR, LPCSTR,
LPCSTR, LPCSTR, LPCSTR, LPCWSTR, BOOL);
```

tpcc_tux.cpp

```
/*        FILE:                TPCC_TUX.CPP
 *                                          Microsoft
TPC-C Kit Ver. 4.20.000
 *                                          Copyright
Microsoft, 1999
 *              All Rights Reserved
 *
 *                                          Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *        PURPOSE:  Implementation for TPC-C Tuxedo
class.
 *        Contact:  Charles Levine
(clevine@microsoft.com)
 *
 *  Change history:
 *                4.20.000 - updated rev number to
match kit
 */

#include <windows.h>
#include <process.h>
#include <stdio.h>
#include <stdarg.h>
#include <malloc.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include <sys\timeb.h>
#include <io.h>
#include <assert.h>

#include <tmenv.h>
#include <xa.h>
#include <atmi.h>

#ifdef ICECAP
```

```
// for IceCAP profiling
#include <icapexp.h>
#endif

// need to declare functions for export
#define DllDecl  __declspec( dllexport )

#include "..\..\common\src\trans.h"
          //tpckit transaction header contains
definations of structures specific to TPC-C
#include "..\..\common\src\error.h"
#include "..\..\common\src\txn_base.h"
#include "tpcc_tux.h"
                    // interface to Tuxedo libraries

static TPINIT
          *tpinf;
static DWORD
          TLSIsTpInitedKey;
static CRITICAL_SECTION
          TpCriticalSection;


BOOL APIENTRY DllMain(HMODULE hModule, DWORD
ul_reason_for_call, LPVOID lpReserved)
{
          switch( ul_reason_for_call )
          {
                    case DLL_PROCESS_ATTACH:

          DisableThreadLibraryCalls(hModule);

                              // create thread local
storage to determine Tuxedo initialization per
thread.
                              // it really should be
possible to do this in the DLL_THREAD_ATTACH call,
but
                              // Ed says he could not
get it to work.
                              // assumption:value
init'd to 0
                              TLSIsTpInitedKey =
TlsAlloc();

                              if ((tpinf = (TPINIT
*)tpalloc("TPINIT", NULL, sizeof(TPINIT))) == NULL)
                              {
                                        // int TpRc =
tperrno;
                                        return FALSE;
                              }
                              tpinf->flags |=
TPMULTICONTEXTS;


          InitializeCriticalSection(&TpCriticalSectio
n);
                              break;

                    case DLL_PROCESS_DETACH:

          TlsFree(TLSIsTpInitedKey);

          DeleteCriticalSection(&TpCriticalSection);
                              break;

                    default:
                              /* nothing */;
          }
          return TRUE;
}

static void ThrTpInit()
{
          static int num_tpinits=0;
          int iRc, TpRc;

          // has this thread been initialized?  check
thread local storage
          if(!TlsGetValue(TLSIsTpInitedKey))
          {

          EnterCriticalSection(&TpCriticalSection);
                    itoa(++num_tpinits, tpinf-
>cltname, 10);

                    iRc = tpinit(tpinf);
                    TpRc = tperrno;

          LeaveCriticalSection(&TpCriticalSection);

                    if (iRc < 0)
                              throw new CTUXERR(
tperrno );

                    int value = 1;

          TlsSetValue(TLSIsTpInitedKey,&value);
          }
}

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_TUXEDO*
CTPCC_TUXEDO_new()
{
          return new CTPCC_TUXEDO();
}

CTPCC_TUXEDO::CTPCC_TUXEDO()
{
          //        Add initialization of Tuxedo
Structures
          m_txn = (TUX_DATA *)tpalloc("CARRAY", NULL,
sizeof(TUX_DATA));
          if (m_txn == NULL)
                    throw new CTUXERR( tperrno );
}

CTPCC_TUXEDO::~CTPCC_TUXEDO()
{
          // free the data structure allocated with
tpalloc
          tpfree((char *)m_txn);
}

void CTPCC_TUXEDO::NewOrder()
{
          long      ilen, *olen;

          ThrTpInit();

          ilen = sizeof(TUX_DATA);
          olen = &ilen;

          if (tpcall("NEWORDER", (char *)m_txn, ilen,
(char **)&m_txn, (long *)olen, TPSIGRSTRT) == -1)
                    throw new CTUXERR( tperrno );

          if ( m_txn->ErrorType != ERR_SUCCESS )
                    throw new CTUXERR( m_txn-
>ErrorType, m_txn->error );
}

void CTPCC_TUXEDO::Payment()
{
          long      ilen, *olen;

          ThrTpInit();

          ilen = sizeof(TUX_DATA);
          olen = &ilen;

          if (tpcall("PAYMENT", (char *)m_txn, ilen,
(char **)&m_txn, (long *)olen, TPSIGRSTRT) == -1)
                    throw new CTUXERR( tperrno );

          if ( m_txn->ErrorType != ERR_SUCCESS )
                    throw new CTUXERR( m_txn-
>ErrorType, m_txn->error );
}

void CTPCC_TUXEDO::Delivery()
{
          int                iRc;
          long      ilen, *olen;

          // Note: Delivery txn code in the tuxedo
server does not implement logging of the delivery
          //       txn results, so cannot be used as
is to run an auditable TPC-C result.  For that
          //       reason, delivery txns should not
be done via tuxedo.
          //       The code is included for
completeness.
          m_txn->u.Delivery.exec_status_code =
eDeliveryFailed;
          return;

          //  normal path...

          ThrTpInit();
```

```
        GetLocalTime(&m_txn-
>u.Delivery.queue_time);

        ilen = sizeof(TUX_DATA);
        olen = &ilen;

        if ((iRc = tpacall("DELIVERY", (char
*)m_txn, ilen, TPNOREPLY)) == -1)
        {
                int TpRc = tperrno;
                m_txn-
>u.Delivery.exec_status_code = eDeliveryFailed;
        }
        else
                m_txn-
>u.Delivery.exec_status_code = eOK;

}

void CTPCC_TUXEDO::StockLevel()
{
        long      ilen, *olen;

        ThrTpInit();

        ilen = sizeof(TUX_DATA);
        olen = &ilen;

        if (tpcall("STOCKLEVEL", (char *)m_txn,
ilen, (char **)&m_txn, (long *)olen, TPSIGRSTRT) == -
1)
                throw new CTUXERR( tperrno );

        if ( m_txn->ErrorType != ERR_SUCCESS )
                throw new CTUXERR( m_txn-
>ErrorType, m_txn->error );
}

void CTPCC_TUXEDO::OrderStatus()
{
        long      ilen, *olen;

        ThrTpInit();

        ilen = sizeof(TUX_DATA);
        olen = &ilen;

        if (tpcall("ORDERSTATUS", (char *)m_txn,
ilen, (char **)&m_txn, (long *)olen, TPSIGRSTRT) == -
1)
                throw new CTUXERR( tperrno );

        if ( m_txn->ErrorType != ERR_SUCCESS )
                throw new CTUXERR( m_txn-
>ErrorType, m_txn->error );
}

char *CTUXERR::ErrorText()
{
        if (m_iErrorType == 0)
        {
                if (m_errno == TPEOS)
                        sprintf( m_szErrorText,
"Error: TUXEDO error # %d, OS error # %d", m_errno,
m_iError );
                else
                        sprintf( m_szErrorText,
"Error: TUXEDO error # %d", m_errno );
        }
        else
                sprintf( m_szErrorText, "Error:
Class %d, error # %d", m_iErrorType, m_iError );
        return m_szErrorText;
};
```

tpcc_tux.h

```
/*      FILE:                   TPCC_TUX.H
 *                                      Microsoft
TPC-C Kit Ver. 4.20.000
 *                                      Copyright
Microsoft, 1999
 *              All Rights Reserved
 *
 *                                      Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *      PURPOSE:  Header file for TPC-C Tuxedo
class implementation.
 *
 *  Change history:
 *                  4.20.000 - updated rev number to
match kit
 */

#pragma once

// need to declare functions for import, unless
define has already been created
// by the DLL's .cpp module for export.
#ifndef DllDecl
#define DllDecl  __declspec( dllimport )
#endif

class DllDecl CTPCC_TUXEDO : public CTPCC_BASE
{
        private:
                struct TUX_DATA
                {
                        int
                        ErrorType;
                        int
                        error;

                        union
                        {

        NEW_ORDER_DATA              NewOrder;
                                    PAYMENT_DATA
                Payment;
                                    DELIVERY_DATA
                Delivery;

        STOCK_LEVEL_DATA    StockLevel;

        ORDER_STATUS_DATA   OrderStatus;
                                    } u;
                } *m_txn;

        public:
                CTPCC_TUXEDO();
                ~CTPCC_TUXEDO(void);

                inline PNEW_ORDER_DATA
        BuffAddr_NewOrder()         { return
&m_txn->u.NewOrder;    };
                inline PPAYMENT_DATA
        BuffAddr_Payment()          { return
&m_txn->u.Payment;     };
                inline PDELIVERY_DATA
        BuffAddr_Delivery()         { return
&m_txn->u.Delivery;    };
                inline PSTOCK_LEVEL_DATA
        BuffAddr_StockLevel()       { return
&m_txn->u.StockLevel;  };
                inline PORDER_STATUS_DATA
        BuffAddr_OrderStatus()      { return
&m_txn->u.OrderStatus; };

                void NewOrder               ();
                void Payment                ();
                void Delivery               ();
                void StockLevel             ();
                void OrderStatus    ();

};

class CTUXERR : public CBaseErr
{
        private:

                // TODO: should use the sz_Msg
field of the base class instead
                char m_szErrorText[64];

        public:
                // use this interface for genuine
Tuxedo errors
                CTUXERR( int iErr )
                {
                        m_errno = iErr;
                        m_iErrorType = 0;
                        m_iError =
GetLastError();     // only meaningful if m_errno ==
TPEOS
                };

                // use this interface to
impersonate a non-Tuxedo error type
```

```
                CTUXERR( int iErrorType, int
iError )
                {
                        m_iErrorType =
iErrorType;
                        m_iError = iError;
                        m_errno = 0;
                }

                int             m_errno;
                int             m_iErrorType;
                int             m_iError;

                // A CTUXERR class can
impersonate another class, which happens if the error
                // was not actually a Tuxedo
error, but was simply transmitted back via Tuxedo.
                int ErrorType()
                {
                        if (m_iErrorType == 0)
                                return
ERR_TYPE_TUXEDO;
                        else
                                return
m_iErrorType;
                }

                int ErrorNum() {return m_errno;};
                char *ErrorText();
};

// wrapper routine for class constructor
extern "C" __declspec(dllexport) CTPCC_TUXEDO*
CTPCC_TUXEDO_new();

typedef CTPCC_TUXEDO* (TYPE_CTPCC_TUXEDO)();
```

tpcc_type.h

```
/* Generated by IDL compiler version DEC DCE V2.0.0-6
*/
#ifndef tpcc_types_v1_0_included
#define tpcc_types_v1_0_included
#ifndef IDLBASE_H
#include <dce\idlbase.h>
#endif

#ifdef __cplusplus
    extern "C" {
#endif

#ifndef nbase_v0_0_included
#include "dce\nbase.h"
#endif
#define NAME_LENGTH (32)
#define NEWO_INTERFACE (1)
#define PAYMENT_INTERFACE (2)
#define ORDER_STAT_INTERFACE (4)
#define DELIVERY_INTERFACE (8)
#define STOCK_INTERFACE (16)
#define ONLINE_INTERFACES (23)
#define ALL_INTERFACE (65535)
#define NEWO_TRANS (1)
#define PAYMENT_TRANS (2)
#define ORDER_STAT_TRANS (3)
#define DELIVERY_TRANS (4)
#define STOCK_TRANS (5)
#define MAX_TRAN_TYPE (5)
#define TPCC_SUCCESS (0)
#define TRPC_ERROR (1)
#define INVALID_NEWO (100)
typedef struct  {
idl_long_int sec;
idl_long_int usec;
} time_type;
typedef struct  {
idl_short_int returncode;
idl_short_int stats;
time_type srv_start;
time_type srv_end;
time_type clnt_start;
time_type clnt_end;
} data_header;
typedef struct  {
idl_long_int first_wh;
idl_long_int last_wh;
idl_long_int server_id;
} dbInfo_data_t;

#ifdef __cplusplus
    }

#endif
#endif
```

trans.h

```
/*        FILE:                 TRANS.H
 *                                              Microsoft
TPC-C Kit Ver. 4.42.000
 *                                              Copyright
Microsoft, 2002
 *             All Rights Reserved
 *
 *                                              Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *        PURPOSE:  Header file for TPC-C structure
templates.
 *
 *  Change history:
 *                  4.42.000 - changed w_id fields
from short to long to support >32K warehouses
 *                  4.20.000 - updated rev number to
match kit
 */
#pragma once

// String length constants
#define SERVER_NAME_LEN            20
#define DATABASE_NAME_LEN          20
#define USER_NAME_LEN              20
#define PASSWORD_LEN               20
#define TABLE_NAME_LEN             20
#define I_DATA_LEN                 50
#define I_NAME_LEN                 24
#define BRAND_LEN                   1
#define LAST_NAME_LEN              16
#define W_NAME_LEN                 10
#define ADDRESS_LEN                20
#define STATE_LEN                   2
#define ZIP_LEN                     9
#define S_DIST_LEN                 24
#define S_DATA_LEN                 50
#define D_NAME_LEN                 10
#define FIRST_NAME_LEN             16
#define MIDDLE_NAME_LEN             2
#define PHONE_LEN                  16
#define DATETIME_LEN               30
#define CREDIT_LEN                  2
#define C_DATA_LEN                250
#define H_DATA_LEN                 24
#define DIST_INFO_LEN              24
#define MAX_OL_NEW_ORDER_ITEMS     15
#define MAX_OL_ORDER_STATUS_ITEMS  15
#define STATUS_LEN                 25
#define OL_DIST_INFO_LEN                    24

// TIMESTAMP_STRUCT is provided by the ODBC header
file sqltypes.h, but is not available
// when compiling with dblib, so redefined here.
Note: we are using the symbol "__SQLTYPES"
// (declared in sqltypes.h) as a way to determine if
TIMESTAMP_STRUCT has been declared.
#ifndef __SQLTYPES
          typedef struct
          {
                          short
          /* SQLSMALLINT */   year;
                          unsigned short      /*
SQLUSMALLINT */     month;
                          unsigned short      /*
SQLUSMALLINT */     day;
                          unsigned short      /*
SQLUSMALLINT */     hour;
                          unsigned short      /*
SQLUSMALLINT */     minute;
                          unsigned short      /*
SQLUSMALLINT */     second;
                          unsigned long       /*
SQLUINTEGER */      fraction;
          } TIMESTAMP_STRUCT;
#endif

// possible values for exec_status_code after
transaction completes
enum EXEC_STATUS
{
          eOK,                          // 0
          "Transaction commited."
```

```
        eInvalidItem,       // 1      "Item number
is not valid."
        eDeliveryFailed     // 2      "Delivery
Post Failed."
};

// transaction structures
typedef struct
{
        // input params
        long
        ol_supply_w_id;
        long
        ol_i_id;
        short
        ol_quantity;

        // output params
        char
        ol_i_name[I_NAME_LEN+1];
        char
        ol_brand_generic[BRAND_LEN+1];
        double
        ol_i_price;
        double
        ol_amount;
        short
        ol_stock;
} OL_NEW_ORDER_DATA;

typedef struct
{
        // input params
        long                w_id;
        short               d_id;
        long                c_id;
        short               o_ol_cnt;

        // output params
        EXEC_STATUS
        exec_status_code;
        char
        c_last[LAST_NAME_LEN+1];
        char                c_credit[CREDIT_LEN+1];
        double              c_discount;
        double              w_tax;
        double              d_tax;
        long                            o_id;
        short
        o_commit_flag;
        TIMESTAMP_STRUCT    o_entry_d;
        short               o_all_local;
        double              total_amount;
        OL_NEW_ORDER_DATA
        OL[MAX_OL_NEW_ORDER_ITEMS];
} NEW_ORDER_DATA, *PNEW_ORDER_DATA;

typedef struct
{       // input params
        long
w_id;
        short
d_id;
        long
c_id;
        short
c_d_id;
        long
c_w_id;
        double
h_amount;
        char
c_last[LAST_NAME_LEN+1];

        // output params
        EXEC_STATUS
exec_status_code;
        TIMESTAMP_STRUCT     h_date;
        char
w_street_1[ADDRESS_LEN+1];
        char
w_street_2[ADDRESS_LEN+1];
        char
w_city[ADDRESS_LEN+1];
        char
w_state[STATE_LEN+1];
        char
w_zip[ZIP_LEN+1];
        char
d_street_1[ADDRESS_LEN+1];
        char
d_street_2[ADDRESS_LEN+1];
        char
d_city[ADDRESS_LEN+1];
        char
d_state[STATE_LEN+1];
        char
d_zip[ZIP_LEN+1];
        char
c_first[FIRST_NAME_LEN+1];
        char
c_middle[MIDDLE_NAME_LEN + 1];
        char
c_street_1[ADDRESS_LEN+1];
        char
c_street_2[ADDRESS_LEN+1];
        char
c_city[ADDRESS_LEN+1];
        char
c_state[STATE_LEN+1];
        char
c_zip[ZIP_LEN+1];
        char
c_phone[PHONE_LEN+1];
        TIMESTAMP_STRUCT     c_since;
        char
c_credit[CREDIT_LEN+1];
        double
c_credit_lim;
        double
c_discount;
        double
c_balance;
        char
c_data[200+1];
} PAYMENT_DATA, *PPAYMENT_DATA;

typedef struct
{
        long
        ol_i_id;
        long
        ol_supply_w_id;
        short
        ol_quantity;
        double
        ol_amount;
        TIMESTAMP_STRUCT    ol_delivery_d;
} OL_ORDER_STATUS_DATA;

typedef struct
{       // input params
        long                w_id;
        short               d_id;
        long                c_id;
        char
c_last[LAST_NAME_LEN+1];

        // output params
        EXEC_STATUS
exec_status_code;
        char
c_first[FIRST_NAME_LEN+1];
        char
c_middle[MIDDLE_NAME_LEN+1];
        double              c_balance;
        long                o_id;
        TIMESTAMP_STRUCT    o_entry_d;
        short               o_carrier_id;
        OL_ORDER_STATUS_DATA
OL[MAX_OL_ORDER_STATUS_ITEMS];
        short               o_ol_cnt;
} ORDER_STATUS_DATA, *PORDER_STATUS_DATA;


typedef struct
{       // input params
        long                            w_id;
        short                           o_carrier_id;

        // output params
        EXEC_STATUS
        exec_status_code;
        SYSTEMTIME                      queue_time;
        long
        o_id[10];          // id's of delivered
orders for districts 1 to 10
} DELIVERY_DATA, *PDELIVERY_DATA;

//This structure is used for posting delivery
transactions and for writing them to the delivery
server.
```

```
typedef struct _DELIVERY_TRANSACTION
{
          SYSTEMTIME          queue;
          //time delivery transaction queued
          long                w_id;
          //delivery warehouse
          short               o_carrier_id;
          //carrier id
} DELIVERY_TRANSACTION;

typedef struct
{         // input params
          long
          w_id;
          short
          d_id;
          short
          threshold;

          // output params
          EXEC_STATUS
          exec_status_code;
          long
          low_stock;
} STOCK_LEVEL_DATA, *PSTOCK_LEVEL_DATA;
```

tuxapp.cpp

```
/*        FILE:               TUXAPP.CPP
 *                                    Microsoft
TPC-C Kit Ver. 4.20.000
 *                                    Copyright
Microsoft, 1999
 *               All Rights Reserved
 *
 *                                    Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *        PURPOSE:  Implementation for TPC-C Tuxedo
server.
 *        Contact:  Charles Levine
(clevine@microsoft.com)
 *
 *  Change history:
 *                  4.20.000 - updated rev number to
match kit
 */

#include <windows.h>
#include <process.h>
#include <tchar.h>
#include <stdio.h>
#include <stdarg.h>
#include <iostream.h>
#include <malloc.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include <sys\timeb.h>
#include <io.h>
#include <assert.h>

#include <sqltypes.h>
#include <sql.h>
#include <sqlext.h>

#include <tmenv.h>
#include <xa.h>
#include <atmi.h>

#include "..\..\common\src\trans.h"
          //tpckit transaction header contains
definations of structures specific to TPC-C
#include "..\..\common\src\error.h"
#include "..\..\common\src\txn_base.h"
#include "..\..\common\src\ReadRegistry.h"
#include "..\..\db_dblib_dll\src\tpcc_dblib.h"
          // DBLIB implementation of TPC-C txns
#include "..\..\db_odbc_dll\src\tpcc_odbc.h"
          // ODBC implementation of TPC-C txns
#include "tuxapp.h"

char
          szMyComputerName[MAX_COMPUTERNAME_LENGTH+1]
;

// configuration settings from registry
TPCCREGISTRYDATA              Reg;

CTPCC_BASE                    *pTxn = NULL;


#include "..\..\common\src\ReadRegistry.cpp"

/* FUNCTION: tpsvrinit ( int argc, char *argv[])
 *
 * PURPOSE:         Initialize the Server to Database
connection.
 *
 * RETURNS:                   int       0
          Success
 *                                                -1
          Failure
 */

int tpsvrinit ( int argc, char *argv[] )
{
          try
          {
                    DWORD dwSize =
MAX_COMPUTERNAME_LENGTH+1;
                    GetComputerName(szMyComputerName,
&dwSize);
                    szMyComputerName[dwSize] = 0;


                    if ( ReadTPCCRegistrySettings(
&Reg ) )
                              throw new CTUXAPP_ERR(
ERR_MISSING_REGISTRY_ENTRIES );
                    GetParameters(argc, argv);

                    switch (Reg.eDB_Protocol)
                    {
                    case ODBC:
                              pTxn = new CTPCC_ODBC(
Reg.szDbServer, Reg.szDbUser, Reg.szDbPassword,
szMyComputerName, Reg.szDbName );
                              break;
                    case DBLIB:
                              pTxn = new CTPCC_DBLIB(
Reg.szDbServer, Reg.szDbUser, Reg.szDbPassword,
szMyComputerName, Reg.szDbName );
                              break;
                    }
          }
          catch (CBaseErr *e)
          {
                    WriteMessageToEventLog(e-
>ErrorText());
                    delete e;
          }
          catch (...)
          {

          WriteMessageToEventLog(TEXT("Unhandled
exception."));
          }

          return 0;
}

/* FUNCTION: tpsvrdone ( void )
 *
 */

void tpsvrdone ( void )
{
          delete pTxn;
          pTxn = NULL;
}

/* FUNCTION: BOOL GetParameters(int argc, char
*argv[])
 *
 * PURPOSE:         This function parses the command
line passed in to the delivery executable,
initializing
 *                            and filling in global
variable parameters.
 *
 * ARGUMENTS:       int                 argc
          number of command line arguments passed to
delivery
 *                                      char
          *argv[]   array of command line argument
pointers
 *
 */

static void GetParameters(int argc, char *argv[])
```

```
{
          // advance through args until "--" is found
          for(int j=0; j<argc; j++)
          {
                    if (strcmp(argv[j],"--") == 0)
                              break;
          }

          for(int i=j+1; i<argc; i++)
          {
                    if ( argv[i][0] == '-' ||
argv[i][0] == '/' )
                    {
                              switch(argv[i][1])
                              {
                                        case 'S':

          strcpy(Reg.szDbServer, argv[i]+2);

          break;
                                        case 'D':

          strcpy(Reg.szDbName, argv[i]+2);

          break;
                                        case 'P':

          strcpy(Reg.szDbPassword, argv[i]+2);

          break;
                                        case 'U':

          strcpy(Reg.szDbUser, argv[i]+2);

          break;
                                        default:

          cout << "Microsoft TPC-C Kit" << endl;

          cout << "Tuxedo Server" << endl << endl;

          cout << "Usage:" << endl;

          cout << "    tuxapp [<tuxedo-args>] -- -
S<sql-server> [-D<database>] [-U<user>] [-
P<password>]" << endl << endl;

          cout << "All parameters default to values
in registry." << endl;

          throw new CTUXAPP_ERR( ERR_BAD_SYNTAX );
                                        }
                    }
          }
}

static void WriteMessageToEventLog(LPTSTR lpszMsg)
{
    TCHAR   szMsg[256];
    HANDLE  hEventSource;
    LPTSTR  lpszStrings[2];

    // Use event logging to log the error.
    //
    hEventSource = RegisterEventSource(NULL,
TEXT("TUXAPP.EXE"));

    _stprintf(szMsg, TEXT("Error in TUXAPP.EXE: "));
    lpszStrings[0] = szMsg;
    lpszStrings[1] = lpszMsg;

    if (hEventSource != NULL)
        {
        ReportEvent(hEventSource, // handle of event
source
            EVENTLOG_ERROR_TYPE,  // event type
            0,                    // event category
            0,                    // event ID
            NULL,                 // current user's
SID
            2,                    // strings in
lpszStrings
            0,                    // no bytes of raw
data
            (LPCTSTR *)lpszStrings,    // array of
error strings
            NULL);                // no raw data

        (VOID) DeregisterEventSource(hEventSource);
    }
}

void NEWORDER( TPSVCINFO *rqst )
{
          PNEW_ORDER_DATA     pNewOrder;
          TUX_DATA            *pData;
          const int           iSize = sizeof(pData-
>u.NewOrder);

          try
          {
                    pData = (TUX_DATA*)rqst->data;
                    pData->retval = ERR_SUCCESS;
                    pData->error = 0;

                    pNewOrder = pTxn-
>BuffAddr_NewOrder();
                    assert( rqst->len ==
sizeof(TUX_DATA) );
                    memcpy(pNewOrder, &pData-
>u.NewOrder, iSize );

                    pTxn->NewOrder();
                    memcpy( &pData->u.NewOrder,
pNewOrder, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
          }
          catch (CBaseErr *e)
          {
                    pData->retval = e->ErrorType();
                    pData->error = e->ErrorNum();
                    memcpy( &pData->u.NewOrder,
pNewOrder, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
                    delete e;
          }
          catch (...)
          {

          WriteMessageToEventLog(TEXT("Unhandled
exception."));
                    pData->retval = ERR_TYPE_LOGIC;
                    pData->error = 0;
                    memcpy( &pData->u.NewOrder,
pNewOrder, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
          }
}

void PAYMENT( TPSVCINFO *rqst )
{
          PPAYMENT_DATA       pPayment;
          TUX_DATA            *pData;
          const int           iSize = sizeof(pData-
>u.Payment);

          try
          {
                    pData = (TUX_DATA*)rqst->data;
                    pData->retval = ERR_SUCCESS;
                    pData->error = 0;

                    pPayment = pTxn-
>BuffAddr_Payment();
                    assert( rqst->len ==
sizeof(TUX_DATA) );
                    memcpy(pPayment, &pData-
>u.Payment, iSize );

                    pTxn->Payment();
                    memcpy( &pData->u.Payment,
pPayment, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
          }
          catch (CBaseErr *e)
          {
                    pData->retval = e->ErrorType();
                    pData->error = e->ErrorNum();
                    memcpy( &pData->u.Payment,
pPayment, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
                    delete e;
          }
          catch (...)
          {

          WriteMessageToEventLog(TEXT("Unhandled
exception."));
```

```
                    pData->retval = ERR_TYPE_LOGIC;
                    pData->error = 0;
                    memcpy( &pData->u.Payment,
pPayment, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
          }
}

// Note: Delivery txn code below does not implement
logging of the delivery
//       txn results, so cannot be used as is to run
an auditable TPC-C result.
//       The code is included for completeness.
void DELIVERY( TPSVCINFO *rqst )
{
          PDELIVERY_DATA      pDelivery;
          TUX_DATA            *pData;
          const int           iSize = sizeof(pData-
>u.Delivery);

          try
          {
                    pData = (TUX_DATA*)rqst->data;
                    pData->retval = ERR_SUCCESS;
                    pData->error = 0;

                    pDelivery = pTxn-
>BuffAddr_Delivery();
                    assert( rqst->len ==
sizeof(TUX_DATA) );
                    memcpy(pDelivery, &pData-
>u.Delivery, iSize );

                    pTxn->Delivery();

                    memcpy( &pData->u.Delivery,
pDelivery, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
          }
          catch (CBaseErr *e)
          {
                    pData->retval = e->ErrorType();
                    pData->error = e->ErrorNum();
                    memcpy( &pData->u.Delivery,
pDelivery, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
                    delete e;
          }
          catch (...)
          {

          WriteMessageToEventLog(TEXT("Unhandled
exception."));
                    pData->retval = ERR_TYPE_LOGIC;
                    pData->error = 0;
                    memcpy( &pData->u.Delivery,
pDelivery, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
          }
}

void STOCKLEVEL( TPSVCINFO *rqst )
{
          PSTOCK_LEVEL_DATA   pStockLevel;
          TUX_DATA                      *pData;
          const int                     iSize =
sizeof(pData->u.StockLevel);

          try
          {
                    pData = (TUX_DATA*)rqst->data;
                    pData->retval = ERR_SUCCESS;
                    pData->error = 0;

                    pStockLevel = pTxn-
>BuffAddr_StockLevel();
                    assert( rqst->len ==
sizeof(TUX_DATA) );
                    memcpy(pStockLevel, &pData-
>u.StockLevel, iSize );

                    pTxn->StockLevel();
                    memcpy( &pData->u.StockLevel,
pStockLevel, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
          }
          catch (CBaseErr *e)
          {
                    pData->retval = e->ErrorType();
                    pData->error = e->ErrorNum();
                    memcpy( &pData->u.StockLevel,
pStockLevel, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
                    delete e;
          }
          catch (...)
          {

          WriteMessageToEventLog(TEXT("Unhandled
exception."));
                    pData->retval = ERR_TYPE_LOGIC;
                    pData->error = 0;
                    memcpy( &pData->u.StockLevel,
pStockLevel, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
          }
}

void ORDERSTATUS( TPSVCINFO *rqst )
{
          PORDER_STATUS_DATA  pOrderStatus;
          TUX_DATA            *pData;
          const int iSize = sizeof(pData-
>u.OrderStatus);

          try
          {
                    pData = (TUX_DATA*)rqst->data;
                    pData->retval = ERR_SUCCESS;
                    pData->error = 0;

                    pOrderStatus = pTxn-
>BuffAddr_OrderStatus();
                    assert( rqst->len ==
sizeof(TUX_DATA) );
                    memcpy(pOrderStatus, &pData-
>u.OrderStatus, iSize );

                    pTxn->OrderStatus();
                    memcpy( &pData->u.OrderStatus,
pOrderStatus, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
          }
          catch (CBaseErr *e)
          {
                    pData->retval = e->ErrorType();
                    pData->error = e->ErrorNum();
                    memcpy( &pData->u.OrderStatus,
pOrderStatus, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
                    delete e;
          }
          catch (...)
          {

          WriteMessageToEventLog(TEXT("Unhandled
exception."));
                    pData->retval = ERR_TYPE_LOGIC;
                    pData->error = 0;
                    memcpy( &pData->u.OrderStatus,
pOrderStatus, iSize );
                    tpreturn( TPSUCCESS, 0, rqst-
>data, sizeof(TUX_DATA), 0);
          }
}

/* FUNCTION: CTUXAPP_ERR::ErrorText
 *
 */

char* CTUXAPP_ERR::ErrorText(void)
{
          int i;

          static SERRORMSG errorMsgs[] =
          {
                    { ERR_MISSING_REGISTRY_ENTRIES,
          "Required entries missing from registry."
                              },
                    { ERR_BAD_SYNTAX,
                    "Syntax error in input
parameters."
          },
```

```
                { ERR_UNKNOWN_DB_PROTOCOL,
        "Unknown database protocol specified in
registry."       },
                { 0,
                                ""



                }
        };

        static char szNotFound[] = "Unknown error
number.";

        for(i=0; errorMsgs[i].szMsg[0]; i++)
        {
                if ( m_Error ==
errorMsgs[i].iError )
                        break;
        }
        if ( !errorMsgs[i].szMsg[0] )
                return szNotFound;
        else
                return errorMsgs[i].szMsg;
}
```

tuxapp.h

```
/*      FILE:               TUXAPP.H
 *                                      Microsoft
TPC-C Kit Ver. 4.20.000
 *                                      Copyright
Microsoft, 1999
 *              All Rights Reserved
 *
 *                                      Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *      PURPOSE:  Header file for TPC-C Tuxedo
server.
 *
 *  Change history:
 *                4.20.000 - updated rev number to
match kit
 */

enum TUXERROR
{
        ERR_MISSING_REGISTRY_ENTRIES = 1,
        ERR_BAD_SYNTAX,
        ERR_UNKNOWN_DB_PROTOCOL
};

class CTUXAPP_ERR : public CBaseErr
{
        public:
                TUXERROR m_Error;
                CTUXAPP_ERR(TUXERROR Err) {
        m_Error = Err; };
                ~CTUXAPP_ERR() {};

                int ErrorType() {return
ERR_TYPE_TUXEDO;};
                int ErrorNum() {return m_Error;};
                char *ErrorText();
};

struct TUX_DATA
{
        int
        retval;
        int
        error;

        union
        {
                NEW_ORDER_DATA
        NewOrder;
                PAYMENT_DATA
        Payment;
                DELIVERY_DATA
        Delivery;
                STOCK_LEVEL_DATA    StockLevel;
                ORDER_STATUS_DATA   OrderStatus;
        } u;
};

static void GetParameters(int argc, char *argv[]);
static void WriteMessageToEventLog(LPTSTR lpszMsg);

#if defined(__cplusplus)
extern "C" {
#endif

void NEWORDER( TPSVCINFO *rqst );
void PAYMENT( TPSVCINFO *rqst );
void DELIVERY( TPSVCINFO *rqst );
void STOCKLEVEL( TPSVCINFO *rqst );
void ORDERSTATUS( TPSVCINFO *rqst );

#if defined(__cplusplus)
}
#endif
```

tuxmain.c

```
/*      FILE:               TUXMAIN.C
 *                                      Microsoft
TPC-C Kit Ver. 4.20.000
 *                                      Copyright
Microsoft, 1999
 *              All Rights Reserved
 *                                      Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *      PURPOSE:  Implementation for TPC-C Tuxedo
server.
 *      Contact:  Charles Levine
(clevine@microsoft.com)
 *
 *  Change history:
 *                4.20.000 - updated rev number to
match kit
 */

#include <stdio.h>
#include <xa.h>
#include <atmi.h>

#if defined(__cplusplus)
extern "C" {
#endif
extern int _tmrunserver _((int));
extern void DELIVERY _((TPSVCINFO *));
extern void NEWORDER _((TPSVCINFO *));
extern void ORDERSTATUS _((TPSVCINFO *));
extern void PAYMENT _((TPSVCINFO *));
extern void STOCKLEVEL _((TPSVCINFO *));
#if defined(__cplusplus)
}
#endif

static struct tmdsptchtbl_t _tmdsptchtbl[] = {
        { "DELIVERY", "DELIVERY", (void (*)
_((TPSVCINFO *))) DELIVERY, 0, 0 },
        { "NEWORDER", "NEWORDER", (void (*)
_((TPSVCINFO *))) NEWORDER, 1, 0 },
        { "ORDERSTATUS", "ORDERSTATUS", (void (*)
_((TPSVCINFO *))) ORDERSTATUS, 2, 0 },
        { "PAYMENT", "PAYMENT", (void (*)
_((TPSVCINFO *))) PAYMENT, 3, 0 },
        { "STOCKLEVEL", "STOCKLEVEL", (void (*)
_((TPSVCINFO *))) STOCKLEVEL, 4, 0 },
        { NULL, NULL, NULL, 0, 0 }
};

#ifndef _TMDLLIMPORT
#define _TMDLLIMPORT
#endif

_TMDLLIMPORT extern struct xa_switch_t tmnull_switch;

struct tmsvrargs_t tmsvrargs = {
        NULL,
        &_tmdsptchtbl[0],
        0,
        tpsvrinit,
        tpsvrdone,
        _tmrunserver,       /* PRIVATE  */
        NULL,                       /* RESERVED
*/
```

```
        NULL,                           /* RESERVED
*/
        NULL,                           /* RESERVED
*/
        NULL                            /* RESERVED
*/
};

struct tmsvrargs_t *
#ifdef _TMPROTOTYPES
_tmgetsvrargs(void)
#else
_tmgetsvrargs()
#endif
{
        tmsvrargs.xa_switch = &tmnull_switch;
        return(&tmsvrargs);
}

int
#ifdef _TMPROTOTYPES
main(int argc, char **argv)
#else
main(argc,argv)
int argc;
char **argv;
#endif
{
#ifdef TMMAINEXIT
#include "mainexit.h"
#endif

        return( _tmstartserver( argc, argv,
_tmgetsvrargs()));
}
```

txn_base.h

```
/*      FILE:               TXN_BASE.H
 *                                      Microsoft
TPC-C Kit Ver. 4.20.000
 *                                      Copyright
Microsoft, 1999
 *              All Rights Reserved
 *
 *                                      Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *      PURPOSE:  Header file for TPC-C txn class
implementation.
 *
 *  Change history:
 *                  4.20.000 - updated rev number to
match kit
 */

#pragma once

// need to declare functions for import, unless
define has already been created
// by the DLL's .cpp module for export.
#ifndef DllDecl
#define DllDecl  __declspec( dllimport )
#endif

class DllDecl CTPCC_BASE
{
        public:
                CTPCC_BASE(void) {};
                virtual ~CTPCC_BASE(void) {};

                virtual PNEW_ORDER_DATA
        BuffAddr_NewOrder()         = 0;
                virtual PPAYMENT_DATA
        BuffAddr_Payment()          = 0;
                virtual PDELIVERY_DATA
        BuffAddr_Delivery()         = 0;
                virtual PSTOCK_LEVEL_DATA
        BuffAddr_StockLevel()       = 0;
                virtual PORDER_STATUS_DATA
        BuffAddr_OrderStatus()      = 0;

                virtual void NewOrder
        () = 0;
                virtual void Payment
        () = 0;
                virtual void Delivery
        () = 0;
                virtual void StockLevel
        () = 0;
                virtual void OrderStatus     ()
= 0;
};
```

tpcc_oledb.cpp

```
/*      FILE:               TPCC_OLEDB.CPP
 *                                      Microsoft
TPC-C Kit Ver. 4.42.000
 *                                      Copyright
Microsoft, 2004
 *                                      Written by
Sergey Vasilevskiy
 *              All Rights Reserved
 *
 *
 *
 *      PURPOSE:  Implements OLEDB calls for TPC-C
txns.
 *      Contact:  Charles Levine
(clevine@microsoft.com)
 *
 *
 */

#include <windows.h>
#include <stdio.h>
#include <assert.h>
#include <stddef.h>

#define DBINITCONSTANTS
#include <oledb.h>
//#include <sqloledb.h> // Use MDAC
#include <sqlncli.h>          // Use SNAC
#include <oledberr.h>

#ifdef ICECAP
#include <icapexp.h>
#endif

// need to declare functions for export
#define DllDecl  __declspec( dllexport )

#include "..\..\common\src\error.h"
#include "..\..\common\src\trans.h"
#include "..\..\common\src\txn_base.h"
#include "tpcc_oledb.h"

#ifndef SQL_MAX_MESSAGE_LENGTH
#define SQL_MAX_MESSAGE_LENGTH 512
#endif

// version string; must match return value from
tpcc_version stored proc
const char          sVersion[] = "4.20.000";

const iMaxRetries = 10;                 // how many
retries on deadlock

const int iErrOleDbProvider = 7312;
const char sErrTimeoutExpired[] = "Timeout expired";

// this needs to be the same as the max length of
machine/database/user/password in Benchcraft
(engstut.h)
const static int    iMaxNameLen = 32;

BOOL APIENTRY DllMain(HMODULE hModule, DWORD
ul_reason_for_call, LPVOID lpReserved)
{
          switch( ul_reason_for_call )
          {
                    case DLL_PROCESS_ATTACH:

          DisableThreadLibraryCalls(hModule);

                              break;

                    case DLL_PROCESS_DETACH:

                              break;

                    default:
                              /* nothing */;
          }
          return TRUE;
}

/* FUNCTION: CTPCC_OLEDB_ERR::ErrorText
```

```
 *
 */

char* CTPCC_OLEDB_ERR::ErrorText(void)
{
          int i;

          static SERRORMSG errorMsgs[] =
          {
                    { ERR_WRONG_SP_VERSION,
          "Wrong version of stored procs on database
server"   },
                    { ERR_INVALID_CUST,
          "Invalid Customer id,name."
                                                        },
                    { ERR_NO_SUCH_ORDER,
          "No orders found for customer."
                                                        },
                    { ERR_RETRIED_TRANS,
          "Retries before transaction succeeded."
                              },
                    { 0,
                              ""



          }
          };

          static char szNotFound[] = "Unknown error
number.";

          for(i=0; errorMsgs[i].szMsg[0]; i++)
          {
                    if ( m_errno ==
errorMsgs[i].iError )
                              break;
          }
          if ( !errorMsgs[i].szMsg[0] )
                    return szNotFound;
          else
                    return errorMsgs[i].szMsg;
}

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_OLEDB* CTPCC_OLEDB_new(
          LPCSTR szServer,              // name of
SQL server
          LPCSTR szUser,                              //
user name for login
          LPCSTR szPassword,            // password
for login
          LPCSTR szHost,                              //
not used
          LPCSTR szDatabase,            // name of
database to use
          LPCWSTR szSPPrefix )                        //
prefix to append to the stored procedure names
{
          return new CTPCC_OLEDB( szServer, szUser,
szPassword, szHost, szDatabase, szSPPrefix );
}



CTPCC_OLEDB::CTPCC_OLEDB (
          LPCSTR szServer,
          // name of SQL server
          LPCSTR szUser,
                    // user name for login
          LPCSTR szPassword,
          // password for login
          LPCSTR szHost,
                    // not used
          LPCSTR szDatabase,
          // name of database to use
          LPCWSTR szSPPrefix
          // prefix to append to the stored procedure
names
          )
          : m_pIMalloc(NULL)
{
          int
          iRc;
          int
          i;
          HRESULT                                     hr;

          IDBInitialize*
          pIDBInitialize = NULL;                      //
data source interface
          IDBProperties*
          pIDBProperties = NULL;
          ICommandText*
          pICommandText;
          // SQL command without parameters
          wchar_t
          szwServer[iMaxNameLen];                     //
Unicode string used to convert to BSTR
          wchar_t
          szwDatabase[iMaxNameLen];     // Unicode
string used to convert to BSTR
          wchar_t
          szwUser[iMaxNameLen];                       //
Unicode string used to convert to BSTR
          wchar_t
          szwPassword[iMaxNameLen];     // Unicode
string used to convert to BSTR

          // Copy stored procedures prefix
          wcsncpy(m_szSPPrefix, szSPPrefix,
sizeof(m_szSPPrefix)/sizeof(m_szSPPrefix[0]));

          // Convert single byte ANSI strings to
Unicode (for later conversion to BSTR)
          iRc = MultiByteToWideChar(CP_THREAD_ACP,
MB_PRECOMPOSED, szServer, (int)strlen(szServer)+1,
szwServer, iMaxNameLen);
          iRc = MultiByteToWideChar(CP_THREAD_ACP,
MB_PRECOMPOSED, szDatabase,
(int)strlen(szDatabase)+1, szwDatabase, iMaxNameLen);
          iRc = MultiByteToWideChar(CP_THREAD_ACP,
MB_PRECOMPOSED, szUser, (int)strlen(szUser)+1,
szwUser, iMaxNameLen);
          iRc = MultiByteToWideChar(CP_THREAD_ACP,
MB_PRECOMPOSED, szPassword,
(int)strlen(szPassword)+1, szwPassword, iMaxNameLen);

          // Initialize COM library to be able to use
OLE-DB interfaces
          CoInitialize(NULL);

          // Initialization - create SQLOLEDB
component
          //hr = CoCreateInstance(CLSID_SQLOLEDB, //
GUID of SQLOLEDB component
          // Compile for SNAC
          hr = CoCreateInstance(CLSID_SQLNCLI,    //
GUID of SQLNCLI component
                              NULL,
                    // not defining an aggregate
component, so NULL
                              CLSCTX_INPROC_SERVER,   //
run the component in our process
                              IID_IDBInitialize,
                              (void **) &pIDBInitialize);
    /*
    Initialize the property values needed
    to establish the connection.
    */
    for(i = 0; i < 4; i++)
        VariantInit(&m_InitProperties[i].vValue);
    //Server name.
    m_InitProperties[0].dwPropertyID  =
DBPROP_INIT_DATASOURCE;
    m_InitProperties[0].vValue.vt     = VT_BSTR;
    m_InitProperties[0].vValue.bstrVal=
SysAllocString(szwServer);
    m_InitProperties[0].dwOptions     =
DBPROPOPTIONS_REQUIRED;
    m_InitProperties[0].colid         = DB_NULLID;
    //Database.
    m_InitProperties[1].dwPropertyID  =
DBPROP_INIT_CATALOG;
    m_InitProperties[1].vValue.vt     = VT_BSTR;
    m_InitProperties[1].vValue.bstrVal=
SysAllocString(szwDatabase);
    m_InitProperties[1].dwOptions     =
DBPROPOPTIONS_REQUIRED;
    m_InitProperties[1].colid         = DB_NULLID;
    //Username (login).
    m_InitProperties[2].dwPropertyID  =
DBPROP_AUTH_USERID;
    m_InitProperties[2].vValue.vt     = VT_BSTR;
    m_InitProperties[2].vValue.bstrVal=
SysAllocString(szwUser);
    m_InitProperties[2].dwOptions     =
DBPROPOPTIONS_REQUIRED;
    m_InitProperties[2].colid         = DB_NULLID;
    //Password.
    m_InitProperties[3].dwPropertyID  =
DBPROP_AUTH_PASSWORD;
    m_InitProperties[3].vValue.vt     = VT_BSTR;
    m_InitProperties[3].vValue.bstrVal=
SysAllocString(szwPassword);
```

```
    m_InitProperties[3].dwOptions     =
DBPROPOPTIONS_REQUIRED;
    m_InitProperties[3].colid         = DB_NULLID;
    /*
    Construct the DBPROPSET
structure(m_rgInitPropSet). The
    DBPROPSET structure is used to pass an array of
DBPROP
    structures (m_InitProperties) to the
SetProperties method.
    */
    m_rgInitPropSet.guidPropertySet =
DBPROPSET_DBINIT;
    m_rgInitPropSet.cProperties    = 4;
    m_rgInitPropSet.rgProperties   =
m_InitProperties;
    //Set initialization properties.
          if (FAILED(hr = pIDBInitialize-
>QueryInterface(IID_IDBProperties,


                    (void **)&pIDBProperties)))
          {
                    ThrowError(pIDBInitialize,
COLEDBERR::eQueryInterface, "CTPCC_OLEDB()");
          }

    hr = pIDBProperties->SetProperties(1,
&m_rgInitPropSet);

    pIDBProperties->Release();
    //Now establish the connection to the data
source.
    hr = pIDBInitialize->Initialize();

          // Free BSTR property strings
          for(i = 0; i < 4; i++)
          {

SysFreeString(m_InitProperties[i].vValue.bstrVal);

          }

          hr = pIDBInitialize-
>QueryInterface(IID_IDBCreateSession, (void
**)&m_pIDBCreateSession);

          // Releasing this has no effect on the SQL
Server connection
    // of the data source object because of the
reference maintained by
    // m_pIDBCreateSession.
    pIDBInitialize->Release();
    pIDBInitialize = NULL;

          hr = m_pIDBCreateSession-
>CreateSession(NULL, IID_IDBCreateCommand, (IUnknown
**)&m_pIDBCreateCommand);
          if (FAILED(hr))
          {
                    ThrowError(m_pIDBCreateSession,
COLEDBERR::eCreateSession, "CTPCC_OLEDB()");
          }

          hr = m_pIDBCreateCommand-
>CreateCommand(NULL, IID_ICommandText, (IUnknown
**)&pICommandText);
          if (FAILED(hr))
          {
                    ThrowError(m_pIDBCreateCommand,
COLEDBERR::eCreateCommand, "CTPCC_OLEDB()");
          }

          hr = pICommandText-
>SetCommandText(DBGUID_SQL, L"set nocount on set
XACT_ABORT ON");
          if (FAILED(hr))
          {
                    ThrowError(pICommandText,
COLEDBERR::eSetCommandText, "CTPCC_OLEDB()");
          }

          hr = pICommandText->Execute(NULL, IID_NULL,
NULL, NULL, NULL);
          if (FAILED(hr))
          {
                    ThrowError(pICommandText,
COLEDBERR::eExecute, "CTPCC_OLEDB()");
          }

          pICommandText->Release();

          // verify that version of stored procs on
server is correct
          CheckSPVersion();

          // Get IMalloc interface
          hr = CoGetMalloc(1, (LPMALLOC
*)&m_pIMalloc);

          // Bind parameters for each of the
transactions
          InitNewOrderParams();
          InitPaymentParams();
          InitOrderStatusParams();
          InitDeliveryParams();
          InitStockLevelParams();
}

CTPCC_OLEDB::~CTPCC_OLEDB( void )
{
          if (m_pIMalloc != NULL)
          {
                    m_pIMalloc->Release();
          }
          m_pIPaymentCommand->Release();
          m_pIDBCreateCommand->Release();
          m_pIDBCreateSession->Release();

          CoUninitialize();   // uninitialize COM
library
}

/*
*         Check stored procedures version on the
server.
*/
void CTPCC_OLEDB::CheckSPVersion()
{
          HRESULT                         hr;
          char
          db_sp_version[10];
          ICommandText*       pICommandText;
          IAccessor*                      pIAccessor;
          IRowset*            pRowset;
          const ULONG                     nOutputParams
= 1;      // output 1st result set columns
          HACCESSOR
          hTpccVersionOutputAccessor;
          // Structure to bind in accessor
          DBBINDING
          acOutputDBBinding[nOutputParams];
          DBBINDSTATUS
          acOutputDBBindStatus[nOutputParams];
          LONG                            cRows = 1;
          // number of rows returned in the rowset
          ULONG
          cRowsObtained;
          HROW                            rghRow;
          //returned row handles
          HROW*                           prghRow =
&rghRow;


          hr = m_pIDBCreateCommand-
>CreateCommand(NULL, IID_ICommandText, (IUnknown
**)&pICommandText);
          if (FAILED(hr))
          {
                    ThrowError(m_pIDBCreateCommand,
COLEDBERR::eCreateCommand, "CheckSPVersion()");
          }

          hr = pICommandText-
>SetCommandText(DBGUID_SQL, L"{call tpcc_version}");
          if (FAILED(hr))
          {
                    ThrowError(pICommandText,
COLEDBERR::eSetCommandText, "CheckSPVersion()");
          }

          hr = pICommandText-
>QueryInterface(IID_IAccessor, (void **)&pIAccessor);
          if (FAILED(hr))
          {
                    ThrowError(pICommandText,
COLEDBERR::eQueryInterface, "CheckSPVersion()");
          }

          // Now fill the binding information for
result set 1 output columns
```

```
        InitBindings(&acOutputDBBinding[0],
nOutputParams, eOutputColumn);

        // Binding for a rowset
        SetBinding(&acOutputDBBinding[0], 0,
sizeof(db_sp_version), DBTYPE_STR);

        hr = pIAccessor->CreateAccessor(
                        DBACCESSOR_ROWDATA,
                        nOutputParams,
                        acOutputDBBinding,
                        sizeof(db_sp_version),

&hTpccVersionOutputAccessor,
                        acOutputDBBindStatus);
        if (FAILED(hr))
        {
                ThrowError(pIAccessor,
COLEDBERR::eCreateAccessor, "CheckSPVersion()");
        }

        hr = pICommandText->Execute(NULL,
IID_IRowset, NULL, NULL, (IUnknown **)&pRowset);
        if (FAILED(hr))
        {
                ThrowError(pICommandText,
COLEDBERR::eExecute, "CheckSPVersion()");
        }

        // Fetch the result row handle(s)
        hr = pRowset->GetNextRows(DB_NULL_HCHAPTER,
0, cRows, &cRowsObtained, &prghRow);
        if (FAILED(hr))
        {
                ThrowError(pICommandText,
COLEDBERR::eGetNextRows, "CheckSPVersion()");
        }

        // Fetch the actual row data by handle
        hr = pRowset->GetData(rghRow,
hTpccVersionOutputAccessor, &db_sp_version);
        if (FAILED(hr))
        {
                ThrowError(pICommandText,
COLEDBERR::eGetData, "CheckSPVersion()");
        }

        // Release row(s)
        hr = pRowset->Release();

        pICommandText->Release();

        // Check the retrieved version
        if (strcmp(db_sp_version,sVersion))
                        throw new
CTPCC_OLEDB_ERR(
CTPCC_OLEDB_ERR::ERR_WRONG_SP_VERSION );
}
```

```
void CTPCC_OLEDB::ThrowError( IUnknown*
pObjectWithError, COLEDBERR::ACTION eAction, LPCTSTR
szLocation)
{
        HRESULT
        hr;
        //char
        szState[6];
        char
        szMsg[SQL_MAX_MESSAGE_LENGTH];
        char
        szTmp[6*SQL_MAX_MESSAGE_LENGTH];
        COLEDBERR
        *pOLEDBErr;                             //
not allocated until needed (maybe never)
        int
                iLen;
        // Interfaces
        IErrorInfo*             pIErrorInfoAll
= NULL;
        IErrorInfo*             pIErrorInfoRecord
= NULL;
        IErrorRecords*          pIErrorRecords
= NULL;
        ISupportErrorInfo*      pISupportErrorInfo
= NULL;
        ISQLServerErrorInfo*
pISQLServerErrorInfo    = NULL;
        ISQLErrorInfo*
        pISQLErrorInfo    = NULL;

        // Information used when cannot get custom
error object
        ERRORINFO
        BasicErrorInfo;
        BSTR
        bstrDescription;
        // Number of error records.
        ULONG                   nRecs;
        ULONG                   nRec;

        // SQL Server error information from
ISQLServerErrorInfo.
        SSERRORINFO*            pSSErrorInfo =
NULL;
        OLECHAR*                pSSErrorStrings =
NULL;

        assert(pObjectWithError != NULL);

        pOLEDBErr = new COLEDBERR(szLocation);

        pOLEDBErr->m_NativeError = 0;
        pOLEDBErr->m_eAction = eAction;
        pOLEDBErr->m_bDeadLock = FALSE;

        szTmp[0] = 0;

        // Only ask for error information if the
interface supports it.
```

```
        // Note: SQLOLEDB provider supports error
interface, so this check is
        // for good style only.
        hr = pObjectWithError-
>QueryInterface(IID_ISupportErrorInfo, (void**)
&pISupportErrorInfo);
        if (FAILED(hr))
        {
                _snprintf(szMsg, sizeof(szMsg),
"SupportErrorInfo interface not supported (hr=0x%X)",
hr);
                pOLEDBErr->m_OLEDBErrStr = new
char[strlen(szMsg)+1];
                strcpy(pOLEDBErr->m_OLEDBErrStr,
szMsg);
                throw pOLEDBErr;
        }
        /*if (FAILED(pISupportErrorInfo-
>InterfaceSupportsErrorInfo(IID_InterfaceWithError)))
        {
                _snprintf(szMsg, sizeof(szMsg),
"InterfaceWithError interface not supported");
                pOLEDBErr->m_OLEDBErrStr = new
char[strlen(szMsg)+1];
                strcpy(pOLEDBErr->m_OLEDBErrStr,
szMsg);
                return;
        }*/

        // Do not test the return of GetErrorInfo.
It can succeed and return
        // a NULL pointer in pIErrorInfoAll. Simply
test the pointer.
        GetErrorInfo(0, &pIErrorInfoAll);

        if (pIErrorInfoAll != NULL)
        {
                // Test to see if it's a valid
OLE DB IErrorInfo interface
                // exposing a list of records.
                if (SUCCEEDED(pIErrorInfoAll-
>QueryInterface(IID_IErrorRecords,      (void**)
&pIErrorRecords)))
                {
                        pIErrorRecords-
>GetRecordCount(&nRecs);

                        // Within each record,
retrieve information from each
                        // of the defined
interfaces.
                        for (nRec = 0; nRec <
nRecs; nRec++)
                        {
                                // Request
the generic SQL error interface.

        pIErrorRecords->GetCustomErrorObject(nRec,
```

```
          IID_ISQLErrorInfo, // generic SQL error
interface

          (IUnknown**) &pISQLErrorInfo);

                                    if
(pISQLErrorInfo != NULL)
                                    {
                                              //
Request SQL Server-specific error interface, not the
generic SQL error interface.

          pISQLErrorInfo->QueryInterface(

          IID_ISQLServerErrorInfo, // SQL Server
error interface


          (void**) &pISQLServerErrorInfo);
                                    }

                                    // Test to
ensure the reference is valid, then
                                    // get error
information from ISQLServerErrorInfo.
                                    if
(pISQLServerErrorInfo != NULL)
                                    {

          pISQLServerErrorInfo-
>GetErrorInfo(&pSSErrorInfo, &pSSErrorStrings);

                                              //
ISQLServerErrorInfo::GetErrorInfo succeeds
                                              //
even when it has nothing to return. Test the
                                              //
pointers before using.
                                              if
(pSSErrorInfo)
                                              {

          // First, add the error message.


          // Convert Unicode error string to ANSI.

          WideCharToMultiByte(CP_THREAD_ACP, 0,

                    pSSErrorInfo->pwszMessage, -1,

                    szMsg, sizeof(szMsg),

                    NULL, NULL);


          // quit if there isn't enough room to
concatenate error text

          if ( (strlen(szMsg) + 2) > (sizeof(szTmp) -
strlen(szTmp)) )

                    break;


          // include line break after first error msg

          if (szTmp[0] != 0)

                    strcat( szTmp, "\r\n");

          // concatenate the error record to the
overall error message

          strcat( szTmp, szMsg );


          // Second, add the stored procedure name
and line number, if available.


          if (wcslen(pSSErrorInfo->pwszProcedure)>0)

          {

                    // Prefix with a line break

                    iLen = sprintf(szMsg,
"\r\nProcedure: ");


                    // Convert Unicode error string
to ANSI.


          WideCharToMultiByte(CP_THREAD_ACP, 0,

                              pSSErrorInfo-
>pwszProcedure, -1,

                              &szMsg[iLen],
sizeof(szMsg) - iLen,

                              NULL, NULL);


                    // Check if have space to add the
line number.

                    // Assume the line number takes
no more than 3 digits.

                    if ((strlen(szMsg) + 4)<
sizeof(szMsg))

                    {

                    _snprintf(&szMsg[strlen(szMsg)],
sizeof(szMsg),

                                                  ":%d",
pSSErrorInfo->wLineNumber);

                    }


                    // quit if there isn't enough
room to concatenate error text

                    if ( (strlen(szMsg) + 2) >
(sizeof(szTmp) - strlen(szTmp)) )

                              break;


                    // concatenate the error record
to the overall error message

                    strcat( szTmp, szMsg );


                    // copy the overall error string
to the exception

                    pOLEDBErr->m_OLEDBErrStr = new
char[strlen(szTmp)+1];

                    strcpy(pOLEDBErr->m_OLEDBErrStr,
szTmp);

          }


          // Third, capture the (first) database
error

          if (pOLEDBErr->m_NativeError == 0 &&
pSSErrorInfo->lNative != 0)

          {

                    pOLEDBErr->m_NativeError =
pSSErrorInfo->lNative;


                    // Check for deadlock error code
and set the deadlock flag

                    if (pSSErrorInfo->lNative ==
1205)

                    {

                              pOLEDBErr->m_bDeadLock
= TRUE;

                    }
```

```
        }


        // IMalloc::Free needed to release
references
        // on returned values.
        if (m_pIMalloc != NULL)
        {
                m_pIMalloc->
>Free(pSSErrorStrings);
                m_pIMalloc->Free(pSSErrorInfo);
        }
                                                }


        pISQLServerErrorInfo->Release();
                                              }
                                              else
                                              {
                                                        //
Custom error object is not supported.
                                                        //
Use general OLE-DB error interface.

                                                        //
Get the numeric error code
        pIErrorRecords->GetBasicErrorInfo(nRec,
&BasicErrorInfo);

                                                if
(pOLEDBErr->m_NativeError == 0)
                                                {
        // Get the failed call HRESULT code, which
is not really the native error
        pOLEDBErr->m_NativeError =
BasicErrorInfo.hrError;
                                                }

                                                //
Try to get the string description of the error.
        pIErrorRecords->GetErrorInfo(nRec,
LOCALE_USER_DEFAULT,
(IErrorInfo**)&pIErrorInfoRecord);

                                                if
(pIErrorInfoRecord)
                                                {

        pIErrorInfoRecord-
>GetDescription(&bstrDescription);
```

```
        // Convert Unicode error string to ANSI.
        WideCharToMultiByte(CP_THREAD_ACP, 0,
                bstrDescription, -1,
                szMsg, sizeof(szMsg),
                NULL, NULL);


        pOLEDBErr->m_OLEDBErrStr = new
char[strlen(szMsg)+1];
        strcpy(pOLEDBErr->m_OLEDBErrStr, szMsg);


                                                }
                                        }
                                }       // for()
                        }       // if
(SUCCEEDED(pIErrorInfoAll-
>QueryInterface(IID_IErrorRecords, (void**)
&pIErrorRecords)))
                        else
                        {       // No IErrorRecords
interface supported. Use default IErrorInfo.
                                // Note: SQLOLEDB
supports IErrorRecords, so this check is for good
style only.
                                _snprintf(szMsg,
sizeof(szMsg), "IErrorRecords interface not
supported");
                                pOLEDBErr-
>m_OLEDBErrStr = new char[strlen(szMsg)+1];
                                strcpy(pOLEDBErr-
>m_OLEDBErrStr, szMsg);
                        }

                        pIErrorInfoAll->Release();

        }       // if (pIErrorInfoAll != NULL)
        else
        {
                // No IErrorInfo interface
supported.
                // Note: SQLOLEDB supports
IErrorInfo, so this check is for good style only.
                _snprintf(szMsg, sizeof(szMsg),
"IErrorInfo interface not supported");
                pOLEDBErr->m_OLEDBErrStr = new
char[strlen(szMsg)+1];
                strcpy(pOLEDBErr->m_OLEDBErrStr,
szMsg);
        }

        throw pOLEDBErr;
}
```

```
/*
*
*       Create a new command object from the SQL
text passed in.
*
*/
void CTPCC_OLEDB::CreateCommand(wchar_t*
szSQLCommand,                           // I: SQL
query for the command

                        ICommandText**
ppICommandText      // O: returned command object

                        )
{
        HRESULT                                 hr;

        // Create a new command object
        hr = m_pIDBCreateCommand-
>CreateCommand(NULL, IID_ICommandText, (IUnknown
**)ppICommandText);
        if (FAILED(hr))
        {
                ThrowError(m_pIDBCreateCommand,
COLEDBERR::eCreateCommand,
"CTPCC_OLEDB::CreateCommand");
        }

        // Set command text
        hr = (*ppICommandText)-
>SetCommandText(DBGUID_SQL, szSQLCommand);
        if (FAILED(hr))
        {
                ThrowError(*ppICommandText,
COLEDBERR::eSetCommandText,
"CTPCC_OLEDB::CreateCommand");
        }

        // Prepare the command
        PrepareCommand(*ppICommandText);
}

/*
*       QueryInterface and Prepare in one function
for simplicity.
*       DEFERRED PREPARE property is set to off to
prepare immediatelly.
*/
void CTPCC_OLEDB::PrepareCommand(ICommandText*
pICommandText)
{
        HRESULT                                 hr;
        ICommandPrepare*    pICommandPrepare;
        ICommandProperties* pICommandProperties;
        DBPROPSET
        rowSetPropSet;
        DBPROP
        rowSetProp;

        // Set the deferred prepare property to
false.
```

```
        rowSetProp.dwPropertyID =
SSPROP_DEFERPREPARE;
        memset(&rowSetProp.vValue, 0,
sizeof(rowSetProp.vValue));
        rowSetProp.dwOptions =
DBPROPOPTIONS_REQUIRED;
        rowSetProp.colid = DB_NULLID;

        rowSetPropSet.cProperties = 1;
        rowSetPropSet.guidPropertySet =
DBPROPSET_SQLSERVERROWSET;
        rowSetPropSet.rgProperties = &rowSetProp;

        // Query interface for setting properties
        hr = pICommandText-
>QueryInterface(IID_ICommandProperties, (void
**)&pICommandProperties);
        if (FAILED(hr))
        {
                ThrowError(pICommandText,
COLEDBERR::eQueryInterface,
"CTPCC_OLEDB::PrepareCommand");
        }

        // Set the property set
        hr = pICommandProperties->SetProperties(1,
&rowSetPropSet);
        if (FAILED(hr))
        {
                ThrowError(pICommandText,
COLEDBERR::eQueryInterface,
"CTPCC_OLEDB::PrepareCommand");
        }

        // Get interface for preparing commands
        hr = pICommandText-
>QueryInterface(IID_ICommandPrepare, (void
**)&pICommandPrepare);
        if (FAILED(hr))
        {
                ThrowError(pICommandText,
COLEDBERR::eQueryInterface,
"CTPCC_OLEDB::PrepareCommand");
        }

        // Prepare Payment command
        hr = pICommandPrepare->Prepare(0xFFFFFFFF);
        if (FAILED(hr))
        {
                ThrowError(pICommandPrepare,
COLEDBERR::ePrepare, "CTPCC_OLEDB::PrepareCommand");
        }
}

/*
*       Initialize fields of an array of bindings
structures.
*       Needs to be called before setting
individual parameter/column bindings.
*/
void CTPCC_OLEDB::InitBindings(DBBINDING*
pDBBindings,        // IO: array of bindings

                    int iCount,
                            // I: number of
elements in the array

                    eBindingType BindingType)     //
I: what the bindings will be used for
(parameters/columns)
{
        int i;

        for(i = 0; i < iCount; i++)
    {
                    pDBBindings[i].iOrdinal = i + 1;
        pDBBindings[i].obLength = 0;
        pDBBindings[i].obStatus = 0;
        pDBBindings[i].pTypeInfo = NULL;
        pDBBindings[i].pObject = NULL;
        pDBBindings[i].pBindExt = NULL;
        pDBBindings[i].dwPart = DBPART_VALUE;

                    switch (BindingType)
                    {
                    case eInputParameter:
                            pDBBindings[i].eParamIO
= DBPARAMIO_INPUT;
                            break;
                    case eOutputParameter:
                            pDBBindings[i].eParamIO
= DBPARAMIO_OUTPUT;
                            break;
                    case eInputOutputParameter:
                            pDBBindings[i].eParamIO
= DBPARAMIO_INPUT | DBPARAMIO_OUTPUT;
                            break;
                    case eOutputColumn:
                            pDBBindings[i].eParamIO
= DBPARAMIO_NOTPARAM;
                            break;
                    default:
                            assert(false);      //
this should never happen
                    }

        pDBBindings[i].dwMemOwner =
DBMEMOWNER_CLIENTOWNED;
        pDBBindings[i].dwFlags = 0;
                    pDBBindings[i].bPrecision = 0;
        pDBBindings[i].bScale = 0;
    }
}

/*
*       Perform binding for one parameter or output
column.
*
*/
void CTPCC_OLEDB::SetBinding(DBBINDING* pDBBinding,
// I: binding row structure
                    size_t obValue,
          // I: parameter (column) offset in the user
buffer

                    size_t cbMaxLen,             //
I: parameter (column) length

                    DBTYPE wType
          // I: parameter (column) type

                    )
{
          pDBBinding->obValue = (ULONG)obValue;
          pDBBinding->cbMaxLen = (ULONG)cbMaxLen;
          pDBBinding->wType = wType;
}

void CTPCC_OLEDB::InitStockLevelParams()
{
          int
                    i;
          HRESULT
          hr;
          wchar_t
          szName[iMAX_SP_NAME_LEN];
          IAccessor*
          pIAccessor;
    const ULONG
          nInputParams = 3;   // input parameters
          const ULONG
          nOutputParams = 1;  // output 1st result
set columns
          // Structure to bind in accessor
          DBBINDING
          acInputDBBinding[nInputParams];
          DBBINDSTATUS
          acInputDBBindStatus[nInputParams];
          DBBINDING
          acOutputDBBinding[nOutputParams];
          DBBINDSTATUS
          acOutputDBBindStatus[nOutputParams];

          // Set command text
          _snwprintf(szName,
sizeof(szName)/sizeof(szName[0]),
                              L"{call
%stpcc_stocklevel (?,?,?)}", m_szSPPrefix);

          // Create and Prepare a new command object
for StockLevel.
          CreateCommand(szName,
&m_pIStockLevelCommand);

          // Describe the consumer buffer by filling
in the array
    // of DBBINDING structures.  Each binding
associates
    // a single parameter to the consumer's buffer.
          InitBindings(&acInputDBBinding[0],
nInputParams, eInputParameter);
```

```
        i = 0;
    // StockLevel parameter 1
        SetBinding(&acInputDBBinding[i++],
offsetof(STOCK_LEVEL_DATA, w_id),
sizeof(m_txn.StockLevel.w_id), DBTYPE_I4);

    // StockLevel parameter 2
        SetBinding(&acInputDBBinding[i++],
offsetof(STOCK_LEVEL_DATA, d_id),
sizeof(m_txn.StockLevel.d_id), DBTYPE_UI1);

        // StockLevel parameter 3
        SetBinding(&acInputDBBinding[i++],
offsetof(STOCK_LEVEL_DATA, threshold),
sizeof(m_txn.StockLevel.threshold), DBTYPE_I2);

        hr = m_pIStockLevelCommand-
>QueryInterface(IID_IAccessor, (void **)&pIAccessor);
        if (FAILED(hr))
        {
                ThrowError(m_pIStockLevelCommand,
COLEDBERR::eQueryInterface,
"InitStockLevelParams()");
        }

        hr = pIAccessor->CreateAccessor(
                        DBACCESSOR_PARAMETERDATA,
                        nInputParams,
                        acInputDBBinding,
                        sizeof(STOCK_LEVEL_DATA),

&m_hStockLevelInputAccessor,
                        acInputDBBindStatus);
        if (FAILED(hr))
        {
                ThrowError(pIAccessor,
COLEDBERR::eCreateAccessor,
"InitStockLevelParams()");
        }

        m_StockLevelExecuteParams.cParamSets = 1;
        m_StockLevelExecuteParams.hAccessor =
m_hStockLevelInputAccessor;
        m_StockLevelExecuteParams.pData =
&m_txn.StockLevel;

        // Now fill the binding information for
result set 1 output columns
        InitBindings(&acOutputDBBinding[0],
nOutputParams, eOutputColumn);

        // Binding for a rowset that may return
more than one row.
        i = 0;
        // StockLevel output column 1
        SetBinding(&acOutputDBBinding[i++],
offsetof(STOCK_LEVEL_DATA, low_stock),
sizeof(m_txn.StockLevel.low_stock), DBTYPE_I4);

        hr = pIAccessor->CreateAccessor(
                        DBACCESSOR_ROWDATA |
DBACCESSOR_OPTIMIZED,
                        nOutputParams,
                        acOutputDBBinding,
                        sizeof(STOCK_LEVEL_DATA),

&m_hStockLevelOutputAccessor,
                        acOutputDBBindStatus);
        if (FAILED(hr))
        {
                ThrowError(pIAccessor,
COLEDBERR::eCreateAccessor,
"InitStockLevelParams()");
        }
}

void CTPCC_OLEDB::StockLevel()
{
        HRESULT                 hr;
        int
        iTryCount = 0;
        IRowset*            pRowset;
        LONG                    cRows = 1;
        // number of rows returned in the rowset
        ULONG
        cRowsObtained;
        HROW                    rghRow;
        //returned row handles
        HROW*                   prghRow =
&rghRow;

        while (TRUE)
        {
                try
                {
                        // Execute the prepared
command
                        hr =
m_pIStockLevelCommand->Execute(NULL, IID_IRowset,
&m_StockLevelExecuteParams, NULL,


        (IUnknown **)&pRowset);
                        if (FAILED(hr))
                        {

        ThrowError(m_pIStockLevelCommand,
COLEDBERR::eExecute, "StockLevel()");
                        }

                        // Fetch the result row
handle(s)
                        hr = pRowset-
>GetNextRows(DB_NULL_HCHAPTER, 0, cRows,
&cRowsObtained, &prghRow);
                        if (FAILED(hr))
                        {

        ThrowError(m_pIStockLevelCommand,
COLEDBERR::eGetNextRows, "StockLevel()");
                        }

                        // Fetch the actual row
data by handle
                        hr = pRowset-
>GetData(rghRow, m_hStockLevelOutputAccessor,
&m_txn.StockLevel);
                        if (FAILED(hr))
                        {

        ThrowError(m_pIStockLevelCommand,
COLEDBERR::eGetData, "StockLevel()");
                        }

                        // Release row(s)
                        hr = pRowset-
>ReleaseRows(cRowsObtained, prghRow, NULL, NULL,
NULL);
                        // Release rowset
                        hr = pRowset-
>Release();


        m_txn.StockLevel.exec_status_code = eOK;

                        break;
                }
                catch (COLEDBERR *e)
                {
                        if ((!e->m_bDeadLock)
|| (++iTryCount > iMaxRetries))
                                throw;

                        // hit deadlock;
backoff for increasingly longer period
                        delete e;
                        Sleep(10 * iTryCount);
                }
        }

//      if (iTryCount)
//              throw new
CTPCC_OLEDB_ERR(CTPCC_OLEDB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}

void CTPCC_OLEDB::InitNewOrderParams()
{
        int
                i, j, iOlCount;
        HRESULT
        hr;
        wchar_t
        szName[iMAX_SP_NAME_LEN];
        IAccessor*
        pIAccessor;
    const ULONG
        nInputParams = 5 +
3*MAX_OL_NEW_ORDER_ITEMS;     // input parameters
        const ULONG
        nOutputParams = 5;  // output 1st result
set columns
```

```
          const ULONG
          nOutputParams2 = 8; // output 2nd result
set columns
          // Structure to bind in accessor
          DBBINDING
          acInputDBBinding[nInputParams];
          DBBINDSTATUS
          acInputDBBindStatus[nInputParams];
          DBBINDING
          acOutputDBBinding[nOutputParams];
          DBBINDSTATUS
          acOutputDBBindStatus[nOutputParams];
          DBBINDING
          acOutputDBBinding2[nOutputParams2];
          DBBINDSTATUS
          acOutputDBBindStatus2[nOutputParams2];

          // Describe the consumer buffer by filling
in the array
    // of DBBINDING structures.  Each binding
associates
    // a single parameter to the consumer's buffer.
          InitBindings(&acInputDBBinding[0],
nInputParams, eInputParameter);

          i = 0;
    // NewOrder parameter 1
          SetBinding(&acInputDBBinding[i++],
offsetof(NEW_ORDER_DATA, w_id),
sizeof(m_txn.NewOrder.w_id), DBTYPE_I4);

    // NewOrder parameter 2
          SetBinding(&acInputDBBinding[i++],
offsetof(NEW_ORDER_DATA, d_id),
sizeof(m_txn.NewOrder.d_id), DBTYPE_UI1);

          // NewOrder parameter 3
          SetBinding(&acInputDBBinding[i++],
offsetof(NEW_ORDER_DATA, c_id),
sizeof(m_txn.NewOrder.c_id), DBTYPE_I4);

          // NewOrder parameter 4
          SetBinding(&acInputDBBinding[i++],
offsetof(NEW_ORDER_DATA, o_ol_cnt),
sizeof(m_txn.NewOrder.o_ol_cnt), DBTYPE_UI1);

          // NewOrder parameter 5
          SetBinding(&acInputDBBinding[i++],
offsetof(NEW_ORDER_DATA, o_all_local),
sizeof(m_txn.NewOrder.o_all_local), DBTYPE_UI1);

          for (j=0; j<MAX_OL_NEW_ORDER_ITEMS; j++)
          {

          SetBinding(&acInputDBBinding[i++],
offsetof(NEW_ORDER_DATA, OL[j].ol_i_id),
sizeof(m_txn.NewOrder.OL[j].ol_i_id), DBTYPE_I4);

          SetBinding(&acInputDBBinding[i++],
offsetof(NEW_ORDER_DATA, OL[j].ol_supply_w_id),
sizeof(m_txn.NewOrder.OL[j].ol_supply_w_id),
DBTYPE_I4);

          SetBinding(&acInputDBBinding[i++],
offsetof(NEW_ORDER_DATA, OL[j].ol_quantity),
sizeof(m_txn.NewOrder.OL[j].ol_quantity), DBTYPE_I2);

          }


          // Now fill the binding information for
result set 1 output columns
          InitBindings(&acOutputDBBinding[0],
nOutputParams, eOutputColumn);

          // Binding for the order line rowsets (each
consist of one row).
          // Bind to offsets of the OL_NEW_ORDER_DATA
structure instead of NEW_ORDER_DATA.
          // IRowset::GetData() will be passed
individual array slots OL[i] to fetch the data
          // from the row set.

          i = 0;
          // NewOrder output column 1
          SetBinding(&acOutputDBBinding[i++],
offsetof(OL_NEW_ORDER_DATA, ol_i_name),
sizeof(m_txn.NewOrder.OL[0].ol_i_name), DBTYPE_STR);

          // NewOrder output column 2
          SetBinding(&acOutputDBBinding[i++],
offsetof(OL_NEW_ORDER_DATA, ol_stock),
sizeof(m_txn.NewOrder.OL[0].ol_stock), DBTYPE_I2);

          // NewOrder output column 3
          SetBinding(&acOutputDBBinding[i++],
offsetof(OL_NEW_ORDER_DATA, ol_brand_generic),
sizeof(m_txn.NewOrder.OL[0].ol_brand_generic),
DBTYPE_STR);

          // NewOrder output column 4
          SetBinding(&acOutputDBBinding[i++],
offsetof(OL_NEW_ORDER_DATA, ol_i_price),
sizeof(m_txn.NewOrder.OL[0].ol_i_price), DBTYPE_R8);

          // NewOrder output column 5
          SetBinding(&acOutputDBBinding[i++],
offsetof(OL_NEW_ORDER_DATA, ol_amount),
sizeof(m_txn.NewOrder.OL[0].ol_amount), DBTYPE_R8);



          // Now fill the binding information for
result set 2 output columns
          InitBindings(&acOutputDBBinding2[0],
nOutputParams2, eOutputColumn);

          i = 0;
          // NewOrder output column 1
          SetBinding(&acOutputDBBinding2[i++],
offsetof(NEW_ORDER_DATA, w_tax),
sizeof(m_txn.NewOrder.w_tax), DBTYPE_R8);

          // NewOrder output column 2
          SetBinding(&acOutputDBBinding2[i++],
offsetof(NEW_ORDER_DATA, d_tax),
sizeof(m_txn.NewOrder.d_tax), DBTYPE_R8);

          // NewOrder output column 3
          SetBinding(&acOutputDBBinding2[i++],
offsetof(NEW_ORDER_DATA, o_id),
sizeof(m_txn.NewOrder.o_id), DBTYPE_I4);

          // NewOrder output column 4
          SetBinding(&acOutputDBBinding2[i++],
offsetof(NEW_ORDER_DATA, c_last),
sizeof(m_txn.NewOrder.c_last), DBTYPE_STR);

          // NewOrder output column 5
          SetBinding(&acOutputDBBinding2[i++],
offsetof(NEW_ORDER_DATA, c_discount),
sizeof(m_txn.NewOrder.c_discount), DBTYPE_R8);

          // NewOrder output column 6
          SetBinding(&acOutputDBBinding2[i++],
offsetof(NEW_ORDER_DATA, c_credit),
sizeof(m_txn.NewOrder.c_credit), DBTYPE_STR);

          // NewOrder output column 7
          SetBinding(&acOutputDBBinding2[i++],
offsetof(NEW_ORDER_DATA, o_entry_d),
sizeof(m_txn.NewOrder.o_entry_d),
DBTYPE_DBTIMESTAMP);

          // NewOrder output column 8
          SetBinding(&acOutputDBBinding2[i++],
offsetof(NEW_ORDER_DATA, o_commit_flag),
sizeof(m_txn.NewOrder.o_commit_flag), DBTYPE_I2);

          for (j=0; j<MAX_OL_NEW_ORDER_ITEMS; j++)
          {
                    // Set command text first

                    // Print the fixed first portion
of parameters
                    i = _snwprintf(szName,
sizeof(szName)/sizeof(szName[0]),

          L"{call %stpcc_neworder (?,?,?,?,?",
m_szSPPrefix);

                    // Now print the variable portion
depending on the number of order line parameters
                    for (iOlCount = 0; iOlCount <= j;
++iOlCount)
                    {
                              i +=
_snwprintf(&szName[i],
sizeof(szName)/sizeof(szName[0]) - i, L",?,?,?");
```

```
                    }

                    // Print the fixed end
                    if (j != MAX_OL_NEW_ORDER_ITEMS -
1)
                    {         // append 'default' for
the parameters that are not used
                              i +=
_snwprintf(&szName[i],
sizeof(szName)/sizeof(szName[0]) - i, L",default)}");

                    }
                    else      // using all 15 order
line parameters
                    {
                              i +=
_snwprintf(&szName[i],
sizeof(szName)/sizeof(szName[0]) - i, L")}");
                    }

                    // Create and Prepare a new
command object for NewOrder.
                    CreateCommand(szName,
&m_pINewOrderCommand[j]);

                    // Now create the input accessor
for this prepared command
                    hr = m_pINewOrderCommand[j]-
>QueryInterface(IID_IAccessor, (void **)&pIAccessor);
                    if (FAILED(hr))
                    {

          ThrowError(m_pINewOrderCommand[j],
COLEDBERR::eQueryInterface, "InitNewOrderParams()");
                    }

                    hr = pIAccessor->CreateAccessor(


          DBACCESSOR_PARAMETERDATA,

                                                   5 +
3 * (j + 1),


          acInputDBBinding,


          sizeof(NEW_ORDER_DATA),


          &m_hNewOrderInputAccessor[j],


          acInputDBBindStatus);
                    if (FAILED(hr))
                    {
                              ThrowError(pIAccessor,
COLEDBERR::eCreateAccessor, "InitNewOrderParams()");
                    }
```

```
          m_NewOrderExecuteParams[j].cParamSets = 1;
                    //
m_NewOrderExecuteParams.hAccessor is set dynamically
at run-time
                    // based on the number of new
order items for the particular transaction call.

          m_NewOrderExecuteParams[j].hAccessor =
m_hNewOrderInputAccessor[j];
                    m_NewOrderExecuteParams[j].pData
= &m_txn.NewOrder;

                    // Create accessor for the first
rowset
                    hr = pIAccessor->CreateAccessor(
                              DBACCESSOR_ROWDATA |
DBACCESSOR_OPTIMIZED,
                              nOutputParams,
                              acOutputDBBinding,

          sizeof(OL_NEW_ORDER_DATA),

          &m_hNewOrderOutputAccessor[j],
                              acOutputDBBindStatus);
                    if (FAILED(hr))
                    {
                              ThrowError(pIAccessor,
COLEDBERR::eCreateAccessor, "InitNewOrderParams()");
                    }

                    // Create accessor for the second
rowset
                    hr = pIAccessor->CreateAccessor(
                              DBACCESSOR_ROWDATA, //
cannot be optimized too because #1 accessor is
                              nOutputParams2,
                              acOutputDBBinding2,
                              sizeof(NEW_ORDER_DATA),

          &m_hNewOrderOutputAccessor2[j],
                              acOutputDBBindStatus2);
                    if (FAILED(hr))
                    {
                              ThrowError(pIAccessor,
COLEDBERR::eCreateAccessor, "InitNewOrderParams()");
                    }

                    pIAccessor->Release();
          }
}

void CTPCC_OLEDB::NewOrder()
{
          HRESULT                                   hr;
          int
          iTryCount = 0;
          IMultipleResults*   pMultipleResults;
          IRowset*                  pRowset;
          IRowset*                  pRowset2;
```

```
          LONG
          cRows = 1;          // number of rows
returned in the 1st rowset
          ULONG
          cRowsObtained;
          HROW
          rghRows;            //returned row handles
for the 1st result set
          HROW*
          prghRows = &rghRows;
          LONG
          cRows2 = 1;         // number of rows
returned in the 2nd rowset
          ULONG
          cRowsObtained2;
          HROW
          rghRows2;           //returned row handle
for the 2nd result set
          HROW*
          prghRows2 = &rghRows2;
          int
          i;
          long
          lRowsAffected;      // the number of
affected rows for a rowset
          int
          iHandleIndex;       // index into the
handle arrays based on the orders count

          // check whether any order lines are for a
remote warehouse
          m_txn.NewOrder.o_all_local = 1;
          for (i = 0; i < m_txn.NewOrder.o_ol_cnt;
i++)
          {
                    if
(m_txn.NewOrder.OL[i].ol_supply_w_id !=
m_txn.NewOrder.w_id)
                    {

          m_txn.NewOrder.o_all_local = 0;  // at
least one remote warehouse
                              break;
                    }
          }

          iHandleIndex = m_txn.NewOrder.o_ol_cnt - 1;
          // for convenience

          while (TRUE)
          {
                    try
                    {
                              // Execute the prepared
command (according to the number of new orders)
                              // Ask for
IMultipleResults because it returns 2 rowsets.
                              hr =
m_pINewOrderCommand[iHandleIndex]->Execute(
```

```
        NULL, IID_IMultipleResults,

        &m_NewOrderExecuteParams[iHandleIndex],

        NULL,

        (IUnknown **)&pMultipleResults);
                        if (FAILED(hr))
                        {
        ThrowError(m_pINewOrderCommand[iHandleIndex
], COLEDBERR::eExecute, "NewOrder()");
                        }

        //////////////////////////
                        // Get order line
results
        //////////////////////////

        m_txn.NewOrder.total_amount = 0;
                        for (i = 0; i <
m_txn.NewOrder.o_ol_cnt; ++i)
                        {
                                // Get the
first rowset object
                                hr =
pMultipleResults->GetResult(NULL, 0, IID_IRowset,
&lRowsAffected, (IUnknown **)&pRowset);
                                if
(FAILED(hr))
                                {

        char szTmp[256];

        _snprintf(szTmp, sizeof(szTmp), "NewOrder()
result set %d, hr=0x%X", i, hr);

        ThrowError(m_pINewOrderCommand[m_txn.NewOrd
er.o_ol_cnt - 1], COLEDBERR::eGetResult, szTmp);
                                }

                                // Fetch the
result row handle(s)
                                hr = pRowset-
>GetNextRows(DB_NULL_HCHAPTER, 0, cRows,
&cRowsObtained, &prghRows);
                                if
(FAILED(hr))
                                {

        ThrowError(m_pINewOrderCommand[iHandleIndex
], COLEDBERR::eGetNextRows, "NewOrder()");
                                }

                                // Fetch the
actual row data by handle
                                hr = pRowset-
>GetData(rghRows,
m_hNewOrderOutputAccessor[iHandleIndex],
&m_txn.NewOrder.OL[i]);
                                if
(FAILED(hr))
                                {

        ThrowError(m_pINewOrderCommand[iHandleIndex
], COLEDBERR::eGetData, "NewOrder()");
                                }

        m_txn.NewOrder.total_amount +=
m_txn.NewOrder.OL[i].ol_amount;

                                // Release
row(s)
                                hr = pRowset-
>ReleaseRows(cRowsObtained, prghRows, NULL, NULL,
NULL);
                                // Release
rowset
                                hr = pRowset-
>Release();
                        }

        ////////////////////////////////
                        // Get the second
rowset object
        ////////////////////////////////
                        hr = pMultipleResults-
>GetResult(NULL, 0, IID_IRowset, &lRowsAffected,
(IUnknown **)&pRowset2);
                        if (FAILED(hr))
                        {
                                char
szTmp[256];

        _snprintf(szTmp, sizeof(szTmp), "NewOrder()
result set %d, hr=%d", i, hr);

        ThrowError(m_pINewOrderCommand[iHandleIndex
], COLEDBERR::eGetResult, szTmp);
                        }

                        // Fetch the result row
handle(s)
                        hr = pRowset2-
>GetNextRows(DB_NULL_HCHAPTER, 0, cRows2,
&cRowsObtained2, &prghRows2);
                        if (FAILED(hr))
                        {

        ThrowError(m_pINewOrderCommand[iHandleIndex
], COLEDBERR::eGetNextRows, "NewOrder()");
                        }

                        // Fetch the actual row
data by handle
                        hr = pRowset2-
>GetData(rghRows2,
m_hNewOrderOutputAccessor2[iHandleIndex],
&m_txn.NewOrder);
                        if (FAILED(hr))
                        {

        ThrowError(m_pINewOrderCommand[iHandleIndex
], COLEDBERR::eGetData, "NewOrder()");
                        }

                        // Release row(s)
                        hr = pRowset2-
>ReleaseRows(cRowsObtained2, prghRows2, NULL, NULL,
NULL);
                        // Release rowset
                        hr = pRowset2-
>Release();

                        // Release the common
MultipleResults interface
                        hr = pMultipleResults-
>Release();

                        if
(m_txn.NewOrder.o_all_local == 1)
                        {

        m_txn.NewOrder.total_amount *= ((1 +
m_txn.NewOrder.w_tax + m_txn.NewOrder.d_tax) * (1 -
m_txn.NewOrder.c_discount));

        m_txn.NewOrder.exec_status_code = eOK;
                        }
                        else
                        {

        m_txn.NewOrder.exec_status_code =
eInvalidItem;
                        }

                        break;

                }
                catch (COLEDBERR *e)
                {
                        if ((!e->m_bDeadLock)
|| (++iTryCount > iMaxRetries))
                                throw;

                        // hit deadlock;
backoff for increasingly longer period
                        delete e;
                        Sleep(10 * iTryCount);
```

```
                }
        }

//      if (iTryCount)
//              throw new
CTPCC_OLEDB_ERR(CTPCC_OLEDB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}

void CTPCC_OLEDB::InitPaymentParams()
{
        int
                i;
        HRESULT
        hr;
        wchar_t
        szName[iMAX_SP_NAME_LEN];
        IAccessor*
        pIAccessor;
    const ULONG
        nInputParams = 7;   // input parameters
        const ULONG
        nOutputParams = 27; // output result set
columns
        // Structure to bind in accessor
        DBBINDING
        acInputDBBinding[nInputParams];
        DBBINDSTATUS
        acInputDBBindStatus[nInputParams];
        DBBINDING
        acOutputDBBinding[nOutputParams];
        DBBINDSTATUS
        acOutputDBBindStatus[nOutputParams];

        // Set command text
        _snwprintf(szName,
sizeof(szName)/sizeof(szName[0]), L"{call
%stpcc_payment(?,?,?,?,?,?,?)}", m_szSPPrefix);

        // Create and Prepare a new command object
for Payment.
        CreateCommand(szName, &m_pIPaymentCommand);


        // Describe the consumer buffer by filling
in the array
    // of DBBINDING structures.  Each binding
associates
    // a single parameter to the consumer's buffer.
        InitBindings(&acInputDBBinding[0],
nInputParams, eInputParameter);

        i = 0;
    // Payment parameter 1
        SetBinding(&acInputDBBinding[i++],
offsetof(PAYMENT_DATA, w_id),
sizeof(m_txn.Payment.w_id), DBTYPE_I4);

    // Payment parameter 2
        SetBinding(&acInputDBBinding[i++],
offsetof(PAYMENT_DATA, c_w_id),
sizeof(m_txn.Payment.c_w_id), DBTYPE_I4);

        // Payment parameter 3
        SetBinding(&acInputDBBinding[i++],
offsetof(PAYMENT_DATA, h_amount),
sizeof(m_txn.Payment.h_amount), DBTYPE_R8);

    // Payment parameter 4
        SetBinding(&acInputDBBinding[i++],
offsetof(PAYMENT_DATA, d_id),
sizeof(m_txn.Payment.d_id), DBTYPE_UI1);

        // Payment parameter 5
        SetBinding(&acInputDBBinding[i++],
offsetof(PAYMENT_DATA, c_d_id),
sizeof(m_txn.Payment.c_d_id), DBTYPE_UI1);

        // Payment parameter 6
        SetBinding(&acInputDBBinding[i++],
offsetof(PAYMENT_DATA, c_id),
sizeof(m_txn.Payment.c_id), DBTYPE_I4);

        // Payment parameter 7
        SetBinding(&acInputDBBinding[i++],
offsetof(PAYMENT_DATA, c_last),
sizeof(m_txn.Payment.c_last), DBTYPE_STR);

        hr = m_pIPaymentCommand-
>QueryInterface(IID_IAccessor, (void **)&pIAccessor);
        if (FAILED(hr))
        {
                ThrowError(m_pIPaymentCommand,
COLEDBERR::eQueryInterface, "InitPaymentParams()");
        }

        hr = pIAccessor->CreateAccessor(
                        DBACCESSOR_PARAMETERDATA,
                        nInputParams,
                        acInputDBBinding,
                        sizeof(PAYMENT_DATA),
                        &m_hPaymentInputAccessor,
                        acInputDBBindStatus);
        if (FAILED(hr))
        {
                ThrowError(pIAccessor,
COLEDBERR::eCreateAccessor, "InitPaymentParams()");
        }

        m_PaymentExecuteParams.cParamSets = 1;
        m_PaymentExecuteParams.hAccessor =
m_hPaymentInputAccessor;
        m_PaymentExecuteParams.pData =
&m_txn.Payment;

        // Now fill the binding information for
output columns
        InitBindings(&acOutputDBBinding[0],
nOutputParams, eOutputColumn);

        i = 0;
        // Payment output column 1
        SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, c_id),
sizeof(m_txn.Payment.c_id), DBTYPE_I4);

        // Payment output column 2
        SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, c_last),
sizeof(m_txn.Payment.c_last), DBTYPE_STR);

        // Payment output column 3
        SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, h_date),
sizeof(m_txn.Payment.h_date), DBTYPE_DBTIMESTAMP);

        // Payment output column 4
        SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, w_street_1),
sizeof(m_txn.Payment.w_street_1), DBTYPE_STR);

        // Payment output column 5
        SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, w_street_2),
sizeof(m_txn.Payment.w_street_2), DBTYPE_STR);

        // Payment output column 6
        SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, w_city),
sizeof(m_txn.Payment.w_city), DBTYPE_STR);

        // Payment output column 7
        SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, w_state),
sizeof(m_txn.Payment.w_state), DBTYPE_STR);

        // Payment output column 8
        SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, w_zip),
sizeof(m_txn.Payment.w_zip), DBTYPE_STR);

        // Payment output column 9
        SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, d_street_1),
sizeof(m_txn.Payment.d_street_1), DBTYPE_STR);

        // Payment output column 10
        SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, d_street_2),
sizeof(m_txn.Payment.d_street_2), DBTYPE_STR);

        // Payment output column 11
        SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, d_city),
sizeof(m_txn.Payment.d_city), DBTYPE_STR);

        // Payment output column 12
        SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, d_state),
sizeof(m_txn.Payment.d_state), DBTYPE_STR);
```

```
          // Payment output column 13
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, d_zip),
sizeof(m_txn.Payment.d_zip), DBTYPE_STR);

          // Payment output column 14
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, c_first),
sizeof(m_txn.Payment.c_first), DBTYPE_STR);

          // Payment output column 15
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, c_middle),
sizeof(m_txn.Payment.c_middle), DBTYPE_STR);

          // Payment output column 16
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, d_street_1),
sizeof(m_txn.Payment.d_street_1), DBTYPE_STR);

          // Payment output column 17
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, d_street_2),
sizeof(m_txn.Payment.d_street_2), DBTYPE_STR);

          // Payment output column 18
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, d_city),
sizeof(m_txn.Payment.d_city), DBTYPE_STR);

          // Payment output column 19
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, d_state),
sizeof(m_txn.Payment.d_state), DBTYPE_STR);

          // Payment output column 20
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, d_zip),
sizeof(m_txn.Payment.d_zip), DBTYPE_STR);

          // Payment output column 21
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, c_phone),
sizeof(m_txn.Payment.c_phone), DBTYPE_STR);

          // Payment output column 22
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, c_since),
sizeof(m_txn.Payment.c_since), DBTYPE_DBTIMESTAMP);

          // Payment output column 23
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, c_credit),
sizeof(m_txn.Payment.c_credit), DBTYPE_STR);

          // Payment output column 24
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, c_credit_lim),
sizeof(m_txn.Payment.c_credit_lim), DBTYPE_R8);

          // Payment output column 25
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, c_discount),
sizeof(m_txn.Payment.c_discount), DBTYPE_R8);

          // Payment output column 26
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, c_balance),
sizeof(m_txn.Payment.c_balance), DBTYPE_R8);

          // Payment output column 27
          SetBinding(&acOutputDBBinding[i++],
offsetof(PAYMENT_DATA, c_data),
sizeof(m_txn.Payment.c_data), DBTYPE_STR);

          hr = pIAccessor->CreateAccessor(
                              DBACCESSOR_ROWDATA |
DBACCESSOR_OPTIMIZED,
                              nOutputParams,
                              acOutputDBBinding,
                              sizeof(PAYMENT_DATA),

&m_hPaymentOutputAccessor,
                              acOutputDBBindStatus);
          if (FAILED(hr))
          {
                    ThrowError(pIAccessor,
COLEDBERR::eCreateAccessor, "InitPaymentParams()");
          }
}

void CTPCC_OLEDB::Payment()
{
          HRESULT                         hr;
          int
          iTryCount = 0;
          IRowset*             pRowset;
          LONG                            cRows = 1;
          // number of rows returned in the rowset
          ULONG
          cRowsObtained;
          HROW                            rghRow;
          //returned row handles
          HROW*                           prghRow =
&rghRow;


          if (m_txn.Payment.c_id != 0)
                    m_txn.Payment.c_last[0] = 0;

          while (TRUE)
          {
                    try
                    {
                              // Execute the prepared
command
                              hr =
m_pIPaymentCommand->Execute(NULL, IID_IRowset,
&m_PaymentExecuteParams, NULL,


          (IUnknown **)&pRowset);
                              if (FAILED(hr))
                              {

          ThrowError(m_pIPaymentCommand,
COLEDBERR::eExecute, "Payment()");
                              }

                              // Fetch the result row
handle(s)
                              hr = pRowset-
>GetNextRows(DB_NULL_HCHAPTER, 0, cRows,
&cRowsObtained, &prghRow);
                              if (FAILED(hr))
                              {

          ThrowError(m_pIPaymentCommand,
COLEDBERR::eGetNextRows, "Payment()");
                              }

                              // Fetch the actual row
data by handle
                              hr = pRowset-
>GetData(rghRow, m_hPaymentOutputAccessor,
&m_txn.Payment);
                              if (FAILED(hr))
                              {

          ThrowError(m_pIPaymentCommand,
COLEDBERR::eGetData, "Payment()");
                              }

                              // Release row(s)
                              hr = pRowset-
>ReleaseRows(cRowsObtained, prghRow, NULL, NULL,
NULL);
                              // Release rowset
                              hr = pRowset-
>Release();

                              if (m_txn.Payment.c_id
== 0)
                                        throw new
CTPCC_OLEDB_ERR( CTPCC_OLEDB_ERR::ERR_INVALID_CUST );
                              else

          m_txn.Payment.exec_status_code = eOK;

                              break;
                    }
                    catch (COLEDBERR *e)
                    {
                              if ((!e->m_bDeadLock)
|| (++iTryCount > iMaxRetries))
                                        throw;

                              // hit deadlock;
backoff for increasingly longer period
                              delete e;
                              Sleep(10 * iTryCount);
                    }
          }
```

```
//        if (iTryCount)
//                  throw new
CTPCC_OLEDB_ERR(CTPCC_OLEDB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}

void CTPCC_OLEDB::InitOrderStatusParams()
{
          int
                    i;
          HRESULT
          hr;
          wchar_t
          szName[iMAX_SP_NAME_LEN];
          IAccessor*
          pIAccessor;
    const ULONG
          nInputParams = 4;   // input parameters
          const ULONG
          nOutputParams = 5;  // output 1st result
set columns
          const ULONG
          nOutputParams2 = 8; // output 2nd result
set columns
          // Structure to bind in accessor
          DBBINDING
          acInputDBBinding[nInputParams];
          DBBINDSTATUS
          acInputDBBindStatus[nInputParams];
          DBBINDING
          acOutputDBBinding[nOutputParams];
          DBBINDSTATUS
          acOutputDBBindStatus[nOutputParams];
          DBBINDING
          acOutputDBBinding2[nOutputParams2];
          DBBINDSTATUS
          acOutputDBBindStatus2[nOutputParams2];

          // Set command text
          _snwprintf(szName,
sizeof(szName)/sizeof(szName[0]),
                              L"{call
%stpcc_orderstatus (?,?,?,?)}", m_szSPPrefix);

          // Create and Prepare a new command object
for OrderStatus.
          CreateCommand(szName,
&m_pIOrderStatusCommand);

          // Describe the consumer buffer by filling
in the array
    // of DBBINDING structures.  Each binding
associates
    // a single parameter to the consumer's buffer.
          InitBindings(&acInputDBBinding[0],
nInputParams, eInputParameter);

          i = 0;
    // OrderStatus parameter 1
          SetBinding(&acInputDBBinding[i++],
offsetof(ORDER_STATUS_DATA, w_id),
sizeof(m_txn.OrderStatus.w_id), DBTYPE_I4);

    // OrderStatus parameter 2
          SetBinding(&acInputDBBinding[i++],
offsetof(ORDER_STATUS_DATA, d_id),
sizeof(m_txn.OrderStatus.d_id), DBTYPE_UI1);

          // OrderStatus parameter 3
          SetBinding(&acInputDBBinding[i++],
offsetof(ORDER_STATUS_DATA, c_id),
sizeof(m_txn.OrderStatus.c_id), DBTYPE_I4);

          // OrderStatus parameter 4
          SetBinding(&acInputDBBinding[i++],
offsetof(ORDER_STATUS_DATA, c_last),
sizeof(m_txn.OrderStatus.c_last), DBTYPE_STR);

          hr = m_pIOrderStatusCommand-
>QueryInterface(IID_IAccessor, (void **)&pIAccessor);
          if (FAILED(hr))
          {

          ThrowError(m_pIOrderStatusCommand,
COLEDBERR::eQueryInterface,
"InitOrderStatusParams()");
          }

          hr = pIAccessor->CreateAccessor(
                              DBACCESSOR_PARAMETERDATA,
                              nInputParams,
                              acInputDBBinding,

sizeof(ORDER_STATUS_DATA),

&m_hOrderStatusInputAccessor,
                              acInputDBBindStatus);
          if (FAILED(hr))
          {
                    ThrowError(pIAccessor,
COLEDBERR::eCreateAccessor,
"InitOrderStatusParams()");
          }

          m_OrderStatusExecuteParams.cParamSets = 1;
          m_OrderStatusExecuteParams.hAccessor =
m_hOrderStatusInputAccessor;
          m_OrderStatusExecuteParams.pData =
&m_txn.OrderStatus;

          // Now fill the binding information for
result set 1 output columns
          InitBindings(&acOutputDBBinding[0],
nOutputParams, eOutputColumn);

          // Binding for a rowset that may return
more than one row.
          // Bind to offsets of the
OL_ORDER_STATUS_DATA structure instead of
ORDER_STATUS_DATA.
          // IRowset::GetData() will be passed
individual array slots OL[i] to fetch the data
          // from the row set.

          i = 0;
          // OrderStatus output column 1
          SetBinding(&acOutputDBBinding[i++],
offsetof(OL_ORDER_STATUS_DATA, ol_supply_w_id),
sizeof(m_txn.OrderStatus.OL[0].ol_supply_w_id),
DBTYPE_I4);

          // OrderStatus output column 2
          SetBinding(&acOutputDBBinding[i++],
offsetof(OL_ORDER_STATUS_DATA, ol_i_id),
sizeof(m_txn.OrderStatus.OL[0].ol_i_id), DBTYPE_I4);

          // OrderStatus output column 3
          SetBinding(&acOutputDBBinding[i++],
offsetof(OL_ORDER_STATUS_DATA, ol_quantity),
sizeof(m_txn.OrderStatus.OL[0].ol_quantity),
DBTYPE_I2);

          // OrderStatus output column 4
          SetBinding(&acOutputDBBinding[i++],
offsetof(OL_ORDER_STATUS_DATA, ol_amount),
sizeof(m_txn.OrderStatus.OL[0].ol_amount),
DBTYPE_R8);

          // OrderStatus output column 5
          SetBinding(&acOutputDBBinding[i++],
offsetof(OL_ORDER_STATUS_DATA, ol_delivery_d),
sizeof(m_txn.OrderStatus.OL[0].ol_delivery_d),
DBTYPE_DBTIMESTAMP);

          hr = pIAccessor->CreateAccessor(
                              DBACCESSOR_ROWDATA |
DBACCESSOR_OPTIMIZED,
                              nOutputParams,
                              acOutputDBBinding,

sizeof(OL_ORDER_STATUS_DATA),

&m_hOrderStatusOutputAccessor,
                              acOutputDBBindStatus);
          if (FAILED(hr))
          {
                    ThrowError(pIAccessor,
COLEDBERR::eCreateAccessor,
"InitOrderStatusParams()");
          }

          // Now fill the binding information for
result set 2 output columns
          InitBindings(&acOutputDBBinding2[0],
nOutputParams2, eOutputColumn);

          i = 0;
          // OrderStatus output column 1
          SetBinding(&acOutputDBBinding2[i++],
offsetof(ORDER_STATUS_DATA, c_id),
sizeof(m_txn.OrderStatus.c_id), DBTYPE_I4);
```

```
        // OrderStatus output column 2
        SetBinding(&acOutputDBBinding2[i++],
offsetof(ORDER_STATUS_DATA, c_last),
sizeof(m_txn.OrderStatus.c_last), DBTYPE_STR);

        // OrderStatus output column 3
        SetBinding(&acOutputDBBinding2[i++],
offsetof(ORDER_STATUS_DATA, c_first),
sizeof(m_txn.OrderStatus.c_first), DBTYPE_STR);

        // OrderStatus output column 4
        SetBinding(&acOutputDBBinding2[i++],
offsetof(ORDER_STATUS_DATA, c_middle),
sizeof(m_txn.OrderStatus.c_middle), DBTYPE_STR);

        // OrderStatus output column 5
        SetBinding(&acOutputDBBinding2[i++],
offsetof(ORDER_STATUS_DATA, o_entry_d),
sizeof(m_txn.OrderStatus.o_entry_d),
DBTYPE_DBTIMESTAMP);

        // OrderStatus output column 7
        SetBinding(&acOutputDBBinding2[i++],
offsetof(ORDER_STATUS_DATA, o_carrier_id),
sizeof(m_txn.OrderStatus.o_carrier_id), DBTYPE_I2);

        // OrderStatus output column 8
        SetBinding(&acOutputDBBinding2[i++],
offsetof(ORDER_STATUS_DATA, c_balance),
sizeof(m_txn.OrderStatus.c_balance), DBTYPE_R8);

        // OrderStatus output column 9
        SetBinding(&acOutputDBBinding2[i++],
offsetof(ORDER_STATUS_DATA, o_id),
sizeof(m_txn.OrderStatus.o_id), DBTYPE_I4);

        hr = pIAccessor->CreateAccessor(
                        DBACCESSOR_ROWDATA, //
cannot be optimized too because #1 accessor is
                        nOutputParams2,
                        acOutputDBBinding2,
                        sizeof(NEW_ORDER_DATA),

&m_hOrderStatusOutputAccessor2,
                        acOutputDBBindStatus2);
        if (FAILED(hr))
        {
                ThrowError(pIAccessor,
COLEDBERR::eCreateAccessor,
"InitOrderStatusParams()");
        }
}

void CTPCC_OLEDB::OrderStatus()
{
        HRESULT                                 hr;
        int
        iTryCount = 0;
        IMultipleResults*   pMultipleResults;
        IRowset*                        pRowset;
        IRowset*                        pRowset2;
        LONG
        cRows = MAX_OL_ORDER_STATUS_ITEMS;      //
number of rows returned in the 1st rowset
        ULONG
        cRowsObtained;
        HROW
        rghRows[MAX_OL_ORDER_STATUS_ITEMS];
        //returned row handles for the 1st result
set
        HROW*
        prghRows = &rghRows[0];
        LONG
        cRows2 = 1;         // number of rows
returned in the 2nd rowset
        ULONG
        cRowsObtained2;
        HROW
        rghRows2;           //returned row handle
for the 2nd result set
        HROW*
        prghRows2 = &rghRows2;
        int
        i;
        long
        lRowsAffected;      // the number of
affected rows for a rowset

        if (m_txn.OrderStatus.c_id != 0)
                m_txn.OrderStatus.c_last[0] = 0;

        while (TRUE)
        {
                try
                {
                                // Execute the prepared
command
                                // Ask for
IMultipleResults because it returns 2 rowsets.
                                hr =
m_pIOrderStatusCommand->Execute(NULL,
IID_IMultipleResults, &m_OrderStatusExecuteParams,
NULL,


        (IUnknown **)&pMultipleResults);
                                if (FAILED(hr))
                                {

        ThrowError(m_pIOrderStatusCommand,
COLEDBERR::eExecute, "OrderStatus()");
                                }


        ////////////////////////
                                // Get order line
results

        ////////////////////////
                                // Get the first rowset
object
                                hr = pMultipleResults-
>GetResult(NULL, 0, IID_IRowset, &lRowsAffected,
(IUnknown **)&pRowset);
                                if (FAILED(hr))
                                {

        ThrowError(m_pIOrderStatusCommand,
COLEDBERR::eGetResult, "OrderStatus()");
                                }

                                // Fetch the result row
handle(s)
                                hr = pRowset-
>GetNextRows(DB_NULL_HCHAPTER, 0, cRows,
&cRowsObtained, &prghRows);
                                if (FAILED(hr))
                                {

        ThrowError(m_pIOrderStatusCommand,
COLEDBERR::eGetNextRows, "OrderStatus()");
                                }


        m_txn.OrderStatus.o_ol_cnt =
(short)cRowsObtained;

                                // Get the data from
multiple rows in this rowset
                                for (i = 0; i <
m_txn.OrderStatus.o_ol_cnt; ++i)
                                {
                                        // Fetch the
actual row data by handle
                                        hr = pRowset-
>GetData(rghRows[i], m_hOrderStatusOutputAccessor,
&m_txn.OrderStatus.OL[i]);
                                        if
(FAILED(hr))
                                        {

        ThrowError(m_pIOrderStatusCommand,
COLEDBERR::eGetData, "OrderStatus()");
                                        }
                                }

                                // Release row(s)
                                hr = pRowset-
>ReleaseRows(cRowsObtained, prghRows, NULL, NULL,
NULL);
                                // Release rowset
                                hr = pRowset-
>Release();


        ////////////////////////////////
                                // Get the second
rowset object

        ////////////////////////////////
```

```
                            if
(m_txn.OrderStatus.o_ol_cnt > 0)
                            {
                                    hr =
pMultipleResults->GetResult(NULL, 0, IID_IRowset,
&lRowsAffected, (IUnknown **)&pRowset2);
                                    if
(FAILED(hr))
                                    {

          ThrowError(m_pIOrderStatusCommand,
COLEDBERR::eGetResult, "OrderStatus()");
                                    }

                                    // Fetch the
result row handle(s)
                                    hr =
pRowset2->GetNextRows(DB_NULL_HCHAPTER, 0, cRows2,
&cRowsObtained2, &prghRows2);
                                    if
(FAILED(hr))
                                    {

          ThrowError(m_pIOrderStatusCommand,
COLEDBERR::eGetNextRows, "OrderStatus()");
                                    }

                                    // Fetch the
actual row data by handle
                                    hr =
pRowset2->GetData(rghRows2,
m_hOrderStatusOutputAccessor2, &m_txn.OrderStatus);
                                    if
(FAILED(hr))
                                    {

          ThrowError(m_pIOrderStatusCommand,
COLEDBERR::eGetData, "OrderStatus()");
                                    }

                                    // Release
row(s)
                                    hr =
pRowset2->Release();
                            }

                            // Release the common
MultipleResults interface
                            hr = pMultipleResults-
>Release();

                            if
(m_txn.OrderStatus.o_ol_cnt == 0)
                                    throw new
CTPCC_OLEDB_ERR( CTPCC_OLEDB_ERR::ERR_NO_SUCH_ORDER
);
                            else if
(m_txn.OrderStatus.c_id == 0 &&
m_txn.OrderStatus.c_last[0] == 0)
                                    throw new
CTPCC_OLEDB_ERR( CTPCC_OLEDB_ERR::ERR_INVALID_CUST );
                            else

          m_txn.OrderStatus.exec_status_code = eOK;

                            break;

                    }
                    catch (COLEDBERR *e)
                    {
                            if ((!e->m_bDeadLock)
|| (++iTryCount > iMaxRetries))
                                    throw;

                            // hit deadlock;
backoff for increasingly longer period
                            delete e;
                            Sleep(10 * iTryCount);
                    }
          }

//        if (iTryCount)
//                throw new
CTPCC_OLEDB_ERR(CTPCC_OLEDB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}

void CTPCC_OLEDB::InitDeliveryParams()
{
          int
                    i;
          HRESULT
          hr;
          wchar_t
          szName[iMAX_SP_NAME_LEN];
          IAccessor*
          pIAccessor;
    const ULONG
          nInputParams = 2;   // input parameters
          const ULONG
          nOutputParams = 10; // output 1st result
set columns
          // Structure to bind in accessor
          DBBINDING
          acInputDBBinding[nInputParams];
          DBBINDSTATUS
          acInputDBBindStatus[nInputParams];
          DBBINDING
          acOutputDBBinding[nOutputParams];
          DBBINDSTATUS
          acOutputDBBindStatus[nOutputParams];

          // Set command text
          _snwprintf(szName,
sizeof(szName)/sizeof(szName[0]),
                            L"{call %stpcc_delivery
(?,?)}", m_szSPPrefix);

          // Create and Prepare a new command object
for Delivery.
          CreateCommand(szName,
&m_pIDeliveryCommand);

          // Describe the consumer buffer by filling
in the array
    // of DBBINDING structures.  Each binding
associates
    // a single parameter to the consumer's buffer.
          InitBindings(&acInputDBBinding[0],
nInputParams, eInputParameter);

          i = 0;
    // Delivery parameter 1
          SetBinding(&acInputDBBinding[i++],
offsetof(DELIVERY_DATA, w_id),
sizeof(m_txn.Delivery.w_id), DBTYPE_I4);

    // Delivery parameter 2
          SetBinding(&acInputDBBinding[i++],
offsetof(DELIVERY_DATA, o_carrier_id),
sizeof(m_txn.Delivery.o_carrier_id), DBTYPE_I2);

          hr = m_pIDeliveryCommand-
>QueryInterface(IID_IAccessor, (void **)&pIAccessor);
          if (FAILED(hr))
          {
                    ThrowError(m_pIDeliveryCommand,
COLEDBERR::eQueryInterface, "InitDeliveryParams()");
          }

          hr = pIAccessor->CreateAccessor(
                              DBACCESSOR_PARAMETERDATA,
                              nInputParams,
                              acInputDBBinding,
                              sizeof(DELIVERY_DATA),

&m_hDeliveryInputAccessor,
                              acInputDBBindStatus);
          if (FAILED(hr))
          {
                    ThrowError(pIAccessor,
COLEDBERR::eCreateAccessor, "InitDeliveryParams()");
          }

          m_DeliveryExecuteParams.cParamSets = 1;
          m_DeliveryExecuteParams.hAccessor =
m_hDeliveryInputAccessor;
          m_DeliveryExecuteParams.pData =
&m_txn.Delivery;

          // Now fill the binding information for
result set 1 output columns
          InitBindings(&acOutputDBBinding[0],
nOutputParams, eOutputColumn);

          // Binding for a rowset that may return
more than one row.
          for (i = 0; i < 10; ++i)
          {
                    // Delivery output column 1
                    SetBinding(&acOutputDBBinding[i],
offsetof(DELIVERY_DATA, o_id[i]),
sizeof(m_txn.Delivery.o_id[i]), DBTYPE_I4);
```

```
	}

	hr = pIAccessor->CreateAccessor(
			DBACCESSOR_ROWDATA |
DBACCESSOR_OPTIMIZED,
			nOutputParams,
			acOutputDBBinding,
			sizeof(DELIVERY_DATA),

&m_hDeliveryOutputAccessor,
			acOutputDBBindStatus);
	if (FAILED(hr))
	{
		ThrowError(pIAccessor,
COLEDBERR::eCreateAccessor, "InitDeliveryParams()");
	}
}

void CTPCC_OLEDB::Delivery()
{
	HRESULT			hr;
	int
	iTryCount = 0;
	IRowset*		pRowset;
	LONG			cRows = 1;
	// number of rows returned in the rowset
	ULONG
	cRowsObtained;
	HROW			rghRow;
	//returned row handles
	HROW*			prghRow =
&rghRow;

	while (TRUE)
	{
		try
		{
			// Execute the prepared
command
			hr =
m_pIDeliveryCommand->Execute(NULL, IID_IRowset,
&m_DeliveryExecuteParams, NULL,


	(IUnknown **)&pRowset);
			if (FAILED(hr))
			{

	ThrowError(m_pIDeliveryCommand,
COLEDBERR::eExecute, "Delivery()");
			}

			// Fetch the result row
handle(s)
			hr = pRowset-
>GetNextRows(DB_NULL_HCHAPTER, 0, cRows,
&cRowsObtained, &prghRow);
			if (FAILED(hr))
			{

	ThrowError(m_pIDeliveryCommand,
COLEDBERR::eGetNextRows, "Delivery()");
			}

			// Fetch the actual row
data by handle
			hr = pRowset-
>GetData(rghRow, m_hDeliveryOutputAccessor,
&m_txn.Delivery);
			if (FAILED(hr))
			{

	ThrowError(m_pIDeliveryCommand,
COLEDBERR::eGetData, "Delivery()");
			}

			// Release row(s)
			hr = pRowset-
>ReleaseRows(cRowsObtained, prghRow, NULL, NULL,
NULL);
			// Release rowset
			hr = pRowset-
>Release();


		m_txn.Delivery.exec_status_code = eOK;

			break;
		}
		catch (COLEDBERR *e)
		{
			if ((!e->m_bDeadLock)
|| (++iTryCount > iMaxRetries))
				throw;

			// hit deadlock;
backoff for increasingly longer period
			delete e;
			Sleep(10 * iTryCount);
		}
	}

//	if (iTryCount)
//		throw new
CTPCC_OLEDB_ERR(CTPCC_OLEDB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}
```

tpcc_oledb.h

```
/*	FILE:		TPCC_OLEDB.H
 *					Microsoft
TPC-C Kit Ver. 4.20.000
 *					Copyright
Microsoft, 1999-2004
 *					Written by
Sergey Vasilevskiy
 *		All Rights Reserved
 *
 *
 *	PURPOSE:  Header file for TPC-C txn class
OLE DB implementation.
 *
 *
 */
#pragma once

// need to declare functions for import, unless
define has already been created
// by the DLL's .cpp module for export.
#ifndef DllDecl
#define DllDecl  __declspec( dllimport )
#endif

#define iMAX_SP_NAME_LEN 256  //maximum length of a
stored procedure name with parameters

// Type of parameter and result set column bindings.
enum eBindingType
{
	eInputParameter,
	eOutputParameter,
	eInputOutputParameter,
	eOutputColumn
};

class COLEDBERR : public CBaseErr
{
	public:
		enum ACTION
		{
			eNone,
			eUnknown,
			eQueryInterface,
		// error from QueryInterface
			eCreateSession,
			eCreateCommand,
			eSetCommandText,
			eExecute,
	// = 6
			eCreateAccessor,
			ePrepare,
			eGetNextRows,
			eGetData,
			eGetResult
		// = 11
		};

		COLEDBERR(LPCTSTR szLoc)
			: CBaseErr(szLoc)
		{
			m_eAction = eNone;
			m_NativeError = 0;
			m_bDeadLock = FALSE;
			m_OLEDBErrStr = NULL;
		};

		~COLEDBERR()
		{
```

```
                        if (m_OLEDBErrStr !=
NULL)
                                delete []
m_OLEDBErrStr;
                };

                ACTION    m_eAction;
                int
        m_NativeError;
                BOOL      m_bDeadLock;
                char   *m_OLEDBErrStr;

                int               ErrorType()
{return ERR_TYPE_OLEDB;};
                char*     ErrorTypeStr() { return
"OLEDB"; }
                int               ErrorNum()
{return m_NativeError;};
                char*     ErrorText() {return
m_OLEDBErrStr;};
                int               ErrorAction()
{ return (int)m_eAction; }

};

class CTPCC_OLEDB_ERR : public CBaseErr
{
        public:
                enum TPCC_OLEDB_ERRS
                {
                        ERR_WRONG_SP_VERSION =
1,      // "Wrong version of stored procs on
database server"
                        ERR_INVALID_CUST,
                // "Invalid Customer id,name."
                        ERR_NO_SUCH_ORDER,
                // "No orders found for
customer."
                        ERR_RETRIED_TRANS,
                // "Retries before transaction
succeeded."
                };

                CTPCC_OLEDB_ERR( int iErr ) {
m_errno = iErr; m_iTryCount = 0; };

                CTPCC_OLEDB_ERR( int iErr, int
iTryCount ) { m_errno = iErr; m_iTryCount =
iTryCount; };

                int               m_errno;
                int               m_iTryCount;

                int               ErrorType()
{return ERR_TYPE_TPCC_OLEDB;};
                char*     ErrorTypeStr() { return
"TPCC OLEDB"; }
                int               ErrorNum()
{return m_errno;};

                char*     ErrorText();
};

class DllDecl CTPCC_OLEDB : public CTPCC_BASE
{
        private:
                // declare variables and private
functions here...
                BOOL
                m_bDeadlock;              //
transaction was selected as deadlock victim
                int
                        m_MaxRetries;
        // retry count on deadlock

                DBPROPSET
                m_rgInitPropSet;          //
initialization property set used to establish a
connection
                DBPROP
                m_InitProperties[4];      //
individual initialization properties

                IDBCreateSession*
        m_pIDBCreateSession;      // session
(connection) interface
                IDBCreateCommand*
        m_pIDBCreateCommand;      // SQL
command creation interface

                IMalloc*
        m_pIMalloc;
        // Needed to release error strings.

                // StockLevel
                ICommandText*
        m_pIStockLevelCommand;
                HACCESSOR
        m_hStockLevelInputAccessor;   // accessor
to bind input parameters
                HACCESSOR
        m_hStockLevelOutputAccessor;  // accessor
to bind output columns
                DBPARAMS
        m_StockLevelExecuteParams;          //
parameter structure for Execute

                // NewOrder
                // One prepared command for each
possible number of new order line items
                ICommandText*
        m_pINewOrderCommand[MAX_OL_NEW_ORDER_ITEMS]
;
                // accessors to bind input
parameters
                // one for each possible number
of new order line items
                HACCESSOR
        m_hNewOrderInputAccessor[MAX_OL_NEW_ORDER_I
TEMS];
                // accessor to bind output
columns of the first rowset
                HACCESSOR
        m_hNewOrderOutputAccessor[MAX_OL_NEW_ORDER_
ITEMS];
                // accessor to bind output
columns of the second rowset
                HACCESSOR
        m_hNewOrderOutputAccessor2[MAX_OL_NEW_ORDER
_ITEMS];
                // parameter structure for
Execute
                DBPARAMS
        m_NewOrderExecuteParams[MAX_OL_NEW_ORDER_IT
EMS];

                // Payment
                ICommandText*
        m_pIPaymentCommand;
                HACCESSOR
        m_hPaymentInputAccessor;      // accessor
to bind input parameters
                HACCESSOR
        m_hPaymentOutputAccessor;     // accessor
to bind output columns
                DBPARAMS
        m_PaymentExecuteParams;                 //
parameter structure for Execute

                // OrderStatus
                ICommandText*
        m_pIOrderStatusCommand;
                HACCESSOR
        m_hOrderStatusInputAccessor;  // accessor
to bind input parameters
                HACCESSOR
        m_hOrderStatusOutputAccessor; // accessor
to bind output columns
                HACCESSOR
        m_hOrderStatusOutputAccessor2;          //
accessor to bind output columns
                DBPARAMS
        m_OrderStatusExecuteParams;             //
parameter structure for Execute

                // Delivery
                ICommandText*
        m_pIDeliveryCommand;
                HACCESSOR
        m_hDeliveryInputAccessor;     // accessor
to bind input parameters
                HACCESSOR
        m_hDeliveryOutputAccessor;    // accessor
to bind output columns
                DBPARAMS
        m_DeliveryExecuteParams;      // parameter
structure for Execute

                wchar_t
                m_szSPPrefix[32];   // stored
procedures prefix
```

```
                    // new-order specific fields

                    int
                              m_no_commit_flag;

                    void ThrowError( IUnknown*
pObjectWithError, COLEDBERR::ACTION eAction, LPCTSTR
szLocation );

                    void CheckSPVersion();

                    void InitNewOrderParams();
                    void InitPaymentParams();
                    void InitDeliveryParams();
                    void InitStockLevelParams();
                    void InitOrderStatusParams();

                    // Helper function to create and
prepare a command
                    void CreateCommand(wchar_t*
szSQLCommand, ICommandText** ppICommandText);
                    // Helper function to prepare a
command
                    void PrepareCommand(ICommandText*
pICommand);

                    // Helper function to fill one
binding
                    // Used for both input parameter
and output column bindings
                    void SetBinding(DBBINDING*
pDBBinding, size_t obValue, size_t cbMaxLen, DBTYPE
wType);

                    // Helper function to initialize
an array of bindings
                    void InitBindings(DBBINDING*
pDBBindings, int iCount, eBindingType BindingType);

                    union
                    {
                              NEW_ORDER_DATA
          NewOrder;
                              PAYMENT_DATA
          Payment;
                              DELIVERY_DATA
          Delivery;
                              STOCK_LEVEL_DATA
          StockLevel;
                              ORDER_STATUS_DATA
          OrderStatus;
                    }
          m_txn;

          public:
                    CTPCC_OLEDB(LPCSTR szServer,
LPCSTR szUser, LPCSTR szPassword, LPCSTR szHost,
LPCSTR szDatabase, LPCWSTR szSPPrefix);
                    ~CTPCC_OLEDB(void);
                              inline PNEW_ORDER_DATA
                    BuffAddr_NewOrder()           { return
&m_txn.NewOrder;    };
                              inline PPAYMENT_DATA
                    BuffAddr_Payment()            { return
&m_txn.Payment;     };
                              inline PDELIVERY_DATA
                    BuffAddr_Delivery()           { return
&m_txn.Delivery;    };
                              inline PSTOCK_LEVEL_DATA
                    BuffAddr_StockLevel()         { return
&m_txn.StockLevel;  };
                              inline PORDER_STATUS_DATA
                    BuffAddr_OrderStatus()        { return
&m_txn.OrderStatus; };

                              void NewOrder                ();
                              void Payment                 ();
                              void Delivery                ();
                              void StockLevel              ();
                              void OrderStatus    ();

};


// wrapper routine for class constructor
extern "C" DllDecl CTPCC_OLEDB* CTPCC_OLEDB_new
          ( LPCSTR szServer, LPCSTR szUser, LPCSTR
szPassword, LPCSTR szHost, LPCSTR szDatabase, LPCWSTR
szSPPrefix );

typedef CTPCC_OLEDB* (TYPE_CTPCC_OLEDB)(LPCSTR,
LPCSTR, LPCSTR, LPCSTR, LPCSTR, LPCWSTR);
```

tpcc_com_all\resource.h

```
//{{NO_DEPENDENCIES}}
// Microsoft Developer Studio generated include file.
// Used by tpcc_com_all.rc
//
#define IDS_PROJNAME                    100
#define IDR_TPCC                        101
#define IDR_NEWORDER                    102
#define IDR_ORDERSTATUS                 103
#define IDR_PAYMENT                     104
#define IDR_STOCKLEVEL                  105

// Next default values for new objects
//
#ifdef APSTUDIO_INVOKED
#ifndef APSTUDIO_READONLY_SYMBOLS
#define _APS_NEXT_RESOURCE_VALUE        202
#define _APS_NEXT_COMMAND_VALUE         32768
#define _APS_NEXT_CONTROL_VALUE         201
#define _APS_NEXT_SYMED_VALUE           106
#endif
#endif
```

isapi_dll\resource.h

```
//{{NO_DEPENDENCIES}}
// Microsoft Developer Studio generated include file.
// Used by tpcc.rc
//
#define IDD_DIALOG1                     101

// Next default values for new objects
//
#ifdef APSTUDIO_INVOKED
#ifndef APSTUDIO_READONLY_SYMBOLS
#define _APS_NEXT_RESOURCE_VALUE        102
#define _APS_NEXT_COMMAND_VALUE         40001
#define _APS_NEXT_CONTROL_VALUE         1000
#define _APS_NEXT_SYMED_VALUE           101
#endif
#endif
```

Appendix B: Database Design

The TPC-C database was created with the following Transact-SQL scripts:

removedb.sql

```
------------------------------------------------------------------------
--                                                                    --
--  File:   REMOVEDB.SQL                                              --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62                   --
--          Copyright Microsoft, 2005                                 --
--                                                                    --
------------------------------------------------------------------------
USE master
GO

------------------------------------------------------------------------
-- remove any existing database and backup files
------------------------------------------------------------------------
EXEC sp_dbremove tpcc, dropdev
GO

EXEC sp_dropdevice 'tpccback1'
EXEC sp_dropdevice 'tpccback2'
EXEC sp_dropdevice 'tpccback3'
EXEC sp_dropdevice 'tpccback4'
GO
```

backupdev.sql

```
------------------------------------------------------------------------
--                                                                    --
--  File:   BACKUPDEV.SQL                                             --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62                   --
--          Copyright Microsoft, 2005                                 --
--                                                                    --
------------------------------------------------------------------------

USE master
GO

------------------------
-- create backup devices
------------------------
EXEC sp_addumpdevice 'disk','tpccback1','w:\tpccback1.dmp'
GO
EXEC sp_addumpdevice 'disk','tpccback2','x:\tpccback2.dmp'
GO
EXEC sp_addumpdevice 'disk','tpccback3','y:\tpccback3.dmp'
GO
EXEC sp_addumpdevice 'disk','tpccback4','z:\tpccback4.dmp'
GO
```

version.sql

```
------------------------------------------------------------------------
--                                                                    --
--  File:   VERSION.SQL                                               --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62                   --
--          Copyright Microsoft, 2005                                 --
--                                                                    --
--          Extracts current version of SQL Server                    --
--                                                                    --
------------------------------------------------------------------------
USE master
GO

SELECT  CONVERT(char(20), SERVERPROPERTY('ProductVersion')),
        CONVERT(char(20), SERVERPROPERTY('ProductLevel')),
        CONVERT(char(29), SERVERPROPERTY('Edition'))
GO

SELECT  CONVERT(char(30), GETDATE(), 21)
GO
```

createdb.sql

```
------------------------------------------------------------------------
--                                                                    --
--  File:   CREATEDB.SQL                                              --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62                   --
--          Copyright Microsoft, 2005                                 --
--                                                                    --
------------------------------------------------------------------------

SET ANSI_NULL_DFLT_OFF ON
GO

USE master
GO

-------------------------------------
-- Create temporary table for timing
-------------------------------------
IF EXISTS( SELECT name FROM sysobjects WHERE name = 'tpcc_timer' )
    DROP TABLE tpcc_timer
GO

CREATE TABLE tpcc_timer
               (start_date   CHAR(30),
                end_date     CHAR(30))
GO

INSERT INTO tpcc_timer VALUES(0,0)
GO

----------------------
-- Store starting time
```

```
----------------------
UPDATE  tpcc_timer
SET     start_date  = (SELECT   CONVERT(CHAR(30), GETDATE(), 21))
GO

-----------------------------
-- create main database files
-----------------------------
CREATE DATABASE tpcc
ON PRIMARY
(         NAME                = MSSQL_tpcc_root,
          FILENAME  = 'Z:\MSSQL_tpcc_root.mdf',
          SIZE                = 8MB,
          FILEGROWTH          = 0),
FILEGROUP MSSQL_misc_fg
(         NAME                = MSSQL_misc1,
          FILENAME  = 'z:\tpcc\misc\misc1\',
          SIZE                = 29000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc2,
          FILENAME  = 'z:\tpcc\misc\misc2\',
          SIZE                = 29000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc3,
          FILENAME  = 'z:\tpcc\misc\misc3\',
          SIZE                = 29000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc4,
          FILENAME  = 'z:\tpcc\misc\misc4\',
          SIZE                = 29000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc5,
          FILENAME  = 'z:\tpcc\misc\misc5\',
          SIZE                = 29000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc6,
          FILENAME  = 'z:\tpcc\misc\misc6\',
          SIZE                = 29000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc7,
          FILENAME  = 'z:\tpcc\misc\misc7\',
          SIZE                = 29000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc8,
          FILENAME  = 'z:\tpcc\misc\misc8\',
          SIZE                = 29000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc9,
          FILENAME  = 'z:\tpcc\misc\misc9\',
          SIZE                = 29000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc10,
          FILENAME  = 'z:\tpcc\misc\misc10\',
          SIZE                = 29000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc11,
          FILENAME  = 'z:\tpcc\misc\misc11\',
          SIZE                = 29000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc12,
          FILENAME  = 'z:\tpcc\misc\misc12\',
          SIZE                = 29000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc13,
          FILENAME  = 'z:\tpcc\misc\misc13\',
          SIZE                = 29000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc14,
          FILENAME  = 'z:\tpcc\misc\misc14\',
          SIZE                = 29000MB,
          FILEGROWTH          = 0),
FILEGROUP MSSQL_cs_fg
(         NAME                = MSSQL_cs1,
          FILENAME  = 'z:\tpcc\cs\cs1\',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs2,
          FILENAME  = 'z:\tpcc\cs\cs2\',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs3,
          FILENAME  = 'z:\tpcc\cs\cs3\',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs4,
          FILENAME  = 'z:\tpcc\cs\cs4\',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs5,
          FILENAME  = 'z:\tpcc\cs\cs5\',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs6,
          FILENAME  = 'z:\tpcc\cs\cs6\',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs7,
          FILENAME  = 'z:\tpcc\cs\cs7\',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs8,
          FILENAME  = 'z:\tpcc\cs\cs8\',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs9,
          FILENAME  = 'z:\tpcc\cs\cs9\',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs10,
          FILENAME  = 'z:\tpcc\cs\cs10\',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs11,
          FILENAME  = 'z:\tpcc\cs\cs11\',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs12,
          FILENAME  = 'z:\tpcc\cs\cs12\',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs13,
          FILENAME  = 'z:\tpcc\cs\cs13\',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs14,
          FILENAME  = 'z:\tpcc\cs\cs14\',
```

```
         SIZE                = 49000MB,
         FILEGROWTH          = 0)
LOG ON
(        NAME                = MSSQL_tpcc_log,
         FILENAME  = 'E:',
         SIZE                = 480000MB,
         FILEGROWTH          = 0)
COLLATE Latin1_General_BIN
GO

--------------------
-- Store ending time
--------------------
UPDATE  tpcc_timer
SET     end_date    = (SELECT   CONVERT(CHAR(30), GETDATE(), 21))
GO

SELECT  DATEDIFF(second,(SELECT start_date FROM tpcc_timer),(SELECT end_date FROM
tpcc_timer))
GO

-------------------------
-- remove temporary table
-------------------------
IF EXISTS ( SELECT name FROM sysobjects WHERE name = 'tpcc_timer' )
    DROP TABLE tpcc_timer
GO
```

dbopt1.sql

```
-----------------------------------------------------------------------
--                                                                   --
--  File:   DBOPT1.SQL                                               --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62                  --
--          Copyright Microsoft, 2005                                --
--                                                                   --
--          Sets database options for load                           --
--                                                                   --
-----------------------------------------------------------------------
USE master
GO

ALTER DATABASE tpcc SET RECOVERY BULK_LOGGED
GO

EXEC sp_dboption tpcc,'trunc. log on chkpt.',TRUE
GO

ALTER DATABASE tpcc SET TORN_PAGE_DETECTION OFF
GO

ALTER DATABASE tpcc SET PAGE_VERIFY NONE
GO

USE tpcc
GO

CHECKPOINT
GO
```

dbopt2.sql

```
-----------------------------------------------------------------------
--                                                                   --
--  File:   DBOPT2.SQL                                               --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62                  --
--          Copyright Microsoft, 2005                                --
--                                                                   --
--          Sets database options after load                         --
--                                                                   --
-----------------------------------------------------------------------
ALTER DATABASE tpcc SET RECOVERY FULL
GO

USE tpcc
GO

CHECKPOINT
GO

sp_configure 'allow updates',1
GO

RECONFIGURE WITH OVERRIDE
GO

DECLARE   @msg               varchar(50)

-------------------------------------------------
--        OPTIONS FOR SQL SERVER 2000          --
-- Set option values for user-defined indexes --
-------------------------------------------------

SET     @msg    = ' '
PRINT   @msg
SET     @msg    = 'Setting SQL Server indexoptions'
PRINT   @msg
SET     @msg    = ' '
PRINT   @msg

EXEC sp_indexoption 'customer',     'DisAllowPageLocks',    TRUE
EXEC sp_indexoption 'district',             'DisAllowPageLocks',      TRUE
EXEC sp_indexoption 'warehouse',    'DisAllowPageLocks',    TRUE
EXEC sp_indexoption 'stock',        'DisAllowPageLocks',    TRUE
EXEC sp_indexoption 'order_line',   'DisAllowRowLocks',     TRUE
EXEC sp_indexoption 'orders',       'DisAllowRowLocks',     TRUE
EXEC sp_indexoption 'new_order',    'DisAllowRowLocks',     TRUE
EXEC sp_indexoption 'item',         'DisAllowRowLocks',     TRUE
EXEC sp_indexoption 'item',         'DisAllowPageLocks',    FALSE
GO

Print ' '
Print '******************'
Print 'Pre-specified Locking Hierarchy:'
Print '     Lockflag = 0 ==> No pre-specified hierarchy'
Print '   Lockflag = 1 ==> Lock at Page-level then Table-level'
Print '   Lockflag = 2 ==> Lock at Row-level then Table-level'
Print '   Lockflag = 3 ==> Lock at Table-level'
Print ' '

SELECT  name,
        lockflags
```

```
FROM    sysindexes
WHERE   object_id('warehouse')  = id OR
        object_id('district')   = id OR
        object_id('customer')   = id OR
        object_id('stock')      = id OR
        object_id('orders')     = id OR
        object_id('order_line') = id OR
        object_id('history')    = id OR
        object_id('new_order')  = id OR
        object_id('item')       = id
ORDER   BY lockflags asc
GO

sp_configure 'allow updates',0
GO

RECONFIGURE WITH OVERRIDE
GO

EXEC sp_dboption tpcc,        'auto update statistics',     FALSE
EXEC sp_dboption tpcc,        'auto create statistics',     FALSE
GO

DECLARE @db_id  int,
        @tbl_id int

SET     @db_id  = DB_ID('tpcc')
SET     @tbl_id = OBJECT_ID('tpcc..warehouse')
DBCC PINTABLE (@db_id, @tbl_id)

SET     @tbl_id = OBJECT_ID('tpcc..district')
DBCC PINTABLE (@db_id, @tbl_id)

SET     @tbl_id = OBJECT_ID('tpcc..new_order')
DBCC PINTABLE (@db_id, @tbl_id)

SET     @tbl_id = OBJECT_ID('tpcc..item')
DBCC PINTABLE (@db_id, @tbl_id)
GO
```

RunSQLCfg.sql

```
-----------------------------------------------------------------------
--                                                                   --
--  File:   RUNSQLCFG.SQL                                            --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62                  --
--          Copyright Microsoft, 2005                                --
--                                                                   --
--          Sets suggested runtime server configuration              --
--          parameters                                               --
--                                                                   --
-----------------------------------------------------------------------
EXEC sp_configure 'show advanced option', 1
GO

RECONFIGURE WITH OVERRIDE
GO

-----------------------------------------------------------------------------
-- change this value to approximately the number of connected users
-----------------------------------------------------------------------------
EXEC sp_configure 'max worker threads',255

-----------------------------------------------------------------------------
-- increase priority of user threads
-----------------------------------------------------------------------------
EXEC sp_configure 'priority boost',1

-----------------------------------------------------------------------------
-- disable automatic checkpointing
-----------------------------------------------------------------------------
EXEC sp_configure 'recovery interval',32767

-----------------------------------------------------------------------------
-- change to a mask appropriate for the number of processors on the server
-----------------------------------------------------------------------------
EXEC sp_configure 'affinity mask',0xf

-----------------------------------------------------------------------------
-- enable fibers
-----------------------------------------------------------------------------
EXEC sp_configure 'lightweight pooling',1
GO

RECONFIGURE WITH OVERRIDE
GO
```

VerifyTpccLoad.sql

```
-----------------------------------------------------------------------
--                                                                   --
--  File:   VerifyTPCCLoad.SQL                                       --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62                  --
--          Copyright Microsoft, 2005                                --
--                                                                   --
-----------------------------------------------------------------------
SET NOCOUNT ON
PRINT   ' '
SELECT  CONVERT(CHAR(30), GETDATE(), 21)
PRINT   ' '

USE       tpcc
GO

IF  EXISTS  (SELECT name
             FROM   sysobjects
             WHERE  name    = 'TPCC_INFO' AND
                    type    = 'U')
    DROP TABLE TPCC_INFO
GO
PRINT   'WAREHOUSE TABLE'
SELECT  count_big(*)
FROM    warehouse
GO

PRINT   'DISTRICT TABLE = (10 * No of warehouses)'
SELECT  count_big(*)
FROM    district
GO

PRINT   'ITEM TABLE = 100,000'
SELECT  count_big(*)
FROM    item
GO
```

```
PRINT   'CUSTOMER TABLE = (30,000 * No of warehouses)'
SELECT  count_big(*)
FROM    customer
GO

PRINT   'ORDERS TABLE = (30,000 * No of warehouses)'
SELECT  count_big(*)
FROM    orders
GO

PRINT   'HISTORY TABLE = (30,000 * No of warehouses)'
SELECT  count_big(*)
FROM    history
GO

PRINT   'STOCK TABLE = (100,000 * No of warehouses)'
SELECT  count_big(*)
FROM    stock
GO

PRINT   'ORDER_LINE TABLE = (300,000 * No of warehouses + some change)'
SELECT  count_big(*)
FROM    order_line
GO

PRINT   'NEW_ORDER TABLE = (9000 * No of warehouses)'
SELECT  count_big(*)
FROM    new_order
GO

CREATE TABLE TPCC_INFO
    (   INFO_DATE                   datetime,
        NUM_WAREHOUSE               bigint,
        WAREHOUSE_TARGET            bigint,
        NUM_DISTRICT                bigint,
        DISTRICT_TARGET             bigint,
        NUM_ITEM                    bigint,
        ITEM_TARGET                 bigint,
        NUM_CUSTOMER                bigint,
        CUSTOMER_TARGET             bigint,
        NUM_ORDERS                  bigint,
        ORDERS_TARGET               bigint,
        ORDERS_TARGET_LOW           bigint,
        ORDERS_TARGET_HIGH          bigint,
        NUM_ORDER_LINE              bigint,
        ORDER_LINE_TARGET           bigint,
        ORDER_LINE_TARGET_LOW       bigint,
        ORDER_LINE_TARGET_HIGH      bigint,
        NUM_NEW_ORDER               bigint,
        NEW_ORDER_TARGET            bigint,
        NEW_ORDER_TARGET_LOW        bigint,
        NEW_ORDER_TARGET_HIGH       bigint,
        NUM_HISTORY                 bigint,
        HISTORY_TARGET              bigint,
        NUM_STOCK                   bigint,
        STOCK_TARGET                bigint)
GO

DECLARE @NUM_WAREHOUSE              bigint,
        @WAREHOUSE_TARGET           bigint,
        @NUM_DISTRICT               bigint,
        @DISTRICT_TARGET            bigint,
        @NUM_ITEM                   bigint,
        @ITEM_TARGET                bigint,
        @NUM_CUSTOMER               bigint,
        @CUSTOMER_TARGET            bigint,
        @NUM_ORDERS                 bigint,
        @ORDERS_TARGET              bigint,
        @ORDERS_TARGET_LOW          bigint,
        @ORDERS_TARGET_HIGH         bigint,
        @NUM_ORDER_LINE             bigint,
        @ORDER_LINE_TARGET          bigint,
        @ORDER_LINE_TARGET_LOW      bigint,
        @ORDER_LINE_TARGET_HIGH     bigint,
        @NUM_NEW_ORDER              bigint,
        @NEW_ORDER_TARGET           bigint,
        @NEW_ORDER_TARGET_LOW       bigint,
        @NEW_ORDER_TARGET_HIGH      bigint,
        @NUM_HISTORY                bigint,
        @HISTORY_TARGET             bigint,
        @NUM_STOCK                  bigint,
        @STOCK_TARGET               bigint

-- set the local variables prior to inserting them into the TPCC_INFO table
SELECT  @NUM_WAREHOUSE      = COUNT_BIG(*)
FROM    warehouse

SELECT  @NUM_DISTRICT       = COUNT_BIG(*)
FROM    district

SELECT  @NUM_ITEM           = COUNT_BIG(*)
FROM    item

SELECT  @NUM_CUSTOMER       = COUNT_BIG(*)
FROM    customer

SELECT  @NUM_ORDERS         = COUNT_BIG(*)
FROM    orders

SELECT  @NUM_ORDER_LINE     = COUNT_BIG(*)
FROM    order_line

SELECT  @NUM_NEW_ORDER      = COUNT_BIG(*)
FROM    new_order

SELECT  @NUM_HISTORY        = COUNT_BIG(*)
FROM    history

SELECT  @NUM_STOCK          = COUNT_BIG(*)
FROM    stock

--- now calculate and set the target values
SELECT  @WAREHOUSE_TARGET       = @NUM_WAREHOUSE,
        @DISTRICT_TARGET        = @NUM_WAREHOUSE * 10,
        @ITEM_TARGET            = 100000,
        @CUSTOMER_TARGET        = @NUM_WAREHOUSE * 30000,
        @ORDERS_TARGET          = @NUM_WAREHOUSE * 30000,
        @ORDERS_TARGET_LOW      = @ORDERS_TARGET - FLOOR(@ORDERS_TARGET * .01),
        @ORDERS_TARGET_HIGH     = @ORDERS_TARGET + FLOOR(@ORDERS_TARGET * .01),
        @ORDER_LINE_TARGET      = @NUM_WAREHOUSE * 300000,
        @ORDER_LINE_TARGET_LOW  = @ORDER_LINE_TARGET - FLOOR(@ORDER_LINE_TARGET *
.01),
        @ORDER_LINE_TARGET_HIGH = @ORDER_LINE_TARGET + FLOOR(@ORDER_LINE_TARGET *
.01),
        @NEW_ORDER_TARGET       = @NUM_WAREHOUSE * 9000,
```

```
        @NEW_ORDER_TARGET_LOW   = @NEW_ORDER_TARGET - FLOOR(@NEW_ORDER_TARGET *
.01),
        @NEW_ORDER_TARGET_HIGH  = @NEW_ORDER_TARGET + FLOOR(@NEW_ORDER_TARGET *
.01),
        @HISTORY_TARGET         = @NUM_WAREHOUSE * 30000,
        @STOCK_TARGET           = @NUM_WAREHOUSE * 100000

--- insert the values into TPCC_INFO
INSERT INTO TPCC_INFO VALUES    (GETDATE(),
                                 @NUM_WAREHOUSE,
                                 @WAREHOUSE_TARGET,
                                 @NUM_DISTRICT,
                                 @DISTRICT_TARGET,
                                 @NUM_ITEM,
                                 @ITEM_TARGET,
                                 @NUM_CUSTOMER,
                                 @CUSTOMER_TARGET,
                                 @NUM_ORDERS,
                                 @ORDERS_TARGET,
                                 @ORDERS_TARGET_LOW,
                                 @ORDERS_TARGET_HIGH,
                                 @NUM_ORDER_LINE,
                                 @ORDER_LINE_TARGET,
                                 @ORDER_LINE_TARGET_LOW,
                                 @ORDER_LINE_TARGET_HIGH,
                                 @NUM_NEW_ORDER,
                                 @NEW_ORDER_TARGET,
                                 @NEW_ORDER_TARGET_LOW,
                                 @NEW_ORDER_TARGET_HIGH,
                                 @NUM_HISTORY,
                                 @HISTORY_TARGET,
                                 @NUM_STOCK,
                                 @STOCK_TARGET)
GO

--- output the row counts from the build
PRINT   ''
PRINT   ''
PRINT   '---------------------------'
PRINT   '|    WAREHOUSE TABLE      |'
PRINT   '---------------------------'
SELECT  TOP 1
        CONVERT(CHAR(30),INFO_DATE,21)  AS  'Date',
        NUM_WAREHOUSE                   AS  'Warehouse Rows',
        WAREHOUSE_TARGET                AS        'Warehouse Target',
        CASE WHEN (NUM_WAREHOUSE = WAREHOUSE_TARGET)
             THEN 'OK!'
             ELSE 'ERROR!!!'
        END                             AS  'Warehouse Message'
FROM    TPCC_INFO
GO

PRINT   ''
PRINT   ''
PRINT   '---------------------------'
PRINT   '|    DISTRICT TABLE       |'
PRINT   '---------------------------'
SELECT  TOP 1
        CONVERT(CHAR(30),INFO_DATE,21)  AS  'Date',
        NUM_DISTRICT                    AS  'District Rows',
        DISTRICT_TARGET                 AS        'District Target',
        CASE WHEN (NUM_DISTRICT = DISTRICT_TARGET)
             THEN 'OK!'
             ELSE 'ERROR!!!'
        END                             AS  'District Message'
FROM    TPCC_INFO
GO

PRINT   ''
PRINT   ''
PRINT   '---------------------------'
PRINT   '|      ITEM TABLE         |'
PRINT   '---------------------------'
SELECT  TOP 1
        CONVERT(CHAR(30),INFO_DATE,21)  AS  'Date',
        NUM_ITEM                        AS  'Item Rows',
        ITEM_TARGET                     AS        'Item Target',
        CASE WHEN (NUM_ITEM = ITEM_TARGET)
             THEN 'OK!'
             ELSE 'ERROR!!!'
        END                             AS  'Item Message'
FROM    TPCC_INFO
GO

PRINT   ''
PRINT   ''
PRINT   '---------------------------'
PRINT   '|    CUSTOMER TABLE       |'
PRINT   '---------------------------'
SELECT  TOP 1
        CONVERT(CHAR(30),INFO_DATE,21)  AS  'Date',
        NUM_CUSTOMER                    AS  'Customer Rows',
        CUSTOMER_TARGET                 AS        'Customer Target',
        CASE WHEN (NUM_CUSTOMER = CUSTOMER_TARGET)
             THEN 'OK!'
             ELSE 'ERROR!!!'
        END                             AS  'Customer Message'
FROM    TPCC_INFO
GO

PRINT   ''
PRINT   ''
PRINT   '---------------------------'
PRINT   '|     ORDERS TABLE        |'
PRINT   '---------------------------'
SELECT  TOP 1
        CONVERT(CHAR(30),INFO_DATE,21)  AS  'Date',
        NUM_ORDERS                      AS  'Orders Rows',
        ORDERS_TARGET                   AS        'Orders Target',
        CASE WHEN (NUM_ORDERS = ORDERS_TARGET)
             THEN 'OK!'
             WHEN (NUM_ORDERS BETWEEN ORDERS_TARGET_LOW AND ORDERS_TARGET_HIGH)
             THEN 'OK! (within 1%)'
             ELSE 'ERROR!!!'
        END                             AS  'Orders Message'
FROM    TPCC_INFO
GO

PRINT   ''
PRINT   ''
PRINT   '---------------------------'
PRINT   '|   ORDER LINE TABLE      |'
PRINT   '---------------------------'
SELECT  TOP 1
        CONVERT(CHAR(30),INFO_DATE,21)  AS  'Date',
        NUM_ORDER_LINE                  AS  'Order Line Rows',
```

```
        ORDER_LINE_TARGET               AS        'Order Line Target',
        CASE WHEN (NUM_ORDER_LINE = ORDER_LINE_TARGET)
             THEN 'OK!'
             WHEN (NUM_ORDER_LINE BETWEEN ORDER_LINE_TARGET_LOW AND
ORDER_LINE_TARGET_HIGH)
             THEN 'OK! (within 1%)'
             ELSE 'ERROR!!!'
        END                             AS  'Orders Message'
FROM    TPCC_INFO
GO

PRINT   ''
PRINT   ''
PRINT   '---------------------------'
PRINT   '|    NEW ORDER TABLE      |'
PRINT   '---------------------------'
SELECT  TOP 1
        CONVERT(CHAR(30),INFO_DATE,21)  AS  'Date',
        NUM_NEW_ORDER                   AS  'New Order Rows',
        NEW_ORDER_TARGET                AS        'New Order Target',
        CASE WHEN (NUM_NEW_ORDER = NEW_ORDER_TARGET)
             THEN 'OK!'
             WHEN (NUM_NEW_ORDER BETWEEN NEW_ORDER_TARGET_LOW AND
NEW_ORDER_TARGET_HIGH)
             THEN 'OK! (within 1%)'
             ELSE 'ERROR!!!'
        END                             AS  'New Order Message'
FROM    TPCC_INFO
GO

PRINT   ''
PRINT   ''
PRINT   '---------------------------'
PRINT   '|     HISTORY TABLE       |'
PRINT   '---------------------------'
SELECT  TOP 1
        CONVERT(CHAR(30),INFO_DATE,21)  AS  'Date',
        NUM_HISTORY                     AS  'History Rows',
        HISTORY_TARGET                  AS        'History Target',
        CASE WHEN (NUM_HISTORY = HISTORY_TARGET)
             THEN 'OK!'
             ELSE 'ERROR!!!'
        END                             AS  'New Order Message'
FROM    TPCC_INFO
GO

PRINT   ''
PRINT   ''
PRINT   '---------------------------'
PRINT   '|      STOCK TABLE        |'
PRINT   '---------------------------'
SELECT  TOP 1
        CONVERT(CHAR(30),INFO_DATE,21)  AS  'Date',
        NUM_STOCK                       AS  'Stock Rows',
        STOCK_TARGET                    AS        'Stock Target',
        CASE WHEN (NUM_STOCK = STOCK_TARGET)
             THEN 'OK!'
             ELSE 'ERROR!!!'
        END                             AS  'Stock Message'
FROM    TPCC_INFO
GO

------------------
```

```
-- Check Indexes
------------------
USE tpcc
GO

PRINT   ''
PRINT   ''
PRINT   '----------------------------'
PRINT   '|      TPC-C INDEXES       |'
PRINT   '----------------------------'
EXEC    sp_helpindex    warehouse
EXEC    sp_helpindex    district
EXEC    sp_helpindex    item
EXEC    sp_helpindex    customer
EXEC    sp_helpindex    orders
EXEC    sp_helpindex    order_line
EXEC    sp_helpindex    new_order
EXEC    sp_helpindex    history
EXEC    sp_helpindex    stock
GO
```

backup.sql

```
-----------------------------------------------------------------------
--                                                                   --
--  File:   BACKUP.SQL                                               --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62                  --
--          Copyright Microsoft, 2005                                --
--                                                                   --
-----------------------------------------------------------------------

DECLARE @startdate  DATETIME,
              @enddate        DATETIME

SELECT  @startdate = GETDATE()
SELECT  'Start date:',
                  CONVERT(VARCHAR(30),@startdate, 21)

DUMP DATABASE tpcc TO tpccback1, tpccback2, tpccback3, tpccback4 WITH init, stats =
1

SELECT  @enddate = GETDATE()
SELECT  'End date: ',
                  CONVERT(VARCHAR(30),@enddate, 21)
SELECT  'Elapsed time (in seconds): ',
                  DATEDIFF(second, @startdate, @enddate)
GO
```

restore.sql

```
-----------------------------------------------------------------------
--                                                                   --
--  File:   RESTORE.SQL                                              --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62                  --
--          Copyright Microsoft, 2005                                --
--                                                                   --
-----------------------------------------------------------------------

DECLARE @startdate  DATETIME,
        @enddate    DATETIME
```

```
SELECT  @startdate = GETDATE()
SELECT  'Start date:',
                  CONVERT(VARCHAR(30),@startdate, 21)

LOAD DATABASE tpcc FROM tpccback1, tpccback2, tpccback3, tpccback4 WITH replace,
stats = 1

SELECT  @enddate = GETDATE()
SELECT  'End date: ',
        CONVERT(VARCHAR(30),@enddate, 21)
SELECT  'Elapsed time (in seconds): ',
        DATEDIFF(second, @startdate, @enddate)
GO
```

sqlshutdown.sql

```
-------------------------------------------------------------------
--                                                               --
--  File:   SQLSHUTDOWN.SQL                                      --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62              --
--          Copyright Microsoft, 2005                            --
--                                                               --
--          Checkpoints tpcc database and issues a shutdown      --
--                                                               --
-------------------------------------------------------------------
USE tpcc
GO

CHECKPOINT
GO

SHUTDOWN
GO
```

idxcuscl.sql

```
-------------------------------------------------------------------
--                                                               --
--  File:   IDXCUSCL.SQL                                         --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62              --
--          Copyright Microsoft, 2005                            --
--                                                               --
--          Creates clustered index on customer table            --
-------------------------------------------------------------------
USE tpcc
GO

DECLARE @startdate  DATETIME,
        @enddate    DATETIME

SELECT  @startdate = GETDATE()
SELECT  'Start date:',
        CONVERT(VARCHAR(30),@startdate,21)

IF EXISTS ( SELECT name FROM sysindexes WHERE name = 'customer_c1' )
    DROP INDEX customer.customer_c1

CREATE UNIQUE CLUSTERED INDEX customer_c1 ON customer(c_w_id, c_d_id, c_id)
    ON MSSQL_cs_fg

SELECT  @enddate = GETDATE()
SELECT  'End date:',
        CONVERT(VARCHAR(30),@enddate,21)
SELECT  'Elapsed time (in seconds): ',
        DATEDIFF(second, @startdate, @enddate)
GO
```

idxcusnc.sql

```
-------------------------------------------------------------------
--                                                               --
--  File:   IDXCUSNC.SQL                                         --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62              --
--          Copyright Microsoft, 2005                            --
--                                                               --
--          Creates non-clustered index on customer table        --
-------------------------------------------------------------------
USE tpcc
GO

DECLARE @startdate  DATETIME,
        @enddate    DATETIME

SELECT  @startdate = GETDATE()
SELECT  'Start date:',
        CONVERT(VARCHAR(30),@startdate,21)

IF EXISTS ( SELECT name FROM sysindexes WHERE name = 'customer_nc1' )
    DROP INDEX customer.customer_nc1

CREATE UNIQUE NONCLUSTERED INDEX customer_nc1 ON customer(c_w_id, c_d_id, c_last,
c_first, c_id)
    ON MSSQL_cs_fg

SELECT  @enddate = GETDATE()
SELECT  'End date:',
        CONVERT(VARCHAR(30),@enddate,21)
SELECT  'Elapsed time (in seconds): ',
        DATEDIFF(second, @startdate, @enddate)
GO
```

idxdiscl.sql

```
-------------------------------------------------------------------
--                                                               --
--  File:   IDXDISCL.SQL                                         --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62              --
--          Copyright Microsoft, 2005                            --
--                                                               --
--          Creates clustered index on district table            --
-------------------------------------------------------------------
USE tpcc
GO

DECLARE @startdate  DATETIME,
        @enddate    DATETIME

SELECT  @startdate = GETDATE()
SELECT  'Start date:',
        CONVERT(VARCHAR(30),@startdate,21)

IF EXISTS ( SELECT name FROM sysindexes WHERE name = 'district_c1' )
```

```
    DROP INDEX district.district_c1

CREATE UNIQUE CLUSTERED INDEX district_c1 ON district(d_w_id, d_id)
    WITH FILLFACTOR=100 ON MSSQL_misc_fg

SELECT  @enddate = GETDATE()
SELECT  'End date:',
        CONVERT(VARCHAR(30),@enddate,21)
SELECT  'Elapsed time (in seconds): ',
        DATEDIFF(second, @startdate, @enddate)
GO
```

idxitmcl.sql

```
-------------------------------------------------------------------
--                                                               --
--  File:   IDXITMCL.SQL                                         --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62              --
--          Copyright Microsoft, 2005                            --
--                                                               --
--          Creates clustered index on item table                --
--                                                               --
-------------------------------------------------------------------
USE tpcc
GO

DECLARE @startdate  DATETIME,
        @enddate    DATETIME

SELECT  @startdate = GETDATE()
SELECT  'Start date:',
        CONVERT(VARCHAR(30),@startdate,21)

IF EXISTS ( SELECT name FROM sysindexes WHERE name = 'item_c1' )
    DROP INDEX item.item_c1

CREATE UNIQUE CLUSTERED INDEX item_c1 ON item(i_id)
    ON MSSQL_misc_fg

SELECT  @enddate = GETDATE()
SELECT  'End date:',
        CONVERT(VARCHAR(30),@enddate,21)
SELECT  'Elapsed time (in seconds): ',
        DATEDIFF(second, @startdate, @enddate)
GO
```

idxnodcl.sql

```
-------------------------------------------------------------------
--                                                               --
--  File:   IDXNODCL.SQL                                         --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62              --
--          Copyright Microsoft, 2005                            --
--                                                               --
--          Creates clustered index on new-order table           --
--                                                               --
-------------------------------------------------------------------
USE tpcc
GO

DECLARE @startdate  DATETIME,
        @enddate    DATETIME

SELECT  @startdate = GETDATE()
SELECT  'Start date:',
        CONVERT(VARCHAR(30),@startdate,21)

IF EXISTS ( SELECT name FROM sysindexes WHERE name = 'new_order_c1' )
    DROP INDEX new_order.new_order_c1

CREATE UNIQUE CLUSTERED INDEX new_order_c1 ON new_order(no_w_id, no_d_id, no_o_id)

    ON MSSQL_misc_fg

SELECT  @enddate = GETDATE()
SELECT  'End date:',
        CONVERT(VARCHAR(30),@enddate,21)
SELECT  'Elapsed time (in seconds): ',
        DATEDIFF(second, @startdate, @enddate)
GO
```

idxodlcl.sql

```
-------------------------------------------------------------------
--                                                               --
--  File:   IDXODLCL.SQL                                         --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62              --
--          Copyright Microsoft, 2005                            --
--                                                               --
--          Creates clustered index on order-line table          --
--                                                               --
-------------------------------------------------------------------
USE tpcc
GO

DECLARE @startdate  DATETIME,
        @enddate    DATETIME

SELECT  @startdate = GETDATE()
SELECT  'Start date:',
        CONVERT(VARCHAR(30),@startdate,21)

IF EXISTS ( SELECT name FROM sysindexes WHERE name = 'order_line_c1' )
    DROP INDEX order_line.order_line_c1

CREATE UNIQUE CLUSTERED INDEX order_line_c1 ON order_line(ol_w_id, ol_d_id, ol_o_id,
ol_number)
    ON MSSQL_misc_fg

SELECT  @enddate = GETDATE()
SELECT  'End date:',
        CONVERT(VARCHAR(30),@enddate,21)
SELECT  'Elapsed time (in seconds): ',
        DATEDIFF(second, @startdate, @enddate)
GO
```

idxordcl.sql

```
-------------------------------------------------------------------
--                                                               --
--  File:   IDXORDCL.SQL                                         --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62              --
```

```
--          Copyright Microsoft, 2005                           --
--                                                              --
--          Creates clustered index on orders table             --
--                                                              --
--------------------------------------------------------------------
USE tpcc
GO

DECLARE @startdate  DATETIME,
        @enddate    DATETIME

SELECT  @startdate = GETDATE()
SELECT  'Start date:',
        CONVERT(VARCHAR(30),@startdate,21)

IF EXISTS ( SELECT name FROM sysindexes WHERE name = 'orders_c1' )
    DROP INDEX orders.orders_c1

CREATE UNIQUE CLUSTERED INDEX orders_c1 ON orders(o_w_id, o_d_id, o_id)
    ON MSSQL_misc_fg

SELECT  @enddate = GETDATE()
SELECT  'End date:',
        CONVERT(VARCHAR(30),@enddate,21)
SELECT  'Elapsed time (in seconds): ',
        DATEDIFF(second, @startdate, @enddate)
GO
```

idxstkcl.sql

```
--------------------------------------------------------------------
--                                                              --
--  File:   IDXSTKCL.SQL                                        --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62             --
--          Copyright Microsoft, 2005                           --
--                                                              --
--          Creates clustered index on stock table              --
--                                                              --
--------------------------------------------------------------------
USE tpcc
GO

DECLARE @startdate  DATETIME,
        @enddate    DATETIME

SELECT  @startdate = GETDATE()
SELECT  'Start date:',
        CONVERT(VARCHAR(30),@startdate,21)

IF EXISTS ( SELECT name FROM sysindexes WHERE name = 'stock_c1' )
    DROP INDEX stock.stock_c1

CREATE UNIQUE CLUSTERED INDEX stock_c1 ON stock(s_i_id, s_w_id)
    ON MSSQL_cs_fg

SELECT  @enddate = GETDATE()
SELECT  'End date:',
        CONVERT(VARCHAR(30),@enddate,21)
SELECT  'Elapsed time (in seconds): ',
        DATEDIFF(second, @startdate, @enddate)
GO
```

idxwarcl.sql

```
--------------------------------------------------------------------
--                                                              --
--  File:   IDXWARCL.SQL                                        --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62             --
--          Copyright Microsoft, 2005                           --
--                                                              --
--          Creates clustered index on warehouse table          --
--                                                              --
--------------------------------------------------------------------
USE tpcc
GO

DECLARE @startdate  DATETIME,
        @enddate    DATETIME

SELECT  @startdate = GETDATE()
SELECT  'Start date:',
        CONVERT(VARCHAR(30),@startdate,21)

IF EXISTS ( SELECT name FROM sysindexes WHERE name = 'warehouse_c1' )
    DROP INDEX warehouse.warehouse_c1

CREATE UNIQUE CLUSTERED INDEX warehouse_c1 ON warehouse(w_id)
    WITH FILLFACTOR=100 ON MSSQL_misc_fg

SELECT  @enddate = GETDATE()
SELECT  'End date:',
        CONVERT(VARCHAR(30),@enddate,21)
SELECT  'Elapsed time (in seconds): ',
        DATEDIFF(second, @startdate, @enddate)
GO
```

idxhiscl.sql

```
--------------------------------------------------------------------
--                                                              --
--  File:   IDXHISCL.SQL                                        --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62             --
--          Copyright Microsoft, 2005                           --
--                                                              --
--          Creates clustered index on history table            --
--                                                              --
--          CAUTION: This index is only beneficial for systems  --
--          CAUTION: with 8 or more processors.                 --
--          CAUTION: It may negatively impact performance on    --
--          CAUTION: systems with less than 8 processors.       --
--                                                              --
--------------------------------------------------------------------
USE tpcc
GO

DECLARE @startdate  DATETIME,
        @enddate    DATETIME

SELECT  @startdate = GETDATE()
SELECT  'Start date:',
        CONVERT(VARCHAR(30),@startdate,21)
```

```
IF EXISTS ( SELECT name FROM sysindexes WHERE name = 'history_c1' )
    DROP INDEX history.history_c1

CREATE UNIQUE CLUSTERED INDEX history_c1 ON history(h_c_w_id, h_date, h_c_d_id,
h_c_id, h_amount)
    ON MSSQL_misc_fg

SELECT  @enddate = GETDATE()
SELECT  'End date:',
        CONVERT(VARCHAR(30),@enddate,21)
SELECT  'Elapsed time (in seconds): ',
        DATEDIFF(second, @startdate, @enddate)
GO
```

tables.sql

```
-----------------------------------------------------------------------
--                                                                   --
--  File:   TABLES.SQL                                               --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62                  --
--          Copyright Microsoft, 2005                                --
--                                                                   --
--          Creates TPC-C tables                                     --
-----------------------------------------------------------------------

SET ANSI_NULL_DFLT_OFF ON
GO

USE tpcc
GO

-----------------------------------
-- Remove all existing TPC-C tables
-----------------------------------
if exists ( select name from sysobjects where name = 'warehouse' )
          drop table warehouse
go
if exists ( select name from sysobjects where name = 'district' )
          drop table district
go
if exists ( select name from sysobjects where name = 'customer' )
          drop table customer
go
if exists ( select name from sysobjects where name = 'history' )
          drop table history
go
if exists ( select name from sysobjects where name = 'new_order' )
          drop table new_order
go
if exists ( select name from sysobjects where name = 'orders' )
          drop table orders
go
if exists ( select name from sysobjects where name = 'order_line' )
          drop table order_line
go
if exists ( select name from sysobjects where name = 'item' )
          drop table item
go
if exists ( select name from sysobjects where name = 'stock' )
          drop table stock
go

--------------------
-- Create new tables
--------------------
create table warehouse
(
          w_id               int,
          w_ytd              money,
          w_tax              smallmoney,
          w_name             char(10),
          w_street_1         char(20),
          w_street_2         char(20),
          w_city             char(20),
          w_state            char(2),
          w_zip              char(9)
) on MSSQL_misc_fg
go

create table district
(
          d_id               tinyint,
          d_w_id             int,
          d_ytd              money,
          d_next_o_id                int,
          d_tax              smallmoney,
          d_name             char(10),
          d_street_1         char(20),
          d_street_2         char(20),
          d_city             char(20),
          d_state            char(2),
          d_zip              char(9)
) on MSSQL_misc_fg
go

create table customer
(
          c_id               int,
          c_d_id             tinyint,
          c_w_id             int,
          c_discount         smallmoney,
          c_credit_lim       money,
          c_last             char(16),
          c_first            char(16),
          c_credit           char(2),
          c_balance          money,
          c_ytd_payment      money,
          c_payment_cnt      smallint,
          c_delivery_cnt     smallint,
          c_street_1         char(20),
          c_street_2         char(20),
          c_city             char(20),
          c_state            char(2),
          c_zip              char(9),
          c_phone            char(16),
          c_since            datetime,
          c_middle           char(2),
          c_data             char(500)
) on MSSQL_cs_fg
go

-- Use the following table option if using c_data varchar(max)
-- sp_tableoption 'customer','large value types out of row','1'
-- go
```

```
create table history
(
          h_c_id              int,
          h_c_d_id            tinyint,
          h_c_w_id            int,
          h_d_id              tinyint,
          h_w_id              int,
          h_date              datetime,
          h_amount            smallmoney,
          h_data              char(24)
) on MSSQL_misc_fg
go

create table new_order
(
          no_o_id             int,
          no_d_id             tinyint,
          no_w_id             int
) on MSSQL_misc_fg
go

create table orders
(
          o_id                int,
          o_d_id              tinyint,
          o_w_id              int,
          o_c_id              int,
          o_carrier_id        tinyint,
          o_ol_cnt            tinyint,
          o_all_local         tinyint,
          o_entry_d           datetime
) on MSSQL_misc_fg
go

create table order_line
(
          ol_o_id             int,
          ol_d_id             tinyint,
          ol_w_id             int,
          ol_number           tinyint,
          ol_i_id             int,
          ol_delivery_d       datetime,
          ol_amount           smallmoney,
          ol_supply_w_id      int,
          ol_quantity         smallint,
          ol_dist_info        char(24)
) on MSSQL_misc_fg
go

create table item
(
          i_id                int,
          i_name              char(24),
          i_price             smallmoney,
          i_data              char(50),
          i_im_id             int
) on MSSQL_misc_fg
go

create table stock
(
          s_i_id              int,
          s_w_id              int,
          s_quantity          smallint,
          s_ytd               int,
          s_order_cnt         smallint,
          s_remote_cnt        smallint,
          s_data              char(50),
          s_dist_01           char(24),
          s_dist_02           char(24),
          s_dist_03           char(24),
          s_dist_04           char(24),
          s_dist_05           char(24),
          s_dist_06           char(24),
          s_dist_07           char(24),
          s_dist_08           char(24),
          s_dist_09           char(24),
          s_dist_10           char(24)
) on MSSQL_cs_fg
go
```

neword.sql

```
-------------------------------------------------------------------
--                                                               --
--  File:   NEWORD.SQL                                           --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62              --
--          Copyright Microsoft, 2005                            --
--                                                               --
--          Creates neworder stored procedure                    --
--                                                               --
--          Interface Level:    4.20.000                         --
--                                                               --
-------------------------------------------------------------------
SET QUOTED_IDENTIFIER OFF
GO

SET ANSI_NULLS ON
GO

USE tpcc
GO

IF EXISTS ( SELECT name FROM sysobjects WHERE name = 'tpcc_neworder' )
    DROP PROCEDURE tpcc_neworder
GO

CREATE PROCEDURE    tpcc_neworder
                        @w_id           int,
                        @d_id           tinyint,
                        @c_id           int,
                        @o_ol_cnt       tinyint,
                        @o_all_local    tinyint,
                        @i_id1  int = 0, @s_w_id1  int = 0, @ol_qty1  smallint = 0,
                        @i_id2  int = 0, @s_w_id2  int = 0, @ol_qty2  smallint = 0,
                        @i_id3  int = 0, @s_w_id3  int = 0, @ol_qty3  smallint = 0,
                        @i_id4  int = 0, @s_w_id4  int = 0, @ol_qty4  smallint = 0,
                        @i_id5  int = 0, @s_w_id5  int = 0, @ol_qty5  smallint = 0,
                        @i_id6  int = 0, @s_w_id6  int = 0, @ol_qty6  smallint = 0,
                        @i_id7  int = 0, @s_w_id7  int = 0, @ol_qty7  smallint = 0,
                        @i_id8  int = 0, @s_w_id8  int = 0, @ol_qty8  smallint = 0,
                        @i_id9  int = 0, @s_w_id9  int = 0, @ol_qty9  smallint = 0,
                        @i_id10 int = 0, @s_w_id10 int = 0, @ol_qty10 smallint = 0,
                        @i_id11 int = 0, @s_w_id11 int = 0, @ol_qty11 smallint = 0,
                        @i_id12 int = 0, @s_w_id12 int = 0, @ol_qty12 smallint = 0,
```

```
                        @i_id13 int = 0, @s_w_id13 int = 0, @ol_qty13 smallint = 0,
                        @i_id14 int = 0, @s_w_id14 int = 0, @ol_qty14 smallint = 0,
                        @i_id15 int = 0, @s_w_id15 int = 0, @ol_qty15 smallint = 0


AS
DECLARE @w_tax          smallmoney,
        @d_tax          smallmoney,
        @c_last         char(16),
        @c_credit       char(2),
        @c_discount     smallmoney,
        @i_price        smallmoney,
        @i_name         char(24),
        @i_data         char(50),
        @o_entry_d      datetime,
        @remote_flag    int,
        @s_quantity     smallint,
        @s_data         char(50),
        @s_dist         char(24),
        @li_no          int,
        @o_id           int,
        @commit_flag    tinyint,
        @li_id          int,
        @li_s_w_id      int,
        @li_qty         smallint,
        @ol_number      int,
        @c_id_local     int

BEGIN

BEGIN TRANSACTION n

------------------------------------------------------------
--  get district tax and next availible order id and update
--  plus initialize local variables
------------------------------------------------------------
    UPDATE  district
    SET     @d_tax          = d_tax,
            @o_id           = d_next_o_id,
            d_next_o_id     = d_next_o_id + 1,
            @o_entry_d      = GETDATE(),
            @li_no          = 0,
            @commit_flag    = 1
    WHERE   d_w_id          = @w_id AND
            d_id            = @d_id

----------------------
--  process orderlines
----------------------
    WHILE (@li_no < @o_ol_cnt)
    BEGIN
        SELECT  @li_no  = @li_no + 1

------------------------------------------------
--  set i_id, s_w_id, and qty for this lineitem
------------------------------------------------
        SELECT  @li_id = CASE @li_no
                              WHEN 1 THEN @i_id1
                              WHEN 2 THEN @i_id2
                              WHEN 3 THEN @i_id3
                              WHEN 4 THEN @i_id4
                              WHEN 5 THEN @i_id5
                              WHEN 6 THEN @i_id6
                              WHEN 7 THEN @i_id7
                              WHEN 8 THEN @i_id8
                              WHEN 9 THEN @i_id9
                              WHEN 10 THEN @i_id10
                              WHEN 11 THEN @i_id11
                              WHEN 12 THEN @i_id12
                              WHEN 13 THEN @i_id13
                              WHEN 14 THEN @i_id14
                              WHEN 15 THEN @i_id15
                         END,

                @li_s_w_id = CASE @li_no
                              WHEN 1 THEN @s_w_id1
                              WHEN 2 THEN @s_w_id2
                              WHEN 3 THEN @s_w_id3
                              WHEN 4 THEN @s_w_id4
                              WHEN 5 THEN @s_w_id5
                              WHEN 6 THEN @s_w_id6
                              WHEN 7 THEN @s_w_id7
                              WHEN 8 THEN @s_w_id8
                              WHEN 9 THEN @s_w_id9
                              WHEN 10 THEN @s_w_id10
                              WHEN 11 THEN @s_w_id11
                              WHEN 12 THEN @s_w_id12
                              WHEN 13 THEN @s_w_id13
                              WHEN 14 THEN @s_w_id14
                              WHEN 15 THEN @s_w_id15
                            END,

                @li_qty = CASE  @li_no
                              WHEN 1 THEN @ol_qty1
                              WHEN 2 THEN @ol_qty2
                              WHEN 3 THEN @ol_qty3
                              WHEN 4 THEN @ol_qty4
                              WHEN 5 THEN @ol_qty5
                              WHEN 6 THEN @ol_qty6
                              WHEN 7 THEN @ol_qty7
                              WHEN 8 THEN @ol_qty8
                              WHEN 9 THEN @ol_qty9
                              WHEN 10 THEN @ol_qty10
                              WHEN 11 THEN @ol_qty11
                              WHEN 12 THEN @ol_qty12
                              WHEN 13 THEN @ol_qty13
                              WHEN 14 THEN @ol_qty14
                              WHEN 15 THEN @ol_qty15
                         END

    ---------------------------------------
    --  get item data (no one updates item)
    ---------------------------------------
            SELECT  @i_price    = i_price,
                    @i_name     = i_name,
                    @i_data     = i_data
            FROM    item WITH (repeatableread)
            WHERE   i_id        = @li_id

    ----------------------
    --  update stock values
    ----------------------
            UPDATE  stock
            SET     s_ytd           = s_ytd + @li_qty,
                    @s_quantity     = s_quantity   = s_quantity - @li_qty +
```

```
                                    CASE WHEN (s_quantity - @li_qty < 10) THEN 91
ELSE 0 END,
                s_order_cnt     = s_order_cnt + 1,
                s_remote_cnt    = s_remote_cnt +
                                    CASE WHEN (@li_s_w_id = @w_id) THEN 0 ELSE 1
END,
                @s_data         = s_data,
                @s_dist         = CASE @d_id
                                    WHEN 1  THEN s_dist_01
                                    WHEN 2  THEN s_dist_02
                                    WHEN 3  THEN s_dist_03
                                    WHEN 4  THEN s_dist_04
                                    WHEN 5  THEN s_dist_05
                                    WHEN 6  THEN s_dist_06
                                    WHEN 7  THEN s_dist_07
                                    WHEN 8  THEN s_dist_08
                                    WHEN 9  THEN s_dist_09
                                    WHEN 10 THEN s_dist_10
                                  END
        WHERE   s_i_id          = @li_id AND
                s_w_id          = @li_s_w_id

-------------------------------------------------------------------------
--  if there actually is a stock (and item) with these ids, go to work
-------------------------------------------------------------------------
        IF (@@rowcount > 0)
        BEGIN
-------------------------------------------------------------
--  insert order_line data (using data from item and stock)
-------------------------------------------------------------
            INSERT INTO order_line VALUES(  @o_id,
                                            @d_id,
                                            @w_id,
                                            @li_no,
                                            @li_id,
                                            'dec 31, 1899',
                                            @i_price * @li_qty,
                                            @li_s_w_id,
                                            @li_qty,
                                            @s_dist)

---------------------------------
--  send line-item data to client
---------------------------------
            SELECT  @i_name,
                    @s_quantity,
                    b_g = CASE  WHEN (   (patindex('%ORIGINAL%',@i_data) > 0) AND

(patindex('%ORIGINAL%',@s_data) > 0) )
                                                                THEN 'B' ELSE 'G' END,
                    @i_price,
                    @i_price * @li_qty
                    END
                    ELSE
                    BEGIN
-------------------------------------------------------------
--  no item (or stock) found - triggers rollback condition
-------------------------------------------------------------
            SELECT  '',0,'',0,0
            SELECT  @commit_flag    = 0
                    END
          END
-------------------------------------------------------

--  get customer last name, discount, and credit rating
-------------------------------------------------------
    SELECT  @c_last     = c_last,
            @c_discount = c_discount,
            @c_credit   = c_credit,
            @c_id_local = c_id
    FROM    customer WITH (repeatableread)
    WHERE   c_id        = @c_id AND
            c_w_id      = @w_id AND
            c_d_id      = @d_id

-------------------------------------
--  insert fresh row into orders table
-------------------------------------
    INSERT INTO orders VALUES ( @o_id,
                                @d_id,
                                @w_id,
                                @c_id_local,
                                0,
                                @o_ol_cnt,
                                @o_all_local,
                                @o_entry_d)

-------------------------------------------------
--  insert corresponding row into new-order table
-------------------------------------------------
    INSERT INTO new_order VALUES (  @o_id,
                                    @d_id,
                                    @w_id)

------------------------
--  select warehouse tax
------------------------
    SELECT  @w_tax  = w_tax
    FROM    warehouse WITH (repeatableread)
    WHERE   w_id    = @w_id

    IF (@commit_flag = 1)
                    COMMIT TRANSACTION n
    ELSE
-------------------------------
--  all that work for nuthin!!!
-------------------------------
        ROLLBACK TRANSACTION n

-------------------------------
--  return order data to client
-------------------------------
    SELECT  @w_tax,
            @d_tax,
            @o_id,
            @c_last,
            @c_discount,
            @c_credit,
            @o_entry_d,
            @commit_flag
END
GO

SET QUOTED_IDENTIFIER OFF
GO

SET ANSI_NULLS ON
```

```
GO
```

delivery.sql

```
-----------------------------------------------------------------
--                                                             --
--  File:   DELIVERY.SQL                                       --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62            --
--          Copyright Microsoft, 2005                          --
--                                                             --
--          Creates delivery stored procedure                  --
--                                                             --
--          Interface Level:    4.20.000                       --
--                                                             --
-----------------------------------------------------------------
SET QUOTED_IDENTIFIER OFF
GO

SET ANSI_NULLS ON
GO

USE tpcc
GO

IF EXISTS ( SELECT name FROM sysobjects WHERE name = 'tpcc_delivery' )
    DROP PROCEDURE tpcc_delivery
GO

CREATE PROC tpcc_delivery
                @w_id           int,

                @o_carrier_id   smallint

AS
DECLARE @d_id       tinyint,
        @o_id       int,
        @c_id       int,
        @total      money,
        @oid1       int,
        @oid2       int,
        @oid3       int,
        @oid4       int,
        @oid5       int,
        @oid6       int,
        @oid7       int,
        @oid8       int,
        @oid9       int,
        @oid10      int

SELECT  @d_id   = 0

BEGIN TRANSACTION d
    WHILE (@d_id < 10)
    BEGIN
        SELECT  @d_id   = @d_id + 1,
                @total  = 0,
                @o_id   = 0

        SELECT  TOP 1
                @o_id   = no_o_id
        FROM    new_order WITH  (serializable updlock)
        WHERE   no_w_id = @w_id AND
                no_d_id = @d_id
        ORDER   BY no_o_id ASC

        IF (@@rowcount <> 0)
        BEGIN
            --  claim the order for this district
            DELETE  new_order
            WHERE   no_w_id = @w_id AND
                    no_d_id = @d_id AND
                    no_o_id = @o_id

            --  set carrier_id on this order (and get customer id)
            UPDATE  orders
            SET     o_carrier_id    = @o_carrier_id,
                    @c_id           = o_c_id
            WHERE   o_w_id          = @w_id AND
                    o_d_id          = @d_id AND
                    o_id            = @o_id

            --  set date in all lineitems for this order (and sum amounts)
            UPDATE  order_line
            SET     ol_delivery_d   = GETDATE(),
                    @total          = @total + ol_amount
            WHERE   ol_w_id         = @w_id AND
                    ol_d_id         = @d_id AND
                    ol_o_id         = @o_id

            --  accummulate lineitem amounts for this order into customer
            UPDATE  customer
            SET     c_balance       = c_balance + @total,
                    c_delivery_cnt  = c_delivery_cnt + 1
            WHERE   c_w_id          = @w_id AND
                    c_d_id          = @d_id AND
                    c_id            = @c_id
        END

    SELECT  @oid1   = CASE @d_id WHEN   1   THEN @o_id ELSE @oid1   END,
            @oid2   = CASE @d_id WHEN   2   THEN @o_id ELSE @oid2   END,
            @oid3   = CASE @d_id WHEN   3   THEN @o_id ELSE @oid3   END,
            @oid4   = CASE @d_id WHEN   4   THEN @o_id ELSE @oid4   END,
            @oid5   = CASE @d_id WHEN   5   THEN @o_id ELSE @oid5   END,
            @oid6   = CASE @d_id WHEN   6   THEN @o_id ELSE @oid6   END,
            @oid7   = CASE @d_id WHEN   7   THEN @o_id ELSE @oid7   END,
            @oid8   = CASE @d_id WHEN   8   THEN @o_id ELSE @oid8   END,
            @oid9   = CASE @d_id WHEN   9   THEN @o_id ELSE @oid9   END,
            @oid10  = CASE @d_id WHEN  10   THEN @o_id ELSE @oid10  END
    END

COMMIT TRANSACTION d

-- return delivery data to client

SELECT  @oid1,
        @oid2,
        @oid3,
        @oid4,
        @oid5,
        @oid6,
        @oid7,
        @oid8,
        @oid9,
        @oid10
GO
```

```
SET QUOTED_IDENTIFIER OFF
GO

SET ANSI_NULLS ON
GO
```

ordstat.sql

```
-----------------------------------------------------------------------
--                                                                   --
--  File:   ORDSTAT.SQL                                              --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62                  --
--          Copyright Microsoft, 2005                                --
--                                                                   --
--          Creates order status stored procedure                    --
--                                                                   --
--          Interface Level:    4.20.000                             --
--                                                                   --
-----------------------------------------------------------------------
SET QUOTED_IDENTIFIER OFF
GO

SET ANSI_NULLS ON
GO

USE tpcc
GO

IF EXISTS ( SELECT name FROM sysobjects WHERE name = 'tpcc_orderstatus' )
    DROP PROCEDURE tpcc_orderstatus
GO

CREATE PROCEDURE    tpcc_orderstatus
                        @w_id       int,
                        @d_id       tinyint,

                        @c_id       int,
                        @c_last     char(16) = ''

AS
DECLARE @c_balance      money,
        @c_first        char(16),
        @c_middle       char(2),
        @o_id           int,
        @o_entry_d      datetime,
        @o_carrier_id   smallint,
        @cnt            smallint

BEGIN TRANSACTION o
    IF (@c_id = 0)
    BEGIN
        ------------------------------------------
        --  get customer id and info using last name
        ------------------------------------------
        SELECT  @cnt    = (count(*)+1)/2
        FROM    customer WITH (repeatableread)
        WHERE   c_last  = @c_last AND
                c_w_id  = @w_id AND
                c_d_id  = @d_id

        SET     rowcount @cnt

        SELECT  @c_id       = c_id,
                @c_balance  = c_balance,
                @c_first    = c_first,
                @c_last     = c_last,
                @c_middle   = c_middle
        FROM    customer WITH (repeatableread)
        WHERE   c_last      = @c_last AND
                c_w_id      = @w_id AND
                c_d_id      = @d_id
        ORDER   BY c_w_id, c_d_id, c_last, c_first

        SET rowcount 0
    END
    ELSE
    BEGIN
        ----------------------------
        --  get customer info if by id
        ----------------------------
        SELECT  @c_balance  = c_balance,
                @c_first    = c_first,
                @c_middle   = c_middle,
                @c_last     = c_last
        FROM    customer WITH (repeatableread)
        WHERE   c_id        = @c_id AND
                c_d_id      = @d_id AND
                c_w_id      = @w_id

        SELECT  @cnt          = @@rowcount
    END

    ----------------------
    --  if no such customer
    ----------------------
    IF (@cnt = 0)
    BEGIN
        RAISERROR('Customer not found',18,1)
        GOTO custnotfound
    END

    -----------------
    --  get order info
    -----------------
    SELECT  @o_id           = o_id,
            @o_entry_d      = o_entry_d,
            @o_carrier_id   = o_carrier_id
    FROM    orders WITH (serializable)
    WHERE   o_c_id          = @c_id AND
            o_d_id          = @d_id AND
            o_w_id          = @w_id
    ORDER   BY o_id ASC

    ------------------------------------------
    --  select order lines for the current order
    ------------------------------------------
    SELECT  ol_supply_w_id,
            ol_i_id,
            ol_quantity,
            ol_amount,
            ol_delivery_d
    FROM    order_line WITH (repeatableread)
    WHERE   ol_o_id = @o_id AND
            ol_d_id = @d_id AND
```

```
            ol_w_id = @w_id

    custnotfound:

    COMMIT TRANSACTION o

    -------------------------
    --  return data to client
    -------------------------
    SELECT  @c_id,
            @c_last,
            @c_first,
            @c_middle,
            @o_entry_d,
            @o_carrier_id,
            @c_balance,
            @o_id
GO
```

payment.sql

```
-----------------------------------------------------------------
--                                                             --
--  File:   PAYMENT.SQL                                        --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62            --
--          Copyright Microsoft, 2005                          --
--                                                             --
--          Creates payment stored procedure                   --
--                                                             --
--          Interface Level:    4.20.000                       --
--                                                             --
-----------------------------------------------------------------
SET QUOTED_IDENTIFIER OFF
GO

SET ANSI_NULLS ON
GO

USE tpcc
GO

IF EXISTS ( SELECT name FROM sysobjects WHERE name = 'tpcc_payment' )
    DROP PROCEDURE tpcc_payment
GO

CREATE PROCEDURE    tpcc_payment
                        @w_id       int,
                        @c_w_id     int,
                        @h_amount   smallmoney,
                        @d_id       tinyint,
                        @c_d_id     tinyint,
                        @c_id       int,
                        @c_last     char(16) = ""

AS
DECLARE @w_street_1     char(20),
        @w_street_2     char(20),
        @w_city         char(20),
        @w_state        char(2),
        @w_zip          char(9),
        @w_name         char(10),
        @d_street_1     char(20),
        @d_street_2     char(20),
        @d_city         char(20),
        @d_state        char(2),
        @d_zip          char(9),
        @d_name         char(10),
        @c_first        char(16),
        @c_middle       char(2),
        @c_street_1     char(20),
        @c_street_2     char(20),
        @c_city         char(20),
        @c_state        char(2),
        @c_zip          char(9),
        @c_phone        char(16),
        @c_since        datetime,
        @c_credit       char(2),
        @c_credit_lim   money,
        @c_balance      money,
        @c_discount     smallmoney,
        @c_data         char(42),
        @datetime       datetime,
        @w_ytd          money,
        @d_ytd          money,
        @cnt            smallint,
        @val            smallint,
        @screen_data    char(200),
        @d_id_local     tinyint,
        @w_id_local     int,
        @c_id_local     int

SELECT  @screen_data    = ""

BEGIN TRANSACTION p
    --  get payment date
    SELECT  @datetime = GETDATE()

    IF (@c_id = 0)
    BEGIN
        --  get customer id and info using last name
        SELECT  @cnt    = COUNT(*)
        FROM    customer WITH (repeatableread)
        WHERE   c_last  = @c_last AND
                                c_w_id  = @c_w_id AND
                                c_d_id  = @c_d_id


        SELECT  @val    = (@cnt + 1) / 2

        SET     rowcount @val

        SELECT  @c_id   = c_id
        FROM    customer WITH (repeatableread)
        WHERE   c_last  = @c_last AND
                                c_w_id  = @c_w_id AND
                                c_d_id  = @c_d_id
        ORDER   BY c_last, c_first

        SET     rowcount 0
    END

    --  get customer info and update balances
    UPDATE  customer
    SET     @c_balance      = c_balance = c_balance - @h_amount,
            c_payment_cnt   = c_payment_cnt + 1,
```

```
        c_ytd_payment   = c_ytd_payment + @h_amount,
        @c_first        = c_first,
        @c_middle       = c_middle,
        @c_last         = c_last,
        @c_street_1     = c_street_1,
        @c_street_2     = c_street_2,
        @c_city         = c_city,
        @c_state        = c_state,
        @c_zip          = c_zip,
        @c_phone        = c_phone,
        @c_credit       = c_credit,
        @c_credit_lim   = c_credit_lim,
        @c_discount     = c_discount,
        @c_since        = c_since,
        @c_id_local     = c_id
WHERE   c_id            = @c_id AND
        c_w_id          = @c_w_id AND
        c_d_id          = @c_d_id

--  if customer has bad credit get some more info
IF (@c_credit = "BC")
BEGIN
    --          compute new info
    SELECT  @c_data =   convert(char(5),@c_id) +
                        convert(char(4),@c_d_id) +
                        convert(char(5),@c_w_id) +
                        convert(char(4),@d_id) +
                        convert(char(5),@w_id) +
                        convert(char(19),@h_amount)

    --  update customer info
    UPDATE  customer
    SET     c_data          = @c_data + substring(c_data, 1, 458),
            @screen_data    = @c_data + substring(c_data, 1, 158)

    WHERE   c_id            = @c_id AND
            c_w_id          = @c_w_id AND
            c_d_id          = @c_d_id
END

--  get district data and update year-to-date
UPDATE  district
SET     d_ytd       = d_ytd + @h_amount,
        @d_street_1 = d_street_1,
        @d_street_2 = d_street_2,
        @d_city     = d_city,
        @d_state    = d_state,
        @d_zip      = d_zip,
        @d_name     = d_name,
        @d_id_local = d_id
WHERE   d_w_id      = @w_id AND
        d_id        = @d_id

--  get warehouse data and update year-to-date
UPDATE  warehouse
SET     w_ytd       = w_ytd + @h_amount,
        @w_street_1 = w_street_1,
        @w_street_2 = w_street_2,
        @w_city     = w_city,
        @w_state     = w_state,
        @w_zip      = w_zip,
        @w_name     = w_name,
        @w_id_local = w_id
WHERE   w_id        = @w_id

--  create history record
      INSERT INTO         history VALUES (@c_id_local,
                            @c_d_id,
                            @c_w_id,
                            @d_id_local,
                            @w_id_local,
                            @datetime,
                            @h_amount,
                            @w_name + '    ' + @d_name)

COMMIT TRANSACTION p

--  return data to client
SELECT  @c_id,
        @c_last,
        @datetime,
        @w_street_1,
        @w_street_2,
        @w_city,
        @w_state,
        @w_zip,
        @d_street_1,
        @d_street_2,
        @d_city,
        @d_state,
        @d_zip,
        @c_first,
        @c_middle,
        @c_street_1,
        @c_street_2,
        @c_city,
        @c_state,
        @c_zip,
        @c_phone,
        @c_since,
        @c_credit,
        @c_credit_lim,
        @c_discount,
        @c_balance,
        @screen_data
GO

SET QUOTED_IDENTIFIER OFF
GO

SET ANSI_NULLS ON
GO
```

stocklev.sql

```
------------------------------------------------------------------------
--                                                                    --
--  File:   STOCKLEV.SQL                                              --
--          Microsoft TPC-C Benchmark Kit Ver. 4.62                   --
--          Copyright Microsoft, 2005                                 --
--                                                                    --
--          Creates stock level stored procedure                      --
--                                                                    --
--          Interface Level:    4.20.000                              --
--                                                                    --
```

```
-----------------------------------------------------------------------
SET QUOTED_IDENTIFIER OFF
GO

SET ANSI_NULLS ON
GO

USE tpcc
GO

IF EXISTS ( SELECT name FROM sysobjects WHERE name = 'tpcc_stocklevel' )
    DROP PROCEDURE tpcc_stocklevel
GO

CREATE PROCEDURE    tpcc_stocklevel
                        @w_id           int,
                        @d_id           tinyint,
                        @threshhold     smallint

AS
DECLARE @o_id_low   int,
        @o_id_high  int

SELECT  @o_id_low   = (d_next_o_id - 20),
        @o_id_high  = (d_next_o_id - 1)
FROM    district
WHERE   d_w_id      = @w_id AND
        d_id        = @d_id

SELECT  COUNT(DISTINCT(s_i_id))
FROM    stock,
        order_line
WHERE   ol_w_id     = @w_id AND
        ol_d_id     = @d_id and
        ol_o_id     BETWEEN @o_id_low AND
                            @o_id_high AND
        s_w_id      = ol_w_id AND
        s_i_id      = ol_i_id AND
        s_quantity  < @threshhold
OPTION(ORDER GROUP)
GO

SET QUOTED_IDENTIFIER OFF
GO

SET ANSI_NULLS ON
GO
```

neworder_rownum_newdb.sql

```
SET QUOTED_IDENTIFIER OFF
GO
SET ANSI_NULLS OFF
GO
-- 8666: full showplan text info (to see if rowset sharing)
dbcc traceon(8666)
go
-- prevent sort over tvf
dbcc traceon(8710)
go

use tpcc
go

drop procedure tpcc_neworder_new
go
-- neworder_new v2.5 6/23/05 PeterCa
-- 1q stock/order_line/client.  upd district & ins neworder.
--  cust/warehouse select together, ins order separate
--  uses rownumber to distinct w any transform
--  uses in-memory sort for distinct on iid,wid
--  uses charindex
-- will rollback if (@i_idX,@s_w_idX pairs not unique) OR (@i_idX not unique).
create proc tpcc_neworder_new
          @w_id           int,
          @d_id           tinyint,
          @c_id           int,
          @o_ol_cnt       tinyint,
          @o_all_local    tinyint,
          @i_id1  int = 0, @s_w_id1  int = 0, @ol_qty1  smallint = 0,
          @i_id2  int = 0, @s_w_id2  int = 0, @ol_qty2  smallint = 0,
          @i_id3  int = 0, @s_w_id3  int = 0, @ol_qty3  smallint = 0,
          @i_id4  int = 0, @s_w_id4  int = 0, @ol_qty4  smallint = 0,
          @i_id5  int = 0, @s_w_id5  int = 0, @ol_qty5  smallint = 0,
          @i_id6  int = 0, @s_w_id6  int = 0, @ol_qty6  smallint = 0,
          @i_id7  int = 0, @s_w_id7  int = 0, @ol_qty7  smallint = 0,
          @i_id8  int = 0, @s_w_id8  int = 0, @ol_qty8  smallint = 0,
          @i_id9  int = 0, @s_w_id9  int = 0, @ol_qty9  smallint = 0,
          @i_id10 int = 0, @s_w_id10 int = 0, @ol_qty10 smallint = 0,
          @i_id11 int = 0, @s_w_id11 int = 0, @ol_qty11 smallint = 0,
          @i_id12 int = 0, @s_w_id12 int = 0, @ol_qty12 smallint = 0,
          @i_id13 int = 0, @s_w_id13 int = 0, @ol_qty13 smallint = 0,
          @i_id14 int = 0, @s_w_id14 int = 0, @ol_qty14 smallint = 0,
          @i_id15 int = 0, @s_w_id15 int = 0, @ol_qty15 smallint = 0


as
begin
declare   @o_id              int,
        @d_tax          smallmoney,
        @o_entry_d      datetime,
          @commit_flag    tinyint



begin transaction n

--  get district tax and next availible order id and update
--  insert corresponding row into new-order table
--  plus initialize local variables

          update    district
          set       @d_tax       = d_tax,
                    @o_id        = d_next_o_id,
                    d_next_o_id  = d_next_o_id + 1,
                    @o_entry_d   = getdate(),
                    @commit_flag = 1
          output deleted.d_next_o_id,@d_id,@w_id into new_order
          where     d_w_id       = @w_id and
                    d_id         = @d_id

-- update stock from stock join (item join (params))
-- output to orderline, output to client
-- NOTE: @@rowcount != @ol_o_cnt
--        if (@i_idX,@s_w_idX pairs not unique) OR (@i_idX not unique).
```

```
update stock
          set       s_ytd               = s_ytd + info.ol_qty,
                    s_quantity   = s_quantity - info.ol_qty +
                              case when (s_quantity - info.ol_qty < 10) then 91 else
0 end,
                    s_order_cnt         = s_order_cnt + 1,
                    s_remote_cnt        = s_remote_cnt +
                              case when (info.w_id = @w_id) then 0 else 1 end

output @o_id,@d_id,@w_id,info.lino,
          info.i_id,"dec 31, 1899",
          info.i_price * info.ol_qty,
          info.w_id,info.ol_qty,
    case @d_id when 1  then inserted.s_dist_01
                       when 2  then inserted.s_dist_02
                       when 3  then inserted.s_dist_03
                       when 4  then inserted.s_dist_04
                       when 5  then inserted.s_dist_05
                       when 6  then inserted.s_dist_06
                       when 7  then inserted.s_dist_07
                       when 8  then inserted.s_dist_08
                       when 9  then inserted.s_dist_09
                       when 10 then inserted.s_dist_10
   end
into order_line

output info.i_name,inserted.s_quantity,
                    case when ((charindex("ORIGINAL",info.i_data) > 0) and
                                        (charindex("ORIGINAL",inserted.s_data) > 0)
)
                              then "B" else "G" end,
          info.i_price,info.i_price*info.ol_qty

from
stock inner join

(select iid,wid,
          lino,ol_qty,
          i_price,
          i_name,
          i_data
from
          (select iid,wid,lino,qty,
                    row_number() over (partition by iid,wid order by iid,wid) from
                    (select @i_id1,@s_w_id1,1,@ol_qty1 union all
                    select @i_id2,@s_w_id2,2,@ol_qty2 union all
                    select @i_id3,@s_w_id3,3,@ol_qty3 union all
                    select @i_id4,@s_w_id4,4,@ol_qty4 union all
                    select @i_id5,@s_w_id5,5,@ol_qty5 union all
                    select @i_id6,@s_w_id6,6,@ol_qty6 union all
                    select @i_id7,@s_w_id7,7,@ol_qty7 union all
                    select @i_id8,@s_w_id8,8,@ol_qty8 union all
                    select @i_id9,@s_w_id9,9,@ol_qty9 union all
                    select @i_id10,@s_w_id10,10,@ol_qty10 union all
                    select @i_id11,@s_w_id11,11,@ol_qty11 union all
                    select @i_id12,@s_w_id12,12,@ol_qty12 union all
                    select @i_id13,@s_w_id13,13,@ol_qty13 union all
                    select @i_id14,@s_w_id14,14,@ol_qty14 union all
                    select @i_id15,@s_w_id15,15,@ol_qty15) as uo1(iid,wid,lino,qty)
          ) as o1(iid,wid,lino,ol_qty,rownum)
inner join
          item (repeatableread) on i_id = iid  -- filters out invalid items
          and rownum=1
) as info(i_id,w_id,lino,ol_qty,i_price,i_name,i_data)

on        s_i_id              = info.i_id and
          s_w_id              = info.w_id


if (@@rowcount <> @o_ol_cnt)  -- must have an invalid item
          select @commit_flag = 0  -- 2.4.2.3 requires rest to proceed

--  insert fresh row into orders table
          insert into orders values (   @o_id,
                                                    @d_id,
                                                    @w_id,
                                                    @c_id,
                                                    0,
                                                    @o_ol_cnt,
                                                    @o_all_local,
                                                    @o_entry_d)

--  get customer last name, discount, and credit rating
--  get warehouse tax
-- return order_data to client

                    select w_tax,@d_tax,@o_id,
                              c_last,c_discount,c_credit,
                              @o_entry_d,@commit_flag
                    from
                    warehouse(repeatableread),customer(repeatableread)
                    where     w_id      = @w_id and
                              c_id                = @c_id and
                              c_w_id              = @w_id and
                              c_d_id              = @d_id

          -- @@rowcount checks that previous select found a valid customer
          if ((@commit_flag = 1) and (@@rowcount = 1))
                    commit transaction n
          else    -- all that work for nothing.
                    rollback transaction n

end
go
set showplan_text on
go
{call tpcc_neworder_new(1,1,1,10,1,
1,1,1,2,1,1,3,1,1,4,1,1,5,1,1,6,1,1,7,1,1,8,1,1,9,1,1,10,1,1)}
go
```

getargs.c

```
//        File:               GETARGS.C
//                                  Microsoft TPC-C Kit Ver. 4.51
//                                  Copyright Microsoft, 1996, 1997, 1998, 1999,
2000, 2001, 2002, 2003
//        Purpose:  Source file for command line processing


// Includes
#include "tpcc.h"

//===================================================================
//
```

```
// Function name: GetArgsLoader
//
//==========================================================================

void GetArgsLoader(int argc, char **argv, TPCCLDR_ARGS *pargs)
{
    int             i;
    char  *ptr;

#ifdef DEBUG
    printf("[%ld]DBG: Entering GetArgsLoader()\n", (int) GetCurrentThreadId());
#endif

    /* init args struct with some useful values */
    pargs->server                       =  SERVER;
    pargs->user                         =  USER;
    pargs->password                     =  PASSWORD;
    pargs->database                     =  DATABASE;
    pargs->batch                        =  BATCH;
    pargs->num_warehouses               =  UNDEF;
          pargs->tables_all                     =  TRUE;
          pargs->table_item                     =  FALSE;
          pargs->table_warehouse                =  FALSE;
          pargs->table_customer                 =  FALSE;
          pargs->table_orders                   =  FALSE;
          pargs->loader_res_file                =  LOADER_RES_FILE;
          pargs->log_path                               =  LOADER_LOG_PATH;
          pargs->pack_size                      =  DEFLDPACKSIZE;
          pargs->starting_warehouse     =  DEF_STARTING_WAREHOUSE;
          pargs->build_index                    =  BUILD_INDEX;
          pargs->index_order                    =  INDEX_ORDER;
          pargs->index_script_path      =  INDEX_SCRIPT_PATH;
          pargs->scale_down                     =  SCALE_DOWN;

    /* check for zero command line args */
    if ( argc == 1 )
                    GetArgsLoaderUsage();

    for (i = 1; i < argc; ++i)
    {
                    if (argv[i][0] != '-' && argv[i][0] != '/')
                    {
                    printf("\nUnrecognized command");
                    GetArgsLoaderUsage();
                    exit(1);
                    }

                    ptr = argv[i];

                    switch (ptr[1])
                    {
                    case '?':     /* Fall throught */
                                  GetArgsLoaderUsage();
                                  break;

                    case 'D':
                                  pargs->database = ptr+2;
                                  break;

                    case 'P':
                                  pargs->password = ptr+2;
                                  break;

                    case 'S':
                                  pargs->server = ptr+2;
                                  break;

                    case 'U':
                                  pargs->user = ptr+2;
                                  break;

                    case 'b':
                                  pargs->batch = atol(ptr+2);
                                  break;

                    case 'W':
                                  pargs->num_warehouses = atol(ptr+2);
                                  break;

                    case 's':
                                  pargs->starting_warehouse = atol(ptr+2);
                                  break;

                    case 't':
                                  {
                                            pargs->tables_all = FALSE;
                                            if (strcmp(ptr+2,"item") == 0)
                                                      pargs->table_item =
TRUE;
                                            else if (strcmp(ptr+2,"warehouse")
== 0)
                                                      pargs->table_warehouse =
TRUE;
                                            else if (strcmp(ptr+2,"customer")
== 0)
                                                      pargs->table_customer =
TRUE;
                                            else if (strcmp(ptr+2,"orders") ==
0)
                                                      pargs->table_orders =
TRUE;
                                            else
                                            {
                                            printf("\nUnrecognized command");
                                            GetArgsLoaderUsage();
                                            exit(1);
                                            }

                                            break;
                                  }

                          case 'f':
                                            pargs->loader_res_file = ptr+2;
                                            break;

                          case 'L':
                                            pargs->log_path = ptr+2;
                                            break;

                          case 'p':
                                            pargs->pack_size = atol(ptr+2);
                                            break;

                          case 'i':
                                            pargs->build_index = atol(ptr+2);
                                            break;
```

```
                        case 'o':
                                pargs->index_order = atol(ptr+2);
                                break;

                        case 'c':
                                pargs->scale_down = atol(ptr+2);
                                break;

                case 'd':
                                pargs->index_script_path = ptr+2;
                                break;

                        default:
                        GetArgsLoaderUsage();
                        exit(-1);
                        break;
                }
    }

    /* check for required args */
    if (pargs->num_warehouses == UNDEF )
    {
                printf("Number of Warehouses is required\n");
                exit(-2);
    }

    return;
}


//=============================================================================
//
// Function name: GetArgsLoaderUsage
//
//=============================================================================

void GetArgsLoaderUsage()
{

#ifdef DEBUG
    printf("[%ld]DBG: Entering GetArgsLoaderUsage()\n", (int) GetCurrentThreadId());
#endif


    printf("TPCCLDR:\n\n");
          printf("Parameter                                                    Default\n");
          printf("-------------------------------------------------------------------
\n");
    printf("-W Number of Warehouses to Load                        Required \n");
    printf("-S Server                                              %s\n", SERVER);
    printf("-U Username                                            %s\n", USER);
    printf("-P Password                                            %s\n", PASSWORD);
    printf("-D Database                                            %s\n", DATABASE);
          printf("-b Batch Size                                          %ld\n",
(long) BATCH);
          printf("-p TDS packet size                                     %ld\n",
(long) DEFLDPACKSIZE);
          printf("-L Loader BCP Log Path                                 %s\n",
LOADER_LOG_PATH);
          printf("-f Loader Results Output Filename                      %s\n",
LOADER_RES_FILE);
          printf("-s Starting Warehouse                                  %ld\n",
(long) DEF_STARTING_WAREHOUSE);
          printf("-i Build Option (data = 0, data and index = 1)         %ld\n",
(long) BUILD_INDEX);
          printf("-o Cluster Index Build Order (before = 1, after = 0)   %ld\n",
(long) INDEX_ORDER);
          printf("-c Build Scaled Database (normal = 0, tiny = 1)        %ld\n",
(long) SCALE_DOWN);
          printf("-d Index Script Path                                   %s\n",
INDEX_SCRIPT_PATH);
          printf("-t Table to Load                                       all tables
\n");
    printf("   [item|warehouse|customer|orders]\n");
    printf("   Notes: \n");
    printf("     - the '-t' parameter may be included multiple times to \n");
    printf("       specify multiple tables to be loaded \n");
    printf("     - 'item' loads ITEM table \n");
    printf("     - 'warehouse' loads WAREHOUSE, DISTRICT, and STOCK tables \n");
    printf("     - 'customer' loads CUSTOMER and HISTORY tables \n");
    printf("     - 'orders' load NEW-ORDER, ORDERS, ORDER-LINE tables \n");

          printf("\nNote:  Command line switches are case sensitive.\n");

    exit(0);
}
```

random.c

```
//        File:               RANDOM.C
//                                    Microsoft TPC-C Kit Ver. 4.62
//                                    Copyright Microsoft, 1996, 1997, 1998, 1999,
2000, 2001, 2002, 2005
//        Purpose:  Random number generation routines for database loader


// Includes
#include "tpcc.h"
#include "math.h"

// Defines
#define A            16807
#define M       2147483647
#define Q           127773      /* M div A */
#define R             2836      /* M mod A */
#define Thread      __declspec(thread)

// Globals
long      Thread Seed = 0;       /* thread local seed */

/*****************************************************************************
*                                                                            *
* random -                                                                   *
*       Implements a GOOD pseudo random number generator.  This generator    *
*       will/should? run the complete period before repeating.               *
*                                                                            *
* Copied from:                                                               *
*       Random Numbers Generators: Good Ones Are Hard to Find.               *
*       Communications of the ACM - October 1988 Volume 31 Number 10         *
*                                                                            *
* Machine Dependencies:                                                      *
```

```
*       long must be 2 ^ 31 - 1 or greater.                                    *
*                                                                              *
*******************************************************************************/

/*******************************************************************************
* seed - load the Seed value used in irand and drand.  Should be used before  *
*       first call to irand or drand.                                          *
*******************************************************************************/

void seed(long val)
{

#ifdef DEBUG
    printf("[%ld]DBG: Entering seed()...\n", (int) GetCurrentThreadId());
          printf("Old Seed %ld New Seed %ld\n",Seed, val);
#endif

    if ( val < 0 )
              val = abs(val);

    Seed = val;

}


/*******************************************************************************
*                                                                              *
* irand - returns a 32 bit integer pseudo random number with a period of      *
*       1 to 2 ^ 32 - 1.                                                       *
*                                                                              *
* parameters:                                                                  *
*       none.                                                                  *
*                                                                              *
* returns:                                                                     *
*       32 bit integer - defined as long ( see above ).                        *
*                                                                              *
* side effects:                                                                *
*       seed get recomputed.                                                   *
*******************************************************************************/

long irand()
{
    register long    s;      /* copy of seed */
    register long    test;   /* test flag */
    register long    hi;     /* tmp value for speed */
    register long    lo;     /* tmp value for speed */

#ifdef DEBUG
    printf("[%ld]DBG: Entering irand()...\n", (int) GetCurrentThreadId());
#endif

    s = Seed;
    hi = s / Q;
    lo = s % Q;

    test = A * lo - R * hi;
    if ( test > 0 )
                    Seed = test;
    else
                    Seed = test + M;

    return( Seed );
}
```

```
/*******************************************************************************
*                                                                              *
* drand - returns a double pseudo random number between 0.0 and 1.0.          *
*       See irand.                                                             *
*******************************************************************************/
double drand()
{

#ifdef DEBUG
    printf("[%ld]DBG: Entering drand()...\n", (int) GetCurrentThreadId());
#endif

    return( (double)irand() / 2147483647.0);
}


//=====================================================================
// Function   : RandomNumber
//
// Description:
//=====================================================================
long RandomNumber(long lower, long upper)
{
    long rand_num;

#ifdef DEBUG
    printf("[%ld]DBG: Entering RandomNumber()...\n", (int) GetCurrentThreadId());
#endif

          if ( upper == lower )         /* pgd 08-13-96 perf enhancement */
                    return lower;

          upper++;

    if ( upper <= lower )
                    rand_num = upper;
    else
                    rand_num = lower + irand() % (upper - lower); /* pgd 08-13-96
perf enhancement */


#ifdef DEBUG
    printf("[%ld]DBG: RandomNumber between %ld & %ld ==> %ld\n",
                                          (int) GetCurrentThreadId(), lower, upper,
rand_num);
#endif


    return rand_num;
}


#if 0

//Orginal code pgd 08/13/96

long RandomNumber(long lower,
                                            long upper)
{
    long rand_num;
```

```
#ifdef DEBUG
    printf("[%ld]DBG: Entering RandomNumber()...\n", (int) GetCurrentThreadId());
#endif

          upper++;

    if ((upper <= lower))
                    rand_num = upper;
    else
                    rand_num = lower + irand() % ((upper > lower) ? upper - lower :
upper);


#ifdef DEBUG
    printf("[%ld]DBG: RandomNumber between %ld & %ld ==> %ld\n",
                                        (int) GetCurrentThreadId(), lower, upper,
rand_num);
#endif


    return rand_num;
}
#endif

//====================================================================
// Function   : NURand
//
// Description:
//====================================================================
long NURand(int iConst,
              long x,
              long y,
              long C)
{
    long rand_num;

#ifdef DEBUG
    printf("[%ld]DBG: Entering NURand()...\n", (int) GetCurrentThreadId());
#endif

    rand_num = (((RandomNumber(0,iConst) | RandomNumber(x,y)) + C) % (y-x+1))+x;

#ifdef DEBUG
    printf("[%ld]DBG: NURand: num = %d\n", (int) GetCurrentThreadId(), rand_num);
#endif

    return rand_num;
}
```

strings.c

```
//        File:               STRINGS.C
//                                    Microsoft TPC-C Kit Ver. 4.51
//                                    Copyright Microsoft, 1996, 1997, 1998, 1999,
2000, 2001, 2002, 2003
//        Purpose:  Source file for database loader string functions


// Includes
#include "tpcc.h"
#include <string.h>
#include <ctype.h>

//====================================================================
//
// Function name: MakeAddress
//
//====================================================================

void MakeAddress(char *street_1,
                                          char *street_2,
                                          char *city,
                                          char *state,
                                          char *zip)
{

#ifdef DEBUG
    printf("[%ld]DBG: Entering MakeAddress()\n", (int) GetCurrentThreadId());
#endif

    MakeAlphaString (10, 20, ADDRESS_LEN, street_1);
    MakeAlphaString (10, 20, ADDRESS_LEN, street_2);
    MakeAlphaString (10, 20, ADDRESS_LEN, city);
    MakeAlphaString ( 2,  2, STATE_LEN, state);
    MakeZipNumberString( 9,  9, ZIP_LEN, zip);

#ifdef DEBUG
    printf("[%ld]DBG: MakeAddress: street_1: %s, street_2: %s, city: %s, state: %s,
zip: %s\n",
                                (int) GetCurrentThreadId(), street_1, street_2, city,
state, zip);
#endif

    return;

}


//====================================================================
//
// Function name: LastName
//
//====================================================================

void LastName(int  num,
                              char *name)
{
    static char *n[] =
    {
                    "BAR" , "OUGHT", "ABLE" , "PRI"  , "PRES",
                    "ESE" , "ANTI" , "CALLY", "ATION", "EING"
    };

#ifdef DEBUG
    printf("[%ld]DBG: Entering LastName()\n", (int) GetCurrentThreadId());
#endif

    if ((num >= 0) && (num < 1000))
    {
                    strcpy(name, n[(num/100)%10]);
                    strcat(name, n[(num/10)%10]);
                    strcat(name, n[(num/1)%10]);
```

```
                    if (strlen(name) < LAST_NAME_LEN)
                    {
                              PaddString(LAST_NAME_LEN, name);
                    }

    }
    else
    {
                    printf("\nError in LastName()... num <%ld> out of range
(0,999)\n", num);
                    exit(-1);
    }


#ifdef DEBUG
    printf("[%ld]DBG: LastName: num = [%d] ==> [%d][%d][%d]\n",
                              (int) GetCurrentThreadId(), num, num/100, (num/10)%10,
num%10);
          printf("[%ld]DBG: LastName: String = %s\n", (int) GetCurrentThreadId(),
name);
#endif

    return;

}


//====================================================================
//
// Function name: MakeAlphaString
//
//====================================================================

//philipdu 08/13/96 Changed MakeAlphaString to use A-Z, a-z, and 0-9 in
//accordance with spec see below:
//The spec says:
//4.3.2.2 The notation random a-string [x .. y]
//(respectively, n-string [x .. y]) represents a string of random alphanumeric
//(respectively, numeric) characters of a random length of minimum x, maximum y,
//and mean (y+x)/2. Alphanumerics are A..Z, a..z, and 0..9.  The only other
//requirement is that the character set used "must be able to represent a minimum
//of 128 different characters".  We are using 8-bit chars, so this is a non issue.
//It is completely unreasonable to stuff non-printing chars into the text fields.
//-CLevine 08/13/96

int MakeAlphaString( int  x, int  y, int  z, char *str)
{
          int                 len;
          int                 i;
    char    cc = 'a';
          static    char chArray[] =
"0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz";
          static    int       chArrayMax = 61;

#ifdef DEBUG
    printf("[%ld]DBG: Entering MakeAlphaString()\n", (int) GetCurrentThreadId());
#endif

          len= RandomNumber(x, y);

          for (i=0; i<len; i++)
                    str[i] = chArray[RandomNumber(0,chArrayMax)];
          str[len] = 0;

    return len;
}

int MakeAlphaStringPadded( int  minLen, int  maxLen, int  padLen, char *str)
{
          int                 len;
          int                 i;
    char    cc = 'a';
          static    char chArray[] =
"0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz";
          static    int       chArrayMax = 61;

#ifdef DEBUG
    printf("[%ld]DBG: Entering MakeAlphaStringPadded()\n", (int)
GetCurrentThreadId());
#endif

          len= RandomNumber(minLen, maxLen);

          for (i=0; i<len; i++)
                    str[i] = chArray[RandomNumber(0,chArrayMax)];
          if (len < padLen)
                    memset(str+len, ' ', padLen - len);
          str[padLen] = 0;
    return padLen;
}



//====================================================================
//
// Function name: MakeOriginalAlphaString
//
//====================================================================

int MakeOriginalAlphaString(int  x,
                                                                  int  y,
                                                                    int  z,
                                                                  char *str,
                                                                int  percent)
{
    int             len;
    int             val;
    int             start;

#ifdef DEBUG
    printf("[%ld]DBG: Entering MakeOriginalAlphaString()\n", (int)
GetCurrentThreadId());
#endif

    // verify prercentage is valid
    if ((percent < 0) || (percent > 100))
    {
                    printf("MakeOrigianlAlphaString: Invalid percentage: %d\n",
percent);
                    exit(-1);
    }

    // verify string is at least 8 chars in length
    if (x < 8)
    {
                    printf("MakeOriginalAlphaString: string length must be >= 8\n");
```

```
                    exit(-1);
    }

    // Make Alpha String
    len = MakeAlphaString(x,y, z, str);

    val = RandomNumber(1,100);
    if (val <= percent)
    {
                    start = RandomNumber(0, len - 8);
                    strncpy(str + start, "ORIGINAL", 8);
    }


#ifdef DEBUG
    printf("[%ld]DBG: MakeOriginalAlphaString: : %s\n",
                            (int) GetCurrentThreadId(), str);
#endif

    return len;
}


//====================================================================
//
// Function name: MakeNumberString
//
//====================================================================
int MakeNumberString(int  x, int  y, int  z, char *str)
{
          char tmp[16];

          //MakeNumberString is always called MakeZipNumberString(16, 16, 16,
string)

          memset(str, '0', 16);
          itoa(RandomNumber(0, 99999999), tmp, 10);
          memcpy(str, tmp, strlen(tmp));

          itoa(RandomNumber(0, 99999999), tmp, 10);
          memcpy(str+8, tmp, strlen(tmp));

          str[16] = 0;

    return 16;
}


//====================================================================
//
// Function name: MakeZipNumberString
//
//====================================================================
int MakeZipNumberString(int  x, int  y, int  z, char *str)
{
          char tmp[16];

          //MakeZipNumberString is always called MakeZipNumberString(9, 9, 9,
string)

          strcpy(str, "000011111");

          itoa(RandomNumber(0, 9999), tmp, 10);

          memcpy(str, tmp, strlen(tmp));

    return 9;
}


//====================================================================
//
// Function name: InitString
//
//====================================================================
void InitString(char *str, int len)
{
#ifdef DEBUG
    printf("[%ld]DBG: Entering InitString()\n", (int) GetCurrentThreadId());
#endif

          memset(str, ' ', len);
    str[len] = 0;
}


//====================================================================
// Function name: InitAddress
//
// Description:
//
//====================================================================

void InitAddress(char *street_1, char *street_2, char *city, char *state, char *zip)
{
          memset(street_1, ' ', ADDRESS_LEN+1);
          memset(street_2, ' ', ADDRESS_LEN+1);
          memset(city, ' ', ADDRESS_LEN+1);

    street_1[ADDRESS_LEN+1] = 0;
    street_2[ADDRESS_LEN+1] = 0;
    city[ADDRESS_LEN+1]     = 0;

          memset(state, ' ', STATE_LEN+1);
    state[STATE_LEN+1] = 0;

          memset(zip, ' ', ZIP_LEN+1);
    zip[ZIP_LEN+1] = 0;
}


//====================================================================
//
// Function name: PaddString
//
//====================================================================

void PaddString(int max, char *name)
{
          int                len;

          len = strlen(name);
          if ( len < max )
                    memset(name+len, ' ', max - len);
          name[max] = 0;

          return;
```

```
}
```

time.c

```
//        File:               TIME.C
//                                    Microsoft TPC-C Kit Ver. 4.62
//                                    Copyright Microsoft, 1996, 1997, 1998, 1999,
2000, 2001, 2002, 2005
//        Purpose:  Source file for time functions


// Includes
#include "tpcc.h"

// Globals
static long start_sec;


//===========================================================================
//
// Function name: TimeNow
//
//===========================================================================

long TimeNow()
{
   long             time_now;
   struct _timeb el_time;

#ifdef DEBUG
    printf("[%ld]DBG: Entering TimeNow()\n", (int) GetCurrentThreadId());
#endif

   _ftime(&el_time);

   time_now = ((el_time.time - start_sec) * 1000) + el_time.millitm;

   return time_now;
}
```

tpcc.h

```
//        File:               TPCC.H
//                                    Microsoft TPC-C Kit Ver. 4.51
//                                    Copyright Microsoft, 1996, 1997, 1998, 1999,
2000, 2001, 2002, 2003, 2005
//        Purpose:  Header file for TPC-C database loader


// Build number of TPC Benchmark Kit
#define TPCKIT_VER  "4.51"

// General headers
#include <windows.h>
#include <winbase.h>
#include <stdlib.h>
#include <stdio.h>
#include <process.h>
#include <stddef.h>
#include <stdarg.h>
#include <string.h>
#include <time.h>
#include <sys\timeb.h>
#include <sys\types.h>
#include <math.h>

// ODBC headers
#include <sql.h>
#include <sqlext.h>
#include <odbcss.h>

// General constants
#define MILLI                           1000
#define FALSE                                   0
#define TRUE                                    1
#define UNDEF                                                   -1
#define MINPRINTASCII                              32
#define MAXPRINTASCII                             126

// Default environment constants
#define SERVER                                  ""
#define DATABASE                                "tpcc"
#define USER                                    "sa"
#define PASSWORD                          ""

// Default loader arguments
#define BATCH                                                   10000
#define DEFLDPACKSIZE                                   32768
#define LOADER_RES_FILE
          "C:\\MSTPCC.450\\SETUP\\LOGS\\load.out"
#define LOADER_LOG_PATH
          "C:\\MSTPCC.450\\SETUP\\LOGS\\"
#define LOADER_NURAND_C                                 123
#define DEF_STARTING_WAREHOUSE                  1
#define BUILD_INDEX                                     1         // build both
data and indexes
#define INDEX_ORDER                                     1         // build
indexes before load
#define SCALE_DOWN                                      0   // build a normal
scale database
#define INDEX_SCRIPT_PATH                       "scripts"

typedef struct
{
    char                                        *server;
    char                                        *database;
    char                                        *user;
    char                                        *password;
          BOOL                                  tables_all;
          // set if loading all tables
          BOOL                                  table_item;
          // set if loading ITEM table specifically
          BOOL                                  table_warehouse;    // set if
loading WAREHOUSE, DISTRICT, and STOCK
          BOOL                                  table_customer;               //
set if loading CUSTOMER and HISTORY
          BOOL                                  table_orders;                 //
set if loading NEW-ORDER, ORDERS, ORDER-LINE
    long                                        num_warehouses;
    long                                        batch;
    long                                        verbose;
          long                                  pack_size;
```

```
        char                                *loader_res_file;
        char                                *log_path;
        char                                *synch_servername;
        long                                case_sensitivity;
        long                                starting_warehouse;
        long                                build_index;
        long                                index_order;
        long                                scale_down;
        char                                *index_script_path;
} TPCCLDR_ARGS;

// String length constants
        #define SERVER_NAME_LEN           20
        #define DATABASE_NAME_LEN         20
        #define USER_NAME_LEN             20
        #define PASSWORD_LEN              20
        #define TABLE_NAME_LEN            20
        #define I_DATA_LEN                50
        #define I_NAME_LEN                24
        #define BRAND_LEN                  1
        #define LAST_NAME_LEN             16
        #define W_NAME_LEN                10
        #define ADDRESS_LEN               20
        #define STATE_LEN                  2
        #define ZIP_LEN                    9
        #define S_DIST_LEN                24
        #define S_DATA_LEN                50
        #define D_NAME_LEN                10
        #define FIRST_NAME_LEN            16
        #define MIDDLE_NAME_LEN            2
        #define PHONE_LEN                 16
        #define CREDIT_LEN                 2
        #define C_DATA_LEN               500
        #define H_DATA_LEN                24
        #define DIST_INFO_LEN             24
        #define MAX_OL_NEW_ORDER_ITEMS    15
        #define MAX_OL_ORDER_STATUS_ITEMS 15
        #define STATUS_LEN                25
        #define OL_DIST_INFO_LEN                  24
        #define C_SINCE_LEN                               23
        #define H_DATE_LEN                                23
        #define OL_DELIVERY_D_LEN                 23
        #define O_ENTRY_D_LEN             23


// Functions in random.c
void      seed();
long      irand();
double    drand();
void      WUCreate();
short     WURand();
long      RandomNumber(long lower, long upper);

// Functions in getargs.c;
void      GetArgsLoader();
void      GetArgsLoaderUsage();

// Functions in time.c
long      TimeNow();

// Functions in strings.c
void      MakeAddress();
void      LastName();
int       MakeAlphaString();
int             MakeAlphaStringPadded();
int       MakeOriginalAlphaString();
int       MakeNumberString();
int       MakeZipNumberString();
void      InitString();
void      InitAddress();
void      PaddString();
```

tpccldr.c

```
//===================================================================
//        File:               TPCCLDR.C
//                                    Microsoft TPC-C Kit Ver. 4.51
//                                    Copyright Microsoft, 1996, 1997, 1998, 1999,
//                                    2000, 2001, 2002, 2003
//        Purpose:  Source file for TPC-C database loader
//===================================================================
// Includes
#include "tpcc.h"
#include "search.h"

// Defines
#define MAXITEMS               100000
#define MAXITEMS_SCALE_DOWN            100
#define CUSTOMERS_PER_DISTRICT  3000
#define CUSTOMERS_SCALE_DOWN  30
#define DISTRICT_PER_WAREHOUSE  10
#define ORDERS_PER_DISTRICT     3000
#define ORDERS_SCALE_DOWN       30
#define MAX_CUSTOMER_THREADS    2
#define MAX_ORDER_THREADS       3
#define MAX_MAIN_THREADS        4
#define MAX_SQL_ERRORS                          10

// Functions declarations
void HandleErrorDBC (SQLHDBC  hdbc1);
long NURand();
void LoadItem();
void LoadWarehouse();
void Stock();
void District();
void LoadCustomer();
void CustomerBufInit();
void CustomerBufLoad();
void LoadCustomerTable();
void LoadHistoryTable();
void LoadOrders();
void OrdersBufInit();
void OrdersBufLoad();
void LoadOrdersTable();
void LoadNewOrderTable();
void LoadOrderLineTable();
void GetPermutation();
void CheckForCommit();
void CheckForCommit_Big();
void OpenConnections();
void BuildIndex();
void FormatDate ();

// Shared memory structures
typedef struct
```

```
{
        double                                  ol;
    long                ol_i_id;
        long                                    ol_supply_w_id;
    short               ol_quantity;
    double              ol_amount;
    char                ol_dist_info[DIST_INFO_LEN+1];
        char
        ol_delivery_d[OL_DELIVERY_D_LEN+1];
} ORDER_LINE_STRUCT;

typedef struct
{
    long                o_id;
    short               o_d_id;
        long                                    o_w_id;
    long                o_c_id;
    short               o_carrier_id;
    short               o_ol_cnt;
    short               o_all_local;
        ORDER_LINE_STRUCT   o_ol[15];
} ORDERS_STRUCT;

typedef struct
{
    long                                c_id;
    short                               c_d_id;
        long                                    c_w_id;
        char                                    c_first[FIRST_NAME_LEN+1];
    char                                c_middle[MIDDLE_NAME_LEN+1];
    char                                c_last[LAST_NAME_LEN+1];
    char                                c_street_1[ADDRESS_LEN+1];
    char                                c_street_2[ADDRESS_LEN+1];
    char                                c_city[ADDRESS_LEN+1];
    char                                c_state[STATE_LEN+1];
    char                                c_zip[ZIP_LEN+1];
    char                                c_phone[PHONE_LEN+1];
    char                                c_credit[CREDIT_LEN+1];
    double                                  c_credit_lim;
    double                                  c_discount;
        char                                    c_balance[6];
    double                                  c_ytd_payment;
        short                                   c_payment_cnt;
        short                                   c_delivery_cnt;
        char                                    c_data[C_DATA_LEN+1];
        double                                  h_amount;
    char                                h_data[H_DATA_LEN+1];
} CUSTOMER_STRUCT;

typedef struct
{
        char                                    c_last[LAST_NAME_LEN+1];
        char                                    c_first[FIRST_NAME_LEN+1];
    long                                c_id;
} CUSTOMER_SORT_STRUCT;

typedef struct
{
    long                time_start;
} LOADER_TIME_STRUCT;


// Global variables
```

```
char      szLastError[300];

HENV      henv;

HDBC      v_hdbc;                                                   // for SQL
Server version verification
HDBC      i_hdbc1;                                                  // for ITEM table
HDBC      w_hdbc1;                                                  // for WAREHOUSE,
DISTRICT, STOCK
HDBC      c_hdbc1;                                                  // for CUSTOMER
HDBC      c_hdbc2;                                                  // for HISTORY
HDBC      o_hdbc1;                                                  // for ORDERS
HDBC      o_hdbc2;                                                  // for NEW-ORDER

HDBC      o_hdbc3;                                                  // for ORDER-LINE

HSTMT     v_hstmt;                                                  // for SQL Server
version verification
HSTMT     i_hstmt1;
HSTMT     w_hstmt1;
HSTMT     c_hstmt1, c_hstmt2;
HSTMT     o_hstmt1, o_hstmt2, o_hstmt3;

int                 total_db_errors;

ORDERS_STRUCT       orders_buf[ORDERS_PER_DISTRICT];
CUSTOMER_STRUCT     customer_buf[CUSTOMERS_PER_DISTRICT];
long                          orders_rows_loaded;
double                        new_order_rows_loaded;
double                        order_line_rows_loaded;
long                          history_rows_loaded;
long                          customer_rows_loaded;
double                        stock_rows_loaded;
long                          district_rows_loaded;
long                          item_rows_loaded;
long                          warehouse_rows_loaded;
long                          main_time_start;
long                          main_time_end;
long                          max_items;
long                          customers_per_district;
long                          orders_per_district;
long                          first_new_order;
long                          last_new_order;

TPCCLDR_ARGS    *aptr, args;

//==============================================================================
//
// Function name: main
//
//==============================================================================
int main(int  argc, char **argv)
{

          DWORD           dwThreadID[MAX_MAIN_THREADS];
          HANDLE          hThread[MAX_MAIN_THREADS];
          FILE            *fLoader;
          char            buffer[255];
          int                                     i;

          for (i=0; i<MAX_MAIN_THREADS; i++)
                    hThread[i] = NULL;
```

```
printf("\n*************************************************");
      printf("\n*                                               *");
      printf("\n*  Microsoft SQL Server                         *");
      printf("\n*                                               *");
      printf("\n*  TPC-C BENCHMARK KIT:  Database loader        *");
      printf("\n*  Version %s                                 *", TPCKIT_VER);
      printf("\n*                                               *");
      printf("\n*************************************************\n\n");

// process command line arguments
aptr = &args;
GetArgsLoader(argc, argv, aptr);

      printf("Build interface is ODBC.\n");

      if (aptr->build_index == 0)
                printf("Data load only - no index creation.\n");
      else
                printf("Data load and index creation.\n");

      if (aptr->index_order == 0)
                printf("Clustered indexes will be created after bulk load.\n");
      else
                printf("Clustered indexes will be created before bulk load.\n");

      // set database scale values
      if (aptr->scale_down == 1)
      {
                printf("*** Scaled Down Database ***\n");
                max_items = MAXITEMS_SCALE_DOWN;
                customers_per_district = CUSTOMERS_SCALE_DOWN;
                orders_per_district = ORDERS_SCALE_DOWN;
                first_new_order = 0;
                last_new_order  = 30;
      }
      else
      {
                max_items = MAXITEMS;
                customers_per_district = CUSTOMERS_PER_DISTRICT;
                orders_per_district = ORDERS_PER_DISTRICT;
                first_new_order = 2100;
                last_new_order  = 3000;
      }

      // open connections to SQL Server
      OpenConnections();

      // open file for loader results
      fLoader = fopen(aptr->loader_res_file, "w");


if (fLoader == NULL)
      {
                printf("Error, loader result file open failed.");
                exit(-1);
      }

// start loading data
sprintf(buffer,"TPC-C load started for %ld warehouses.\n",aptr->num_warehouses);
      if        (aptr->scale_down == 1)
      {
                sprintf(buffer,"SCALED DOWN DATABASE.\n");
      }
          printf("%s",buffer);
          fprintf(fLoader,"%s",buffer);

          main_time_start = (TimeNow() / MILLI);

          // start parallel load threads
          if (aptr->tables_all || aptr->table_item)
          {
                    fprintf(fLoader, "\nStarting loader threads for: item\n");

                    hThread[0] = CreateThread(NULL,
                                                                                                        0,
(LPTHREAD_START_ROUTINE) LoadItem,
NULL,
                                                                                                        0,
&dwThreadID[0]);

                    if (hThread[0] == NULL)
                    {
                              printf("Error, failed in creating creating thread =
0.\n");
                              exit(-1);
                    }
          }

          if (aptr->tables_all || aptr->table_warehouse)
          {
                    fprintf(fLoader, "Starting loader threads for: warehouse\n");

                    hThread[1] = CreateThread(NULL,
                                                                                                        0,
(LPTHREAD_START_ROUTINE) LoadWarehouse,
NULL,
                                                                                                        0,
&dwThreadID[1]);

                    if (hThread[1] == NULL)
                    {
                              printf("Error, failed in creating creating thread =
1.\n");
                              exit(-1);
                    }
          }

          if (aptr->tables_all || aptr->table_customer)
          {
                    fprintf(fLoader, "Starting loader threads for: customer\n");

                    hThread[2] = CreateThread(NULL,
                                                                                                        0,
(LPTHREAD_START_ROUTINE) LoadCustomer,
NULL,
                                                                                                        0,
```

```
&dwThreadID[2]);

                    if (hThread[2] == NULL)
                    {
                              printf("Error, failed in creating creating main thread
= 2.\n");
                              exit(-1);
                    }
          }

          if (aptr->tables_all || aptr->table_orders)
          {
                    fprintf(fLoader, "Starting loader threads for: orders\n");

                    hThread[3] = CreateThread(NULL,
                                                                                0,

(LPTHREAD_START_ROUTINE) LoadOrders,

NULL,
                                                                                0,

&dwThreadID[3]);

                    if (hThread[3] == NULL)
                    {
                              printf("Error, failed in creating creating main thread
= 3.\n");
                              exit(-1);
                    }
          }

          // Wait for threads to finish...
          for (i=0; i<MAX_MAIN_THREADS; i++)
          {
                    if (hThread[i] != NULL)
                    {
                              WaitForSingleObject( hThread[i], INFINITE );
                              CloseHandle(hThread[i]);
                              hThread[i] = NULL;
                    }
          }

          main_time_end = (TimeNow() / MILLI);

    sprintf(buffer,"\nTPC-C load completed successfully in %ld minutes.\n",
                              (main_time_end - main_time_start)/60);

          printf("%s",buffer);
          fprintf(fLoader, "%s", buffer);

          fclose(fLoader);

          SQLFreeEnv(henv);

    exit(0);

          return 0;
}


//============================================================================
//
// Function name: LoadItem
//
//============================================================================
void LoadItem()
{
    int                       i;
          long                i_id;
          long                i_im_id;
    char            i_name[I_NAME_LEN+1];
    double                    i_price;
    char            i_data[I_DATA_LEN+1];
          char                name[20];
          long                time_start;
          RETCODE             rc;
          DBINT               rcint;
          char                bcphint[128];
          char                err_log_path[256];

          // Seed with unique number
          seed(11);

          printf("Loading item table...\n");

          //if build index before load
          if ((aptr->build_index == 1) && (aptr->index_order == 1))
                    BuildIndex("idxitmcl");

          InitString(i_name, I_NAME_LEN+1);
          InitString(i_data, I_DATA_LEN+1);

          sprintf(name, "%s..%s", aptr->database, "item");

          strcpy(err_log_path,aptr->log_path);
          strcat(err_log_path,"item.err");
          rc = bcp_init(i_hdbc1, name, NULL, err_log_path , DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(i_hdbc1);

          if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                    sprintf(bcphint, "tablock, order (i_id), ROWS_PER_BATCH =
100000");
                    rc = bcp_control(i_hdbc1, BCPHINTS, (void*) bcphint);
                    if (rc != SUCCEED)
                              HandleErrorDBC(i_hdbc1);
          }

          i = 0;
          rc = bcp_bind(i_hdbc1, (BYTE *) &i_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(i_hdbc1);
          rc = bcp_bind(i_hdbc1, (BYTE *) i_name, 0, I_NAME_LEN, NULL, 0, 0, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(i_hdbc1);
          rc = bcp_bind(i_hdbc1, (BYTE *) &i_price, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(i_hdbc1);
          rc = bcp_bind(i_hdbc1, (BYTE *) i_data, 0, SQL_VARLEN_DATA, "", 1, 0,
++i);
          if (rc != SUCCEED)
```

```
                HandleErrorDBC(i_hdbc1);
        rc = bcp_bind(i_hdbc1, (BYTE *) &i_im_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
        if (rc != SUCCEED)
                HandleErrorDBC(i_hdbc1);

        time_start = (TimeNow() / MILLI);

        item_rows_loaded = 0;

        for (i_id = 1; i_id <= max_items; i_id++)
        {
                i_im_id = RandomNumber(1L, 10000L);

                MakeAlphaStringPadded(14, 24, I_NAME_LEN, i_name);

                i_price = ((float) RandomNumber(100L, 10000L))/100.0;

                MakeOriginalAlphaString(26, 50, I_DATA_LEN, i_data, 10);

                rc = bcp_sendrow(i_hdbc1);
                if (rc != SUCCEED)
                        HandleErrorDBC(i_hdbc1);

                item_rows_loaded++;
                CheckForCommit(i_hdbc1, i_hstmt1, item_rows_loaded, "item",
&time_start);
        }

        rcint = bcp_done(i_hdbc1);
        if (rcint < 0)
                HandleErrorDBC(i_hdbc1);

        printf("Finished loading item table.\n");

        SQLFreeStmt(i_hstmt1, SQL_DROP);
        SQLDisconnect(i_hdbc1);
        SQLFreeConnect(i_hdbc1);

        // if build index after load
        if ((aptr->build_index == 1) && (aptr->index_order == 0))
                BuildIndex("idxitmcl");

}

//================================================================================
//
// Function   : LoadWarehouse
//
// Loads WAREHOUSE table and loads Stock and District as Warehouses are created
//
//================================================================================
void LoadWarehouse()
{
        int             i;
        long    w_id;
    char  w_name[W_NAME_LEN+1];
    char  w_street_1[ADDRESS_LEN+1];
    char  w_street_2[ADDRESS_LEN+1];
    char  w_city[ADDRESS_LEN+1];
    char  w_state[STATE_LEN+1];
    char  w_zip[ZIP_LEN+1];
    double          w_tax;
    double          w_ytd;
        char    name[20];
        long    time_start;
        RETCODE rc;
        DBINT   rcint;
        char    bcphint[128];
        char    err_log_path[256];

        // Seed with unique number
        seed(2);

        printf("Loading warehouse table...\n");

        // if build index before load...
        if ((aptr->build_index == 1) && (aptr->index_order == 1))
                BuildIndex("idxwarcl");

        InitString(w_name, W_NAME_LEN+1);
        InitAddress(w_street_1, w_street_2, w_city, w_state, w_zip);

        sprintf(name, "%s..%s", aptr->database, "warehouse");

        strcpy(err_log_path,aptr->log_path);
        strcat(err_log_path,"whouse.err");
        rc = bcp_init(w_hdbc1, name, NULL, err_log_path, DB_IN);

        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        if ((aptr->build_index == 1) && (aptr->index_order == 1))
        {
                sprintf(bcphint, "tablock, order (w_id), ROWS_PER_BATCH = %d",
aptr->num_warehouses);
                rc = bcp_control(w_hdbc1, BCPHINTS, (void*) bcphint);
                if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);
        }

        i = 0;
        rc = bcp_bind(w_hdbc1, (BYTE *) &w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);
        rc = bcp_bind(w_hdbc1, (BYTE *) &w_ytd, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, ++i);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);
        rc = bcp_bind(w_hdbc1, (BYTE *) &w_tax, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, ++i);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);
        rc = bcp_bind(w_hdbc1, (BYTE *) w_name, 0, W_NAME_LEN, NULL, 0, 0, ++i);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);
        rc = bcp_bind(w_hdbc1, (BYTE *) w_street_1, 0, ADDRESS_LEN, NULL, 0, 0,
++i);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);
        rc = bcp_bind(w_hdbc1, (BYTE *) w_street_2, 0, ADDRESS_LEN, NULL, 0, 0,
++i);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);
        rc = bcp_bind(w_hdbc1, (BYTE *) w_city, 0, ADDRESS_LEN, NULL, 0, 0, ++i);
```

```
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) w_state, 0, STATE_LEN, NULL, 0, 0, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) w_zip, 0, ZIP_LEN, NULL, 0, 0, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          time_start = (TimeNow() / MILLI);

          warehouse_rows_loaded = 0;

          for (w_id = (long)aptr->starting_warehouse; w_id <= aptr->num_warehouses;
w_id++)
          {
                    MakeAlphaStringPadded(6,10, W_NAME_LEN, w_name);

                    MakeAddress(w_street_1, w_street_2, w_city, w_state, w_zip);

                    w_tax = ((float) RandomNumber(0L,2000L))/10000.00;

                    w_ytd = 300000.00;

                    rc = bcp_sendrow(w_hdbc1);
                    if (rc != SUCCEED)
                              HandleErrorDBC(w_hdbc1);

                    warehouse_rows_loaded++;
                    CheckForCommit(w_hdbc1, i_hstmt1, warehouse_rows_loaded,
"warehouse", &time_start);
          }

          rcint = bcp_done(w_hdbc1);
          if (rcint < 0)
                    HandleErrorDBC(w_hdbc1);

          printf("Finished loading warehouse table.\n");

          // if build index after load...
          if ((aptr->build_index == 1) && (aptr->index_order == 0))
                    BuildIndex("idxwarcl");

          stock_rows_loaded = 0;
          district_rows_loaded = 0;

          District();
          Stock();
}

//============================================================================
//
// Function   : District
//
//============================================================================
void District()
{
    int             i;
          short     d_id;
          long      d_w_id;
    char  d_name[D_NAME_LEN+1];
    char  d_street_1[ADDRESS_LEN+1];
    char  d_street_2[ADDRESS_LEN+1];
    char  d_city[ADDRESS_LEN+1];
    char  d_state[STATE_LEN+1];
    char  d_zip[ZIP_LEN+1];
    double          d_tax;
    double          d_ytd;
          char      name[20];
    long  d_next_o_id;
          long      time_start;
          long      w_id;
          RETCODE   rc;
          DBINT     rcint;
          char      bcphint[128];
          char      err_log_path[256];

          // Seed with unique number
          seed(4);

          printf("Loading district table...\n");

          // build index before load
          if ((aptr->build_index == 1) && (aptr->index_order == 1))
                    BuildIndex("idxdiscl");

          InitString(d_name, D_NAME_LEN+1);
          InitAddress(d_street_1, d_street_2, d_city, d_state, d_zip);
          sprintf(name, "%s..%s", aptr->database, "district");

          strcpy(err_log_path,aptr->log_path);
          strcat(err_log_path,"district.err");
          rc = bcp_init(w_hdbc1, name, NULL, err_log_path, DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                    sprintf(bcphint, "tablock, order (d_w_id, d_id), ROWS_PER_BATCH
= %u", (aptr->num_warehouses * 10));
                    rc = bcp_control(w_hdbc1, BCPHINTS, (void*) bcphint);
                    if (rc != SUCCEED)
                              HandleErrorDBC(w_hdbc1);
          }

          i = 0;
          rc = bcp_bind(w_hdbc1, (BYTE *) &d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) &d_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) &d_ytd, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) &d_next_o_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) &d_tax, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
```

```
        rc = bcp_bind(w_hdbc1, (BYTE *) d_name, 0, D_NAME_LEN, NULL, 0, 0, ++i);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);
        rc = bcp_bind(w_hdbc1, (BYTE *) d_street_1, 0, ADDRESS_LEN, NULL, 0, 0,
++i);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);
        rc = bcp_bind(w_hdbc1, (BYTE *) d_street_2, 0, ADDRESS_LEN, NULL, 0, 0,
++i);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);
        rc = bcp_bind(w_hdbc1, (BYTE *) d_city, 0, ADDRESS_LEN, NULL, 0, 0, ++i);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);
        rc = bcp_bind(w_hdbc1, (BYTE *) d_state, 0, STATE_LEN, NULL, 0, 0, ++i);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);
        rc = bcp_bind(w_hdbc1, (BYTE *) d_zip, 0, ZIP_LEN, NULL, 0, 0, ++i);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        d_ytd  = 30000.0;

        d_next_o_id = orders_per_district+1;

        time_start = (TimeNow() / MILLI);

        for (w_id = aptr->starting_warehouse; w_id <= aptr->num_warehouses;
w_id++)
        {
                d_w_id = w_id;

                for (d_id = 1; d_id <= DISTRICT_PER_WAREHOUSE; d_id++)
                {
                        MakeAlphaStringPadded(6,10,D_NAME_LEN, d_name);

                        MakeAddress(d_street_1, d_street_2, d_city, d_state,
d_zip);

                        d_tax = ((float) RandomNumber(0L,2000L))/10000.00;

                        rc = bcp_sendrow(w_hdbc1);
                        if (rc != SUCCEED)
                                HandleErrorDBC(w_hdbc1);

                        district_rows_loaded++;
                        CheckForCommit(w_hdbc1, w_hstmt1,
district_rows_loaded, "district", &time_start);
                }
    }

        rcint = bcp_done(w_hdbc1);
        if (rcint < 0)
                HandleErrorDBC(w_hdbc1);

        printf("Finished loading district table.\n");

        // if build index after load...
        if ((aptr->build_index == 1) && (aptr->index_order == 0))
                BuildIndex("idxdiscl");

    return;
}
```

```
//================================================================
//
// Function   : Stock
//
//================================================================
void Stock()
{
          int                i;
          long      s_i_id;
          long      s_w_id;
    short s_quantity;
    char  s_dist_01[S_DIST_LEN+1];
    char  s_dist_02[S_DIST_LEN+1];
    char  s_dist_03[S_DIST_LEN+1];
    char  s_dist_04[S_DIST_LEN+1];
    char  s_dist_05[S_DIST_LEN+1];
    char  s_dist_06[S_DIST_LEN+1];
    char  s_dist_07[S_DIST_LEN+1];
    char  s_dist_08[S_DIST_LEN+1];
    char  s_dist_09[S_DIST_LEN+1];
    char  s_dist_10[S_DIST_LEN+1];
    long  s_ytd;
    short s_order_cnt;
    short s_remote_cnt;
    char  s_data[S_DATA_LEN+1];
    short len;
          char      name[20];
          long      time_start;
          RETCODE   rc;
          DBINT     rcint;
          char      bcphint[128];
          char      err_log_path[256];

          // Seed with unique number
          seed(3);

          // if build index before load...
          if ((aptr->build_index == 1) && (aptr->index_order == 1))
                    BuildIndex("idxstkcl");

          sprintf(name, "%s..%s", aptr->database, "stock");

          strcpy(err_log_path,aptr->log_path);
          strcat(err_log_path,"stock.err");
          rc = bcp_init(w_hdbc1, name, NULL, err_log_path, DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                    sprintf(bcphint, "tablock, order (s_i_id, s_w_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 100000));
                    rc = bcp_control(w_hdbc1, BCPHINTS, (void*) bcphint);
                    if (rc != SUCCEED)
                              HandleErrorDBC(w_hdbc1);
          }

          i = 0;
          rc = bcp_bind(w_hdbc1, (BYTE *) &s_i_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
```

```
          rc = bcp_bind(w_hdbc1, (BYTE *) &s_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) &s_quantity, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) &s_ytd, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) &s_order_cnt, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) &s_remote_cnt, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT2, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) s_data, 0, SQL_VARLEN_DATA, "", 1, 0,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_01, 0, S_DIST_LEN, NULL, 0, 0,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_02, 0, S_DIST_LEN, NULL, 0, 0,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_03, 0, S_DIST_LEN, NULL, 0, 0,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_04, 0, S_DIST_LEN, NULL, 0, 0,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_05, 0, S_DIST_LEN, NULL, 0, 0,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_06, 0, S_DIST_LEN, NULL, 0, 0,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_07, 0, S_DIST_LEN, NULL, 0, 0,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_08, 0, S_DIST_LEN, NULL, 0, 0,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_09, 0, S_DIST_LEN, NULL, 0, 0,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);
          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_10, 0, S_DIST_LEN, NULL, 0, 0,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          s_ytd = s_order_cnt = s_remote_cnt = 0;

          time_start = (TimeNow() / MILLI);

          printf("...Loading stock table\n");

          for (s_i_id=1; s_i_id <= max_items; s_i_id++)
          {

                    for (s_w_id = (long)aptr->starting_warehouse; s_w_id <= aptr-
>num_warehouses; s_w_id++)
                    {

                              s_quantity = (short)RandomNumber(10L,100L);
                              len = MakeAlphaString(24,24,S_DIST_LEN, s_dist_01);
                              len = MakeAlphaString(24,24,S_DIST_LEN, s_dist_02);
                              len = MakeAlphaString(24,24,S_DIST_LEN, s_dist_03);
                              len = MakeAlphaString(24,24,S_DIST_LEN, s_dist_04);
                              len = MakeAlphaString(24,24,S_DIST_LEN, s_dist_05);
                              len = MakeAlphaString(24,24,S_DIST_LEN, s_dist_06);
                              len = MakeAlphaString(24,24,S_DIST_LEN, s_dist_07);
                              len = MakeAlphaString(24,24,S_DIST_LEN, s_dist_08);
                              len = MakeAlphaString(24,24,S_DIST_LEN, s_dist_09);
                              len = MakeAlphaString(24,24,S_DIST_LEN, s_dist_10);

                              len = MakeOriginalAlphaString(26,50, S_DATA_LEN,
s_data,10);

                              rc = bcp_sendrow(w_hdbc1);
                              if (rc != SUCCEED)
                                        HandleErrorDBC(w_hdbc1);

                              stock_rows_loaded++;
                              CheckForCommit_Big(w_hdbc1, w_hstmt1,
stock_rows_loaded, "stock", &time_start);
                    }
          }

          rcint = bcp_done(w_hdbc1);
          if (rcint < 0)
                    HandleErrorDBC(w_hdbc1);

          printf("Finished loading stock table.\n");

          SQLFreeStmt(w_hstmt1, SQL_DROP);
          SQLDisconnect(w_hdbc1);
          SQLFreeConnect(w_hdbc1);

          // if build index after load...
          if ((aptr->build_index == 1) && (aptr->index_order == 0))
                    BuildIndex("idxstkcl");

          return;
}

//============================================================================
//
// Function   : LoadCustomer
//
//============================================================================
void LoadCustomer()
```

```
{
        LOADER_TIME_STRUCT      customer_time_start;
        LOADER_TIME_STRUCT      history_time_start;
        long                                    w_id;
    short                   d_id;
        DWORD                           dwThreadID[MAX_CUSTOMER_THREADS];
        HANDLE                          hThread[MAX_CUSTOMER_THREADS];
        char                            name[20];
        RETCODE                                 rc;
        DBINT                                   rcint;
        char                                    bcphint[128];
        char                                    cmd[256];
        int                                             num_procs;
        char                                    err_log_path_cust[256];
        char                                    err_log_path_hist[256];

        // Seed with unique number
        seed(5);

        printf("Loading customer and history tables...\n");

        // if build index before load...
        if ((aptr->build_index == 1) && (aptr->index_order == 1))
        {
                BuildIndex("idxcuscl");
                 // check the number of processors on this system
                 // if 8 or more processors, then build index on History.
                 // if less than 8 processors, do not build the index
                num_procs = atoi(getenv( "NUMBER_OF_PROCESSORS" ));
                if ( num_procs >= 8 )
                        BuildIndex("idxhiscl");
        }

        // Initialize bulk copy
        sprintf(name, "%s..%s", aptr->database, "customer");

        strcpy(err_log_path_cust,aptr->log_path);
        strcat(err_log_path_cust,"customer.err");
        rc = bcp_init(c_hdbc1, name, NULL, err_log_path_cust, DB_IN);
        if (rc != SUCCEED)
                HandleErrorDBC(c_hdbc1);

        if ((aptr->build_index == 1) && (aptr->index_order == 1))
        {
                sprintf(bcphint, "tablock, order (c_w_id, c_d_id, c_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 30000));
                rc = bcp_control(c_hdbc1, BCPHINTS, (void*) bcphint);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);
        }

        sprintf(name, "%s..%s", aptr->database, "history");

        rc = bcp_init(c_hdbc2, name, NULL, "logs\\history.err", DB_IN);
        strcpy(err_log_path_hist,aptr->log_path);
        strcat(err_log_path_hist,"history.err");
        rc = bcp_init(c_hdbc2, name, NULL, err_log_path_hist, DB_IN);
        if (rc != SUCCEED)
                HandleErrorDBC(c_hdbc2);

        sprintf(bcphint, "tablock");
        rc = bcp_control(c_hdbc2, BCPHINTS, (void*) bcphint);
        if (rc != SUCCEED)
                HandleErrorDBC(c_hdbc2);

        customer_rows_loaded    = 0;
        history_rows_loaded     = 0;

        CustomerBufInit();

        customer_time_start.time_start = (TimeNow() / MILLI);
        history_time_start.time_start = (TimeNow() / MILLI);

        for (w_id = (long)aptr->starting_warehouse; w_id <= aptr->num_warehouses;
w_id++)
        {
                for (d_id = 1; d_id <= DISTRICT_PER_WAREHOUSE; d_id++)
                {

                        CustomerBufLoad(d_id, w_id);

                        // Start parallel loading threads here...
                        // Start customer table thread
                        printf("...Loading customer table for: d_id = %d, w_id
= %d\n", d_id, w_id);

                        hThread[0] = CreateThread(NULL,

          0,

          (LPTHREAD_START_ROUTINE) LoadCustomerTable,

          &customer_time_start,

          0,

          &dwThreadID[0]);

                        if (hThread[0] == NULL)
                        {
                                printf("Error, failed in creating creating
thread = 0.\n");
                                exit(-1);
                        }

                        // Start History table thread
                        printf("...Loading history table for: d_id = %d, w_id
= %d\n", d_id, w_id);

                        hThread[1] = CreateThread(NULL,

          0,

          (LPTHREAD_START_ROUTINE) LoadHistoryTable,

          &history_time_start,

          0,

          &dwThreadID[1]);

                        if (hThread[1] == NULL)
                        {
                                printf("Error, failed in creating creating
thread = 1.\n");
                                exit(-1);
```

```
                                }

                                WaitForSingleObject( hThread[0], INFINITE );
                                WaitForSingleObject( hThread[1], INFINITE );

                                if (CloseHandle(hThread[0]) == FALSE)
                                {
                                        printf("Error, failed in closing customer
thread handle with errno: %d\n", GetLastError());
                                }

                                if (CloseHandle(hThread[1]) == FALSE)
                                {
                                        printf("Error, failed in closing history
thread handle with errno: %d\n", GetLastError());
                                }
                        }
                }

                // flush the bulk connection
                rcint = bcp_done(c_hdbc1);
                if (rcint < 0)
                        HandleErrorDBC(c_hdbc1);

                rcint = bcp_done(c_hdbc2);
                if (rcint < 0)
                        HandleErrorDBC(c_hdbc2);

                printf("Finished loading customer table.\n");

                // if build index after load...
                if ((aptr->build_index == 1) && (aptr->index_order == 0))
                {
                        BuildIndex("idxcuscl");
                        // check the number of processors on this system
                        // if 8 or more processors, then build index on History.
                        // if less than 8 processors, do not build the index
                        num_procs = atoi(getenv( "NUMBER_OF_PROCESSORS" ));
                        if (num_procs >= 8)
                                BuildIndex("idxhiscl");
                }

                // build non-clustered index
                if (aptr->build_index == 1)
                        BuildIndex("idxcusnc");

                // Output the NURAND used for the loader into C_FIRST for C_ID = 1,
                // C_W_ID = 1, and C_D_ID = 1
                sprintf(cmd, "osql -S%s -U%s -P%s -d%s -e -Q\"update customer set c_first
= 'C_LOAD = %d' where c_id = 1 and c_w_id = 1 and c_d_id = 1\" > %snurand_load.log",
                                        aptr->server,
                                        aptr->user,
                                        aptr->password,
                                        aptr->database,
                                        LOADER_NURAND_C,
                                        aptr->log_path);

                system(cmd);

                SQLFreeStmt(c_hstmt1, SQL_DROP);
                SQLDisconnect(c_hdbc1);
                SQLFreeConnect(c_hdbc1);

                SQLFreeStmt(c_hstmt2, SQL_DROP);
                SQLDisconnect(c_hdbc2);
                SQLFreeConnect(c_hdbc2);

        return;
}

//=============================================================================
//
// Function   : CustomerBufInit
//
//=============================================================================
void CustomerBufInit()
{
        long     i;

        for (i=0;i<customers_per_district;i++)
        {
                customer_buf[i].c_id = 0;
                customer_buf[i].c_d_id = 0;
                customer_buf[i].c_w_id = 0;

                strcpy(customer_buf[i].c_first,"");
                strcpy(customer_buf[i].c_middle,"");
                strcpy(customer_buf[i].c_last,"");
                strcpy(customer_buf[i].c_street_1,"");
                strcpy(customer_buf[i].c_street_2,"");
                strcpy(customer_buf[i].c_city,"");
                strcpy(customer_buf[i].c_state,"");
                strcpy(customer_buf[i].c_zip,"");
                strcpy(customer_buf[i].c_phone,"");
                strcpy(customer_buf[i].c_credit,"");

                customer_buf[i].c_credit_lim = 0;
                customer_buf[i].c_discount = (float) 0;

                strcpy(customer_buf[i].c_balance,"");

                customer_buf[i].c_ytd_payment = 0;
                customer_buf[i].c_payment_cnt = 0;
                customer_buf[i].c_delivery_cnt = 0;

                strcpy(customer_buf[i].c_data,"");

                customer_buf[i].h_amount = 0;

                strcpy(customer_buf[i].h_data,"");
        }
}

//=============================================================================
//
// Function   : CustomerBufLoad
//
// Fills shared buffer for HISTORY and CUSTOMER
//=============================================================================
void CustomerBufLoad(int d_id, long w_id)
{
        long                                    i;
    CUSTOMER_SORT_STRUCT    c[CUSTOMERS_PER_DISTRICT];

        for (i=0;i<customers_per_district;i++)
        {
```

```
                    if (i < 1000)
                              LastName(i, c[i].c_last);
                    else
                              LastName(NURand(255,0,999,LOADER_NURAND_C),
c[i].c_last);

                    MakeAlphaStringPadded(8,16,FIRST_NAME_LEN, c[i].c_first);

                    c[i].c_id = i+1;
          }

          printf("...Loading customer buffer for: d_id = %d, w_id = %d\n",
                              d_id, w_id);

          for (i=0;i<customers_per_district;i++)
          {
                    customer_buf[i].c_d_id = d_id;
                    customer_buf[i].c_w_id = w_id;
                    customer_buf[i].h_amount = 10.0;
                    customer_buf[i].c_ytd_payment  = 10.0;
                    customer_buf[i].c_payment_cnt  = 1;
                    customer_buf[i].c_delivery_cnt = 0;
                    customer_buf[i].c_id = c[i].c_id;
                    strcpy(customer_buf[i].c_first, c[i].c_first);
                    strcpy(customer_buf[i].c_last, c[i].c_last);
                    customer_buf[i].c_middle[0] = 'O';
                    customer_buf[i].c_middle[1] = 'E';
                    MakeAddress(customer_buf[i].c_street_1,
                                        customer_buf[i].c_street_2,
                                        customer_buf[i].c_city,
                                        customer_buf[i].c_state,
                                        customer_buf[i].c_zip);
                    MakeNumberString(16, 16, PHONE_LEN, customer_buf[i].c_phone);

                    if (RandomNumber(1L, 100L) > 10)
                              customer_buf[i].c_credit[0] = 'G';
                    else
                              customer_buf[i].c_credit[0] = 'B';
                    customer_buf[i].c_credit[1] = 'C';
                    customer_buf[i].c_credit_lim = 50000.0;
                    customer_buf[i].c_discount = ((float) RandomNumber(0L, 5000L)) /
10000.0;
                    strcpy(customer_buf[i].c_balance,"-10.0");
                    MakeAlphaStringPadded(300, 500, C_DATA_LEN,
customer_buf[i].c_data);

                    // Generate HISTORY data
                    MakeAlphaStringPadded(12, 24, H_DATA_LEN,
customer_buf[i].h_data);
          }
}

//====================================================================
//
// Function   : LoadCustomerTable
//
//====================================================================
void LoadCustomerTable(LOADER_TIME_STRUCT *customer_time_start)
{
          long                i;
    long        c_id;
    short       c_d_id;
          long                c_w_id;
    char        c_first[FIRST_NAME_LEN+1];
    char        c_middle[MIDDLE_NAME_LEN+1];
    char        c_last[LAST_NAME_LEN+1];
    char        c_street_1[ADDRESS_LEN+1];
    char        c_street_2[ADDRESS_LEN+1];
    char        c_city[ADDRESS_LEN+1];
    char        c_state[STATE_LEN+1];
    char        c_zip[ZIP_LEN+1];
    char        c_phone[PHONE_LEN+1];
    char        c_credit[CREDIT_LEN+1];
    double      c_credit_lim;
    double      c_discount;
          char                c_balance[6];
    double      c_ytd_payment;
    short       c_payment_cnt;
    short       c_delivery_cnt;
    char        c_data[C_DATA_LEN+1];
          char                c_since[C_SINCE_LEN+1];
          RETCODE             rc;

    i = 0;
          rc = bcp_bind(c_hdbc1, (BYTE *) &c_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
          rc = bcp_bind(c_hdbc1, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) &c_discount, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) &c_credit_lim, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) c_last, 0, LAST_NAME_LEN, NULL, 0, 0, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
          rc = bcp_bind(c_hdbc1, (BYTE *) c_first, 0, FIRST_NAME_LEN, NULL, 0, 0,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) c_credit, 0, CREDIT_LEN, NULL, 0, 0, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) c_balance, 0, 5, NULL, 0, SQLCHARACTER, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) &c_ytd_payment, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) &c_payment_cnt, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
```

```
    rc = bcp_bind(c_hdbc1, (BYTE *) &c_delivery_cnt,0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) c_street_1, 0, ADDRESS_LEN, NULL, 0, 0, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) c_street_2, 0, ADDRESS_LEN, NULL,0,0, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) c_city, 0, ADDRESS_LEN, NULL, 0, 0, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) c_state, 0, STATE_LEN, NULL, 0, 0, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) c_zip, 0, ZIP_LEN, NULL, 0, 0, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) c_phone, 0, PHONE_LEN, NULL, 0, 0, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
          rc = bcp_bind(c_hdbc1, (BYTE *) &c_since, 0, C_SINCE_LEN, NULL, 0,
SQLCHARACTER, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
          rc = bcp_bind(c_hdbc1, (BYTE *) c_middle, 0, MIDDLE_NAME_LEN,NULL, 0, 0,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) c_data, 0, C_DATA_LEN, NULL, 0, 0, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    for (i = 0; i < customers_per_district; i++)
    {
                    c_id = customer_buf[i].c_id;
                    c_d_id = customer_buf[i].c_d_id;
                    c_w_id = customer_buf[i].c_w_id;

                    strcpy(c_first, customer_buf[i].c_first);
                    strcpy(c_middle, customer_buf[i].c_middle);
                    strcpy(c_last, customer_buf[i].c_last);
                    strcpy(c_street_1, customer_buf[i].c_street_1);
                    strcpy(c_street_2, customer_buf[i].c_street_2);
                    strcpy(c_city, customer_buf[i].c_city);
                    strcpy(c_state, customer_buf[i].c_state);
                    strcpy(c_zip, customer_buf[i].c_zip);
                    strcpy(c_phone, customer_buf[i].c_phone);
                    strcpy(c_credit, customer_buf[i].c_credit);

                    FormatDate(&c_since);


                    c_credit_lim = customer_buf[i].c_credit_lim;
                    c_discount = customer_buf[i].c_discount;
                    strcpy(c_balance, customer_buf[i].c_balance);
                    c_ytd_payment = customer_buf[i].c_ytd_payment;
                    c_payment_cnt = customer_buf[i].c_payment_cnt;
                    c_delivery_cnt = customer_buf[i].c_delivery_cnt;
                    strcpy(c_data, customer_buf[i].c_data);

                    // Send data to server
                    rc = bcp_sendrow(c_hdbc1);
                    if (rc != SUCCEED)
                              HandleErrorDBC(c_hdbc1);

                    customer_rows_loaded++;
                    CheckForCommit(c_hdbc1, c_hstmt1, customer_rows_loaded,
"customer", &customer_time_start->time_start);
    }
}

//=============================================================================
//
// Function   : LoadHistoryTable
//
//=============================================================================
void LoadHistoryTable(LOADER_TIME_STRUCT *history_time_start)
{
          long                i;
    long        c_id;
    short       c_d_id;
          long                c_w_id;
          double    h_amount;
    char        h_data[H_DATA_LEN+1];
          char                h_date[H_DATE_LEN+1];
          RETCODE             rc;

          i = 0;
    rc = bcp_bind(c_hdbc2, (BYTE *) &c_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT4,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);
    rc = bcp_bind(c_hdbc2, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);
          rc = bcp_bind(c_hdbc2, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);
    rc = bcp_bind(c_hdbc2, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);
          rc = bcp_bind(c_hdbc2, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);
          rc = bcp_bind(c_hdbc2, (BYTE *) &h_date, 0, H_DATE_LEN, NULL, 0,
SQLCHARACTER, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);
    rc = bcp_bind(c_hdbc2, (BYTE *) &h_amount, 0, SQL_VARLEN_DATA, NULL, 0, SQLFLT8,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);
    rc = bcp_bind(c_hdbc2, (BYTE *) h_data, 0, H_DATA_LEN, NULL, 0, 0, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);

    for (i = 0; i < customers_per_district; i++)
    {
                    c_id = customer_buf[i].c_id;
                    c_d_id = customer_buf[i].c_d_id;
```

```
                    c_w_id = customer_buf[i].c_w_id;
                    h_amount = customer_buf[i].h_amount;
                    strcpy(h_data, customer_buf[i].h_data);

                    FormatDate(&h_date);

                    // send to server
                    rc = bcp_sendrow(c_hdbc2);
                    if (rc != SUCCEED)
                              HandleErrorDBC(c_hdbc2);

                    history_rows_loaded++;
                    CheckForCommit(c_hdbc2, c_hstmt2, history_rows_loaded,
"history", &history_time_start->time_start);
          }
}

//=============================================================-===============
//
// Function   : LoadOrders
//
//=============================================================================
void LoadOrders()
{
          LOADER_TIME_STRUCT      orders_time_start;
          LOADER_TIME_STRUCT      new_order_time_start;
          LOADER_TIME_STRUCT      order_line_time_start;
          long                                              w_id;
    short                         d_id;
          DWORD                           dwThreadID[MAX_ORDER_THREADS];
          HANDLE                          hThread[MAX_ORDER_THREADS];
          char                            name[20];
          RETCODE                                           rc;
          char                                              bcphint[128];
          char                                              err_log_path_ord[256];
          char                                              err_log_path_nord[256];
          char                                              err_log_path_ordl[256];

          // seed with unique number
          seed(6);

          printf("Loading orders...\n");

          // if build index before load...
          if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                              BuildIndex("idxordcl");
                              BuildIndex("idxnodcl");
                              BuildIndex("idxodlcl");
          }

          // initialize bulk copy
          sprintf(name, "%s..%s", aptr->database, "orders");

          rc = bcp_init(o_hdbc1, name, NULL, "logs\\orders.err", DB_IN);
          strcpy(err_log_path_ord,aptr->log_path);
          strcat(err_log_path_ord,"orders.err");
          rc = bcp_init(o_hdbc1, name, NULL, err_log_path_ord, DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc1);

          if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                    sprintf(bcphint, "tablock, order (o_w_id, o_d_id, o_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 30000));
                    rc = bcp_control(o_hdbc1, BCPHINTS, (void*) bcphint);
                    if (rc != SUCCEED)
                              HandleErrorDBC(o_hdbc1);
          }

          sprintf(name, "%s..%s", aptr->database, "new_order");

          rc = bcp_init(o_hdbc2, name, NULL, "logs\\neword.err", DB_IN);
          strcpy(err_log_path_nord,aptr->log_path);
          strcat(err_log_path_nord,"neword.err");
          rc = bcp_init(o_hdbc2, name, NULL, err_log_path_nord, DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc2);

          if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                    sprintf(bcphint, "tablock, order (no_w_id, no_d_id, no_o_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 9000));
                    rc = bcp_control(o_hdbc2, BCPHINTS, (void*) bcphint);
                    if (rc != SUCCEED)
                              HandleErrorDBC(o_hdbc2);
          }

          sprintf(name, "%s..%s", aptr->database, "order_line");

          rc = bcp_init(o_hdbc3, name, NULL, "logs\\ordline.err", DB_IN);
          strcpy(err_log_path_ordl,aptr->log_path);
          strcat(err_log_path_ordl,"ordline.err");
          rc = bcp_init(o_hdbc3, name, NULL, err_log_path_ordl, DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);

    if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                    sprintf(bcphint, "tablock, order (ol_w_id, ol_d_id, ol_o_id,
ol_number), ROWS_PER_BATCH = %u", (aptr->num_warehouses * 300000));
                    rc = bcp_control(o_hdbc3, BCPHINTS, (void*) bcphint);
                    if (rc != SUCCEED)
                              HandleErrorDBC(o_hdbc3);
          }

          orders_rows_loaded      = 0;
          new_order_rows_loaded   = 0;
          order_line_rows_loaded  = 0;

          OrdersBufInit();

          orders_time_start.time_start = (TimeNow() / MILLI);
          new_order_time_start.time_start = (TimeNow() / MILLI);
          order_line_time_start.time_start = (TimeNow() / MILLI);

          for (w_id = (long)aptr->starting_warehouse; w_id <= aptr->num_warehouses;
w_id++)
          {
                    for (d_id = 1; d_id <= DISTRICT_PER_WAREHOUSE; d_id++)
                    {

                              OrdersBufLoad(d_id, w_id);

                              // start parallel loading threads here...
                              // start Orders table thread
```

```
                        printf("...Loading Order Table for: d_id = %d, w_id =
%d\n", d_id, w_id);
                        hThread[0] = CreateThread(NULL,
        0,
        (LPTHREAD_START_ROUTINE) LoadOrdersTable,
        &orders_time_start,
        0,
        &dwThreadID[0]);
                        if (hThread[0] == NULL)
                        {
                                printf("Error, failed in creating creating
thread = 0.\n");
                                exit(-1);
                        }
                        // start NewOrder table thread
                        printf("...Loading New-Order Table for: d_id = %d,
w_id = %d\n", d_id, w_id);
                        hThread[1] = CreateThread(NULL,
        0,
        (LPTHREAD_START_ROUTINE) LoadNewOrderTable,
        &new_order_time_start,
        0,
        &dwThreadID[1]);
                        if (hThread[1] == NULL)
                        {
                                printf("Error, failed in creating creating
thread = 1.\n");
                                exit(-1);
                        }
                        // start Order-Line table thread
                        printf("...Loading Order-Line Table for: d_id = %d,
w_id = %d\n", d_id, w_id);
                        hThread[2] = CreateThread(NULL,
        0,
        (LPTHREAD_START_ROUTINE) LoadOrderLineTable,
        &order_line_time_start,
        0,
        &dwThreadID[2]);
                        if (hThread[2] == NULL)
                        {
                                printf("Error, failed in creating creating
thread = 2.\n");
                                exit(-1);
                        }
                        WaitForSingleObject( hThread[0], INFINITE );
                        WaitForSingleObject( hThread[1], INFINITE );
                        WaitForSingleObject( hThread[2], INFINITE );
                        if (CloseHandle(hThread[0]) == FALSE)
                        {
                                printf("Error, failed in closing Orders
thread handle with errno: %d\n", GetLastError());
                        }
                        if (CloseHandle(hThread[1]) == FALSE)
                        {
                                printf("Error, failed in closing NewOrder
thread handle with errno: %d\n", GetLastError());
                        }
                        if (CloseHandle(hThread[2]) == FALSE)
                        {
                                printf("Error, failed in closing OrderLine
thread handle with errno: %d\n", GetLastError());
                        }
                }
        }
        printf("Finished loading orders.\n");
    return;
}
//===============================================================
//
// Function   : OrdersBufInit
//
// Clears shared buffer for ORDERS, NEWORDER, and ORDERLINE
//
//===============================================================
void OrdersBufInit()
{
        int     i;
        int             j;
        for (i=0;i<orders_per_district;i++)
        {
                orders_buf[i].o_id = 0;
                orders_buf[i].o_d_id = 0;
                orders_buf[i].o_w_id = 0;
                orders_buf[i].o_c_id = 0;
                orders_buf[i].o_carrier_id = 0;
                orders_buf[i].o_ol_cnt = 0;
                orders_buf[i].o_all_local = 0;
                for (j=0;j<=14;j++)
                {
                        orders_buf[i].o_ol[j].ol = 0;
                        orders_buf[i].o_ol[j].ol_i_id = 0;
                        orders_buf[i].o_ol[j].ol_supply_w_id = 0;
                        orders_buf[i].o_ol[j].ol_quantity = 0;
                        orders_buf[i].o_ol[j].ol_amount = 0;
```

```
                        strcpy(orders_buf[i].o_ol[j].ol_dist_info,"");
                }
        }
}

//================================================================================
//
// Function   : OrdersBufLoad
//
// Fills shared buffer for ORDERS, NEWORDER, and ORDERLINE
//
//================================================================================
void OrdersBufLoad(short d_id, long w_id)
{

        int     cust[ORDERS_PER_DISTRICT+1];
        long    o_id;
        long      ol;

        printf("...Loading Order Buffer for: d_id = %d, w_id = %d\n",
                        d_id, w_id);

        GetPermutation(cust, orders_per_district);

        for (o_id=0;o_id<orders_per_district;o_id++)
        {
                // Generate ORDER and NEW-ORDER data
                orders_buf[o_id].o_d_id = d_id;
                orders_buf[o_id].o_w_id = w_id;
                orders_buf[o_id].o_id = o_id+1;
                orders_buf[o_id].o_c_id = cust[o_id+1];
                orders_buf[o_id].o_ol_cnt = (short)RandomNumber(5L, 15L);

                if (o_id < first_new_order)
                {
                        orders_buf[o_id].o_carrier_id =
(short)RandomNumber(1L, 10L);
                        orders_buf[o_id].o_all_local  = 1;
                }
                else
                {
                        orders_buf[o_id].o_carrier_id = 0;
                        orders_buf[o_id].o_all_local  = 1;
                }

                for (ol=0; ol<orders_buf[o_id].o_ol_cnt; ol++)
                {

                        orders_buf[o_id].o_ol[ol].ol = ol+1;
                        orders_buf[o_id].o_ol[ol].ol_i_id = RandomNumber(1L,
max_items);
                        orders_buf[o_id].o_ol[ol].ol_supply_w_id = w_id;
                        orders_buf[o_id].o_ol[ol].ol_quantity = 5;
                        MakeAlphaString(24, 24, OL_DIST_INFO_LEN,
&orders_buf[o_id].o_ol[ol].ol_dist_info);

                        // Generate ORDER-LINE data
                        if (o_id < first_new_order)
                        {
                                orders_buf[o_id].o_ol[ol].ol_amount = 0;
                                // Added to insure ol_delivery_d set
properly during load
        FormatDate(&orders_buf[o_id].o_ol[ol].ol_delivery_d);

                        }
                        else
                        {
                                orders_buf[o_id].o_ol[ol].ol_amount =
RandomNumber(1,999999)/100.0;
                                // Added to insure ol_delivery_d set
properly during load
                                // odbc datetime format

        strcpy(orders_buf[o_id].o_ol[ol].ol_delivery_d,"1899-12-31 00:00:00.000");
                        }
                }
        }
}

//================================================================================
//
// Function   : LoadOrdersTable
//
//================================================================================
void LoadOrdersTable(LOADER_TIME_STRUCT *orders_time_start)
{
        int         i;
    long        o_id;
        short     o_d_id;
        long              o_w_id;
    long        o_c_id;
    short       o_carrier_id;
    short       o_ol_cnt;
    short       o_all_local;
        char              o_entry_d[O_ENTRY_D_LEN+1];
        RETCODE           rc;
        DBINT             rcint;

        // bind ORDER data
    i = 0;
        rc = bcp_bind(o_hdbc1, (BYTE *) &o_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);
    rc = bcp_bind(o_hdbc1, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
++i);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);
        rc = bcp_bind(o_hdbc1, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);
    rc = bcp_bind(o_hdbc1, (BYTE *) &o_c_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT4,
++i);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);
    rc = bcp_bind(o_hdbc1, (BYTE *) &o_carrier_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, ++i);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);
    rc = bcp_bind(o_hdbc1, (BYTE *) &o_ol_cnt, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
++i);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);
```

```
    rc = bcp_bind(o_hdbc1, (BYTE *) &o_all_local, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc1);
          rc = bcp_bind(o_hdbc1, (BYTE *) &o_entry_d, 0, O_ENTRY_D_LEN, NULL, 0,
SQLCHARACTER, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc1);

    for (i = 0; i < orders_per_district; i++)
    {
                    o_id         = orders_buf[i].o_id;
                    o_d_id       = orders_buf[i].o_d_id;
                    o_w_id       = orders_buf[i].o_w_id;
                    o_c_id       = orders_buf[i].o_c_id;
                    o_carrier_id = orders_buf[i].o_carrier_id;
                    o_ol_cnt     = orders_buf[i].o_ol_cnt;
                    o_all_local  = orders_buf[i].o_all_local;

                    FormatDate(&o_entry_d);

                    // send data to server
                    rc = bcp_sendrow(o_hdbc1);
                    if (rc != SUCCEED)
                              HandleErrorDBC(o_hdbc1);

                    orders_rows_loaded++;
                    CheckForCommit(o_hdbc1, o_hstmt1, orders_rows_loaded, "orders",
&orders_time_start->time_start);
    }

          if ((o_w_id == aptr->num_warehouses) && (o_d_id == 10))
          {
                    rcint = bcp_done(o_hdbc1);
                    if (rcint < 0)
                              HandleErrorDBC(o_hdbc1);

                    SQLFreeStmt(o_hstmt1, SQL_DROP);
                    SQLDisconnect(o_hdbc1);
                    SQLFreeConnect(o_hdbc1);

                    // if build index after load...
                    if ((aptr->build_index == 1) && (aptr->index_order == 0))
                              BuildIndex("idxordcl");

                    // build non-clustered index
                    if (aptr->build_index == 1)
                              BuildIndex("idxordnc");
          }
}

//================================================================================
//
// Function   : LoadNewOrderTable
//
//================================================================================
void LoadNewOrderTable(LOADER_TIME_STRUCT *new_order_time_start)
{
          long               i;
    long       o_id;
    short      o_d_id;
          long               o_w_id;
          RETCODE            rc;
          DBINT              rcint;

          // Bind NEW-ORDER data
          i = 0;
    rc = bcp_bind(o_hdbc2, (BYTE *) &o_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT4,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc2);
    rc = bcp_bind(o_hdbc2, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc2);
          rc = bcp_bind(o_hdbc2, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc2);

          for (i = first_new_order; i < last_new_order; i++)
          {
                    o_id    = orders_buf[i].o_id;
                    o_d_id  = orders_buf[i].o_d_id;
                    o_w_id  = orders_buf[i].o_w_id;

                    rc = bcp_sendrow(o_hdbc2);
                    if (rc != SUCCEED)
                              HandleErrorDBC(o_hdbc2);

                    new_order_rows_loaded++;
                    CheckForCommit_Big(o_hdbc2, o_hstmt2, new_order_rows_loaded,
"new_order", &new_order_time_start->time_start);
          }

          if ((o_w_id == aptr->num_warehouses) && (o_d_id == 10))
          {
                    rcint = bcp_done(o_hdbc2);
                    if (rcint < 0)
                              HandleErrorDBC(o_hdbc2);

                    SQLFreeStmt(o_hstmt2, SQL_DROP);
                    SQLDisconnect(o_hdbc2);
                    SQLFreeConnect(o_hdbc2);

                    // if build index after load...
                    if ((aptr->build_index == 1) && (aptr->index_order == 0))
                              BuildIndex("idxnodcl");
          }
}

//================================================================================
//
// Function   : LoadOrderLineTable
//
//================================================================================
void LoadOrderLineTable(LOADER_TIME_STRUCT *order_line_time_start)
{
          long               i;
          long               j;
    long       o_id;
          short     o_d_id;
          long               o_w_id;
          double             ol;
          long      ol_i_id;
          long               ol_supply_w_id;
```

```
    short       ol_quantity;
    double      ol_amount;
    char        ol_dist_info[DIST_INFO_LEN+1];
          char                ol_delivery_d[OL_DELIVERY_D_LEN+1];
          RETCODE             rc;
          DBINT               rcint;

          // bind ORDER-LINE data
          i = 0;
    rc = bcp_bind(o_hdbc3, (BYTE *) &o_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT4,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);
    rc = bcp_bind(o_hdbc3, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);
          rc = bcp_bind(o_hdbc3, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);
          rc = bcp_bind(o_hdbc3, (BYTE *) &ol, 0, SQL_VARLEN_DATA, NULL, 0, SQLFLT8,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);
    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_i_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT4,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);
          rc = bcp_bind(o_hdbc3, (BYTE *) &ol_delivery_d, 0, OL_DELIVERY_D_LEN,
NULL, 0, SQLCHARACTER, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);
    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_amount, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);
          rc = bcp_bind(o_hdbc3, (BYTE *) &ol_supply_w_id, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT4, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);
    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_quantity, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, ++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);
    rc = bcp_bind(o_hdbc3, (BYTE *) ol_dist_info, 0, DIST_INFO_LEN, NULL, 0, 0,
++i);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);

          for (i = 0; i < orders_per_district; i++)
    {
                    o_id    = orders_buf[i].o_id;
                    o_d_id  = orders_buf[i].o_d_id;
                    o_w_id  = orders_buf[i].o_w_id;

                    for (j=0; j < orders_buf[i].o_ol_cnt; j++)
                    {
                              ol             = orders_buf[i].o_ol[j].ol;
                              ol_i_id        = orders_buf[i].o_ol[j].ol_i_id;
                              ol_supply_w_id = orders_buf[i].o_ol[j].ol_supply_w_id;
                              ol_quantity    = orders_buf[i].o_ol[j].ol_quantity;
                              ol_amount      = orders_buf[i].o_ol[j].ol_amount;


          strcpy(ol_delivery_d,orders_buf[i].o_ol[j].ol_delivery_d);


          strcpy(ol_dist_info,orders_buf[i].o_ol[j].ol_dist_info);

                              rc = bcp_sendrow(o_hdbc3);
                              if (rc != SUCCEED)
                                        HandleErrorDBC(o_hdbc3);

                              order_line_rows_loaded++;

                              CheckForCommit_Big(o_hdbc3, o_hstmt3,
order_line_rows_loaded, "order_line", &order_line_time_start->time_start);
                    }
          }

          if ((o_w_id == aptr->num_warehouses) && (o_d_id == 10))
          {
                    rcint = bcp_done(o_hdbc3);
                    if (rcint < 0)
                              HandleErrorDBC(o_hdbc3);

                    SQLFreeStmt(o_hstmt3, SQL_DROP);
                    SQLDisconnect(o_hdbc3);
                    SQLFreeConnect(o_hdbc3);

                    // if build index after load...
                    if ((aptr->build_index == 1) && (aptr->index_order == 0))
                              BuildIndex("idxodlcl");
          }
}

//===================================================================
//
// Function   : GetPermutation
//
//===================================================================
void GetPermutation(int perm[], int n)
{
          int i, r, t;

          for (i=1;i<=n;i++)
                    perm[i] = i;

          for (i=1;i<=n;i++)
          {
                    r = RandomNumber(i,n);
                    t = perm[i];
                    perm[i] = perm[r];
                    perm[r] = t;
          }
}

//===================================================================
//
// Function   : CheckForCommit
//
//===================================================================
void CheckForCommit(HDBC hdbc,
                                                  HSTMT hstmt,
```

```
                                                long rows_loaded,
                                                char *table_name,
                                        long *time_start)
{

    long  time_end, time_diff;

    if ( !(rows_loaded % aptr->batch) )
    {
                    time_end = (TimeNow() / MILLI);
                    time_diff = time_end - *time_start;

                    printf("-> Loaded %ld rows into %s in %ld sec - Total = %d (%.2f
rps)\n",
                                aptr->batch,
                                table_name,
                                        time_diff,
                                rows_loaded,
                                        (float) aptr->batch / (time_diff ? time_diff
: 1L));

                    *time_start = time_end;
    }

    return;
}

//=========================================================================
//
// Function   : CheckForCommit_Big
//
//=========================================================================
void CheckForCommit_Big(HDBC hdbc,
                                                HSTMT hstmt,
                                                double rows_loaded,
                                                char *table_name,
                                        long *time_start)
{

    long  time_end, time_diff;

    if ( !(fmod(rows_loaded,aptr->batch) ) )
    {
                    time_end = (TimeNow() / MILLI);
                    time_diff = time_end - *time_start;

                    printf("-> Loaded %ld rows into %s in %ld sec - Total = %.0f
(%.2f rps)\n",
                                aptr->batch,
                                table_name,
                                        time_diff,
                                rows_loaded,
                                        (float) aptr->batch / (time_diff ? time_diff
: 1L));

                    *time_start = time_end;
    }

    return;
}

//=========================================================================
//
```

```
// Function   : OpenConnections
//
//=========================================================================
void OpenConnections()
{

          RETCODE         rc;

          char                          szDriverString[300];
          char                          szDriverStringOut[1024];
          SQLSMALLINT                   cbDriverStringOut;


          SQLAllocHandle(SQL_HANDLE_ENV, SQL_NULL_HANDLE, &henv );

          SQLSetEnvAttr(henv, SQL_ATTR_ODBC_VERSION, (void*)SQL_OV_ODBC3, 0 );

          SQLAllocHandle(SQL_HANDLE_DBC, henv , &i_hdbc1);
          SQLAllocHandle(SQL_HANDLE_DBC, henv , &w_hdbc1);
          SQLAllocHandle(SQL_HANDLE_DBC, henv , &c_hdbc1);
          SQLAllocHandle(SQL_HANDLE_DBC, henv , &c_hdbc2);
          SQLAllocHandle(SQL_HANDLE_DBC, henv , &o_hdbc1);
          SQLAllocHandle(SQL_HANDLE_DBC, henv , &o_hdbc2);
          SQLAllocHandle(SQL_HANDLE_DBC, henv , &o_hdbc3);

          SQLSetConnectAttr(i_hdbc1, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );
          SQLSetConnectAttr(w_hdbc1, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );
          SQLSetConnectAttr(c_hdbc1, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );
          SQLSetConnectAttr(c_hdbc2, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );
          SQLSetConnectAttr(o_hdbc1, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );
          SQLSetConnectAttr(o_hdbc2, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );
          SQLSetConnectAttr(o_hdbc3, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );

          // Open connections to SQL Server
          // Connection 1
          sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
                                                                aptr->server,
                                                                aptr->user,
                                                                aptr->password,
                                                                aptr->database );

          rc = SQLSetConnectOption (i_hdbc1, SQL_PACKET_SIZE, aptr->pack_size);
          if (rc != SUCCEED)
                    HandleErrorDBC(i_hdbc1);

          rc = SQLDriverConnect ( i_hdbc1,
                                                          NULL,

          (SQLCHAR*)&szDriverString[0] ,
                                                                SQL_NTS,

          (SQLCHAR*)&szDriverStringOut[0],

          sizeof(szDriverStringOut),
                                                                &cbDriverStringOut,
```

```
                                                        SQL_DRIVER_NOPROMPT );
        if ( (rc != SUCCEED) &&
                 (rc != SQL_SUCCESS_WITH_INFO) )
        {
                HandleErrorDBC(i_hdbc1);
                printf("TPC-C Loader aborted!\n");
                exit(9);
        }

        // Connection 2
        sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
                                                      aptr->server,
                                                      aptr->user,
                                                      aptr->password,
                                                      aptr->database );

        rc = SQLSetConnectOption (w_hdbc1, SQL_PACKET_SIZE, aptr->pack_size);

        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = SQLDriverConnect ( w_hdbc1,
                                                             NULL,

        (SQLCHAR*)&szDriverString[0] ,
                                                             SQL_NTS,

        (SQLCHAR*)&szDriverStringOut[0],

        sizeof(szDriverStringOut),

        &cbDriverStringOut,

        SQL_DRIVER_NOPROMPT );

        if ( (rc != SUCCEED) &&
                 (rc != SQL_SUCCESS_WITH_INFO) )
        {
                HandleErrorDBC(w_hdbc1);
                printf("TPC-C Loader aborted!\n");
                exit(9);
        }

        // Connection 3
        sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
                                                      aptr->server,
                                                      aptr->user,
                                                      aptr->password,
                                                      aptr->database );

        rc = SQLSetConnectOption (c_hdbc1, SQL_PACKET_SIZE, aptr->pack_size);
        if (rc != SUCCEED)
                HandleErrorDBC(c_hdbc1);

        rc = SQLDriverConnect ( c_hdbc1,
                                                             NULL,

        (SQLCHAR*)&szDriverString[0] ,
                                                             SQL_NTS,

        (SQLCHAR*)&szDriverStringOut[0],

        sizeof(szDriverStringOut),

        &cbDriverStringOut,

        SQL_DRIVER_NOPROMPT );
        if ( (rc != SUCCEED) &&
                 (rc != SQL_SUCCESS_WITH_INFO) )
        {
                HandleErrorDBC(c_hdbc1);
                printf("TPC-C Loader aborted!\n");
                exit(9);
        }

        // Connection 4
        sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
                                                                aptr->server,
                                                                aptr->user,
                                                                aptr->password,
                                                                aptr->database );

        rc = SQLSetConnectOption (c_hdbc2, SQL_PACKET_SIZE, aptr->pack_size);
        if (rc != SUCCEED)
                HandleErrorDBC(c_hdbc2);

        rc = SQLDriverConnect ( c_hdbc2,
                                                                       NULL,

        (SQLCHAR*)&szDriverString[0] ,
                                                                       SQL_NTS,

        (SQLCHAR*)&szDriverStringOut[0],

        sizeof(szDriverStringOut),

        &cbDriverStringOut,

        SQL_DRIVER_NOPROMPT );
        if ( (rc != SUCCEED) &&
                 (rc != SQL_SUCCESS_WITH_INFO) )
        {
                HandleErrorDBC(c_hdbc2);
                printf("TPC-C Loader aborted!\n");
                exit(9);
        }

        // Connection 5
        sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
                                                                aptr->server,
                                                                aptr->user,
                                                                aptr->password,
                                                                aptr->database );

        rc = SQLSetConnectOption (o_hdbc1, SQL_PACKET_SIZE, aptr->pack_size);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);

        rc = SQLDriverConnect ( o_hdbc1,
                                                                       NULL,

        (SQLCHAR*)&szDriverString[0] ,
```

```
                                                                SQL_NTS,

        (SQLCHAR*)&szDriverStringOut[0],

        sizeof(szDriverStringOut),

        &cbDriverStringOut,

        SQL_DRIVER_NOPROMPT );
        if ( (rc != SUCCEED) &&
                 (rc != SQL_SUCCESS_WITH_INFO) )
        {
                HandleErrorDBC(o_hdbc1);
                printf("TPC-C Loader aborted!\n");
                exit(9);
        }

        // Connection 6
        sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
                                                        aptr->server,
                                                        aptr->user,
                                                        aptr->password,
                                                        aptr->database );

        rc = SQLSetConnectOption (o_hdbc2, SQL_PACKET_SIZE, aptr->pack_size);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc2);

        rc = SQLDriverConnect ( o_hdbc2,
                                                                NULL,

        (SQLCHAR*)&szDriverString[0] ,
                                                                SQL_NTS,

        (SQLCHAR*)&szDriverStringOut[0],

        sizeof(szDriverStringOut),

        &cbDriverStringOut,

        SQL_DRIVER_NOPROMPT );
        if ( (rc != SUCCEED) &&
                 (rc != SQL_SUCCESS_WITH_INFO) )
        {
                HandleErrorDBC(o_hdbc2);
                printf("TPC-C Loader aborted!\n");
                exit(9);
        }

        // Connection 7
        sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
                                                        aptr->server,
                                                        aptr->user,
                                                        aptr->password,
                                                        aptr->database );

        rc = SQLSetConnectOption (o_hdbc3, SQL_PACKET_SIZE, aptr->pack_size);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc3);

        rc = SQLDriverConnect ( o_hdbc3,
                                                                NULL,

        (SQLCHAR*)&szDriverString[0] ,
                                                                SQL_NTS,

        (SQLCHAR*)&szDriverStringOut[0],

        sizeof(szDriverStringOut),

        &cbDriverStringOut,

        SQL_DRIVER_NOPROMPT );
        if ( (rc != SUCCEED) &&
                 (rc != SQL_SUCCESS_WITH_INFO) )
        {
                HandleErrorDBC(o_hdbc3);
                printf("TPC-C Loader aborted!\n");
                exit(9);
        }
}

//============================================================================
//
// Function name: BuildIndex
//
//============================================================================
void BuildIndex(char          *index_script)
{
        char      cmd[256];

        printf("Starting index creation:  %s\n",index_script);

        sprintf(cmd, "osql -S%s -U%s -P%s -e -i%s\\%s.sql > %s%s.log",
                                        aptr->server,
                                        aptr->user,
                                        aptr->password,
                                        aptr->index_script_path,
                                        index_script,
                                        aptr->log_path,
                                        index_script);

        system(cmd);

        printf("Finished index creation:  %s\n",index_script);
}

//============================================================================
//
// Function name: HandleErrorDBC
//
//============================================================================
void HandleErrorDBC (SQLHDBC  hdbc1)
{

        SQLCHAR             SqlState[6], Msg[SQL_MAX_MESSAGE_LENGTH];
        SQLLEN              NativeError;
        SQLSMALLINT i, MsgLen;
        SQLRETURN   rc2;
        char                timebuf[128];
        char                datebuf[128];
        char                err_log_path[256];
        FILE                *fp1;
```

```
	i = 1;
	while (( rc2 = SQLGetDiagRec(SQL_HANDLE_DBC , hdbc1, i, SqlState ,
&NativeError,
					Msg, sizeof(Msg) , &MsgLen )) !=
SQL_NO_DATA )
	{
		sprintf( szLastError , "%s" ,  Msg );

		_strtime(timebuf);
		_strdate(datebuf);

		printf( "[%s : %s] %s\n==>SQLState: %s\n" , datebuf, timebuf,
szLastError, SqlState);

		strcpy(err_log_path,aptr->log_path);
		strcat(err_log_path,"tpccldr.err");
		fp1 = fopen(err_log_path,"a+");
		if (fp1 == NULL)
			printf("ERROR:  Unable to open errorlog file.\n");
		else
		{
			fprintf(fp1, "[%s : %s] %s\nSQLState: %s\n" , datebuf,
timebuf, szLastError, SqlState);
			fclose(fp1);
		}

		i++;
	}
}

//========================================================================
//
// Function   : HandleErrorSTMT
//
//========================================================================
void HandleErrorSTMT (HSTMT  hstmt1)
{
	SQLCHAR		SqlState[6], Msg[SQL_MAX_MESSAGE_LENGTH];
	SQLLEN		NativeError;
	SQLSMALLINT i, MsgLen;
	SQLRETURN   rc2;
	char		timebuf[128];
	char		datebuf[128];
	char		err_log_path[256];
	FILE		*fp1;

	i = 1;
	while (( rc2 = SQLGetDiagRec(SQL_HANDLE_STMT , hstmt1, i, SqlState ,
&NativeError,
					Msg, sizeof(Msg) , &MsgLen )) !=
SQL_NO_DATA )
	{
		if (total_db_errors >= MAX_SQL_ERRORS)
		{
			printf(">>>>> Maximum SQL errors of %d exceeded.
Terminating TPCCLDR.<<<<<\n",total_db_errors);
			exit(9);
		}
		total_db_errors++;

		sprintf( szLastError , "%s" ,  Msg );

		_strtime(timebuf);
		_strdate(datebuf);

		printf( "[%s : %s] %s\nSQLState: %s\n" , datebuf, timebuf,
szLastError, SqlState);

		strcpy(err_log_path,aptr->log_path);
		strcat(err_log_path,"tpccldr.err");
		fp1 = fopen(err_log_path,"a+");
		if (fp1 == NULL)
			printf("ERROR:  Unable to open errorlog file.\n");
		else
		{
			fprintf(fp1, "[%s : %s] %s\nSQLState: %s\n" , datebuf,
timebuf, szLastError, SqlState);
			fclose(fp1);
		}

		i++;
	}
}

//========================================================================
//
// Function   : FormatDate
//
//========================================================================
void FormatDate ( char* szTimeCOutput )
{
	struct tm when;
	time_t now;

	time( &now );
	when  = *localtime( &now );

	mktime( &when );

	// odbc datetime format
	strftime( szTimeCOutput , 30 , "%Y-%m-%d %H:%M:%S.000", &when );

	return;
}
```

Appendix C: Tunable Parameters

Microsoft SQL Server 2005 Installation Procedures

```
Microsoft SQL Server 2005 Installation Procedures
Type of installation: custom
During the custom installation, use the default
settings for all except the following two areas:
Services accounts:
SQL Server - local system account
SQL Server Agent - local system account
Set the sort order/collation as Latin1_General_Bin
```

Microsoft SQL Server Startup Parameters

```
start sqlservr.exe -c -x -T3502 -T677 -T8011 -T8012 -
T8018 -T8019 -T661 -T8710

Where:
-c        Start SQL Server independently of the
Windows NT Service Control Manager
-x        Disables the keeping of CPU time and cache-
hit ratio statistics
-t3502  Prints a message to the SQL Server log at the
start and end of each checkpoint
-T677   Disable checks in Access Methods, flag not
needed in RTM, disabled by default.
-T8011  Disable diagnostics for resource monitor
-T8012  Disable ring buffer for scheduler
-T8018  Disable exceptions rung buffer
-T8019  Disable stack collection for exception ring
buffer
-T661   Disable ghost writer
-T8710  Diable HP checks.
```

Microsoft SQL Server TCP/IP Config

```
REGEDIT4

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\MSSQL.1\MSSQLServer\SuperSocketNetLib]
"ForceEncryption"=dword:00000000
"HideInstance"=dword:00000000
"Certificate"=""
"DisplayName"="SQL Server Network Configuration"

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\MSSQL.1\MSSQLServer\SuperSocketNetLib\AdminCon
nection]
"DisplayName"="Dedicated Administrative Connection"

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\MSSQL.1\MSSQLServer\SuperSocketNetLib\AdminCon
nection\Tcp]
"TcpDynamicPorts"="1434"
"DisplayName"="TCP/IP"

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\MSSQL.1\MSSQLServer\SuperSocketNetLib\Np]
"Enabled"=dword:00000000
"LocalAccessOnly"=dword:00000000
"PipeName"="\\\\.\\pipe\\sql\\query"
"DisplayName"="Named Pipes"

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\MSSQL.1\MSSQLServer\SuperSocketNetLib\Sm]
"Enabled"=dword:00000001
"DisplayName"="Shared Memory"

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\MSSQL.1\MSSQLServer\SuperSocketNetLib\Tcp]
"Enabled"=dword:00000001
"ListenOnAllIPs"=dword:00000001
"NoDelay"=dword:00000000
"KeepAlive"=dword:00007530
"DisplayName"="TCP/IP"

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\MSSQL.1\MSSQLServer\SuperSocketNetLib\Tcp\IP1]
"Enabled"=dword:00000000
"Active"=dword:00000001
"TcpPort"="1433"
"TcpDynamicPorts"=""
"DisplayName"="Specific IP Address"
"IpAddress"="130.169.206.34"

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\MSSQL.1\MSSQLServer\SuperSocketNetLib\Tcp\IP2]
"Enabled"=dword:00000000
"Active"=dword:00000001
"TcpPort"="1433"
"TcpDynamicPorts"=""
"DisplayName"="Specific IP Address"
"IpAddress"="130.168.206.33"

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\MSSQL.1\MSSQLServer\SuperSocketNetLib\Tcp\IP3]
"Enabled"=dword:00000000
"Active"=dword:00000001
"TcpPort"="1433"
"TcpDynamicPorts"=""
"DisplayName"="Specific IP Address"
"IpAddress"="127.0.0.1"

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\MSSQL.1\MSSQLServer\SuperSocketNetLib\Tcp\IPAl
l]
"TcpPort"="2001[0x1], 2002[0x2], 2003[0x4],
2004[0x8]"
"TcpDynamicPorts"=""
"DisplayName"="Any IP Address"

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\MSSQL.1\MSSQLServer\SuperSocketNetLib\Via]
"Enabled"=dword:00000000
"DefaultServerPort"="0:1433"
"ListenInfo"="0:1433"
"DisplayName"="VIA"
```

Microsoft SQL Server Node Configuration

```
REGEDIT4

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\90\NodeConfiguration]

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\90\NodeConfiguration\Node0]
"CPUMask"=dword:00000001

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\90\NodeConfiguration\Node1]
"CPUMask"=dword:00000002

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\90\NodeConfiguration\Node2]
"CPUMask"=dword:00000004

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL
Server\90\NodeConfiguration\Node3]
"CPUMask"=dword:00000008
```

Microsoft SQL Server Configuration Parameters

```
 name                                 minimum
maximum     config_value run_value
 ------------------------------------ ----------- ----
------- ------------ -----------
 Ad Hoc Distributed Queries                     0
1           0           0
 affinity I/O mask                     -2147483648
2147483647            0           0
 affinity mask                         -2147483648
2147483647           15          15
 Agent XPs                                      0
1           0           0
 allow updates                                  0
1           0           0
 awe enabled                                    0
1           1           1
 blocked process threshold                      0
86400           0           0
 c2 audit mode                                  0
1           0           0
 clr enabled                                    0
1           0           0
 cost threshold for parallelism                 0
32767           5           5
 cross db ownership chaining                    0
1           0           0
 cursor threshold                              -1
2147483647          -1          -1
 Database Mail XPs                              0
1           0           0
 default full-text language                     0
2147483647        1033        1033
 default language                               0
9999            0           0
 default trace enabled                          0
1           0           0
 disallow results from triggers                 0
1           0           0
 fill factor (%)                                0
100             0           0
 ft crawl bandwidth (max)                       0
32767         100         100
 ft crawl bandwidth (min)                       0
32767           0           0
 ft notify bandwidth (max)                      0
32767         100         100
 ft notify bandwidth (min)                      0
32767           0           0
 in-doubt xact resolution                       0
2           0           0
 index create memory (KB)                     704
2147483647            0           0
 lightweight pooling                            0
1           1           1
 locks                                       5000
2147483647            0           0
 max degree of parallelism                      0
64              1           1
 max full-text crawl range                      0
256             4           4
 max server memory (MB)                        16
2147483647        63700       63700
 max text repl size (B)                         0
2147483647        65536       65536
 max worker threads                           128
32767          405         405
 media retention                                0
365             0           0
 min memory per query (KB)                    512
2147483647         1024        1024
 min server memory (MB)                         0
2147483647            0           0
 nested triggers                                0
1           1           1
 network packet size (B)                      512
32767         4096        4096
 Ole Automation Procedures                      0
1           0           0
 open objects                                   0
2147483647            0           0
 PH timeout (s)                                 1
3600           60          60
 precompute rank                                0
1           0           0
 priority boost                                 0
1           1           1
 query governor cost limit                      0
2147483647            0           0
 query wait (s)                                -1
2147483647           -1          -1
 recovery interval (min)                        0
32767        32767       32767
 remote access                                  0
1           1           1
 remote admin connections                       0
1           0           0
 remote login timeout (s)                       0
2147483647          20          20
 remote proc trans                              0
1           0           0
 remote query timeout (s)                       0
2147483647          600         600
 Replication XPs                                0
1           0           0
 scan for startup procs                         0
1           0           0
 server trigger recursion                       0
1           1           1
 set working set size                           0
1           0           0
 show advanced options                          0
1           1           1
 SMO and DMO XPs                                0
1           1           1
 SQL Mail XPs                                   0
1           0           0
 transform noise words                          0
1           0           0
 two digit year cutoff                       1753
9999         2049        2049
 user connections                               0
32767           0           0
 user options                                   0
32767           0           0
 Web Assistant Procedures                       0
1           0           0
 xp_cmdshell                                    0
1           0           0
```

Database Server System Configuration

```
System Information report written at: 09/19/05
15:03:36
System Name: SCOTTSDALE
[System Summary]

Item      Value
OS Name   Microsoft(R) Windows(R) Server 2003,
Enterprise Edition
Version   5.2.3790 Service Pack 1 Build 3790
Other OS Description          Not Available
OS Manufacturer     Microsoft Corporation
System Name         SCOTTSDALE
System Manufacturer HP
System Model        ProLiant DL585 G1
System Type         X86-based PC
Processor x86 Family 15 Model 37 Stepping 1
AuthenticAMD ~2799 Mhz
Processor x86 Family 15 Model 37 Stepping 1
AuthenticAMD ~2799 Mhz
Processor x86 Family 15 Model 37 Stepping 1
AuthenticAMD ~2799 Mhz
Processor x86 Family 15 Model 37 Stepping 1
AuthenticAMD ~2799 Mhz
BIOS Version/Date   HP A01, 8/9/2005
SMBIOS Version      2.3
Windows Directory   C:\WINDOWS
System Directory    C:\WINDOWS\system32
Boot Device         \Device\HarddiskVolume34
Locale    United States
Hardware Abstraction Layer    Version =
"5.2.3790.1830 (srv03_sp1_rtm.050324-1447)"
User Name SCOTTSDALE\Administrator
Time Zone Central Daylight Time
Total Physical Memory         65,367.27 MB
Available Physical Memory     3.13 GB
Total Virtual Memory          1.26 GB
Available Virtual Memory      1.14 GB
Page File Space     2.00 GB
Page File C:\pagefile.sys
```

```
[Hardware Resources]


[Conflicts/Sharing]

Resource  Device
I/O Port 0x0000A000-0x0000BFFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x0000A000-0x0000BFFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x0000A000-0x0000BFFF          Smart Array
6400 Controller (Non-Miniport)

I/O Port 0x00000000-0x000003AF          PCI bus
I/O Port 0x00000000-0x000003AF          Direct memory
access controller

Memory Address 0xF7C00000-0xF7DFFFFF    PCI standard
PCI-to-PCI bridge
Memory Address 0xF7C00000-0xF7DFFFFF    PCI standard
PCI-to-PCI bridge

I/O Port 0x000003C0-0x000003DF          PCI bus
I/O Port 0x000003C0-0x000003DF          PCI standard
PCI-to-PCI bridge
I/O Port 0x000003C0-0x000003DF          Standard VGA
Graphics Adapter

Memory Address 0xF7E00000-0xF7FFFFFF    PCI standard
PCI-to-PCI bridge
Memory Address 0xF7E00000-0xF7FFFFFF    PCI standard
PCI-to-PCI bridge

I/O Port 0x00009000-0x00009FFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00009000-0x00009FFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00009000-0x00009FFF          Smart Array
6400 Controller (Non-Miniport)

I/O Port 0x00006000-0x00007FFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00006000-0x00007FFF          Smart Array
642 Controller (Non-Miniport)

Memory Address 0xF7A00000-0xF7FFFFFF    PCI bus
Memory Address 0xF7A00000-0xF7FFFFFF    PCI standard
PCI-to-PCI bridge
Memory Address 0xF7A00000-0xF7FFFFFF    PCI standard
PCI-to-PCI bridge

I/O Port 0x0000B000-0x0000BFFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x0000B000-0x0000BFFF          Smart Array
6400 Controller (Non-Miniport)

I/O Port 0x00005000-0x00005FFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00005000-0x00005FFF          Compaq Smart
Array 5i Controller

I/O Port 0x000000A0-0x000000A1          Motherboard
resources
I/O Port 0x000000A0-0x000000A1          Programmable
interrupt controller

IRQ 19    Standard OpenHCD USB Host Controller
IRQ 19    Standard OpenHCD USB Host Controller

Memory Address 0xA0000-0xBFFFF          PCI bus
Memory Address 0xA0000-0xBFFFF          PCI standard
PCI-to-PCI bridge
Memory Address 0xA0000-0xBFFFF          Standard VGA
Graphics Adapter

Memory Address 0xF7B00000-0xF7BFFFFF    PCI standard
PCI-to-PCI bridge
Memory Address 0xF7B00000-0xF7BFFFFF    PCI standard
PCI-to-PCI bridge

I/O Port 0x00007000-0x00007FFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00007000-0x00007FFF          Smart Array
6400 Controller (Non-Miniport)

Memory Address 0xF5F00000-0xF79FFFFF    PCI bus
Memory Address 0xF5F00000-0xF79FFFFF    PCI standard
PCI-to-PCI bridge

Memory Address 0xF5E00000-0xF5EFFFFF    PCI bus
Memory Address 0xF5E00000-0xF5EFFFFF    PCI standard
PCI-to-PCI bridge

I/O Port 0x000003B0-0x000003BB          PCI bus
I/O Port 0x000003B0-0x000003BB          PCI standard
PCI-to-PCI bridge
I/O Port 0x000003B0-0x000003BB          Standard VGA
Graphics Adapter

I/O Port 0x00004000-0x00004FFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00004000-0x00004FFF          Base System
Device

I/O Port 0x0000C000-0x0000DFFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x0000C000-0x0000DFFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x0000C000-0x0000DFFF          Smart Array
6400 Controller (Non-Miniport)

I/O Port 0x00008000-0x0000DFFF          PCI bus
I/O Port 0x00008000-0x0000DFFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00008000-0x0000DFFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00008000-0x0000DFFF          Smart Array
6400 Controller (Non-Miniport)

I/O Port 0x0000D000-0x0000DFFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x0000D000-0x0000DFFF          Smart Array
6400 Controller (Non-Miniport)

I/O Port 0x00000020-0x00000021          Motherboard
resources
I/O Port 0x00000020-0x00000021          Programmable
interrupt controller


[DMA]

Resource  Device    Status
Channel 7 Direct memory access controller         OK

Channel 2 Standard floppy disk controller         OK


[Forced Hardware]

Device    PNP Device ID

[I/O]

Resource  Device    Status
0x00000000-0x000003AF         PCI bus   OK
0x00000000-0x000003AF         Direct memory access
controller          OK
0x000003B0-0x000003BB         PCI bus   OK
0x000003B0-0x000003BB         PCI standard PCI-to-PCI
bridge    OK
0x000003B0-0x000003BB         Standard VGA Graphics
Adapter   OK
0x000003C0-0x000003DF         PCI bus   OK
0x000003C0-0x000003DF         PCI standard PCI-to-PCI
bridge    OK
0x000003C0-0x000003DF         Standard VGA Graphics
Adapter   OK
0x000003E0-0x00000FFF         PCI bus   OK
0x00001000-0x00007FFF         PCI bus   OK
0x00004000-0x00004FFF         PCI standard PCI-to-PCI
bridge    OK
0x00004000-0x00004FFF         Base System Device  OK

0x00004800-0x000048FF         Base System Device  OK

0x00004400-0x000044FF         Standard VGA Graphics
Adapter   OK
0x00000A79-0x00000A79         ISAPNP Read Data Port
          OK
0x00000279-0x00000279         ISAPNP Read Data Port
          OK
0x00000274-0x00000277         ISAPNP Read Data Port
          OK
0x00000020-0x00000021         Motherboard resources
          OK
0x00000020-0x00000021         Programmable interrupt
controller          OK
0x00000050-0x00000051         Motherboard resources
          OK
0x00000092-0x00000092         Motherboard resources
          OK
0x000000A0-0x000000A1         Motherboard resources
          OK
0x000000A0-0x000000A1         Programmable interrupt
controller          OK
```

```
0x000000F0-0x000000F1         Motherboard resources
          OK
0x00000230-0x00000233         Motherboard resources
          OK
0x00000260-0x00000267         Motherboard resources
          OK
0x000004D0-0x000004D1         Motherboard resources
          OK
0x00000800-0x0000081F         Motherboard resources
          OK
0x00000900-0x00000903         Motherboard resources
          OK
0x00000904-0x00000907         Motherboard resources
          OK
0x00000908-0x0000090B         Motherboard resources
          OK
0x0000090C-0x0000092E         Motherboard resources
          OK
0x0000092F-0x0000092F         Motherboard resources
          OK
0x00000930-0x000009FF         Motherboard resources
          OK
0x00000C80-0x00000C87         Motherboard resources
          OK
0x00000CF9-0x00000CF9         Motherboard resources
          OK
0x000002F8-0x000002FF         Motherboard resources
          OK
0x00000040-0x00000043         System timer        OK

0x00000080-0x0000008F         Direct memory access
controller          OK
0x000000C0-0x000000DF         Direct memory access
controller          OK
0x00000061-0x00000061         System speaker      OK

0x00000060-0x00000060         Standard 101/102-Key or
Microsoft Natural PS/2 Keyboard         OK
0x00000064-0x00000064         Standard 101/102-Key or
Microsoft Natural PS/2 Keyboard         OK
0x0000002E-0x0000002F         Extended IO Bus     OK

0x00000220-0x00000223         Extended IO Bus     OK

0x00000240-0x0000025F         Extended IO Bus     OK

0x00000070-0x00000073         Extended IO Bus     OK

0x000003F8-0x000003FF         Communications Port
(COM1)    OK
0x000003F2-0x000003F5         Standard floppy disk
controller          OK
0x000003F7-0x000003F7         Standard floppy disk
controller          OK
0x00002000-0x0000200F         Standard Dual Channel
PCI IDE Controller  OK
0x000001F0-0x000001F7         Primary IDE Channel OK

0x000003F6-0x000003F6         Primary IDE Channel OK

0x00000170-0x00000177         Secondary IDE Channel
          OK
```

```
0x00000376-0x00000376         Secondary IDE Channel
          OK
0x00005000-0x00005FFF         PCI standard PCI-to-PCI
bridge    OK
0x00005000-0x00005FFF         Compaq Smart Array 5i
Controller          OK
0x00006000-0x00007FFF         PCI standard PCI-to-PCI
bridge    OK
0x00006000-0x00007FFF         Smart Array 642
Controller (Non-Miniport)     OK
0x00007000-0x00007FFF         PCI standard PCI-to-PCI
bridge    OK
0x00007000-0x00007FFF         Smart Array 6400
Controller (Non-Miniport)     OK
0x00007400-0x000074FF         Smart Array 6400
Controller U320 Expansion Module (Non-Miniport)   OK

0x00008000-0x0000DFFF         PCI bus   OK
0x00008000-0x0000DFFF         PCI standard PCI-to-PCI
bridge    OK
0x00008000-0x0000DFFF         PCI standard PCI-to-PCI
bridge    OK
0x00008000-0x0000DFFF         Smart Array 6400
Controller (Non-Miniport)     OK
0x00008400-0x000084FF         Smart Array 6400
Controller U320 Expansion Module (Non-Miniport)   OK

0x00009000-0x00009FFF         PCI standard PCI-to-PCI
bridge    OK
0x00009000-0x00009FFF         PCI standard PCI-to-PCI
bridge    OK
0x00009000-0x00009FFF         Smart Array 6400
Controller (Non-Miniport)     OK
0x00009400-0x000094FF         Smart Array 6400
Controller U320 Expansion Module (Non-Miniport)   OK

0x0000A000-0x0000BFFF         PCI standard PCI-to-PCI
bridge    OK
0x0000A000-0x0000BFFF         PCI standard PCI-to-PCI
bridge    OK
0x0000A000-0x0000BFFF         Smart Array 6400
Controller (Non-Miniport)     OK
0x0000A400-0x0000A4FF         Smart Array 6400
Controller U320 Expansion Module (Non-Miniport)   OK

0x0000B000-0x0000BFFF         PCI standard PCI-to-PCI
bridge    OK
0x0000B000-0x0000BFFF         Smart Array 6400
Controller (Non-Miniport)     OK
0x0000B400-0x0000B4FF         Smart Array 6400
Controller U320 Expansion Module (Non-Miniport)   OK

0x0000C000-0x0000DFFF         PCI standard PCI-to-PCI
bridge    OK
0x0000C000-0x0000DFFF         PCI standard PCI-to-PCI
bridge    OK
0x0000C000-0x0000DFFF         Smart Array 6400
Controller (Non-Miniport)     OK
0x0000C400-0x0000C4FF         Smart Array 6400
Controller U320 Expansion Module (Non-Miniport)   OK

0x0000D000-0x0000DFFF         PCI standard PCI-to-PCI
bridge    OK
```

```
0x0000D000-0x0000DFFF         Smart Array 6400
Controller (Non-Miniport)     OK
0x0000D400-0x0000D4FF         Smart Array 6400
Controller U320 Expansion Module (Non-Miniport)   OK


[IRQs]

Resource  Device    Status
IRQ 9     Microsoft ACPI-Compliant System         OK

IRQ 19    Standard OpenHCD USB Host Controller    OK

IRQ 19    Standard OpenHCD USB Host Controller    OK

IRQ 7     Base System Device  OK
IRQ 10    Base System Device  OK
IRQ 0     System timer        OK
IRQ 1     Standard 101/102-Key or Microsoft Natural
PS/2 Keyboard       OK
IRQ 12    PS/2 Compatible Mouse         OK
IRQ 4     Communications Port (COM1)    OK
IRQ 6     Standard floppy disk controller          OK

IRQ 14    Primary IDE Channel OK
IRQ 18    Compaq Smart Array 5i Controller         OK

IRQ 25    HP NC7782 Gigabit Server Adapter         OK

IRQ 24    HP NC7782 Gigabit Server Adapter #2      OK

IRQ 28    Smart Array 642 Controller (Non-Miniport)
          OK
IRQ 30    Smart Array 6400 Controller (Non-Miniport)
          OK
IRQ 31    Smart Array 6400 Controller U320 Expansion
Module (Non-Miniport)         OK
IRQ 32    Smart Array 6400 Controller (Non-Miniport)
          OK
IRQ 33    Smart Array 6400 Controller U320 Expansion
Module (Non-Miniport)         OK
IRQ 36    Smart Array 6400 Controller (Non-Miniport)
          OK
IRQ 37    Smart Array 6400 Controller U320 Expansion
Module (Non-Miniport)         OK
IRQ 40    Smart Array 6400 Controller (Non-Miniport)
          OK
IRQ 41    Smart Array 6400 Controller U320 Expansion
Module (Non-Miniport)         OK
IRQ 42    Smart Array 6400 Controller (Non-Miniport)
          OK
IRQ 43    Smart Array 6400 Controller U320 Expansion
Module (Non-Miniport)         OK
IRQ 44    Smart Array 6400 Controller (Non-Miniport)
          OK
IRQ 45    Smart Array 6400 Controller U320 Expansion
Module (Non-Miniport)         OK
IRQ 46    Smart Array 6400 Controller (Non-Miniport)
          OK
IRQ 47    Smart Array 6400 Controller U320 Expansion
Module (Non-Miniport)         OK

[Memory]
```

```
Resource  Device    Status
0xA0000-0xBFFFF     PCI bus   OK
0xA0000-0xBFFFF     PCI standard PCI-to-PCI bridge
          OK
0xA0000-0xBFFFF     Standard VGA Graphics Adapter OK

0xF5E00000-0xF5EFFFFF         PCI bus   OK
0xF5E00000-0xF5EFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF5F00000-0xF79FFFFF         PCI bus   OK
0xF5F00000-0xF79FFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF76F0000-0xF76F0FFF         Standard OpenHCD USB
Host Controller     OK
0xF76E0000-0xF76E0FFF         Standard OpenHCD USB
Host Controller     OK
0xF76B0000-0xF76B01FF         Base System Device  OK

0xF76A0000-0xF76A07FF         Base System Device  OK

0xF7690000-0xF7691FFF         Base System Device  OK

0xF7600000-0xF767FFFF         Base System Device  OK

0xF6000000-0xF6FFFFFF         Standard VGA Graphics
Adapter   OK
0xF5FF0000-0xF5FF0FFF         Standard VGA Graphics
Adapter   OK
0xF7700000-0xF77FFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF77C0000-0xF77FFFFF         Compaq Smart Array 5i
Controller          OK
0xF5EF0000-0xF5EF3FFF         Compaq Smart Array 5i
Controller          OK
0xF77B0000-0xF77BFFFF         HP NC7782 Gigabit
Server Adapter      OK
0xF77A0000-0xF77AFFFF         HP NC7782 Gigabit
Server Adapter #2   OK
0xF7800000-0xF79FFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF78F0000-0xF78F1FFF         Smart Array 642
Controller (Non-Miniport)     OK
0xF7880000-0xF78BFFFF         Smart Array 642
Controller (Non-Miniport)     OK
0xF7900000-0xF79FFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF79F0000-0xF79F1FFF         Smart Array 6400
Controller (Non-Miniport)     OK
0xF7970000-0xF7971FFF         Smart Array 6400
Controller U320 Expansion Module (Non-Miniport)   OK

0xF7A00000-0xF7FFFFFF         PCI bus   OK
0xF7A00000-0xF7FFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF7A00000-0xF7FFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF7AF0000-0xF7AF1FFF         Smart Array 6400
Controller (Non-Miniport)     OK
0xF7A70000-0xF7A71FFF         Smart Array 6400
Controller U320 Expansion Module (Non-Miniport)   OK

0xF7B00000-0xF7BFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF7B00000-0xF7BFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF7BF0000-0xF7BF1FFF         Smart Array 6400
Controller (Non-Miniport)     OK
0xF7B70000-0xF7B71FFF         Smart Array 6400
Controller U320 Expansion Module (Non-Miniport)   OK

0xF7C00000-0xF7DFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF7C00000-0xF7DFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF7CF0000-0xF7CF1FFF         Smart Array 6400
Controller (Non-Miniport)     OK
0xF7C70000-0xF7C71FFF         Smart Array 6400
Controller U320 Expansion Module (Non-Miniport)   OK

0xF7D00000-0xF7DFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF7DF0000-0xF7DF1FFF         Smart Array 6400
Controller (Non-Miniport)     OK
0xF7D70000-0xF7D71FFF         Smart Array 6400
Controller U320 Expansion Module (Non-Miniport)   OK

0xF7E00000-0xF7FFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF7E00000-0xF7FFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF7EF0000-0xF7EF1FFF         Smart Array 6400
Controller (Non-Miniport)     OK
0xF7E70000-0xF7E71FFF         Smart Array 6400
Controller U320 Expansion Module (Non-Miniport)   OK

0xF7F00000-0xF7FFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xF7FF0000-0xF7FF1FFF         Smart Array 6400
Controller (Non-Miniport)     OK
0xF7F70000-0xF7F71FFF         Smart Array 6400
Controller U320 Expansion Module (Non-Miniport)   OK


[Components]



[Multimedia]



[Audio Codecs]

CODEC     Manufacturer        Description
          Status    File      Version   Size
          Creation Date
c:\windows\system32\l3codeca.acm        Fraunhofer
Institut Integrierte Schaltungen IIS    Fraunhofer
IIS MPEG Layer-3 Codec        OK
          C:\WINDOWS\system32\L3CODECA.ACM        1,
9, 0, 0305          284.00 KB (290,816 bytes)
          3/25/2003 6:00 AM
c:\windows\system32\sl_anet.acm         Sipro Lab
Telecom Inc.        Sipro Lab Telecom Audio Codec OK
          C:\WINDOWS\system32\SL_ANET.ACM
          3.02      84.00 KB (86,016 bytes)
          3/25/2003 6:00 AM
c:\windows\system32\msgsm32.acm         Microsoft
Corporation                 OK
          C:\WINDOWS\system32\MSGSM32.ACM
          5.2.3790.0 (srv03_rtm.030324-2048)
          20.50 KB (20,992 bytes)       3/25/2003
6:00 AM
c:\windows\system32\msg723.acm          Microsoft
Corporation                 OK
          C:\WINDOWS\system32\MSG723.ACM
          5.2.3790.1830       120.00 KB (122,880
bytes)    6/14/2005 3:23 PM
c:\windows\system32\imaadp32.acm        Microsoft
Corporation                 OK
          C:\WINDOWS\system32\IMAADP32.ACM
          5.2.3790.0 (srv03_rtm.030324-2048)
          15.50 KB (15,872 bytes)       3/25/2003
6:00 AM
c:\windows\system32\msaud32.acm         Microsoft
Corporation         Windows Media Audio Codec     OK
          C:\WINDOWS\system32\MSAUD32.ACM
          8.00.00.4487        288.00 KB (294,912
bytes)    3/25/2003 6:00 AM
c:\windows\system32\tssoft32.acm        DSP GROUP,
INC.                OK
          C:\WINDOWS\system32\TSSOFT32.ACM
          1.01      9.50 KB (9,728 bytes)
          3/25/2003 6:00 AM
c:\windows\system32\msg711.acm          Microsoft
Corporation                 OK
          C:\WINDOWS\system32\MSG711.ACM
          5.2.3790.0 (srv03_rtm.030324-2048)
          10.00 KB (10,240 bytes)       3/25/2003
6:00 AM
c:\windows\system32\msadp32.acm         Microsoft
Corporation                 OK
          C:\WINDOWS\system32\MSADP32.ACM
          5.2.3790.0 (srv03_rtm.030324-2048)
          14.50 KB (14,848 bytes)       3/25/2003
6:00 AM

[Video Codecs]

CODEC     Manufacturer        Description
          Status    File      Version   Size
          Creation Date
c:\windows\system32\msh263.drv          Microsoft
Corporation                 OK
          C:\WINDOWS\system32\MSH263.DRV
          5.2.3790.1830       288.00 KB (294,912
bytes)    6/14/2005 3:23 PM
c:\windows\system32\msyuv.dll Microsoft Corporation
                  OK
          C:\WINDOWS\system32\MSYUV.DLL 5.2.3790.0
(srv03_rtm.030324-2048)       16.50 KB (16,896 bytes)
          3/24/2003 7:49 PM
c:\windows\system32\iyuv_32.dll         Microsoft
Corporation                 OK
          C:\WINDOWS\system32\IYUV_32.DLL
          5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
```

```
         46.50 KB (47,616 bytes)       6/14/2005
3:23 PM
c:\windows\system32\msvidc32.dll        Microsoft
Corporation                   OK
         C:\WINDOWS\system32\MSVIDC32.DLL
         5.2.3790.0 (srv03_rtm.030324-2048)
         26.50 KB (27,136 bytes)       3/25/2003
6:00 AM
c:\windows\system32\tsbyuv.dll          Microsoft
Corporation                   OK
         C:\WINDOWS\system32\TSBYUV.DLL
         5.2.3790.0 (srv03_rtm.030324-2048)
         8.00 KB (8,192 bytes)         3/24/2003
7:50 PM
c:\windows\system32\msrle32.dll         Microsoft
Corporation                   OK
         C:\WINDOWS\system32\MSRLE32.DLL
         5.2.3790.0 (srv03_rtm.030324-2048)
         10.50 KB (10,752 bytes)       3/25/2003
6:00 AM
c:\windows\system32\msh261.drv          Microsoft
Corporation                   OK
         C:\WINDOWS\system32\MSH261.DRV
         5.2.3790.1830       184.00 KB (188,416
bytes)    6/14/2005 3:23 PM

[CD-ROM]

Item      Value
Drive     D:
Description         CD-ROM Drive
Media Loaded        No
Media Type          CD-ROM
Name      COMPAQ CD-224E
Manufacturer        (Standard CD-ROM drives)
Status    OK
Transfer Rate       Not Available
SCSI Target ID      0
PNP Device ID       IDE\CDROMCOMPAQ_CD-
224E_____________________________A.8D____\5&2DC47F1C&0&0
.0.0
Driver    c:\windows\system32\drivers\cdrom.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 51.00 KB
(52,224 bytes), 3/25/2003 6:00 AM)

[Sound Device]

Item      Value

[Display]

Item      Value
Name      Standard VGA Graphics Adapter
PNP Device ID
         PCI\VEN_1002&DEV_4752&SUBSYS_001E0E11&REV_2
7\4&12365AD0&0&1818
Adapter Type        ATI MACH64, (Standard display
types) compatible
Adapter Description Standard VGA Graphics Adapter
Adapter RAM         7.94 MB (8,323,072 bytes)
Installed Drivers
         vga.dll,framebuf.dll,vga256.dll,vga64k.dll
Driver Version      5.2.3790.1830
INF File  display.inf (vga section)
Color Planes        1
Color Table Entries 16777216
Resolution          1024 x 768 x 1 hertz
Bits/Pixel          24
Memory Address      0xF6000000-0xF6FFFFFF
I/O Port  0x00004400-0x000044FF
Memory Address      0xF5FF0000-0xF5FF0FFF
I/O Port  0x000003B0-0x000003BB
I/O Port  0x000003C0-0x000003DF
Memory Address      0xA0000-0xBFFFF
Driver    c:\windows\system32\drivers\vgapnp.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 23.50 KB
(24,064 bytes), 9/18/2005 8:48 AM)

[Infrared]

Item      Value

[Input]



[Keyboard]

Item      Value
Description         Standard 101/102-Key or Microsoft
Natural PS/2 Keyboard
Name      Enhanced (101- or 102-key)
Layout    00000409
PNP Device ID       ACPI\PNP0303\4&1C7DEDE8&0
Number of Function Keys       12
I/O Port  0x00000060-0x00000060
I/O Port  0x00000064-0x00000064
IRQ Channel         IRQ 1
Driver    c:\windows\system32\drivers\i8042prt.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 54.50 KB
(55,808 bytes), 3/25/2003 6:00 AM)

[Pointing Device]

Item      Value
Hardware Type       PS/2 Compatible Mouse
Number of Buttons   5
Status    OK
PNP Device ID       ACPI\PNP0F13\4&1C7DEDE8&0
Power Management Supported    No
Double Click Threshold        6
Handedness          Right Handed Operation
IRQ Channel         IRQ 12
Driver    c:\windows\system32\drivers\i8042prt.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 54.50 KB
(55,808 bytes), 3/25/2003 6:00 AM)

[Modem]

Item      Value

[Network]

[Adapter]

Item      Value
Name      [00000001] RAS Async Adapter
Adapter Type        Not Available
Product Type        RAS Async Adapter
Installed Yes
PNP Device ID       Not Available
Last Reset          9/19/2005 2:58 PM
Index     1
Service Name        AsyncMac
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available

Name      [00000002] WAN Miniport (L2TP)
Adapter Type        Not Available
Product Type        WAN Miniport (L2TP)
Installed Yes
PNP Device ID       ROOT\MS_L2TPMINIPORT\0000
Last Reset          9/19/2005 2:58 PM
Index     2
Service Name        Rasl2tp
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Driver    c:\windows\system32\drivers\rasl2tp.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 66.00 KB
(67,584 bytes), 3/25/2003 6:00 AM)

Name      [00000003] WAN Miniport (PPTP)
Adapter Type        Wide Area Network (WAN)
Product Type        WAN Miniport (PPTP)
Installed Yes
PNP Device ID       ROOT\MS_PPTPMINIPORT\0000
Last Reset          9/19/2005 2:58 PM
Index     3
Service Name        PptpMiniport
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         50:50:54:50:30:30
Driver    c:\windows\system32\drivers\raspptp.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 61.00 KB
(62,464 bytes), 3/25/2003 6:00 AM)

Name      [00000004] WAN Miniport (PPPOE)
Adapter Type        Wide Area Network (WAN)
Product Type        WAN Miniport (PPPOE)
```

```
Installed Yes
PNP Device ID       ROOT\MS_PPPOEMINIPORT\0000
Last Reset          9/19/2005 2:58 PM
Index     4
Service Name        RasPppoe
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         33:50:6F:45:30:30
Driver    c:\windows\system32\drivers\raspppoe.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 40.00 KB
(40,960 bytes), 3/25/2003 6:00 AM)

Name      [00000005] Direct Parallel
Adapter Type        Not Available
Product Type        Direct Parallel
Installed Yes
PNP Device ID       ROOT\MS_PTIMINIPORT\0000
Last Reset          9/19/2005 2:58 PM
Index     5
Service Name        Raspti
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Driver    c:\windows\system32\drivers\raspti.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 19.50 KB
(19,968 bytes), 3/25/2003 6:00 AM)

Name      [00000006] WAN Miniport (IP)
Adapter Type        Not Available
Product Type        WAN Miniport (IP)
Installed Yes
PNP Device ID       ROOT\MS_NDISWANIP\0000
Last Reset          9/19/2005 2:58 PM
Index     6
Service Name        NdisWan
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Driver    c:\windows\system32\drivers\ndiswan.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 91.00 KB
(93,184 bytes), 3/25/2003 6:00 AM)

Name      [00000007] HP NC7770 Gigabit Server Adapter

Adapter Type        Not Available
Product Type        HP NC7770 Gigabit Server Adapter

Installed Yes
PNP Device ID       Not Available
Last Reset          9/19/2005 2:58 PM
Index     7
Service Name        q57w2k
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available

Name      [00000008] HP NC7770 Gigabit Server Adapter

Adapter Type        Not Available
Product Type        HP NC7770 Gigabit Server Adapter

Installed Yes
PNP Device ID       Not Available
Last Reset          9/19/2005 2:58 PM
Index     8
Service Name        q57w2k
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available

Name      [00000009] HP NC7782 Gigabit Server Adapter

Adapter Type        Ethernet 802.3
Product Type        HP NC7782 Gigabit Server Adapter

Installed Yes
PNP Device ID
          PCI\VEN_14E4&DEV_1648&SUBSYS_00D00E11&REV_1
0\4&82820FC&0&3038
Last Reset          9/19/2005 2:58 PM
Index     9
Service Name        q57w2k
IP Address          130.168.206.33
IP Subnet 255.255.0.0
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         00:0B:CD:C4:C9:99
Memory Address      0xF77B0000-0xF77BFFFF
IRQ Channel         IRQ 25
Driver    c:\windows\system32\drivers\q57xp32.sys
(7.103.0.0 built by: WinDDK, 125.25 KB (128,256
bytes), 6/14/2005 3:14 PM)

Name      [00000010] HP NC7782 Gigabit Server Adapter

Adapter Type        Ethernet 802.3
Product Type        HP NC7782 Gigabit Server Adapter

Installed Yes
PNP Device ID
          PCI\VEN_14E4&DEV_1648&SUBSYS_00D00E11&REV_1
0\4&82820FC&0&3138
Last Reset          9/19/2005 2:58 PM
Index     10
Service Name        q57w2k
IP Address          130.169.206.34
IP Subnet 255.255.0.0
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         00:0B:CD:C4:C9:98
Memory Address      0xF77A0000-0xF77AFFFF
IRQ Channel         IRQ 24
Driver    c:\windows\system32\drivers\q57xp32.sys
(7.103.0.0 built by: WinDDK, 125.25 KB (128,256
bytes), 6/14/2005 3:14 PM)

Name      [00000011] HP NC7770 Gigabit Server Adapter

Adapter Type        Not Available
Product Type        HP NC7770 Gigabit Server Adapter

Installed Yes
PNP Device ID       Not Available
Last Reset          9/19/2005 2:58 PM
Index     11
Service Name        q57w2k
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available

[Protocol]

Item      Value
Name      MSAFD Tcpip [TCP/IP]
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          16 bytes
Maximum Message Size          0 bytes
Message Oriented    No
Minimum Address Size          16 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       Yes
Supports Graceful Closing     Yes
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD Tcpip [UDP/IP]
Connectionless Service        Yes
```

```
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          16 bytes
Maximum Message Size          63.93 KB (65,467 bytes)

Message Oriented    Yes
Minimum Address Size          16 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         Yes

Name      RSVP UDP Service Provider
Connectionless Service        Yes
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          16 bytes
Maximum Message Size          63.93 KB (65,467 bytes)

Message Oriented    Yes
Minimum Address Size          16 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption Yes
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         Yes

Name      RSVP TCP Service Provider
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          16 bytes
Maximum Message Size          0 bytes
Message Oriented    No
Minimum Address Size          16 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption Yes
Supports Expedited Data       Yes
Supports Graceful Closing     Yes
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{4B8726D1-63B1-4C7E-A80F-
3BB2C35581B2}] SEQPACKET 6
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{4B8726D1-63B1-4C7E-A80F-
3BB2C35581B2}] DATAGRAM 6
Connectionless Service        Yes
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{7F1FF71A-EC45-48BC-BBA2-
1F03AEB64A8F}] SEQPACKET 5
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{7F1FF71A-EC45-48BC-BBA2-
1F03AEB64A8F}] DATAGRAM 5
Connectionless Service        Yes
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{6441BAC3-773E-4211-BD5A-
15F7088E76DF}] SEQPACKET 4
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{6441BAC3-773E-4211-BD5A-
15F7088E76DF}] DATAGRAM 4
Connectionless Service        Yes
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{6E58A2D6-E938-4735-9FE3-
48D0C14F0E63}] SEQPACKET 3
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)
```

```
Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{6E58A2D6-E938-4735-9FE3-
48D0C14F0E63}] DATAGRAM 3
Connectionless Service        Yes
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{FCA6ACAB-21FE-49A9-859C-
D3D7D68E9324}] SEQPACKET 0
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{FCA6ACAB-21FE-49A9-859C-
D3D7D68E9324}] DATAGRAM 0
Connectionless Service        Yes
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)
```

```
Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{1657DD1D-1E83-4FD6-8F8C-
8F533E640DDF}] SEQPACKET 1
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{1657DD1D-1E83-4FD6-8F8C-
8F533E640DDF}] DATAGRAM 1
Connectionless Service        Yes
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{D308AD08-B2DC-47F4-B63A-
450EFCBFA184}] SEQPACKET 2
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)
```

```
Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{D308AD08-B2DC-47F4-B63A-
450EFCBFA184}] DATAGRAM 2
Connectionless Service        Yes
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

[WinSock]

Item      Value
File      c:\windows\system32\winsock.dll
Size      2.80 KB (2,864 bytes)
Version   3.10

File      c:\windows\system32\wsock32.dll
Size      22.00 KB (22,528 bytes)
Version   5.2.3790.0 (srv03_rtm.030324-2048)

[Ports]



[Serial]

Item      Value
Name      Communications Port (COM1)
Status    OK
PNP Device ID       ACPI\PNP0501\0
Maximum Input Buffer Size     0
Maximum Output Buffer Size    No
Settable Baud Rate  Yes
Settable Data Bits  Yes
Settable Flow Control         Yes
Settable Parity     Yes
Settable Parity Check         Yes
Settable Stop Bits  Yes
Settable RLSD       Yes
```

```
Supports RLSD       Yes
Supports 16 Bit Mode          No
Supports Special Characters   No
Baud Rate 9600
Bits/Byte 8
Stop Bits 1
Parity    None
Busy      No
Abort Read/Write on Error     No
Binary Mode Enabled Yes
Continue XMit on XOff         No
CTS Outflow Control No
Discard NULL Bytes  No
DSR Outflow Control 0
DSR Sensitivity     0
DTR Flow Control Type         Enable
EOF Character       0
Error Replace Character       0
Error Replacement Enabled     No
Event Character     0
Parity Check Enabled          No
RTS Flow Control Type         Enable
XOff Character      19
XOffXMit Threshold  512
XOn Character       17
XOnXMit Threshold   2048
XOnXOff InFlow Control        0
XOnXOff OutFlow Control       0
IRQ Channel         IRQ 4
I/O Port  0x000003F8-0x000003FF
Driver    c:\windows\system32\drivers\serial.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 64.00 KB
(65,536 bytes), 3/25/2003 6:00 AM)

[Parallel]

Item      Value

[Storage]



[Drives]

Item      Value
Drive     A:
Description         3 1/2 Inch Floppy Drive

Drive     C:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size      33.91 GB (36,410,552,320 bytes)
Free Space          24.86 GB (26,696,830,976 bytes)

Volume Name
Volume Serial Number          204C4854

Drive     D:
Description         CD-ROM Disc

Drive     E:
Description         Local Fixed Disk
Compressed          Not Available
File System         Not Available
Size      Not Available
Free Space          Not Available
Volume Name         Not Available
Volume Serial Number          Not Available

Drive     V:
Description         Network Connection
Provider Name       \\inforb\audit_fdr

Drive     W:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size      436.21 GB (468,380,311,552 bytes)
Free Space          226.09 GB (242,766,442,496 bytes)

Volume Name         tpccback1
Volume Serial Number          C80591EF

Drive     X:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size      436.21 GB (468,380,311,552 bytes)
Free Space          226.09 GB (242,766,495,744 bytes)

Volume Name         tpccback2
Volume Serial Number          181AB61F

Drive     Y:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size      436.21 GB (468,380,311,552 bytes)
Free Space          223.41 GB (239,883,472,896 bytes)

Volume Name         tpccback3
Volume Serial Number          04D1DDE8

Drive     Z:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size      436.21 GB (468,380,311,552 bytes)
Free Space          207.80 GB (223,121,920,000 bytes)

Volume Name         tpccback4
Volume Serial Number          887839A8

[Disks]

Item      Value
Description         \\.\PHYSICALDRIVE0
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      474.85 GB (509,868,656,640 bytes)
Total Cylinders     61,988
Total Sectors       995,837,220
Total Tracks        15,806,940
Tracks/Cylinder     255
Partition Disk #0, Partition #0
Partition Size      474.85 GB (509,868,624,384 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE25
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      28.80 GB (30,927,052,800 bytes)
Total Cylinders     3,760
Total Sectors       60,404,400
Total Tracks        958,800
Tracks/Cylinder     255
Partition Disk #25, Partition #0
Partition Size      28.80 GB (30,927,020,544 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE26
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      48.34 GB (51,901,516,800 bytes)
Total Cylinders     6,310
Total Sectors       101,370,150
Total Tracks        1,609,050
Tracks/Cylinder     255
Partition Disk #26, Partition #0
Partition Size      48.33 GB (51,893,259,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE20
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
```

```
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      28.80 GB (30,927,052,800 bytes)
Total Cylinders     3,760
Total Sectors       60,404,400
Total Tracks        958,800
Tracks/Cylinder     255
Partition Disk #20, Partition #0
Partition Size      28.80 GB (30,927,020,544 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE21
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      48.34 GB (51,901,516,800 bytes)
Total Cylinders     6,310
Total Sectors       101,370,150
Total Tracks        1,609,050
Tracks/Cylinder     255
Partition Disk #21, Partition #0
Partition Size      48.33 GB (51,893,259,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE22
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      436.21 GB (468,380,344,320 bytes)
Total Cylinders     56,944
Total Sectors       914,805,360
Total Tracks        14,520,720
Tracks/Cylinder     255
Partition Disk #22, Partition #0
Partition Size      436.21 GB (468,380,312,064 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE5
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      28.80 GB (30,927,052,800 bytes)
Total Cylinders     3,760
Total Sectors       60,404,400
Total Tracks        958,800
Tracks/Cylinder     255
Partition Disk #5, Partition #0
Partition Size      28.80 GB (30,927,020,544 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE6
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      48.34 GB (51,901,516,800 bytes)
Total Cylinders     6,310
Total Sectors       101,370,150
Total Tracks        1,609,050
Tracks/Cylinder     255
Partition Disk #6, Partition #0
Partition Size      48.33 GB (51,893,259,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE7
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      436.21 GB (468,380,344,320 bytes)
Total Cylinders     56,944
Total Sectors       914,805,360
Total Tracks        14,520,720
Tracks/Cylinder     255
Partition Disk #7, Partition #0
Partition Size      436.21 GB (468,380,312,064 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE8
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      28.80 GB (30,927,052,800 bytes)
Total Cylinders     3,760
Total Sectors       60,404,400
Total Tracks        958,800
Tracks/Cylinder     255
Partition Disk #8, Partition #0
Partition Size      28.80 GB (30,927,020,544 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE9
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      48.34 GB (51,901,516,800 bytes)
Total Cylinders     6,310
Total Sectors       101,370,150
Total Tracks        1,609,050
Tracks/Cylinder     255
Partition Disk #9, Partition #0
Partition Size      48.33 GB (51,893,259,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE27
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      28.80 GB (30,927,052,800 bytes)
Total Cylinders     3,760
Total Sectors       60,404,400
Total Tracks        958,800
Tracks/Cylinder     255
Partition Disk #27, Partition #0
```

```
Partition Size      28.80 GB (30,927,020,544 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE28
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      48.34 GB (51,901,516,800 bytes)
Total Cylinders     6,310
Total Sectors       101,370,150
Total Tracks        1,609,050
Tracks/Cylinder     255
Partition Disk #28, Partition #0
Partition Size      48.33 GB (51,893,259,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE29
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      28.80 GB (30,927,052,800 bytes)
Total Cylinders     3,760
Total Sectors       60,404,400
Total Tracks        958,800
Tracks/Cylinder     255
Partition Disk #29, Partition #0
Partition Size      28.80 GB (30,927,020,544 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE30
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      48.34 GB (51,901,516,800 bytes)
Total Cylinders     6,310
Total Sectors       101,370,150
Total Tracks        1,609,050
Tracks/Cylinder     255
Partition Disk #30, Partition #0
Partition Size      48.33 GB (51,893,259,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE23
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      28.80 GB (30,927,052,800 bytes)
Total Cylinders     3,760
Total Sectors       60,404,400
Total Tracks        958,800
Tracks/Cylinder     255
Partition Disk #23, Partition #0
Partition Size      28.80 GB (30,927,020,544 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE24
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      48.34 GB (51,901,516,800 bytes)
Total Cylinders     6,310
Total Sectors       101,370,150
Total Tracks        1,609,050
Tracks/Cylinder     255
Partition Disk #24, Partition #0
Partition Size      48.33 GB (51,893,259,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE31
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      28.80 GB (30,927,052,800 bytes)
Total Cylinders     3,760
Total Sectors       60,404,400
Total Tracks        958,800
Tracks/Cylinder     255
Partition Disk #31, Partition #0
Partition Size      28.80 GB (30,927,020,544 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE32
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      48.34 GB (51,901,516,800 bytes)
Total Cylinders     6,310
Total Sectors       101,370,150
Total Tracks        1,609,050
Tracks/Cylinder     255
Partition Disk #32, Partition #0
Partition Size      48.33 GB (51,893,259,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE18
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      28.80 GB (30,927,052,800 bytes)
Total Cylinders     3,760
Total Sectors       60,404,400
Total Tracks        958,800
Tracks/Cylinder     255
Partition Disk #18, Partition #0
Partition Size      28.80 GB (30,927,020,544 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE19
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
```

```
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      48.34 GB (51,901,516,800 bytes)
Total Cylinders     6,310
Total Sectors       101,370,150
Total Tracks        1,609,050
Tracks/Cylinder     255
Partition Disk #19, Partition #0
Partition Size      48.33 GB (51,893,259,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE10
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      28.80 GB (30,927,052,800 bytes)
Total Cylinders     3,760
Total Sectors       60,404,400
Total Tracks        958,800
Tracks/Cylinder     255
Partition Disk #10, Partition #0
Partition Size      28.80 GB (30,927,020,544 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE11
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      48.34 GB (51,901,516,800 bytes)
Total Cylinders     6,310
Total Sectors       101,370,150
Total Tracks        1,609,050
Tracks/Cylinder     255
Partition Disk #11, Partition #0
Partition Size      48.33 GB (51,893,259,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE12
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      436.21 GB (468,380,344,320 bytes)
Total Cylinders     56,944
Total Sectors       914,805,360
Total Tracks        14,520,720
Tracks/Cylinder     255
Partition Disk #12, Partition #0
Partition Size      436.21 GB (468,380,312,064 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE1
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      28.80 GB (30,927,052,800 bytes)
Total Cylinders     3,760
Total Sectors       60,404,400
Total Tracks        958,800
Tracks/Cylinder     255
Partition Disk #1, Partition #0
Partition Size      28.80 GB (30,927,020,544 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE2
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      48.34 GB (51,901,516,800 bytes)
Total Cylinders     6,310
Total Sectors       101,370,150
Total Tracks        1,609,050
Tracks/Cylinder     255
Partition Disk #2, Partition #0
Partition Size      48.33 GB (51,893,259,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE3
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      28.80 GB (30,927,052,800 bytes)
Total Cylinders     3,760
Total Sectors       60,404,400
Total Tracks        958,800
Tracks/Cylinder     255
Partition Disk #3, Partition #0
Partition Size      28.80 GB (30,927,020,544 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE4
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      48.34 GB (51,901,516,800 bytes)
Total Cylinders     6,310
Total Sectors       101,370,150
Total Tracks        1,609,050
Tracks/Cylinder     255
Partition Disk #4, Partition #0
Partition Size      48.33 GB (51,893,259,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE13
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      28.80 GB (30,927,052,800 bytes)
Total Cylinders     3,760
Total Sectors       60,404,400
Total Tracks        958,800
Tracks/Cylinder     255
Partition Disk #13, Partition #0
Partition Size      28.80 GB (30,927,020,544 bytes)

Partition Starting Offset     32,256 bytes
```

```
Description         \\.\PHYSICALDRIVE14
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      48.34 GB (51,901,516,800 bytes)
Total Cylinders     6,310
Total Sectors       101,370,150
Total Tracks        1,609,050
Tracks/Cylinder     255
Partition Disk #14, Partition #0
Partition Size      48.33 GB (51,893,259,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE15
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      28.80 GB (30,927,052,800 bytes)
Total Cylinders     3,760
Total Sectors       60,404,400
Total Tracks        958,800
Tracks/Cylinder     255
Partition Disk #15, Partition #0
Partition Size      28.80 GB (30,927,020,544 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE16
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      48.34 GB (51,901,516,800 bytes)
Total Cylinders     6,310
Total Sectors       101,370,150
Total Tracks        1,609,050
Tracks/Cylinder     255
Partition Disk #16, Partition #0
Partition Size      48.33 GB (51,893,259,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE17
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      436.21 GB (468,380,344,320 bytes)
Total Cylinders     56,944
Total Sectors       914,805,360
Total Tracks        14,520,720
Tracks/Cylinder     255
Partition Disk #17, Partition #0
Partition Size      436.21 GB (468,380,312,064 bytes)

Partition Starting Offset     32,256 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     COMPAQ LOGICAL VOLUME SCSI Disk Device
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  0
SCSI Logical Unit   0
SCSI Port 2
SCSI Target ID      4
Sectors/Track       32
Size      33.91 GB (36,414,750,720 bytes)
Total Cylinders     8,716
Total Sectors       71,122,560
Total Tracks        2,222,580
Tracks/Cylinder     255
Partition Disk #33, Partition #0
Partition Size      33.91 GB (36,410,556,416 bytes)

Partition Starting Offset     16,384 bytes

[SCSI]

Item      Value
Name      Compaq Smart Array 5i Controller
Manufacturer        Compaq
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_B178&SUBSYS_40800E11&REV_0
1\4&82820FC&0&2038
Memory Address      0xF77C0000-0xF77FFFFF
I/O Port  0x00005000-0x00005FFF
Memory Address      0xF5EF0000-0xF5EF3FFF
IRQ Channel         IRQ 18
Driver    c:\windows\system32\drivers\cpqcissm.sys
(5.48.0.32 Build 3 (NT.041001-1408), 18.00 KB (18,432
bytes), 3/25/2003 6:00 AM)

Name      Smart Array 642 Controller (Non-Miniport)

Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409B0E11&REV_0
1\4&24B9E852&0&3840
Memory Address      0xF78F0000-0xF78F1FFF
I/O Port  0x00006000-0x00007FFF
Memory Address      0xF7880000-0xF78BFFFF
IRQ Channel         IRQ 28
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

Name      Smart Array 6400 Controller (Non-Miniport)

Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_0
1\5&34813DC5&0&204040
Memory Address      0xF79F0000-0xF79F1FFF
I/O Port  0x00007000-0x00007FFF
IRQ Channel         IRQ 30
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

Name      Smart Array 6400 Controller U320 Expansion
Module (Non-Miniport)
Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_0
1\5&34813DC5&0&284040
Memory Address      0xF7970000-0xF7971FFF
I/O Port  0x00007400-0x000074FF
IRQ Channel         IRQ 31
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

Name      Smart Array 6400 Controller (Non-Miniport)

Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_0
1\5&56DD264&0&206848
Memory Address      0xF7AF0000-0xF7AF1FFF
I/O Port  0x00008000-0x0000DFFF
IRQ Channel         IRQ 32
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

Name      Smart Array 6400 Controller U320 Expansion
Module (Non-Miniport)
```

```
Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_0
1\5&56DD264&0&286848
Memory Address      0xF7A70000-0xF7A71FFF
I/O Port  0x00008400-0x000084FF
IRQ Channel         IRQ 33
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

Name      Smart Array 6400 Controller (Non-Miniport)

Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_0
1\5&25998046&0&207050
Memory Address      0xF7BF0000-0xF7BF1FFF
I/O Port  0x00009000-0x00009FFF
IRQ Channel         IRQ 36
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

Name      Smart Array 6400 Controller U320 Expansion
Module (Non-Miniport)
Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_0
1\5&25998046&0&287050
Memory Address      0xF7B70000-0xF7B71FFF
I/O Port  0x00009400-0x000094FF
IRQ Channel         IRQ 37
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

Name      Smart Array 6400 Controller (Non-Miniport)

Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_0
1\5&1B3A307E&0&204858
Memory Address      0xF7CF0000-0xF7CF1FFF
I/O Port  0x0000A000-0x0000BFFF
IRQ Channel         IRQ 40
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

Name      Smart Array 6400 Controller U320 Expansion
Module (Non-Miniport)
Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_0
1\5&1B3A307E&0&284858
Memory Address      0xF7C70000-0xF7C71FFF
I/O Port  0x0000A400-0x0000A4FF
IRQ Channel         IRQ 41
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

Name      Smart Array 6400 Controller (Non-Miniport)

Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_0
1\5&12699507&0&205058
Memory Address      0xF7DF0000-0xF7DF1FFF
I/O Port  0x0000B000-0x0000BFFF
IRQ Channel         IRQ 42
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

Name      Smart Array 6400 Controller U320 Expansion
Module (Non-Miniport)
Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_0
1\5&12699507&0&285058
Memory Address      0xF7D70000-0xF7D71FFF
I/O Port  0x0000B400-0x0000B4FF
IRQ Channel         IRQ 43
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

Name      Smart Array 6400 Controller (Non-Miniport)

Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_0
1\5&30FCE3FC&0&205860
Memory Address      0xF7EF0000-0xF7EF1FFF
I/O Port  0x0000C000-0x0000DFFF
IRQ Channel         IRQ 44
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

Name      Smart Array 6400 Controller U320 Expansion
Module (Non-Miniport)
Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_0
1\5&30FCE3FC&0&285860
Memory Address      0xF7E70000-0xF7E71FFF
I/O Port  0x0000C400-0x0000C4FF
IRQ Channel         IRQ 45
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

Name      Smart Array 6400 Controller (Non-Miniport)

Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_0
1\5&282C4885&0&206060
Memory Address      0xF7FF0000-0xF7FF1FFF
I/O Port  0x0000D000-0x0000DFFF
IRQ Channel         IRQ 46
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

Name      Smart Array 6400 Controller U320 Expansion
Module (Non-Miniport)
Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_0
1\5&282C4885&0&286060
Memory Address      0xF7F70000-0xF7F71FFF
I/O Port  0x0000D400-0x0000D4FF
IRQ Channel         IRQ 47
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.14.2.32 built by: kadambi, 39.00 KB (39,936
bytes), 6/14/2005 3:52 PM)

[IDE]

Item      Value
Name      Standard Dual Channel PCI IDE Controller

Manufacturer        (Standard IDE ATA/ATAPI
controllers)
Status    OK
PNP Device ID
          PCI\VEN_1022&DEV_7469&SUBSYS_32040E11&REV_0
3\3&20FEA912&0&21
I/O Port  0x00002000-0x0000200F
Driver    c:\windows\system32\drivers\pciide.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 5.50 KB (5,632
bytes), 3/25/2003 6:00 AM)

Name      Primary IDE Channel
Manufacturer        (Standard IDE ATA/ATAPI
controllers)
Status    OK
PNP Device ID       PCIIDE\IDECHANNEL\4&21637DBD&0&0

I/O Port  0x000001F0-0x000001F7
I/O Port  0x000003F6-0x000003F6
IRQ Channel         IRQ 14
Driver    c:\windows\system32\drivers\atapi.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 93.50 KB
(95,744 bytes), 3/25/2003 6:00 AM)

Name      Secondary IDE Channel
Manufacturer        (Standard IDE ATA/ATAPI
controllers)
Status    OK
PNP Device ID       PCIIDE\IDECHANNEL\4&21637DBD&0&1

I/O Port  0x00000170-0x00000177
I/O Port  0x00000376-0x00000376
```

```
Driver    c:\windows\system32\drivers\atapi.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 93.50 KB
(95,744 bytes), 3/25/2003 6:00 AM)

[Printing]

Name      Driver    Port Name Server Name

[Problem Devices]

Device    PNP Device ID       Error Code
Base System Device
          PCI\VEN_0E11&DEV_B203&SUBSYS_B2060E11&REV_0
1\4&12365AD0&0&1018 The drivers for this device are
not installed.
Base System Device
          PCI\VEN_0E11&DEV_B204&SUBSYS_B2060E11&REV_0
1\4&12365AD0&0&1218 The drivers for this device are
not installed.

[USB]

Device    PNP Device ID
Standard OpenHCD USB Host Controller
          PCI\VEN_1022&DEV_7464&SUBSYS_32020E11&REV_0
B\4&12365AD0&0&0018
Standard OpenHCD USB Host Controller
          PCI\VEN_1022&DEV_7464&SUBSYS_32020E11&REV_0
B\4&12365AD0&0&0118

[Software Environment]



[System Drivers]

Name      Description         File      Type
          Started   Start Mode          State
          Status    Error Control       Accept Pause
          Accept Stop
abiosdsk  Abiosdsk  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Ignore    No        No
acpi      Microsoft ACPI Driver
          c:\windows\system32\drivers\acpi.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

acpiec    ACPIEC
          c:\windows\system32\drivers\acpiec.sys
          Kernel Driver       No        Disabled
          Stopped   OK        Normal    No        No

adpu160m  adpu160m  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
adpu320   adpu320   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
afcnt     afcnt     Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No

afd       AFD Networking Support Environment
          c:\windows\system32\drivers\afd.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

aha154x   Aha154x   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
aic78u2   aic78u2   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
aic78xx   aic78xx   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
aliide    AliIde    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
amdk8     AMD K8 Processor Driver
          c:\windows\system32\drivers\amdk8.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

asyncmac  RAS Asynchronous Media Driver
          c:\windows\system32\drivers\asyncmac.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

atapi     Standard IDE/ESDI Hard Disk Controller
          c:\windows\system32\drivers\atapi.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

atdisk    Atdisk    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Ignore    No        No
ati2mpad  ati2mpad
          c:\windows\system32\drivers\ati2mpad.sys
          Kernel Driver       No        Manual
          Stopped   OK        Ignore    No        No

atmarpc   ATM ARP Client Protocol
          c:\windows\system32\drivers\atmarpc.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

audstub   Audio Stub Driver
          c:\windows\system32\drivers\audstub.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

b57w2k    BCM5701 Gigabit Ethernet
          c:\windows\system32\drivers\b57xp32.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

beep      Beep
          c:\windows\system32\drivers\beep.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

cbidf2k   cbidf2k
          c:\windows\system32\drivers\cbidf2k.sys
          Kernel Driver       No        Disabled
          Stopped   OK        Normal    No        No

cd20xrnt  cd20xrnt  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
cdfs      Cdfs
          c:\windows\system32\drivers\cdfs.sys
          File System Driver  Yes       Disabled
          Running   OK        Normal    No        Yes

cdrom     CD-ROM Driver
          c:\windows\system32\drivers\cdrom.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

changer   Changer   Not Available       Kernel Driver
          No        System    Stopped   OK
          Ignore    No        No
clusdisk  Cluster Disk Driver
          c:\windows\system32\drivers\clusdisk.sys
          Kernel Driver       No        Disabled
          Stopped   OK        Normal    No        No

cmdide    CmdIde    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
cpqarray  Cpqarray  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
cpqarry2  cpqarry2  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
cpqcissm  cpqcissm
          c:\windows\system32\drivers\cpqcissm.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

cpqfcalm  cpqfcalm  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
cpuspy3   CpuSpy3 Driver
          \??\c:\windows\system32\drivers\cpuspy3.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

crcdisk   CRC Disk Filter Driver
          c:\windows\system32\drivers\crcdisk.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

dac960nt  dac960nt  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
dellcerc  dellcerc  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
dfsdriver DfsDriver
          c:\windows\system32\drivers\dfs.sys
          File System Driver  Yes       Boot
          Running   OK        Normal    No        Yes

disk      Disk Driver
          c:\windows\system32\drivers\disk.sys
```

```
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

dmboot    dmboot
          c:\windows\system32\drivers\dmboot.sys
          Kernel Driver       No        Disabled
          Stopped   OK        Normal    No        No

dmio      Logical Disk Manager Driver
          c:\windows\system32\drivers\dmio.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

dmload    dmload
          c:\windows\system32\drivers\dmload.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

dpti2o    dpti2o    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
fastfat   Fastfat
          c:\windows\system32\drivers\fastfat.sys
          File System Driver  No        Disabled
          Stopped   OK        Normal    No        No

fdc       Floppy Disk Controller Driver
          c:\windows\system32\drivers\fdc.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

fips      Fips
          c:\windows\system32\drivers\fips.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

flpydisk  Floppy Disk Driver
          c:\windows\system32\drivers\flpydisk.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

fltmgr    FltMgr
          c:\windows\system32\drivers\fltmgr.sys
          File System Driver  Yes       Boot
          Running   OK        Normal    No        Yes

ftdisk    Volume Manager Driver
          c:\windows\system32\drivers\ftdisk.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

gpc       Generic Packet Classifier
          c:\windows\system32\drivers\msgpc.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

hpcisss2  HpCISSs2
          c:\windows\system32\drivers\hpcisss2.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes
```

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hpn       hpn       Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
hpqcissb  Smart Array Controllers Non-Miniport Bus
Driver    c:\windows\system32\drivers\hpqcissb.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

hpqcissd  Smart Array Controllers Non-Miniport Disk
Driver    c:\windows\system32\drivers\hpqcissd.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

hpt3xx    hpt3xx    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
http      HTTP
          c:\windows\system32\drivers\http.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

i2omgmt   i2omgmt   Not Available       Kernel Driver
          No        System    Stopped   OK
          Normal    No        No
i2omp     i2omp     Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
i8042prt  i8042 Keyboard and PS/2 Mouse Port Driver
          c:\windows\system32\drivers\i8042prt.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

iirsp     iirsp     Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
imapi     CD-Burning Filter Driver
          c:\windows\system32\drivers\imapi.sys
          Kernel Driver       No        System
          Stopped   OK        Normal    No        No

intelide  IntelIde  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ip6fw     IPv6 Windows Firewall Driver
          c:\windows\system32\drivers\ip6fw.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

ipfilterdriver      IP Traffic Filter Driver
          c:\windows\system32\drivers\ipfltdrv.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

ipinip    IP in IP Tunnel Driver
          c:\windows\system32\drivers\ipinip.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

ipnat     IP Network Address Translator
          c:\windows\system32\drivers\ipnat.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No
```

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ipsec     IPSEC driver
          c:\windows\system32\drivers\ipsec.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

ipsraidn  ipsraidn  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
isapnp    PnP ISA/EISA Bus Driver
          c:\windows\system32\drivers\isapnp.sys
          Kernel Driver       Yes       Boot
          Running   OK        Critical  No        Yes

kbdclass  Keyboard Class Driver
          c:\windows\system32\drivers\kbdclass.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

ksecdd    KSecDD
          c:\windows\system32\drivers\ksecdd.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

lp6nds35  lp6nds35  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
mnmdd     mnmdd
          c:\windows\system32\drivers\mnmdd.sys
          Kernel Driver       Yes       System
          Running   OK        Ignore    No        Yes

modem     Modem
          c:\windows\system32\drivers\modem.sys
          Kernel Driver       No        Manual
          Stopped   OK        Ignore    No        No

mouclass  Mouse Class Driver
          c:\windows\system32\drivers\mouclass.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

mountmgr  Mount Point Manager
          c:\windows\system32\drivers\mountmgr.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

mraid35x  mraid35x  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
mrxdav    WebDav Client Redirector
          c:\windows\system32\drivers\mrxdav.sys
          File System Driver  No        Manual
          Stopped   OK        Normal    No        No

mrxsmb    MRXSMB
          c:\windows\system32\drivers\mrxsmb.sys
          File System Driver  Yes       System
          Running   OK        Normal    No        Yes

msfs      Msfs
          c:\windows\system32\drivers\msfs.sys
          File System Driver  Yes       System
```

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          Running   OK        Normal    No        Yes

mssmbios  Microsoft System Management BIOS Driver
          c:\windows\system32\drivers\mssmbios.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

multevent MultEvent Driver
          \??\c:\windows\system32\drivers\multeventdr
iver.sys  Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

mup       Mup
          c:\windows\system32\drivers\mup.sys
          File System Driver  Yes       Boot
          Running   OK        Normal    No        Yes

ndis      NDIS System Driver
          c:\windows\system32\drivers\ndis.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

ndistapi  Remote Access NDIS TAPI Driver
          c:\windows\system32\drivers\ndistapi.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

ndisuio   NDIS Usermode I/O Protocol
          c:\windows\system32\drivers\ndisuio.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

ndiswan   Remote Access NDIS WAN Driver
          c:\windows\system32\drivers\ndiswan.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

ndproxy   NDIS Proxy
          c:\windows\system32\drivers\ndproxy.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

netbios   NetBIOS Interface
          c:\windows\system32\drivers\netbios.sys
          File System Driver  Yes       System
          Running   OK        Normal    No        Yes

netbt     NetBios over Tcpip
          c:\windows\system32\drivers\netbt.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

nfrd960   nfrd960   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
npfs      Npfs
          c:\windows\system32\drivers\npfs.sys
          File System Driver  Yes       System
          Running   OK        Normal    No        Yes

ntfs      Ntfs
          c:\windows\system32\drivers\ntfs.sys
          File System Driver  Yes       Disabled
          Running   OK        Normal    No        Yes

null      Null
          c:\windows\system32\drivers\null.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

parport   Parport
          c:\windows\system32\drivers\parport.sys
          Kernel Driver       No        Manual
          Stopped   OK        Ignore    No        No

partmgr   Partition Manager
          c:\windows\system32\drivers\partmgr.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

pci       PCI Bus Driver
          c:\windows\system32\drivers\pci.sys
          Kernel Driver       Yes       Boot
          Running   OK        Critical  No        Yes

pciide    PCIIde
          c:\windows\system32\drivers\pciide.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

pcmcia    Pcmcia
          c:\windows\system32\drivers\pcmcia.sys
          Kernel Driver       No        Disabled
          Stopped   OK        Normal    No        No

pdcomp    PDCOMP    Not Available       Kernel Driver
          No        Manual    Stopped   OK
          Ignore    No        No
pdframe   PDFRAME   Not Available       Kernel Driver
          No        Manual    Stopped   OK
          Ignore    No        No
pdreli    PDRELI    Not Available       Kernel Driver
          No        Manual    Stopped   OK
          Ignore    No        No
pdrframe  PDRFRAME  Not Available       Kernel Driver
          No        Manual    Stopped   OK
          Ignore    No        No
perc2     perc2     Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
perc2hib  perc2hib  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
pptpminiport        WAN Miniport (PPTP)
          c:\windows\system32\drivers\raspptp.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

processor Processor Driver
          c:\windows\system32\drivers\processr.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

ptilink   Direct Parallel Link Driver
          c:\windows\system32\drivers\ptilink.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

q57w2k    HP NC7770 Gigabit Server Adapter
          c:\windows\system32\drivers\q57xp32.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

ql1080    ql1080    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ql10wnt   Ql10wnt   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ql12160   ql12160   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ql1240    ql1240    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ql1280    ql1280    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ql2100    ql2100    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ql2200    ql2200    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ql2300    ql2300    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
rasacd    Remote Access Auto Connection Driver
          c:\windows\system32\drivers\rasacd.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

rasl2tp   WAN Miniport (L2TP)
          c:\windows\system32\drivers\rasl2tp.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

raspppoe  Remote Access PPPOE Driver
          c:\windows\system32\drivers\raspppoe.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

raspti    Direct Parallel
          c:\windows\system32\drivers\raspti.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

rdbss     Rdbss
          c:\windows\system32\drivers\rdbss.sys
          File System Driver  Yes       System
          Running   OK        Normal    No        Yes

rdpcdd    RDPCDD
          c:\windows\system32\drivers\rdpcdd.sys
          Kernel Driver       Yes       System
          Running   OK        Ignore    No        Yes

rdpdr     Terminal Server Device Redirector Driver
          c:\windows\system32\drivers\rdpdr.sys
```

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          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

rdpwd     RDPWD
          c:\windows\system32\drivers\rdpwd.sys
          Kernel Driver       Yes       Manual
          Running   OK        Ignore    No        Yes

redbook   Digital CD Audio Playback Filter Driver
          c:\windows\system32\drivers\redbook.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

secdrv    Secdrv
          c:\windows\system32\drivers\secdrv.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

serenum   Serenum Filter Driver
          c:\windows\system32\drivers\serenum.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

serial    Serial port driver
          c:\windows\system32\drivers\serial.sys
          Kernel Driver       Yes       System
          Running   OK        Ignore    No        Yes

sfloppy   Sfloppy
          c:\windows\system32\drivers\sfloppy.sys
          Kernel Driver       No        System
          Stopped   OK        Ignore    No        No

simbad    Simbad    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
sparrow   Sparrow   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
srv       Srv
          c:\windows\system32\drivers\srv.sys
          File System Driver  Yes       Manual
          Running   OK        Normal    No        Yes

swenum    Software Bus Driver
          c:\windows\system32\drivers\swenum.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

symc810   symc810   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
symc8xx   symc8xx   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
symmpi    symmpi    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
sym_hi    sym_hi    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No

sym_u3    sym_u3    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
tcpip     TCP/IP Protocol Driver
          c:\windows\system32\drivers\tcpip.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

tdpipe    TDPIPE
          c:\windows\system32\drivers\tdpipe.sys
          Kernel Driver       No        Manual
          Stopped   OK        Ignore    No        No

tdtcp     TDTCP
          c:\windows\system32\drivers\tdtcp.sys
          Kernel Driver       Yes       Manual
          Running   OK        Ignore    No        Yes

termdd    Terminal Device Driver
          c:\windows\system32\drivers\termdd.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

toside    TosIde    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
udfs      Udfs
          c:\windows\system32\drivers\udfs.sys
          File System Driver  No        Disabled
          Stopped   OK        Normal    No        No

ultra     ultra     Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
update    Microcode Update Driver
          c:\windows\system32\drivers\update.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

usbhub    Microsoft USB Standard Hub Driver
          c:\windows\system32\drivers\usbhub.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

usbohci   Microsoft USB Open Host Controller Miniport
Driver    c:\windows\system32\drivers\usbohci.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

usbstor   USB Mass Storage Driver
          c:\windows\system32\drivers\usbstor.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

vga       vga
          c:\windows\system32\drivers\vgapnp.sys
          Kernel Driver       Yes       Manual
          Running   OK        Ignore    No        Yes

vgasave   VGA Display Controller.
          c:\windows\system32\drivers\vga.sys
          Kernel Driver       No        System
          Stopped   OK        Ignore    No        No

viaide    ViaIde    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
volsnap   Storage volumes
          c:\windows\system32\drivers\volsnap.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

wanarp    Remote Access IP ARP Driver
          c:\windows\system32\drivers\wanarp.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

wdica     WDICA     Not Available       Kernel Driver
          No        Manual    Stopped   OK
          Ignore    No        No
wlbs      Network Load Balancing
          c:\windows\system32\drivers\wlbs.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No


[Signed Drivers]

Device Name         Signed    Device Class
          Driver Version      Driver Date
          Manufacturer        INF Name  Driver Name
          Device ID
Microsoft System Management BIOS Driver Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available       ROOT\SYSTEM\0002
Microcode Update Device       Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ROOT\SYSTEM\0001
Plug and Play Software Device Enumerator          Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available       ROOT\SYSTEM\0000
Terminal Server Mouse Driver  Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ROOT\RDP_MOU\0000
Terminal Server Keyboard Driver         Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available       ROOT\RDP_KBD\0000
Terminal Server Device Redirector       Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available       ROOT\RDPDR\0000
Direct Parallel     Yes       NET       5.2.3790.0
          10/1/2002 Microsoft netrasa.inf         Not
Available ROOT\MS_PTIMINIPORT\0000
WAN Miniport (PPTP) Yes       NET       5.2.3790.0
          10/1/2002 Microsoft netrasa.inf         Not
Available ROOT\MS_PPTPMINIPORT\0000
WAN Miniport (PPPOE)          Yes       NET
          5.2.3790.0          10/1/2002 Microsoft
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          netrasa.inf         Not Available
          ROOT\MS_PPPOEMINIPORT\0000
WAN Miniport (IP)   Yes       NET       5.2.3790.0
          10/1/2002 Microsoft netrasa.inf         Not
Available ROOT\MS_NDISWANIP\0000
WAN Miniport (L2TP) Yes       NET       5.2.3790.0
          10/1/2002 Microsoft netrasa.inf         Not
Available ROOT\MS_L2TPMINIPORT\0000
Video Codecs        Yes       MEDIA     5.2.3790.0
          10/1/2002 (Standard system devices)
          wave.inf  Not Available
          ROOT\MEDIA\MS_MMVID
Legacy Video Capture Devices  Yes       MEDIA
          5.2.3790.0          10/1/2002 (Standard
system devices)     wave.inf  Not Available
          ROOT\MEDIA\MS_MMVCD
Media Control Devices         Yes       MEDIA
          5.2.3790.0          10/1/2002 (Standard
system devices)     wave.inf  Not Available
          ROOT\MEDIA\MS_MMMCI
Legacy Audio Drivers          Yes       MEDIA
          5.2.3790.0          10/1/2002 (Standard
system devices)     wave.inf  Not Available
          ROOT\MEDIA\MS_MMDRV
Audio Codecs        Yes       MEDIA     5.2.3790.0
          10/1/2002 (Standard system devices)
          wave.inf  Not Available
          ROOT\MEDIA\MS_MMACM
Remote Access IP ARP Driver   Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_WANARP\0000
volsnap   Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available
          ROOT\LEGACY_VOLSNAP\0000
TDTCP     Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_TDTCP\0000

TCP/IP Protocol Driver        Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_TCPIP\0000
RDPWD     Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_RDPWD\0000

RDPCDD    Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_RDPCDD\0000

Remote Access Auto Connection Driver    Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_RASACD\0000
Partition Manager   Not Available       LEGACYDRIVER
          Not Available       Not Available       Not
Available Not Available       Not Available
          ROOT\LEGACY_PARTMGR\0000
Null      Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_NULL\0000

NetBios over Tcpip  Not Available       LEGACYDRIVER
          Not Available       Not Available       Not
Available Not Available       Not Available
          ROOT\LEGACY_NETBT\0000
NDProxy   Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available
          ROOT\LEGACY_NDPROXY\0000
NDIS Usermode I/O Protocol    Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_NDISUIO\0000
Remote Access NDIS TAPI Driver          Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_NDISTAPI\0000
NDIS System Driver  Not Available       LEGACYDRIVER
          Not Available       Not Available       Not
Available Not Available       Not Available
          ROOT\LEGACY_NDIS\0000
MultEvent Driver    Not Available       LEGACYDRIVER
          Not Available       Not Available       Not
Available Not Available       Not Available
          ROOT\LEGACY_MULTEVENT\0000
mountmgr  Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available
          ROOT\LEGACY_MOUNTMGR\0000
mnmdd     Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_MNMDD\0000

ksecdd    Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_KSECDD\0000

IPSEC driver        Not Available       LEGACYDRIVER
          Not Available       Not Available       Not
Available Not Available       Not Available
          ROOT\LEGACY_IPSEC\0000
HpCISSs2  Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available
          ROOT\LEGACY_HPCISSS2\0000
Generic Packet Classifier     Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_GPC\0000
Fips      Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_FIPS\0000

dmload    Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_DMLOAD\0000

dmboot    Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_DMBOOT\0000

CRC Disk Filter Driver        Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_CRCDISK\0000
CpuSpy3 Driver      Not Available       LEGACYDRIVER
          Not Available       Not Available       Not
Available Not Available       Not Available
          ROOT\LEGACY_CPUSPY3\0000
Beep      Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_BEEP\0000

AFD Networking Support Environment      Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
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          10/1/2002 Microsoft volume.inf          Not
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          10/1/2002 Microsoft volume.inf          Not
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Generic volume      Yes       VOLUME    5.2.3790.1830
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Generic volume      Yes       VOLUME    5.2.3790.1830
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57OFFSET7E00LENGTHC15144C00
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
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Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
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        10/1/2002 Microsoft volume.inf          Not
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        10/1/2002 Microsoft volume.inf          Not
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        10/1/2002 Microsoft volume.inf          Not
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        10/1/2002 Microsoft volume.inf          Not
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Generic volume      Yes       VOLUME    5.2.3790.1830
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Generic volume      Yes       VOLUME    5.2.3790.1830
        10/1/2002 Microsoft volume.inf          Not
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Generic volume      Yes       VOLUME    5.2.3790.1830
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        10/1/2002 Microsoft volume.inf          Not
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        10/1/2002 Microsoft volume.inf          Not
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Generic volume      Yes       VOLUME    5.2.3790.1830
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        machine.inf         Not Available
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Logical Disk Manager          Yes       SYSTEM
        5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
        ROOT\DMIO\0000
ACPI Fixed Feature Button     Yes       SYSTEM
        5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
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AMD-8131 HyperTransport(tm) IOAPIC Controller     Yes
        SYSTEM    5.2.3790.1830       10/1/2002 AMD
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Smart Array 6400 Controller U320 Expansion Module
(Non-Miniport)      No        SCSIADAPTER
        5.14.2.32 2/8/2005  Hewlett-Packard
        oem1.inf  Not Available
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        5.8.2.32  2/8/2005  Hewlett-Packard
        oem2.inf  Not Available
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        Hewlett-Packard     oem1.inf  Not Available
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PCI standard PCI-to-PCI bridge          Yes
        SYSTEM    5.2.3790.1830       10/1/2002
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Smart Array 6400 Controller U320 Expansion Module
(Non-Miniport)      No        SCSIADAPTER
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Smart Array 6400 Controller (Non-Miniport)        No
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          Hewlett-Packard     oem1.inf  Not Available
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PCI standard PCI-to-PCI bridge          Yes
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PCI standard PCI-to-PCI bridge          Yes
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AMD-8131 HyperTransport(tm) IOAPIC Controller     Yes
          SYSTEM    5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
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Smart Array 6400 Controller U320 Expansion Module
(Non-Miniport)      No        SCSIADAPTER
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PCI standard PCI-to-PCI bridge          Yes
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Smart Array 6400 Controller U320 Expansion Module
(Non-Miniport)      No        SCSIADAPTER
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Smart Array 6400 Controller (Non-Miniport)        No
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PCI standard PCI-to-PCI bridge          Yes
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AMD-8131 HyperTransport(tm) IOAPIC Controller     Yes
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(Non-Miniport)      No        SCSIADAPTER
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(Non-Miniport)      No        SCSIADAPTER
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          SCSIADAPTER         5.14.2.32 2/8/2005
          Hewlett-Packard     oem1.inf  Not Available
          PCI\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_0
1\5&56DD264&0&206848
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_1014&DEV_01A7&SUBSYS_00000000&REV_0
2\4&25F4D2AC&0&6848
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_1022&DEV_7450&SUBSYS_00000000&REV_1
2\3&33B859B7&0&48
PCI bus   Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0A03\8
AMD Miscellaneous Configuration         Yes
          SYSTEM    5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_1103&SUBSYS_00000000&REV_0
0\3&20FEA912&0&DB
AMD DRAM and HyperTransport(tm) Trace Mode
Configuration       Yes       SYSTEM    5.2.3790.1830
          10/1/2002 AMD       machine.inf         Not
Available
          PCI\VEN_1022&DEV_1102&SUBSYS_00000000&REV_0
0\3&20FEA912&0&DA
AMD Address Map Configuration Yes       SYSTEM
          5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_1101&SUBSYS_00000000&REV_0
0\3&20FEA912&0&D9
AMD HyperTransport(tm) Configuration    Yes
          SYSTEM    5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_1100&SUBSYS_00000000&REV_0
0\3&20FEA912&0&D8
AMD Miscellaneous Configuration         Yes
          SYSTEM    5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_1103&SUBSYS_00000000&REV_0
0\3&20FEA912&0&D3
AMD DRAM and HyperTransport(tm) Trace Mode
Configuration       Yes       SYSTEM    5.2.3790.1830
          10/1/2002 AMD       machine.inf         Not
Available
          PCI\VEN_1022&DEV_1102&SUBSYS_00000000&REV_0
0\3&20FEA912&0&D2
AMD Address Map Configuration Yes       SYSTEM
          5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_1101&SUBSYS_00000000&REV_0
0\3&20FEA912&0&D1
AMD HyperTransport(tm) Configuration    Yes
          SYSTEM    5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_1100&SUBSYS_00000000&REV_0
0\3&20FEA912&0&D0
AMD Miscellaneous Configuration         Yes
          SYSTEM    5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_1103&SUBSYS_00000000&REV_0
0\3&20FEA912&0&CB
AMD DRAM and HyperTransport(tm) Trace Mode
Configuration       Yes       SYSTEM    5.2.3790.1830
          10/1/2002 AMD       machine.inf         Not
Available
          PCI\VEN_1022&DEV_1102&SUBSYS_00000000&REV_0
0\3&20FEA912&0&CA
AMD Address Map Configuration Yes       SYSTEM
          5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_1101&SUBSYS_00000000&REV_0
0\3&20FEA912&0&C9
AMD HyperTransport(tm) Configuration    Yes
          SYSTEM    5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_1100&SUBSYS_00000000&REV_0
0\3&20FEA912&0&C8
AMD Miscellaneous Configuration         Yes
          SYSTEM    5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_1103&SUBSYS_00000000&REV_0
0\3&20FEA912&0&C3
AMD DRAM and HyperTransport(tm) Trace Mode
Configuration       Yes       SYSTEM    5.2.3790.1830
          10/1/2002 AMD       machine.inf         Not
Available
          PCI\VEN_1022&DEV_1102&SUBSYS_00000000&REV_0
0\3&20FEA912&0&C2
AMD Address Map Configuration Yes       SYSTEM
          5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_1101&SUBSYS_00000000&REV_0
0\3&20FEA912&0&C1
AMD HyperTransport(tm) Configuration    Yes
          SYSTEM    5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_1100&SUBSYS_00000000&REV_0
0\3&20FEA912&0&C0
AMD-8131 HyperTransport(tm) IOAPIC Controller     Yes
          SYSTEM    5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_7451&SUBSYS_00000000&REV_0
1\3&20FEA912&0&41
Smart Array Logical Volume    No        DISKDRIVE
          5.8.2.32  2/8/2005  Hewlett-Packard
          oem2.inf  Not Available
          HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\6&4
F22543&0&0100004000000000
Smart Array Logical Volume    No        DISKDRIVE
          5.8.2.32  2/8/2005  Hewlett-Packard
          oem2.inf  Not Available
          HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\6&4
F22543&0&0000004000000000
Smart Array 6400 Controller U320 Expansion Module
(Non-Miniport)      No        SCSIADAPTER
          5.14.2.32 2/8/2005  Hewlett-Packard
          oem1.inf  Not Available
          PCI\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_0
1\5&34813DC5&0&284040
Smart Array Logical Volume    No        DISKDRIVE
          5.8.2.32  2/8/2005  Hewlett-Packard
          oem2.inf  Not Available
          HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\6&4
B48C0D&0&0100004000000000
Smart Array Logical Volume    No        DISKDRIVE
          5.8.2.32  2/8/2005  Hewlett-Packard
          oem2.inf  Not Available
          HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\6&4
B48C0D&0&0000004000000000
Smart Array 6400 Controller (Non-Miniport)        No
          SCSIADAPTER         5.14.2.32 2/8/2005
          Hewlett-Packard     oem1.inf  Not Available
          PCI\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_0
1\5&34813DC5&0&204040
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_1014&DEV_01A7&SUBSYS_00000000&REV_0
3\4&24B9E852&0&4040
Smart Array Logical Volume    No        DISKDRIVE
          5.8.2.32  2/8/2005  Hewlett-Packard
          oem2.inf  Not Available
          HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\5&1
56CD7E2&0&0000014001000000
Smart Array 642 Controller (Non-Miniport)         No
          SCSIADAPTER         5.14.2.32 2/8/2005
          Hewlett-Packard     oem1.inf  Not Available
          PCI\VEN_0E11&DEV_0046&SUBSYS_409B0E11&REV_0
1\4&24B9E852&0&3840
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
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          Not Available
          PCI\VEN_1022&DEV_7450&SUBSYS_00000000&REV_1
2\3&20FEA912&0&40
AMD-8131 HyperTransport(tm) IOAPIC Controller     Yes
          SYSTEM    5.2.3790.1830       10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_7451&SUBSYS_00000000&REV_0
1\3&20FEA912&0&39
HP NC7782 Gigabit Server Adapter        Yes       NET
          7.103.0.0 1/27/2005 Hewlett-Packard Company
          oem0.inf  Not Available
          PCI\VEN_14E4&DEV_1648&SUBSYS_00D00E11&REV_1
0\4&82820FC&0&3138
HP NC7782 Gigabit Server Adapter        Yes       NET
          7.103.0.0 1/27/2005 Hewlett-Packard Company
          oem0.inf  Not Available
          PCI\VEN_14E4&DEV_1648&SUBSYS_00D00E11&REV_1
0\4&82820FC&0&3038
Disk drive          Yes       DISKDRIVE 5.2.3790.0
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&RE
V_2.58\5&208597A6&0&040
Compaq Virtual LUN  Yes       SYSTEM    5.2.3790.0
          10/1/2002 Compaq    scsidev.inf         Not
Available
          SCSI\OTHER&VEN_COMPAQ&PROD_SCSI_COMMUNICATE
&REV_CISS\5&208597A6&0&000
Compaq Smart Array 5i Controller        Yes
          SCSIADAPTER         5.2.3790.0
          10/1/2002 Compaq    pnpscsi.inf         Not
Available
          PCI\VEN_0E11&DEV_B178&SUBSYS_40800E11&REV_0
1\4&82820FC&0&2038
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_1022&DEV_7450&SUBSYS_00000000&REV_1
2\3&20FEA912&0&38
AMD-8111 System Management Controller   Yes
          SYSTEM    5.2.3790.0          10/1/2002 AMD
          machine.inf         Not Available
          PCI\VEN_1022&DEV_746B&SUBSYS_32050E11&REV_0
5\3&20FEA912&0&23
Secondary IDE Channel         Yes       HDC
          5.2.3790.0          10/1/2002 (Standard IDE
ATA/ATAPI controllers)        mshdc.inf Not Available
          PCIIDE\IDECHANNEL\4&21637DBD&0&1
CD-ROM Drive        Yes       CDROM     5.2.3790.0
          10/1/2002 (Standard CD-ROM drives)
          cdrom.inf Not Available
          IDE\CDROMCOMPAQ_CD-
224E_____________________A.8D____\5&2DC47F1C&0&0
.0.0
Primary IDE Channel Yes       HDC       5.2.3790.0
          10/1/2002 (Standard IDE ATA/ATAPI
controllers)        mshdc.inf Not Available
          PCIIDE\IDECHANNEL\4&21637DBD&0&0
Standard Dual Channel PCI IDE Controller          Yes
          HDC       5.2.3790.0          10/1/2002
          (Standard IDE ATA/ATAPI controllers)
          mshdc.inf Not Available
          PCI\VEN_1022&DEV_7469&SUBSYS_32040E11&REV_0
3\3&20FEA912&0&21
Floppy disk drive   Yes       FLOPPYDISK
          5.2.3790.0          10/1/2002 (Standard
floppy disk drives) flpydisk.inf        Not Available
          FDC\GENERIC_FLOPPY_DRIVE\6&2F72E85F&0&0
Standard floppy disk controller         Yes       FDC
          5.2.3790.0          10/1/2002 (Standard
floppy disk controllers)      fdc.inf   Not Available
          ACPI\PNP0700\5&1C430410&0
Communications Port Yes       PORTS     5.2.3790.0
          10/1/2002 (Standard port types)
          msports.inf         Not Available
          ACPI\PNP0501\0
Extended IO Bus     Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0A06\4&1C7DEDE8&0
PS/2 Compatible Mouse         Yes       MOUSE
          5.2.3790.0          10/1/2002 Microsoft
          msmouse.inf         Not Available
          ACPI\PNP0F13\4&1C7DEDE8&0
Standard 101/102-Key or Microsoft Natural PS/2
Keyboard  Yes       KEYBOARD  5.2.3790.0
          10/1/2002 (Standard keyboards)
          keyboard.inf        Not Available
          ACPI\PNP0303\4&1C7DEDE8&0
System speaker      Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0800\4&1C7DEDE8&0
Direct memory access controller         Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          ACPI\PNP0200\4&1C7DEDE8&0
System timer        Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0100\4&1C7DEDE8&0
Programmable interrupt controller       Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          ACPI\PNP0000\4&1C7DEDE8&0
Motherboard resources         Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ACPI\PNP0C02\0
ISAPNP Read Data Port         Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ISAPNP\READDATAPORT\0
PCI standard ISA bridge       Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          PCI\VEN_1022&DEV_7468&SUBSYS_00000000&REV_0
5\3&20FEA912&0&20
Plug and Play Monitor         Yes       MONITOR
          5.1.2001.0          6/6/2001  (Standard
monitor types)      monitor.inf         Not Available
          DISPLAY\AVO0000\5&38B1FFCB&0&12345678&01&03
Standard VGA Graphics Adapter Yes       DISPLAY
          5.2.3790.0          10/1/2002 (Standard
display types)      display.inf         Not Available
          PCI\VEN_1002&DEV_4752&SUBSYS_001E0E11&REV_2
7\4&12365AD0&0&1818
Base System Device  Not Available       UNKNOWN   Not
Available Not Available       Not Available       Not
Available Not Available
          PCI\VEN_0E11&DEV_B204&SUBSYS_B2060E11&REV_0
1\4&12365AD0&0&1218
Base System Device  Not Available       UNKNOWN   Not
Available Not Available       Not Available       Not
Available Not Available
          PCI\VEN_0E11&DEV_B203&SUBSYS_B2060E11&REV_0
1\4&12365AD0&0&1018
USB Root Hub        Yes       USB       5.2.3790.0
          10/1/2002 (Standard USB Host Controller)
          usbport.inf         Not Available
          USB\ROOT_HUB\5&194CD4CC&0
Standard OpenHCD USB Host Controller    Yes       USB
          5.2.3790.0          10/1/2002 (Standard USB
Host Controller)    usbport.inf         Not Available
          PCI\VEN_1022&DEV_7464&SUBSYS_32020E11&REV_0
B\4&12365AD0&0&0118
USB Root Hub        Yes       USB       5.2.3790.0
          10/1/2002 (Standard USB Host Controller)
          usbport.inf         Not Available
          USB\ROOT_HUB\5&9B4CD91&0
Standard OpenHCD USB Host Controller    Yes       USB
          5.2.3790.0          10/1/2002 (Standard USB
Host Controller)    usbport.inf         Not Available
          PCI\VEN_1022&DEV_7464&SUBSYS_32020E11&REV_0
B\4&12365AD0&0&0018
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_1022&DEV_7460&SUBSYS_00000000&REV_0
7\3&20FEA912&0&18
PCI bus   Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0A03\7
AMD K8 Processor    Yes       PROCESSOR 5.2.3790.1830
          10/1/2002 Advanced Micro Devices
          cpu.inf   Not Available
          ACPI\AUTHENTICAMD_-
_X86_FAMILY_15_MODEL_37\_3
AMD K8 Processor    Yes       PROCESSOR 5.2.3790.1830
          10/1/2002 Advanced Micro Devices
          cpu.inf   Not Available
          ACPI\AUTHENTICAMD_-
_X86_FAMILY_15_MODEL_37\_2
AMD K8 Processor    Yes       PROCESSOR 5.2.3790.1830
          10/1/2002 Advanced Micro Devices
          cpu.inf   Not Available
          ACPI\AUTHENTICAMD_-
_X86_FAMILY_15_MODEL_37\_1
AMD K8 Processor    Yes       PROCESSOR 5.2.3790.1830
          10/1/2002 Advanced Micro Devices
          cpu.inf   Not Available
          ACPI\AUTHENTICAMD_-
_X86_FAMILY_15_MODEL_37\_0
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Microsoft ACPI-Compliant System         Yes
          SYSTEM    5.2.3790.0          10/1/2002
          Microsoft acpi.inf  Not Available
          ACPI_HAL\PNP0C08\0
ACPI Multiprocessor PC          Yes       COMPUTER
          5.2.3790.0          10/1/2002 (Standard
computers)          hal.inf   Not Available
          ROOT\ACPI_HAL\0000
Not Available       Not Available       Not Available
          Not Available       Not Available       Not
Available Not Available       Not Available
          HTREE\ROOT\0

[Environment Variables]

Variable  Value     User Name
ClusterLog          C:\WINDOWS\Cluster\cluster.log
          <SYSTEM>
ComSpec   %SystemRoot%\system32\cmd.exe <SYSTEM>
FP_NO_HOST_CHECK    NO        <SYSTEM>
NUMBER_OF_PROCESSORS          4         <SYSTEM>
OS        Windows_NT          <SYSTEM>
Path      C:\Program Files\Microsoft Visual Studio
8\Common7\IDE\PrivateAssemblies\;C:\Program
Files\Microsoft SQL
Server\90\Tools\Binn\VSShell\Common7\IDE\;C:\Program
Files\Microsoft SQL
Server\90\DTS\Binn\;%SystemRoot%\system32;%SystemRoot
%;%SystemRoot%\System32\Wbem;C:\Program
Files\Microsoft SQL
Server\MSSQL.1\MSSQL\Binn;C:\Program Files\Microsoft
SQL Server\90\Tools\binn\     <SYSTEM>
PATHEXT
          .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF
;.WSH     <SYSTEM>
PROCESSOR_ARCHITECTURE        x86       <SYSTEM>
PROCESSOR_IDENTIFIER          x86 Family 15 Model 37
Stepping 1, AuthenticAMD      <SYSTEM>
PROCESSOR_LEVEL     15        <SYSTEM>
PROCESSOR_REVISION  2501      <SYSTEM>
TEMP      %SystemRoot%\TEMP   <SYSTEM>
TMP       %SystemRoot%\TEMP   <SYSTEM>
windir    %SystemRoot%        <SYSTEM>
lib       C:\Program Files\SQLXML 4.0\bin\
          <SYSTEM>
TEMP      %USERPROFILE%\Local Settings\Temp       NT
AUTHORITY\SYSTEM
TMP       %USERPROFILE%\Local Settings\Temp       NT
AUTHORITY\SYSTEM
TEMP      %USERPROFILE%\Local Settings\Temp       NT
AUTHORITY\LOCAL SERVICE
TMP       %USERPROFILE%\Local Settings\Temp       NT
AUTHORITY\LOCAL SERVICE
TEMP      %USERPROFILE%\Local Settings\Temp       NT
AUTHORITY\NETWORK SERVICE
TMP       %USERPROFILE%\Local Settings\Temp       NT
AUTHORITY\NETWORK SERVICE
TEMP      %USERPROFILE%\Local Settings\Temp
          SCOTTSDALE\Administrator
TMP       %USERPROFILE%\Local Settings\Temp
          SCOTTSDALE\Administrator

[Print Jobs]

Document  Size      Owner     Notify    Status
          Time Submitted      Start Time
          Until Time          Elapsed Time
          Pages Printed       Job ID    Priority
          Parameters          Driver    Print
Processor Host Print Queue    Data Type Name

[Network Connections]

Local Name          Remote Name         Type
          Status    User Name
V:        \\inforb\audit_fdr  Disk      Current
Connection          SCOTTSDALE\bcampbell

[Running Tasks]

Name      Path      Process ID          Priority  Min
Working Set         Max Working Set     Start Time
          Version   Size      File Date
system idle process Not Available       0         0
          Not Available       Not Available       Not
Available Not Available       Not Available       Not
Available
system    Not Available       4         8         0
          1413120   Not Available       Not Available
          Not Available       Not Available
smss.exe  Not Available       1460      11
          204800    1413120   9/19/2005 3:00 PM   Not
Available Not Available       Not Available
csrss.exe Not Available       1588      13        Not
Available Not Available       9/19/2005 3:00 PM   Not
Available Not Available       Not Available
winlogon.exe        c:\windows\system32\winlogon.exe
          1676      13        204800    1413120
          9/19/2005 3:00 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   497.00 KB (508,928
bytes)    6/14/2005 3:23 PM
services.exe        c:\windows\system32\services.exe
          1736      9         204800    1413120
          9/19/2005 3:00 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   107.50 KB (110,080
bytes)    3/25/2003 6:00 AM
lsass.exe c:\windows\system32\lsass.exe 1748      9
          204800    1413120   9/19/2005 3:00 PM
          5.2.3790.0 (srv03_rtm.030324-2048)
          13.00 KB (13,312 bytes)       3/25/2003
6:00 AM
svchost.exe         c:\windows\system32\svchost.exe
          1920      8         204800    1413120
          9/19/2005 3:00 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   14.00 KB (14,336 bytes)
          6/14/2005 3:23 PM
svchost.exe         c:\windows\system32\svchost.exe
          1996      8         204800    1413120
          9/19/2005 3:00 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   14.00 KB (14,336 bytes)
          6/14/2005 3:23 PM
svchost.exe         Not Available       220       8
          Not Available       Not Available
          9/19/2005 3:00 PM   Not Available       Not
Available Not Available
svchost.exe         Not Available       364       8
          Not Available       Not Available
          9/19/2005 3:00 PM   Not Available       Not
Available Not Available
svchost.exe         c:\windows\system32\svchost.exe
          400       8         204800    1413120
          9/19/2005 3:00 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   14.00 KB (14,336 bytes)
          6/14/2005 3:23 PM
spoolsv.exe         c:\windows\system32\spoolsv.exe
          772       8         204800    1413120
          9/19/2005 3:00 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   57.00 KB (58,368 bytes)
          6/14/2005 3:23 PM
msdtc.exe Not Available       808       8         Not
Available Not Available       9/19/2005 3:00 PM   Not
Available Not Available       Not Available
svchost.exe         c:\windows\system32\svchost.exe
          1020      8         204800    1413120
          9/19/2005 3:00 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   14.00 KB (14,336 bytes)
          6/14/2005 3:23 PM
svchost.exe         Not Available       1148      8
          Not Available       Not Available
          9/19/2005 3:00 PM   Not Available       Not
Available Not Available
dllhost.exe         c:\windows\system32\dllhost.exe
          1280      8         204800    1413120
          9/19/2005 3:00 PM   5.2.3790.0
(srv03_rtm.030324-2048)       5.50 KB (5,632 bytes)
          3/25/2003 6:00 AM
msftesql.exe        c:\program files\microsoft sql
server\mssql.1\mssql\binn\msftesql.exe  1348      8
          204800    1413120   9/19/2005 3:00 PM
          12.0.5211.0         86.70 KB (88,784 bytes)
          4/11/2005 2:51 AM
dfssvc.exe          c:\windows\system32\dfssvc.exe
          324       8         204800    1413120
          9/19/2005 3:00 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   160.50 KB (164,352
bytes)    6/14/2005 3:23 PM
svchost.exe         c:\windows\system32\svchost.exe
          296       8         204800    1413120
          9/19/2005 3:00 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   14.00 KB (14,336 bytes)
          6/14/2005 3:23 PM
explorer.exe        c:\windows\explorer.exe
          1116      8         204800    1413120
          9/19/2005 3:00 PM   6.00.3790.1830
(srv03_sp1_rtm.050324-1447)   1.00 MB (1,050,624
bytes)    6/14/2005 3:23 PM
svchost.exe         c:\windows\system32\svchost.exe
          1872      8         204800    1413120
          9/19/2005 3:00 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   14.00 KB (14,336 bytes)
          6/14/2005 3:23 PM
wmiprvse.exe        Not Available       724       8
          Not Available       Not Available
          9/19/2005 3:00 PM   Not Available       Not
Available Not Available
helpctr.exe
          c:\windows\pchealth\helpctr\binaries\helpct
r.exe     3044      8         204800    1413120
```

```
          9/19/2005 3:01 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   778.00 KB (796,672
bytes)    6/14/2005 3:23 PM
helpsvc.exe
          c:\windows\pchealth\helpctr\binaries\helpsv
c.exe     3144      8         204800    1413120
          9/19/2005 3:01 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   745.00 KB (762,880
bytes)    6/14/2005 3:23 PM
wmiprvse.exe        Not Available       3152      8
          Not Available       Not Available
          9/19/2005 3:01 PM   Not Available       Not
Available Not Available

[Loaded Modules]

Name      Version   Size      File Date Manufacturer
          Path
winlogon  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          497.00 KB (508,928 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\winlogon.exe
ntdll     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          748.50 KB (766,464 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\ntdll.dll
kernel32  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1,014.00 KB (1,038,336 bytes) 6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\kernel32.dll
advapi32  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          605.50 KB (620,032 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\advapi32.dll
rpcrt4    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          627.00 KB (642,048 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\rpcrt4.dll
crypt32   5.131.3790.1830 (srv03_sp1_rtm.050324-1447)
          582.00 KB (595,968 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\crypt32.dll
msasn1    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          56.50 KB (57,856 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\msasn1.dll
msvcrt    7.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          340.50 KB (348,672 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\msvcrt.dll
user32    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          574.50 KB (588,288 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\user32.dll
gdi32     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          273.00 KB (279,552 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\gdi32.dll
nddeapi   5.2.3790.0 (srv03_rtm.030324-2048)
          16.00 KB (16,384 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\nddeapi.dll
profmap   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          22.50 KB (23,040 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\profmap.dll
netapi32  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          341.50 KB (349,696 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\netapi32.dll
userenv   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          771.00 KB (789,504 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\userenv.dll
psapi     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          20.00 KB (20,480 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\psapi.dll
regapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          55.00 KB (56,320 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\regapi.dll
secur32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          64.00 KB (65,536 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\secur32.dll
setupapi  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.03 MB (1,079,808 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\setupapi.dll
version   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          18.00 KB (18,432 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\version.dll
winsta    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          54.50 KB (55,808 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\winsta.dll
ws2_32    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          82.00 KB (83,968 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\ws2_32.dll
ws2help   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          19.50 KB (19,968 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\ws2help.dll
msgina    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.16 MB (1,211,904 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\msgina.dll
shsvcs    6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          131.50 KB (134,656 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\shsvcs.dll
shlwapi   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          313.50 KB (321,024 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\shlwapi.dll
sfc       5.2.3790.0 (srv03_rtm.030324-2048)
          4.50 KB (4,608 bytes)         3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\sfc.dll
sfc_os    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          138.00 KB (141,312 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\sfc_os.dll
wintrust  5.131.3790.1830 (srv03_sp1_rtm.050324-1447)
          162.00 KB (165,888 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wintrust.dll
imagehlp  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          145.50 KB (148,992 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\imagehlp.dll
ole32     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.19 MB (1,245,184 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\ole32.dll
comctl32  6.0 (srv03_sp1_rtm.050324-1447)
          1.00 MB (1,051,136 bytes)     3/24/2005
8:41 PM   Microsoft Corporation
          c:\windows\winsxs\x86_microsoft.windows.com
mon-controls_6595b64144ccf1df_6.0.3790.1830_x-
ww_7ae38ccf\comctl32.dll
winscard  5.2.3790.0 (srv03_rtm.030324-2048)
          98.50 KB (100,864 bytes)      3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\winscard.dll
wtsapi32  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          19.00 KB (19,456 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wtsapi32.dll
winmm     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          172.50 KB (176,640 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\winmm.dll
sxs       5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          743.50 KB (761,344 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\sxs.dll
shell32   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          7.99 MB (8,379,392 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\shell32.dll
wldap32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          174.50 KB (178,688 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wldap32.dll
rsaenh    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          183.98 KB (188,392 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\rsaenh.dll
cscdll    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          100.00 KB (102,400 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\cscdll.dll
dimsntfy  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          19.00 KB (19,456 bytes)       6/14/2005
3:24 PM   Microsoft Corporation
          c:\windows\system32\dimsntfy.dll
wlnotify  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          94.50 KB (96,768 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wlnotify.dll
mpr       5.2.3790.0 (srv03_rtm.030324-2048)
          56.00 KB (57,344 bytes)       3/25/2003
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6:00 AM   Microsoft Corporation
          c:\windows\system32\mpr.dll
oleaut32  5.2.3790.1830       543.00 KB (556,032
bytes)    3/25/2003 6:00 AM   Microsoft Corporation
          c:\windows\system32\oleaut32.dll
winspool  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          147.00 KB (150,528 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\winspool.drv
comctl32  5.82 (srv03_sp1_rtm.050324-1447)
          585.00 KB (599,040 bytes)     3/24/2005
8:41 PM   Microsoft Corporation
          c:\windows\winsxs\x86_microsoft.windows.com
mon-controls_6595b64144ccf1df_5.82.3790.1830_x-
ww_1b6f474a\comctl32.dll
uxtheme   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          202.00 KB (206,848 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\uxtheme.dll
samlib    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          46.50 KB (47,616 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\samlib.dll
cscui     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          319.50 KB (327,168 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\cscui.dll
clbcatq   2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     502.50 KB (514,560 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\clbcatq.dll
comres    2001.12.4720.0 (srv03_rtm.030324-2048)
          778.00 KB (796,672 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\comres.dll
ntmarta   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          120.50 KB (123,392 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\ntmarta.dll
xpsp2res  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          2.76 MB (2,897,920 bytes)     6/14/2005
3:24 PM   Microsoft Corporation
          c:\windows\system32\xpsp2res.dll
services  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          107.50 KB (110,080 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\services.exe
ncobjapi  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          36.00 KB (36,864 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\ncobjapi.dll
msvcp60   6.05.2144.0         388.00 KB (397,312
bytes)    3/25/2003 6:00 AM   Microsoft Corporation
          c:\windows\system32\msvcp60.dll
scesrv    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          327.00 KB (334,848 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\scesrv.dll
authz     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          66.50 KB (68,096 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\authz.dll
umpnpmgr  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          126.50 KB (129,536 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\umpnpmgr.dll
eventlog  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          67.50 KB (69,120 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\eventlog.dll
lsass     5.2.3790.0 (srv03_rtm.030324-2048)
          13.00 KB (13,312 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\lsass.exe
lsasrv    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          803.00 KB (822,272 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\lsasrv.dll
ntdsapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          71.00 KB (72,704 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\ntdsapi.dll
dnsapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          153.50 KB (157,184 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\dnsapi.dll
samsrv    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          450.50 KB (461,312 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\samsrv.dll
cryptdll  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          32.00 KB (32,768 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\cryptdll.dll
msprivs   5.2.3790.0 (srv03_rtm.030324-2048)
          46.50 KB (47,616 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\msprivs.dll
kerberos  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          340.50 KB (348,672 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\kerberos.dll
msv1_0    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          141.00 KB (144,384 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\msv1_0.dll
iphlpapi  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          92.50 KB (94,720 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\iphlpapi.dll
netlogon  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          409.50 KB (419,328 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\netlogon.dll
w32time   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          222.00 KB (227,328 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\w32time.dll
schannel  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          141.00 KB (144,384 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\schannel.dll
wdigest   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          74.00 KB (75,776 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wdigest.dll
rassfm    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          23.00 KB (23,552 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\rassfm.dll
kdcsvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          213.50 KB (218,624 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\kdcsvc.dll
ntdsa     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.45 MB (1,516,032 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\ntdsa.dll
esent     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1,022.50 KB (1,047,040 bytes) 6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\esent.dll
ntdsatq   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          29.50 KB (30,208 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\ntdsatq.dll
mswsock   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          250.50 KB (256,512 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\mswsock.dll
scecli    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          186.50 KB (190,976 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\scecli.dll
ws03res   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          793.50 KB (812,544 bytes)     6/14/2005
3:24 PM   Microsoft Corporation
          c:\windows\system32\ws03res.dll
ipsecsvc  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          180.50 KB (184,832 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\ipsecsvc.dll
oakley    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          264.00 KB (270,336 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\oakley.dll
winipsec  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          35.50 KB (36,352 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\winipsec.dll
pstorsvc  5.2.3790.0 (srv03_rtm.030324-2048)
          24.00 KB (24,576 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\pstorsvc.dll
psbase    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          84.00 KB (86,016 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\psbase.dll
hnetcfg   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          343.50 KB (351,744 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\hnetcfg.dll
wshtcpip  5.2.3790.0 (srv03_rtm.030324-2048)
          18.00 KB (18,432 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\wshtcpip.dll
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dssenh    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          139.98 KB (143,336 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\dssenh.dll
wlbsctrl  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          82.00 KB (83,968 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wlbsctrl.dll
svchost   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          14.00 KB (14,336 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\svchost.exe
rpcss     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          406.00 KB (415,744 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\rpcss.dll
schedsvc  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          197.50 KB (202,240 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\schedsvc.dll
msidle    6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          6.50 KB (6,656 bytes)         6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\msidle.dll
wkssvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          130.00 KB (133,120 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\wkssvc.dll
wiarpc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          32.50 KB (33,280 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wiarpc.dll
aelupsvc  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          26.00 KB (26,624 bytes)       6/14/2005
3:24 PM   Microsoft Corporation
          c:\windows\system32\aelupsvc.dll
apphelp   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          146.50 KB (150,016 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\apphelp.dll
cryptsvc  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          55.50 KB (56,832 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\cryptsvc.dll
certcli   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          227.00 KB (232,448 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\certcli.dll
atl       3.05.2283 83.00 KB (84,992 bytes)
          3/25/2003 6:00 AM   Microsoft Corporation
          c:\windows\system32\atl.dll
vssapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          548.00 KB (561,152 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\vssapi.dll
dmserver  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          25.50 KB (26,112 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\dmserver.dll
es        2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     233.00 KB (238,592 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\es.dll
pchsvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          39.00 KB (39,936 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\pchsvc
.dll
srvsvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          93.50 KB (95,744 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\srvsvc.dll
netman    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          258.50 KB (264,704 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\netman.dll
mprapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          89.00 KB (91,136 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\mprapi.dll
activeds  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          194.00 KB (198,656 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\activeds.dll
adsldpc   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          146.00 KB (149,504 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\adsldpc.dll
credui    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          162.00 KB (165,888 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\credui.dll
rtutils   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          34.50 KB (35,328 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\rtutils.dll
netshell  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.73 MB (1,812,992 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\netshell.dll
clusapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          60.00 KB (61,440 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\clusapi.dll
rasapi32  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          239.50 KB (245,248 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\rasapi32.dll
rasman    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          61.50 KB (62,976 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\rasman.dll
tapi32    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          179.50 KB (183,808 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\tapi32.dll
wininet   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          646.00 KB (661,504 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wininet.dll
wzcsapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          41.00 KB (41,984 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wzcsapi.dll
wzcsvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          364.50 KB (373,248 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wzcsvc.dll
wmi       5.2.3790.0 (srv03_rtm.030324-2048)
          6.50 KB (6,656 bytes)         3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\wmi.dll
dhcpcsvc  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          113.50 KB (116,224 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\dhcpcsvc.dll
seclogon  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          18.50 KB (18,944 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\seclogon.dll
sens      5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          36.50 KB (37,376 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\sens.dll
trkwks    5.2.3790.0 (srv03_rtm.030324-2048)
          85.00 KB (87,040 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\trkwks.dll
wuauserv  5.7.3790.1830 (srv03_sp1_rtm.050324-1447)
          8.00 KB (8,192 bytes)         6/14/2005
3:24 PM   Microsoft Corporation
          c:\windows\system32\wuauserv.dll
wuaueng   5.7.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.18 MB (1,232,896 bytes)     6/14/2005
3:24 PM   Microsoft Corporation
          c:\windows\system32\wuaueng.dll
advpack   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          98.00 KB (100,352 bytes)      6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\advpack.dll
cabinet   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          81.50 KB (83,456 bytes)       3/24/2005
7:35 PM   Microsoft Corporation
          c:\windows\system32\cabinet.dll
mspatcha  5.2.3790.0 (srv03_rtm.030324-2048)
          29.00 KB (29,696 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\mspatcha.dll
shfolder  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          24.50 KB (25,088 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\shfolder.dll
winhttp   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          353.00 KB (361,472 bytes)     3/24/2005
8:41 PM   Microsoft Corporation
          c:\windows\winsxs\x86_microsoft.windows.win
http_6595b64144ccf1df_5.1.3790.1830_x-
ww_74150efb\winhttp.dll
wmisvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          140.00 KB (143,360 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wbem\wmisvc.dll
comsvcs   2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     1.19 MB (1,248,256 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\comsvcs.dll
browser   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          76.50 KB (78,336 bytes)       6/14/2005
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3:23 PM   Microsoft Corporation
          c:\windows\system32\browser.dll
actxprxy  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          96.50 KB (98,816 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\actxprxy.dll
netrap    5.2.3790.0 (srv03_rtm.030324-2048)
          11.50 KB (11,776 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\netrap.dll
netcfgx   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          763.00 KB (781,312 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\netcfgx.dll
wbemprox  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          20.50 KB (20,992 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wbem\wbemprox.dll
wbemcomn  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          221.00 KB (226,304 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wbem\wbemcomn.dll
wbemcore  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          497.50 KB (509,440 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wbem\wbemcore.dll
esscli    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          250.00 KB (256,000 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wbem\esscli.dll
fastprox  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          471.00 KB (482,304 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wbem\fastprox.dll
wbemsvc   5.2.3790.0 (srv03_rtm.030324-2048)
          42.50 KB (43,520 bytes)       6/14/2005
2:53 PM   Microsoft Corporation
          c:\windows\system32\wbem\wbemsvc.dll
wmiutils  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          93.50 KB (95,744 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wbem\wmiutils.dll
repdrvfs  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          172.50 KB (176,640 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wbem\repdrvfs.dll
wmiprvsd  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          404.00 KB (413,696 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wbem\wmiprvsd.dll
wbemess   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          271.50 KB (278,016 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wbem\wbemess.dll
rasmans   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          176.00 KB (180,224 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\rasmans.dll
rastapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          62.00 KB (63,488 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\rastapi.dll
ncprov    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          46.50 KB (47,616 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wbem\ncprov.dll
rasppp    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          205.00 KB (209,920 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\rasppp.dll
ntlsapi   5.2.3790.0 (srv03_rtm.030324-2048)
          8.00 KB (8,192 bytes)         3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\ntlsapi.dll
raschap   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          119.50 KB (122,368 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\raschap.dll
rastls    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          180.00 KB (184,320 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\rastls.dll
cryptui   5.131.3790.1830 (srv03_sp1_rtm.050324-1447)
          496.50 KB (508,416 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\cryptui.dll
ipbootp   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          36.00 KB (36,864 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\ipbootp.dll
rasdlg    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          663.00 KB (678,912 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\rasdlg.dll
rasadhlp  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          7.50 KB (7,680 bytes)         6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\rasadhlp.dll
wbemcons  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          45.50 KB (46,592 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wbem\wbemcons.dll
msxml3    8.70.1104.0         1.06 MB (1,107,456
bytes)    6/14/2005 3:23 PM   Microsoft Corporation
          c:\windows\system32\msxml3.dll
spoolsv   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          57.00 KB (58,368 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\spoolsv.exe
spoolss   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          85.00 KB (87,040 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\spoolss.dll
localspl  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          339.00 KB (347,136 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\localspl.dll
cnbjmon   5.2.3790.1224 (dnsrv(skatari).040514-1058)
          46.50 KB (47,616 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\cnbjmon.dll
pjlmon    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          15.00 KB (15,360 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\pjlmon.dll
tcpmon    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          47.00 KB (48,128 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\tcpmon.dll
wsnmp32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          43.00 KB (44,032 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wsnmp32.dll
tcpmib    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          17.50 KB (17,920 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\tcpmib.dll
wsock32   5.2.3790.0 (srv03_rtm.030324-2048)
          22.00 KB (22,528 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\wsock32.dll
mgmtapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          15.50 KB (15,872 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\mgmtapi.dll
snmpapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          19.50 KB (19,968 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\snmpapi.dll
usbmon    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          17.00 KB (17,408 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\usbmon.dll
winrnr    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          17.00 KB (17,408 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\winrnr.dll
wshqos    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          24.00 KB (24,576 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\wshqos.dll
win32spl  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          100.50 KB (102,912 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\win32spl.dll
inetpp    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          75.00 KB (76,800 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\inetpp.dll
icmp      5.2.3790.0 (srv03_rtm.030324-2048)
          4.50 KB (4,608 bytes)         3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\icmp.dll
ersvc     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          24.00 KB (24,576 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\ersvc.dll
dllhost   5.2.3790.0 (srv03_rtm.030324-2048)
          5.50 KB (5,632 bytes)         3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\dllhost.exe
txflog    2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     96.50 KB (98,816 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\txflog.dll
msftesql  12.0.5211.0         86.70 KB (88,784 bytes)
          4/11/2005 2:51 AM   Microsoft Corporation
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         c:\program files\microsoft sql
server\mssql.1\mssql\binn\msftesql.exe
msfte     12.0.5211.0         2.30 MB (2,411,216
bytes)    4/11/2005 2:51 AM   Microsoft Corporation
         c:\program files\microsoft sql
server\mssql.1\mssql\binn\msfte.dll
dbghelp   6.4.0004.3 (vbl_core(jshay).041001-1326)
         966.21 KB (989,400 bytes)     5/24/2005
9:13 PM   Microsoft Corporation         c:\program
files\microsoft sql
server\mssql.1\mssql\binn\dbghelp.dll
dfssvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         160.50 KB (164,352 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\dfssvc.exe
resutils  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         63.50 KB (65,024 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\resutils.dll
termsrv   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         239.00 KB (244,736 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\termsrv.dll
icaapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         12.50 KB (12,800 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\icaapi.dll
mstlsapi  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         116.00 KB (118,784 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\mstlsapi.dll
rdpwsx    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         101.63 KB (104,072 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\rdpwsx.dll
explorer  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
         1.00 MB (1,050,624 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\explorer.exe
browseui  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
         1,009.00 KB (1,033,216 bytes) 6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\browseui.dll
shdocvw   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
         1.43 MB (1,502,720 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\shdocvw.dll
themeui   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
         377.50 KB (386,560 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\themeui.dll
msimg32   5.2.3790.0 (srv03_rtm.030324-2048)
         4.50 KB (4,608 bytes)         3/25/2003
6:00 AM   Microsoft Corporation
         c:\windows\system32\msimg32.dll
linkinfo  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         19.00 KB (19,456 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\linkinfo.dll
ntshrui   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
         140.00 KB (143,360 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\ntshrui.dll
webcheck  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
         272.50 KB (279,040 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\webcheck.dll
stobject  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         120.50 KB (123,392 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\stobject.dll
batmeter  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
         31.50 KB (32,256 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\batmeter.dll
powrprof  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
         16.50 KB (16,896 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\powrprof.dll
urlmon    6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
         673.00 KB (689,152 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\urlmon.dll
browselc  6.00.3790.0 (srv03_rtm.030324-2048)
         62.00 KB (63,488 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
         c:\windows\system32\browselc.dll
shdoclc   6.00.3790.0 (srv03_rtm.030324-2048)
         588.50 KB (602,624 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
         c:\windows\system32\shdoclc.dll
mprui     5.2.3790.0 (srv03_rtm.030324-2048)
         49.00 KB (50,176 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
         c:\windows\system32\mprui.dll
netui0    5.2.3790.0 (srv03_rtm.030324-2048)
         75.50 KB (77,312 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
         c:\windows\system32\netui0.dll
netui2    5.2.3790.0 (srv03_rtm.030324-2048)
         309.50 KB (316,928 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
         c:\windows\system32\netui2.dll
netui1    5.2.3790.0 (srv03_rtm.030324-2048)
         184.00 KB (188,416 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
         c:\windows\system32\netui1.dll
comdlg32  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
         274.50 KB (281,088 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
         c:\windows\system32\comdlg32.dll
netmsg    5.2.3790.0 (srv03_rtm.030324-2048)
         178.00 KB (182,272 bytes)     3/25/2003
6:00 AM   Microsoft Corporation
         c:\windows\system32\netmsg.dll
netplwiz  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         855.00 KB (875,520 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\netplwiz.dll
drprov    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         14.00 KB (14,336 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\drprov.dll
ntlanman  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         43.50 KB (44,544 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\ntlanman.dll
davclnt   5.2.3790.0 (srv03_rtm.030324-2048)
         23.50 KB (24,064 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
         c:\windows\system32\davclnt.dll
tapisrv   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         248.50 KB (254,464 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\tapisrv.dll
unimdm    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         203.00 KB (207,872 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\unimdm.tsp
uniplat   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         13.00 KB (13,312 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\uniplat.dll
kmddsp    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         34.50 KB (35,328 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\kmddsp.tsp
ndptsp    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         47.00 KB (48,128 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\ndptsp.tsp
ipconf    5.2.3790.0 (srv03_rtm.030324-2048)
         16.50 KB (16,896 bytes)       3/25/2003
6:00 AM   Microsoft Corporation
         c:\windows\system32\ipconf.tsp
h323      5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         259.50 KB (265,728 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\h323.tsp
hidphone  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         29.50 KB (30,208 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\hidphone.tsp
hid       5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         18.50 KB (18,944 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\hid.dll
helpctr   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         778.00 KB (796,672 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\pchealth\helpctr\binaries\helpct
r.exe
hcappres  5.2.3790.0 (srv03_rtm.030324-2048)
         6.50 KB (6,656 bytes)         6/14/2005
2:55 PM   Microsoft Corporation
         c:\windows\pchealth\helpctr\binaries\hcappr
es.dll
itss      5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         133.50 KB (136,704 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\system32\itss.dll
pchshell  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
         104.50 KB (107,008 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
         c:\windows\pchealth\helpctr\binaries\pchshe
ll.dll
mlang     6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
         577.50 KB (591,360 bytes)     6/14/2005
```

```
3:23 PM   Microsoft Corporation
          c:\windows\system32\mlang.dll
mshtml    6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          2.96 MB (3,108,864 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\mshtml.dll
msls31    3.10.349.0          142.00 KB (145,408
bytes)    6/14/2005 3:23 PM   Microsoft Corporation
          c:\windows\system32\msls31.dll
msimtf    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          156.00 KB (159,744 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\msimtf.dll
msctf     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          311.00 KB (318,464 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\msctf.dll
jscript   5.6.0.8827          448.00 KB (458,752
bytes)    6/14/2005 3:23 PM   Microsoft Corporation
          c:\windows\system32\jscript.dll
imm32     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          108.00 KB (110,592 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\imm32.dll
mshtmled  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          454.50 KB (465,408 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\mshtmled.dll
vbscript  5.6.0.8827          392.00 KB (401,408
bytes)    6/14/2005 3:23 PM   Microsoft Corporation
          c:\windows\system32\vbscript.dll
msinfo    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          376.00 KB (385,024 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\msinfo
.dll
mfc42u    6.06.8063.0         1.11 MB (1,163,776
bytes)    6/14/2005 3:23 PM   Microsoft Corporation
          c:\windows\system32\mfc42u.dll
odbc32    3.526.1830.0 (srv03_sp1_rtm.050324-1447)
          240.00 KB (245,760 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\odbc32.dll
odbcint   3.526.1830.0 (srv03_sp1_rtm.050324-1447)
          92.00 KB (94,208 bytes)       6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\system32\odbcint.dll
riched32  5.2.3790.0 (srv03_rtm.030324-2048)
          3.50 KB (3,584 bytes)         3/25/2003
6:00 AM   Microsoft Corporation
          c:\windows\system32\riched32.dll
riched20  5.31.23.1224        439.00 KB (449,536
bytes)    6/14/2005 3:23 PM   Microsoft Corporation
          c:\windows\system32\riched20.dll
helpsvc   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          745.00 KB (762,880 bytes)     6/14/2005
3:23 PM   Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\helpsv
c.exe

[Services]
```

```
Display Name        Name      State     Start Mode
          Service Type        Path      Error Control
          Start Name          Tag ID
Application Experience Lookup Service   AeLookupSvc
          Running   Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Alerter   Alerter   Stopped   Disabled  Share Process
          c:\windows\system32\svchost.exe -k
localservice        Normal    NT
AUTHORITY\LocalService        0
Application Layer Gateway Service       ALG
          Stopped   Manual    Own Process
          c:\windows\system32\alg.exe   Normal    NT
AUTHORITY\LocalService        0
Application Management        AppMgmt   Stopped
          Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
ASP.NET State Service         aspnet_state
          Stopped   Manual    Own Process
          c:\windows\microsoft.net\framework\v2.0.507
27\aspnet_state.exe Normal    NT
AUTHORITY\NetworkService      0
Windows Audio       AudioSrv  Stopped   Disabled
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Background Intelligent Transfer Service BITS
          Stopped   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Computer Browser    Browser   Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Indexing Service    CiSvc     Stopped   Disabled
          Share Process
          c:\windows\system32\cisvc.exe Normal
          LocalSystem         0
ClipBook  ClipSrv   Stopped   Disabled  Own Process
          c:\windows\system32\clipsrv.exe
          Normal    LocalSystem         0
.NET Runtime Optimization Service v2.0.50215_X86
          clr_optimization_v2.0.50215_32
          Stopped   Manual    Own Process
          c:\windows\microsoft.net\framework\v2.0.502
15\mscorsvw.exe     Ignore    LocalSystem         0

COM+ System Application       COMSysApp Running
          Auto      Own Process
          c:\windows\system32\dllhost.exe
/processid:{02d4b3f1-fd88-11d1-960d-00805fc79235}
          Normal    LocalSystem         0
Cryptographic Services        CryptSvc  Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
DCOM Server Process Launcher  DcomLaunch
          Running   Auto      Share Process
          c:\windows\system32\svchost.exe -k
dcomlaunch          Normal    LocalSystem         0
```

```
Distributed File System       Dfs       Running
          Auto      Own Process
          c:\windows\system32\dfssvc.exe
          Normal    LocalSystem         0
DHCP Client         Dhcp      Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k
networkservice      Normal    NT
AUTHORITY\NetworkService      0
Logical Disk Manager Administrative Service
          dmadmin   Stopped   Manual    Share Process
          c:\windows\system32\dmadmin.exe /com
          Normal    LocalSystem         0
Logical Disk Manager          dmserver  Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
DNS Client          Dnscache  Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k
networkservice      Normal    NT
AUTHORITY\NetworkService      0
Error Reporting Service       ERSvc     Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k winerr
          Ignore    LocalSystem         0
Event Log Eventlog  Running   Auto      Share Process
          c:\windows\system32\services.exe
          Normal    LocalSystem         0
COM+ Event System   EventSystem         Running
          Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Help and Support    helpsvc   Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Human Interface Device Access HidServ   Stopped
          Disabled  Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
HTTP SSL  HTTPFilter          Stopped   Manual
          Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
IMAPI CD-Burning COM Service  ImapiService
          Stopped   Disabled  Own Process
          c:\windows\system32\imapi.exe Normal
          LocalSystem         0
Intersite Messaging IsmServ   Stopped   Disabled  Own
Process   c:\windows\system32\ismserv.exe
          Normal    LocalSystem         0
Kerberos Key Distribution Center        kdc
          Stopped   Disabled  Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
Server    lanmanserver        Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Workstation         lanmanworkstation   Running
          Auto      Share Process
```

```
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
License Logging     LicenseService      Stopped
          Disabled  Own Process
          c:\windows\system32\llssrv.exe
          Normal    NT AUTHORITY\NetworkService   0

TCP/IP NetBIOS Helper         LmHosts   Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k
localservice        Normal    NT
AUTHORITY\LocalService        0
Messenger Messenger Stopped   Disabled  Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
NetMeeting Remote Desktop Sharing       mnmsrvc
          Stopped   Disabled  Own Process
          c:\windows\system32\mnmsrvc.exe
          Normal    LocalSystem         0
Distributed Transaction Coordinator     MSDTC
          Running   Auto      Own Process
          c:\windows\system32\msdtc.exe Normal    NT
AUTHORITY\NetworkService      0
msftesql  msftesql  Running   Auto      Own Process
          "c:\program files\microsoft sql
server\mssql.1\mssql\binn\msftesql.exe" -s:mssql.1 -
f:mssqlserver       Normal    LocalSystem         0

Windows Installer   MSIServer Stopped   Manual
          Share Process
          c:\windows\system32\msiexec.exe /v
          Normal    LocalSystem         0
SQL Server (MSSQLSERVER)      MSSQLSERVER
          Stopped   Manual    Own Process
          "c:\program files\microsoft sql
server\mssql.1\mssql\binn\sqlservr.exe" -smssqlserver
          Normal    LocalSystem         0
SQL Server Active Directory Helper
          MSSQLServerADHelper Stopped   Disabled  Own
Process   "c:\program files\microsoft sql
server\90\shared\sqladhlp90.exe"        Normal    NT
AUTHORITY\NETWORK SERVICE     0
Network DDE         NetDDE    Stopped   Manual
          Share Process
          c:\windows\system32\netdde.exe
          Normal    LocalSystem         0
Network DDE DSDM    NetDDEdsdm          Stopped
          Disabled  Share Process
          c:\windows\system32\netdde.exe
          Normal    LocalSystem         0
Net Logon Netlogon  Stopped   Manual    Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
Network Connections Netman    Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Network Location Awareness (NLA)        Nla
          Running   Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
File Replication    NtFrs     Stopped   Manual    Own
Process   c:\windows\system32\ntfrs.exe Ignore
          LocalSystem         0
NT LM Security Support Provider         NtLmSsp
          Running   Manual    Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
Removable Storage   NtmsSvc   Stopped   Manual
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Office Source Engine          ose       Stopped
          Manual    Own Process         "c:\program
files\common files\microsoft shared\source
engine\ose.exe"     Normal    LocalSystem         0

Plug and Play       PlugPlay  Running   Auto
          Share Process
          c:\windows\system32\services.exe
          Normal    LocalSystem         0
IPSEC Services      PolicyAgent         Running
          Auto      Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
Protected Storage   ProtectedStorage    Running
          Auto      Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
Remote Access Auto Connection Manager   RasAuto
          Stopped   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Remote Access Connection Manager        RasMan
          Running   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Remote Desktop Help Session Manager     RDSessMgr
          Stopped   Manual    Own Process
          c:\windows\system32\sessmgr.exe
          Normal    LocalSystem         0
Routing and Remote Access     RemoteAccess
          Stopped   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Remote Registry     RemoteRegistry      Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k regsvc
          Normal    NT AUTHORITY\LocalService     0

Remote Procedure Call (RPC) Locator     RpcLocator
          Stopped   Manual    Own Process
          c:\windows\system32\locator.exe
          Normal    LocalSystem         0
Remote Procedure Call (RPC)   RpcSs     Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k rpcss
          Normal    LocalSystem         0
Resultant Set of Policy Provider        RSoPProv
          Stopped   Manual    Share Process
          c:\windows\system32\rsopprov.exe
          Normal    LocalSystem         0
Special Administration Console Helper   sacsvr
          Stopped   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Security Accounts Manager     SamSs     Running
          Auto      Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
Smart Card          SCardSvr  Stopped   Manual
          Share Process
          c:\windows\system32\scardsvr.exe
          Ignore    NT AUTHORITY\LocalService     0

Task Scheduler      Schedule  Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Secondary Logon     seclogon  Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Ignore    LocalSystem         0
System Event Notification     SENS      Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Windows Firewall/Internet Connection Sharing (ICS)
          SharedAccess        Stopped   Disabled
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Shell Hardware Detection      ShellHWDetection
          Running   Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Ignore    LocalSystem         0
Print Spooler       Spooler   Running   Auto      Own
Process   c:\windows\system32\spoolsv.exe
          Normal    LocalSystem         0
SQL Server Browser  SQLBrowser          Stopped
          Disabled  Own Process         "c:\program
files\microsoft sql server\90\shared\sqlbrowser.exe"
          Normal    LocalSystem         0
SQL Server Agent (MSSQLSERVER)
          SQLSERVERAGENT      Stopped   Disabled  Own
Process   "c:\program files\microsoft sql
server\mssql.1\mssql\binn\sqlagent90.exe" -i
mssqlserver         Normal    LocalSystem         0

SQL Server VSS Writer         SQLWriter Stopped
          Disabled  Own Process         "c:\program
files\microsoft sql server\90\shared\sqlwriter.exe"
          Normal    LocalSystem         0
Windows Image Acquisition (WIA)         stisvc
          Stopped   Disabled  Share Process
          c:\windows\system32\svchost.exe -k imgsvc
          Normal    NT AUTHORITY\LocalService     0

Microsoft Software Shadow Copy Provider swprv
          Stopped   Manual    Own Process
          c:\windows\system32\svchost.exe -k swprv
          Normal    LocalSystem         0
Performance Logs and Alerts   SysmonLog Stopped
          Manual    Own Process
          c:\windows\system32\smlogsvc.exe
          Normal    NT Authority\NetworkService   0
```

```
Telephony TapiSrv   Running   Manual    Share Process
          c:\windows\system32\svchost.exe -k tapisrv
          Normal    LocalSystem         0
Terminal Services   TermService         Running
          Manual    Share Process
          c:\windows\system32\svchost.exe -k termsvcs
          Normal    LocalSystem         0
Themes    Themes    Stopped   Disabled  Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Telnet    TlntSvr   Stopped   Disabled  Own Process
          c:\windows\system32\tlntsvr.exe
          Normal    NT AUTHORITY\LocalService     0

Distributed Link Tracking Server        TrkSvr
          Stopped   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Distributed Link Tracking Client        TrkWks
          Running   Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Terminal Services Session Directory     Tssdis
          Stopped   Disabled  Own Process
          c:\windows\system32\tssdis.exe
          Normal    LocalSystem         0
Windows User Mode Driver Framework      UMWdf
          Stopped   Manual    Own Process
          c:\windows\system32\wdfmgr.exe
          Normal    NT AUTHORITY\LocalService     0

Upload Manager      uploadmgr Stopped   Manual
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Uninterruptible Power Supply  UPS       Stopped
          Manual    Own Process
          c:\windows\system32\ups.exe   Normal
          LocalSystem         0
Virtual Disk Service          vds       Stopped
          Manual    Own Process
          c:\windows\system32\vds.exe   Normal
          LocalSystem         0
Volume Shadow Copy  VSS       Stopped   Manual    Own
Process   c:\windows\system32\vssvc.exe Normal
          LocalSystem         0
Windows Time        W32Time   Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k
localservice        Normal    NT
AUTHORITY\LocalService        0
WebClient WebClient Stopped   Disabled  Share Process
          c:\windows\system32\svchost.exe -k
localservice        Normal    NT
AUTHORITY\LocalService        0
WinHTTP Web Proxy Auto-Discovery Service
          WinHttpAutoProxySvc Stopped   Manual
          Share Process
          c:\windows\system32\svchost.exe -k
localservice        Normal    NT
AUTHORITY\LocalService        0
Windows Management Instrumentation      winmgmt
          Running   Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Ignore    LocalSystem         0
Portable Media Serial Number Service    WmdmPmSN
          Stopped   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Windows Management Instrumentation Driver Extensions
          Wmi       Stopped   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
WMI Performance Adapter       WmiApSrv  Stopped
          Manual    Own Process
          c:\windows\system32\wbem\wmiapsrv.exe
          Normal    LocalSystem         0
Automatic Updates   wuauserv  Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Wireless Configuration        WZCSVC    Stopped
          Disabled  Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Network Provisioning Service  xmlprov   Stopped
          Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0

[Program Groups]

Group Name          Name      User Name
Accessories         Default User:Accessories
          Default User
Accessories\Accessibility     Default
User:Accessories\Accessibility          Default User

Accessories\Entertainment     Default
User:Accessories\Entertainment          Default User

Startup   Default User:Startup          Default User

Accessories         All Users:Accessories         All
Users
Accessories\Accessibility     All
Users:Accessories\Accessibility         All Users
Accessories\Communications    All
Users:Accessories\Communications        All Users
Accessories\Entertainment     All
Users:Accessories\Entertainment         All Users
Accessories\System Tools      All
Users:Accessories\System Tools          All Users
Administrative Tools          All
Users:Administrative Tools    All Users
AMD System Analysis Tools     All Users:AMD System
Analysis Tools      All Users
AMD System Analysis Tools\CpuSpy        All Users:AMD
System Analysis Tools\CpuSpy  All Users
AMD System Analysis Tools\MultEvent     All Users:AMD
System Analysis Tools\MultEvent         All Users
Microsoft SQL Server 2005 CTP All Users:Microsoft SQL
Server 2005 CTP     All Users
Microsoft SQL Server 2005 CTP\Analysis Services   All
Users:Microsoft SQL Server 2005 CTP\Analysis Services
          All Users
Microsoft SQL Server 2005 CTP\Configuration Tools All
Users:Microsoft SQL Server 2005 CTP\Configuration
Tools     All Users
Microsoft SQL Server 2005 CTP\Documentation and
Tutorials All Users:Microsoft SQL Server 2005
CTP\Documentation and Tutorials         All Users
Microsoft SQL Server 2005 CTP\Documentation and
Tutorials\Tutorials All Users:Microsoft SQL Server
2005 CTP\Documentation and Tutorials\Tutorials    All
Users
Microsoft SQL Server 2005 CTP\Performance Tools   All
Users:Microsoft SQL Server 2005 CTP\Performance Tools
          All Users
Microsoft Visual Studio 2005 Beta 2     All
Users:Microsoft Visual Studio 2005 Beta 2         All
Users
Startup   All Users:Startup   All Users
Accessories         NT AUTHORITY\SYSTEM:Accessories
          NT AUTHORITY\SYSTEM
Accessories\Accessibility     NT
AUTHORITY\SYSTEM:Accessories\Accessibility        NT
AUTHORITY\SYSTEM
Accessories\Entertainment     NT
AUTHORITY\SYSTEM:Accessories\Entertainment        NT
AUTHORITY\SYSTEM
Startup   NT AUTHORITY\SYSTEM:Startup   NT
AUTHORITY\SYSTEM
Accessories
          SCOTTSDALE\Administrator:Accessories
          SCOTTSDALE\Administrator
Accessories\Accessibility
          SCOTTSDALE\Administrator:Accessories\Access
ibility   SCOTTSDALE\Administrator
Accessories\Entertainment
          SCOTTSDALE\Administrator:Accessories\Entert
ainment   SCOTTSDALE\Administrator
Administrative Tools
          SCOTTSDALE\Administrator:Administrative
Tools     SCOTTSDALE\Administrator
Startup   SCOTTSDALE\Administrator:Startup
          SCOTTSDALE\Administrator

[Startup Programs]

Program   Command   User Name Location
desktop   desktop.ini         NT AUTHORITY\SYSTEM
          Startup
desktop   desktop.ini
          SCOTTSDALE\Administrator      Startup
desktop   desktop.ini         .DEFAULT  Startup
desktop   desktop.ini         All Users Common
Startup

[OLE Registration]

Object    Local Server
Sound (OLE2)        sndrec32.exe
Media Clip          mplay32.exe
Video Clip          mplay32.exe /avi
MIDI Sequence       mplay32.exe /mid
Sound     Not Available
Media Clip          Not Available
```

```
WordPad Document    "%programfiles%\windows
nt\accessories\wordpad.exe"
Windows Media Services DRM Storage object         Not
Available
Bitmap Image        mspaint.exe

[Windows Error Reporting]

Time      Type      Details

[Internet Settings]



[Internet Explorer]

[ Following are sub-categories of this main category
]
[Summary]

Item      Value
Version   6.0.3790.1830
Build     63790.1830
Application Path    C:\Program Files\Internet
Explorer
Language  English (United States)
Active Printer      Not Available

Cipher Strength     128-bit
Content Advisor     Disabled
IEAK Install        No

[File Versions]

File      Version   Size      Date      Path
          Company
actxprxy.dll        6.0.3790.1830       97 KB
          3/24/2005 5:55:26 PM
          C:\WINDOWS\system32 Microsoft Corporation

advpack.dll         6.0.3790.1830       98 KB
          3/24/2005 5:55:28 PM
          C:\WINDOWS\system32 Microsoft Corporation

asctrls.ocx         6.0.3790.0          90 KB
          3/25/2003 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

browselc.dll        6.0.3790.0          62 KB
          3/25/2003 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

browseui.dll        6.0.3790.1830       1,009 KB
          3/24/2005 5:56:10 PM
          C:\WINDOWS\system32 Microsoft Corporation

cdfview.dll         6.0.3790.1830       149 KB
          3/24/2005 5:56:32 PM
          C:\WINDOWS\system32 Microsoft Corporation

comctl32.dll        5.82.3790.1830      585 KB
          3/24/2005 5:57:56 PM
          C:\WINDOWS\system32 Microsoft Corporation

dxtrans.dll         6.3.3790.1830       205 KB
          3/24/2005 6:00:58 PM
          C:\WINDOWS\system32 Microsoft Corporation

dxtmsft.dll         6.3.3790.1830       355 KB
          3/24/2005 6:00:58 PM
          C:\WINDOWS\system32 Microsoft Corporation

iecont.dll          <File Missing>      Not Available
          Not Available       Not Available       Not
Available
iecontlc.dll        <File Missing>      Not Available
          Not Available       Not Available       Not
Available
iedkcs32.dll        16.0.3790.1830      324 KB
          3/24/2005 6:04:58 PM
          C:\WINDOWS\system32 Microsoft Corporation

iepeers.dll         6.0.3790.1830       248 KB
          3/24/2005 6:04:58 PM
          C:\WINDOWS\system32 Microsoft Corporation

iesetup.dll         6.0.3790.1830       61 KB
          3/24/2005 6:04:58 PM
          C:\WINDOWS\system32 Microsoft Corporation

ieuinit.inf         Not Available       24 KB
          3/24/2005 6:04:58 PM
          C:\WINDOWS\system32 Not Available
iexplore.exe        6.0.3790.1830       92 KB
          3/24/2005 6:04:58 PM          C:\Program
Files\Internet Explorer       Microsoft Corporation

imgutil.dll         6.0.3790.1830       38 KB
          3/24/2005 6:05:04 PM
          C:\WINDOWS\system32 Microsoft Corporation

inetcpl.cpl         6.0.3790.1830       358 KB
          3/24/2005 6:05:06 PM
          C:\WINDOWS\system32 Microsoft Corporation

inetcplc.dll        6.0.3790.0          109 KB
          3/25/2003 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

inseng.dll          6.0.3790.1830       94 KB
          3/24/2005 6:05:06 PM
          C:\WINDOWS\system32 Microsoft Corporation

mlang.dll 6.0.3790.1830       578 KB    3/24/2005
6:07:20 PM          C:\WINDOWS\system32 Microsoft
Corporation
msencode.dll        2002.10.4.0         112 KB
          3/25/2003 7:00:00 AM
          C:\WINDOWS\system32 ?????w??
mshta.exe 6.0.3790.1830       30 KB     3/24/2005
6:07:26 PM          C:\WINDOWS\system32 Microsoft
Corporation
mshtml.dll          6.0.3790.1830       3,036 KB
          3/24/2005 6:07:26 PM
          C:\WINDOWS\system32 Microsoft Corporation

mshtml.tlb          6.0.3790.1830       1,320 KB
          3/24/2005 6:07:26 PM
          C:\WINDOWS\system32 Microsoft Corporation

mshtmled.dll        6.0.3790.1830       455 KB
          3/24/2005 6:07:26 PM
          C:\WINDOWS\system32 Microsoft Corporation

mshtmler.dll        6.0.3790.1830       56 KB
          3/24/2005 6:07:26 PM
          C:\WINDOWS\system32 Microsoft Corporation

msident.dll         6.0.3790.1830       48 KB
          3/24/2005 6:07:28 PM
          C:\WINDOWS\system32 Microsoft Corporation

msidntld.dll        6.0.3790.0          15 KB
          3/25/2003 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

msieftp.dll         6.0.3790.1830       244 KB
          3/24/2005 6:07:28 PM
          C:\WINDOWS\system32 Microsoft Corporation

msrating.dll        6.0.3790.1830       144 KB
          3/24/2005 6:07:36 PM
          C:\WINDOWS\system32 Microsoft Corporation

mstime.dll          6.0.3790.1830       523 KB
          3/24/2005 6:07:38 PM
          C:\WINDOWS\system32 Microsoft Corporation

occache.dll         6.0.3790.1830       94 KB
          3/24/2005 6:08:34 PM
          C:\WINDOWS\system32 Microsoft Corporation

proctexe.ocx        6.3.3790.1830       83 KB
          3/24/2005 6:12:26 PM
          C:\WINDOWS\system32 Intel Corporation
sendmail.dll        6.0.3790.1830       56 KB
          3/24/2005 6:13:36 PM
          C:\WINDOWS\system32 Microsoft Corporation

shdoclc.dll         6.0.3790.0          589 KB
          3/25/2003 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

shdocvw.dll         6.0.3790.1830       1,468 KB
          3/24/2005 6:13:36 PM
          C:\WINDOWS\system32 Microsoft Corporation

shfolder.dll        6.0.3790.1830       25 KB
          3/24/2005 6:13:36 PM
          C:\WINDOWS\system32 Microsoft Corporation

shlwapi.dll         6.0.3790.1830       314 KB
          3/24/2005 6:13:40 PM
          C:\WINDOWS\system32 Microsoft Corporation
```

```
tdc.ocx   1.3.0.3130          58 KB     3/25/2003
7:00:00 AM          C:\WINDOWS\system32 Microsoft
Corporation
url.dll   6.0.3790.1830       37 KB     3/24/2005
6:26:12 PM          C:\WINDOWS\system32 Microsoft
Corporation
urlmon.dll          6.0.3790.1830       673 KB
          3/24/2005 6:26:12 PM
          C:\WINDOWS\system32 Microsoft Corporation

webcheck.dll        6.0.3790.1830       273 KB
          3/24/2005 6:26:16 PM
          C:\WINDOWS\system32 Microsoft Corporation

wininet.dll         6.0.3790.1830       646 KB
          3/24/2005 6:26:18 PM
          C:\WINDOWS\system32 Microsoft Corporation


[Connectivity]

Item      Value
Connection Preference         Never dial

LAN Settings

AutoConfigProxy     wininet.dll
AutoProxyDetectMode Disabled
AutoConfigURL
Proxy     Disabled
ProxyServer
ProxyOverride

[Cache]

[ Following are sub-categories of this main category
]
[Summary]

Item      Value
Page Refresh Type   Automatic
Temporary Internet Files Folder         C:\Documents
and Settings\Administrator\Local Settings\Temporary
Internet Files
Total Disk Space    Not Available
Available Disk Space          Not Available
Maximum Cache Size  Not Available
Available Cache Size          Not Available

[List of Objects]

Program File        Status    CodeBase
No cached object information available


[Content]

[ Following are sub-categories of this main category
]
[Summary]

Item      Value
Content Advisor     Disabled


[Personal Certificates]

Issued To Issued By Validity  Signature Algorithm
No personal certificate information available


[Other People Certificates]

Issued To Issued By Validity  Signature Algorithm
No other people certificate information available


[Publishers]

Name
No publisher information available

[Security]

Zone      Security Level
My Computer         Custom
Local intranet      Custom
Trusted sites       Custom
Internet  Custom
Restricted sites    Custom
```

Server Bus Performance Driver Registry Parameters

```
REGEDIT4

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissb]
"Type"=dword:00000001
"Start"=dword:00000000
"ErrorControl"=dword:00000001
"Tag"=dword:00000102
"ImagePath"=hex(2):73,79,73,74,65,6d,33,32,5c,44,52,4
9,56,45,52,53,5c,68,70,71,\
  63,69,73,73,62,2e,73,79,73,00
"DisplayName"="Smart Array Controllers Non-Miniport
Bus Driver"
"Group"="port"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissb\Parameters]
"CompletionMode"=dword:00000002
"CosTimerRate"=dword:00000005

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissb\Parameters\Controller0]
"CompletionMode"=dword:00000001

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissb\Security]
"Security"=hex:01,00,14,80,b8,00,00,00,c4,00,00,00,14
,00,00,00,30,00,00,00,02,\

00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00
,00,00,00,00,01,00,00,\

00,00,02,00,88,00,06,00,00,00,00,00,14,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,00,00,18,00,ff,01,0f,00,01,02,00,00,00
,00,00,05,20,00,00,00,\

20,02,00,00,00,00,14,00,8d,01,02,00,01,01,00,00,00,00
,00,05,04,00,00,00,00,\

00,14,00,8d,01,02,00,01,01,00,00,00,00,00,05,06,00,00
,00,00,00,14,00,00,01,\

00,00,01,01,00,00,00,00,00,05,0b,00,00,00,00,00,18,00
,fd,01,02,00,01,02,00,\

00,00,00,00,05,20,00,00,00,23,02,00,00,01,01,00,00,00
,00,00,05,12,00,00,00,\
  01,01,00,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissb\Enum]
"0"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409B0E11&REV_01\\4
&24b9e852&0&3840"
"Count"=dword:0000000f
"NextInstance"=dword:0000000f
"1"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_01\\5
&34813dc5&0&204040"
"2"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_01\\5
&34813dc5&0&284040"
"3"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_01\\5
&56dd264&0&206848"
"4"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_01\\5
&56dd264&0&286848"
"5"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_01\\5
&25998046&0&207050"
"6"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_01\\5
&25998046&0&287050"
"7"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_01\\5
&1b3a307e&0&204858"
"8"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_01\\5
&1b3a307e&0&284858"
"9"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_01\\5
&12699507&0&205058"
"10"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_01\\
5&12699507&0&285058"
"11"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_01\\
5&30fce3fc&0&205860"
"12"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_01\\
5&30fce3fc&0&285860"
"13"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409C0E11&REV_01\\
5&282c4885&0&206060"
"14"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409D0E11&REV_01\\
5&282c4885&0&286060"
```

Server Disk Device Performance Driver Registry Parameters

```
REGEDIT4

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissd]
"Type"=dword:00000001
"Start"=dword:00000000
"ErrorControl"=dword:00000001
"Tag"=dword:00000102
"ImagePath"=hex(2):73,79,73,74,65,6d,33,32,5c,44,52,4
9,56,45,52,53,5c,68,70,71,\
  63,69,73,73,64,2e,73,79,73,00
"DisplayName"="Smart Array Controllers Non-Miniport
Disk Driver"
"Group"="Primary Disk"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissd\Security]
"Security"=hex:01,00,14,80,b8,00,00,00,c4,00,00,00,14
,00,00,00,30,00,00,00,02,\

00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00
,00,00,00,00,01,00,00,\

00,00,02,00,88,00,06,00,00,00,00,00,14,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,00,00,18,00,ff,01,0f,00,01,02,00,00,00
,00,00,05,20,00,00,00,\

20,02,00,00,00,00,14,00,8d,01,02,00,01,01,00,00,00,00
,00,05,04,00,00,00,00,\

00,14,00,8d,01,02,00,01,01,00,00,00,00,00,05,06,00,00
,00,00,00,14,00,00,01,\

00,00,01,01,00,00,00,00,00,05,0b,00,00,00,00,00,18,00
,fd,01,02,00,01,02,00,\

00,00,00,00,05,20,00,00,00,23,02,00,00,01,01,00,00,00
,00,00,05,12,00,00,00,\
  01,01,00,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissd\Enum]
"0"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\5&156c
d7e2&0&0000014001000000"
"Count"=dword:00000021
"NextInstance"=dword:00000021
"1"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&4b48
c0d&0&0000004000000000"
"2"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&4b48
c0d&0&0100004000000000"
"3"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&4f22
543&0&0000004000000000"
"4"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&4f22
543&0&0100004000000000"
"5"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&1bb4
d19c&0&0000004000000000"
"6"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&1bb4
d19c&0&0100004000000000"
"7"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&1bb4
d19c&0&0200004000000000"
"8"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&1ec0
8c08&0&0000004000000000"
"9"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&1ec0
8c08&0&0100004000000000"
"10"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&3b8
1cb25&0&0000004000000000"
"11"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&3b8
1cb25&0&0100004000000000"
"12"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&3b8
1cb25&0&0200004000000000"
"13"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&9bf
b032&0&0000004000000000"
"14"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&9bf
b032&0&0100004000000000"
"15"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&ab0
1d09&0&0000004000000000"
"16"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&ab0
1d09&0&0100004000000000"
"17"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&ab0
1d09&0&0200004000000000"
"18"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&3a9
15e4e&0&0000004000000000"
"19"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&3a9
15e4e&0&0100004000000000"
"20"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&16a
3488b&0&0000004000000000"
"21"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&16a
3488b&0&0100004000000000"
"22"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&16a
3488b&0&0200004000000000"
"23"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&2e9
e32cc&0&0000004000000000"
"24"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&2e9
e32cc&0&0100004000000000"
"25"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&152
00e66&0&0000004000000000"
"26"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&152
00e66&0&0100004000000000"
"27"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&1ec
6bfb6&0&0000004000000000"
"28"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&1ec
6bfb6&0&0100004000000000"
"29"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&267
0e50&0&0000004000000000"
"30"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&267
0e50&0&0100004000000000"
"31"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&345
b2707&0&0000004000000000"
"32"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\6&345
b2707&0&0100004000000000"
```

Web Client Hardware Configuration

```
System Information report written at: 09/19/2005
12:15:25 PM
[System Information]

[ Following are sub-categories of this main category
]

[System Summary]

Item      Value
OS Name   Microsoft Windows 2000 Server
Version   5.0.2195 Service Pack 4 Build 2195
OS Manufacturer     Microsoft Corporation
System Name         CL55
System Manufacturer HP
System Model        ProLiant DL360 G4
System Type         X86-based PC
Processor x86 Family 15 Model 4 Stepping 1
GenuineIntel ~3600 Mhz
Processor x86 Family 15 Model 4 Stepping 1
GenuineIntel ~3600 Mhz
BIOS Version        12/02/04
Windows Directory   C:\WINNT
System Directory    C:\WINNT\system32
Boot Device         \Device\Harddisk0\Partition1
Locale    United States
User Name CL55\Administrator
Time Zone Central Daylight Time
Total Physical Memory         1,048,056 KB
Available Physical Memory     876,528 KB
Total Virtual Memory          2,782,760 KB
Available Virtual Memory      2,528,260 KB
Page File Space     1,734,704 KB
Page File C:\pagefile.sys

[Hardware Resources]

[ Following are sub-categories of this main category
]

[Conflicts/Sharing]

Resource  Device
IRQ 16    PCI standard PCI-to-PCI bridge
IRQ 16    PCI standard PCI-to-PCI bridge
IRQ 16    PCI standard PCI-to-PCI bridge
IRQ 16    Standard Universal PCI to USB Host
Controller
IRQ 5     Universal Serial Bus (USB) Controller
IRQ 5     Base System Device
```

```
IRQ 5     Base System Device

[DMA]

Channel   Device    Status
7         Direct memory access controller         OK
2         Standard floppy disk controller         OK

[Forced Hardware]

Device    PNP Device ID
No Forced Hardware

[I/O]

Address Range       Device    Status
0x0000-0x0CF7       PCI bus   OK
0x0000-0x0CF7       Direct memory access controller
          OK
0x0D00-0xFFFF       PCI bus   OK
0x4000-0x4FFF       PCI standard PCI-to-PCI bridge
          OK
0x4000-0x4FFF       Smart Array 6i      OK
0x2000-0x201F       Standard Universal PCI to USB
Host Controller     OK
0x2020-0x203F       Standard Universal PCI to USB
Host Controller     OK
0x3000-0x30FF       ATI Technologies Inc. RAGE XL PCI
          OK
0x03B0-0x03BB       ATI Technologies Inc. RAGE XL PCI
          OK
0x03C0-0x03DF       ATI Technologies Inc. RAGE XL PCI
          OK
0x1800-0x18FF       Base System Device  OK
0x3400-0x34FF       Base System Device  OK
0x0A79-0x0A79       ISAPNP Read Data Port         OK
0x0279-0x0279       ISAPNP Read Data Port         OK
0x0274-0x0277       ISAPNP Read Data Port         OK
0x0070-0x0077       Motherboard resources         OK
0x0408-0x040F       Motherboard resources         OK
0x04D0-0x04D1       Motherboard resources         OK
0x0020-0x003F       Motherboard resources         OK
0x00A0-0x00BF       Motherboard resources         OK
0x0090-0x009F       Motherboard resources         OK
0x0050-0x0053       Motherboard resources         OK
0x0700-0x071F       Motherboard resources         OK
0x0800-0x083F       Motherboard resources         OK
0x0900-0x097F       Motherboard resources         OK
0x0010-0x001F       Motherboard resources         OK
0x0C80-0x0C83       Motherboard resources         OK
0x0CD4-0x0CD7       Motherboard resources         OK
0x0F50-0x0F58       Motherboard resources         OK
0x02F8-0x02FF       Motherboard resources         OK
0x0040-0x0043       System timer        OK
0x0080-0x008F       Direct memory access controller
          OK
0x00C0-0x00DF       Direct memory access controller
          OK
0x0061-0x0061       System speaker      OK
0x0060-0x0060       Standard 101/102-Key or Microsoft
Natural PS/2 Keyboard         OK
0x0064-0x0064       Standard 101/102-Key or Microsoft
Natural PS/2 Keyboard         OK
0x002E-0x002F       Extended IO Bus     OK
0x004E-0x004F       Extended IO Bus     OK
0x0220-0x025F       Extended IO Bus     OK
0x0280-0x029F       Extended IO Bus     OK
0x03F8-0x03FF       Communications Port (COM1)    OK
0x03F2-0x03F5       Standard floppy disk controller
          OK
0x03F7-0x03F7       Standard floppy disk controller
          OK
0x0500-0x050F       Standard Dual Channel PCI IDE
Controller          OK
0x01F0-0x01F7       Primary IDE Channel OK
0x03F6-0x03F6       Primary IDE Channel OK
0x0170-0x0177       Secondary IDE Channel         OK
0x0376-0x0376       Secondary IDE Channel         OK

[IRQs]

IRQ Number          Device
9         Microsoft ACPI-Compliant System
16        PCI standard PCI-to-PCI bridge
16        PCI standard PCI-to-PCI bridge
16        PCI standard PCI-to-PCI bridge
16        Standard Universal PCI to USB Host
Controller
24        Smart Array 6i
25        HP NC7782 Gigabit Server Adapter
26        HP NC7782 Gigabit Server Adapter #2
19        Standard Universal PCI to USB Host
Controller
5         Universal Serial Bus (USB) Controller
5         Base System Device
5         Base System Device
1         Standard 101/102-Key or Microsoft Natural
PS/2 Keyboard
12        PS/2 Compatible Mouse
4         Communications Port (COM1)
6         Standard floppy disk controller
14        Primary IDE Channel

[Memory]

Range     Device    Status
0xA0000-0xBFFFF     PCI bus   OK
0xA0000-0xBFFFF     ATI Technologies Inc. RAGE XL PCI
          OK
0x40000000-0xFEBFFFFF         PCI bus   OK
0xFDF00000-0xFDFFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xFDFF0000-0xFDFF1FFF         Smart Array 6i      OK
0xFDF80000-0xFDFBFFFF         Smart Array 6i      OK
0xFDF70000-0xFDF7FFFF         HP NC7782 Gigabit
Server Adapter      OK
0xFDF60000-0xFDF6FFFF         HP NC7782 Gigabit
Server Adapter #2   OK
0xFBEF0000-0xFBEF000F         Intel(R) 6300ESB
Watchdog Timer - 25AB         OK
0xFBEE0000-0xFBEE03FF         Universal Serial Bus
(USB) Controller    OK
0xFC000000-0xFCFFFFFF         ATI Technologies Inc.
RAGE XL PCI         OK
0xFBFF0000-0xFBFF0FFF         ATI Technologies Inc.
RAGE XL PCI         OK
0xFBFE0000-0xFBFE01FF         Base System Device  OK
0xFBFD0000-0xFBFD07FF         Base System Device  OK
0xFBFC0000-0xFBFC1FFF         Base System Device  OK
0xFBF00000-0xFBF7FFFF         Base System Device  OK
0xE0000000-0xEFFFFFFF         Motherboard resources
          OK
0xFEBFFC00-0xFEBFFFFF         Standard Dual Channel
PCI IDE Controller  OK

[Components]

[ Following are sub-categories of this main category
]

[Multimedia]

[ Following are sub-categories of this main category
]

[Audio Codecs]

Codec     Manufacturer        Description
          Status    File      Version   Size
          Creation Date
c:\winnt\system32\iac25_32.ax Intel Corporation
          Indeo® audio software         OK
          C:\WINNT\system32\IAC25_32.AX 2.05.53
          195.00 KB (199,680 bytes)     12/7/1999
7:00:00 AM
c:\winnt\system32\msg723.acm  Microsoft Corporation
                    OK
          C:\WINNT\system32\MSG723.ACM  4.4.3385
          106.77 KB (109,328 bytes)     9/13/2002
5:46:03 PM
c:\winnt\system32\msadp32.acm Microsoft Corporation
                    OK
          C:\WINNT\system32\MSADP32.ACM 5.00.2134.1
          14.77 KB (15,120 bytes)       12/7/1999
7:00:00 AM
c:\winnt\system32\tssoft32.acm          DSP GROUP,
INC.                OK
          C:\WINNT\system32\TSSOFT32.ACM
          1.01      9.27 KB (9,488 bytes)
          12/7/1999 7:00:00 AM
c:\winnt\system32\msg711.acm  Microsoft Corporation
                    OK
          C:\WINNT\system32\MSG711.ACM  5.00.2134.1
          10.27 KB (10,512 bytes)       12/7/1999
7:00:00 AM
c:\winnt\system32\lhacm.acm   Microsoft Corporation
                    OK
          C:\WINNT\system32\LHACM.ACM   4.4.3385
          33.27 KB (34,064 bytes)       9/13/2002
5:46:04 PM
c:\winnt\system32\msgsm32.acm Microsoft Corporation
                    OK
          C:\WINNT\system32\MSGSM32.ACM 5.00.2134.1
          22.27 KB (22,800 bytes)       12/7/1999
7:00:00 AM
c:\winnt\system32\imaadp32.acm          Microsoft
Corporation                 OK
          C:\WINNT\system32\IMAADP32.ACM
```

```
          5.00.2195.6612      16.27 KB (16,656 bytes)
          8/16/2005 3:14:07 PM

[Video Codecs]

Codec     Manufacturer        Description
          Status    File      Version   Size
          Creation Date
c:\winnt\system32\ir50_32.dll Intel Corporation
          Indeo® video 5.10   OK
          C:\WINNT\system32\IR50_32.DLL
          R.5.10.15.2.55      737.50 KB (755,200
bytes)    12/7/1999 7:00:00 AM
c:\winnt\system32\msh261.drv  Microsoft Corporation
                    OK
          C:\WINNT\system32\MSH261.DRV  4.4.3385
          163.77 KB (167,696 bytes)     9/13/2002
5:46:04 PM
c:\winnt\system32\msvidc32.dll          Microsoft
Corporation                 OK
          C:\WINNT\system32\MSVIDC32.DLL
          5.00.2134.1         27.27 KB (27,920 bytes)
          12/7/1999 7:00:00 AM
c:\winnt\system32\msh263.drv  Microsoft Corporation
                    OK
          C:\WINNT\system32\MSH263.DRV  4.4.3385
          252.27 KB (258,320 bytes)     9/13/2002
5:45:39 PM
c:\winnt\system32\msrle32.dll Microsoft Corporation
                    OK
          C:\WINNT\system32\MSRLE32.DLL
          5.00.2195.6612      10.77 KB (11,024 bytes)
          8/16/2005 3:14:13 PM
c:\winnt\system32\ir32_32.dll Intel(R) Corporation
                    OK
          C:\WINNT\system32\IR32_32.DLL Not Available
          194.50 KB (199,168 bytes)     12/7/1999
7:00:00 AM
c:\winnt\system32\iccvid.dll  Radius Inc.
          OK        C:\WINNT\system32\ICCVID.DLL
          1.10.0.6  108.00 KB (110,592 bytes)
          12/7/1999 7:00:00 AM

[CD-ROM]

Item      Value
Drive     D:
Description         CD-ROM Drive
Media Loaded        False
Media Type          CD-ROM
Name      COMPAQ CRN-8245B
Manufacturer        (Standard CD-ROM drives)
Status    OK
Transfer Rate       Not Available
SCSI Target ID      0
PNP Device ID       IDE\CDROMCOMPAQ_CRN-
8245B_____________________2.19____\5&180B77CF&0&0.
0.0


[Sound Device]

Item      Value
No sound devices

[Display]

Item      Value
Name      ATI Technologies Inc. RAGE XL PCI
PNP Device ID
          PCI\VEN_1002&DEV_4752&SUBSYS_001E0E11&REV_2
7\4&2183A681&0&18F0
Adapter Type        ATI RAGE XL PCI, ATI Technologies
Inc. compatible
Adapter Description ATI Technologies Inc. RAGE XL PCI
Adapter RAM         8.00 MB (8,388,608 bytes)
Installed Drivers   atidrab.dll
Driver Version      5.00.2179.1
INF File  display.inf (atirage3 section)
Color Planes        1
Color Table Entries 65536
Resolution          640 x 480 x 60 hertz
Bits/Pixel          16


[Infrared]

Item      Value
No infrared devices

[Input]

[ Following are sub-categories of this main category
]

[Keyboard]

Item      Value
Description         Standard 101/102-Key or Microsoft
Natural PS/2 Keyboard
Name      Enhanced (101- or 102-key)
Layout    00000409
PNP Device ID       ACPI\PNP0303\4&1F443D2A&0
NumberOfFunctionKeys          12


[Pointing Device]

Item      Value
Hardware Type       PS/2 Compatible Mouse
Number of Buttons   2
Status    OK
PNP Device ID       ACPI\PNP0F13\4&1F443D2A&0
Power Management Supported    False
Double Click Threshold        6
Handedness          Right Handed Operation


[Modem]

Item      Value
No modems

[Network]

[ Following are sub-categories of this main category
]

[Adapter]

Item      Value
Name      [00000000] RAS Async Adapter
Adapter Type        Not Available
Product Name        RAS Async Adapter
Installed True
PNP Device ID       Not Available
Last Reset          9/19/2005 4:42:12 AM
Index     0
Service Name        AsyncMac
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Service Name        Not Available

Name      [00000001] WAN Miniport (L2TP)
Adapter Type        Not Available
Product Name        WAN Miniport (L2TP)
Installed True
PNP Device ID       ROOT\MS_L2TPMINIPORT\0000
Last Reset          9/19/2005 4:42:12 AM
Index     1
Service Name        Rasl2tp
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Service Name        Rasl2tp
Driver    c:\winnt\system32\drivers\rasl2tp.sys
(52112, 5.00.2195.6655)

Name      [00000002] WAN Miniport (PPTP)
Adapter Type        Wide Area Network (WAN)
Product Name        WAN Miniport (PPTP)
Installed True
PNP Device ID       ROOT\MS_PPTPMINIPORT\0000
Last Reset          9/19/2005 4:42:12 AM
Index     2
Service Name        PptpMiniport
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         50:50:54:50:30:30
Service Name        PptpMiniport
Driver    c:\winnt\system32\drivers\raspptp.sys
(48464, 5.00.2195.6711)
```

```
Name      [00000003] Direct Parallel
Adapter Type        Not Available
Product Name        Direct Parallel
Installed True
PNP Device ID       ROOT\MS_PTIMINIPORT\0000
Last Reset          9/19/2005 4:42:12 AM
Index     3
Service Name        Raspti
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Service Name        Raspti
Driver    c:\winnt\system32\drivers\raspti.sys
(16880, 5.00.2146.1)

Name      [00000004] WAN Miniport (IP)
Adapter Type        Not Available
Product Name        WAN Miniport (IP)
Installed True
PNP Device ID       ROOT\MS_NDISWANIP\0000
Last Reset          9/19/2005 4:42:12 AM
Index     4
Service Name        NdisWan
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Service Name        NdisWan
Driver    c:\winnt\system32\drivers\ndiswan.sys
(93360, 5.00.2195.6699)

Name      [00000005] Compaq NC7780 Gigabit Server
Adapter
Adapter Type        Not Available
Product Name        Compaq NC7780 Gigabit Server
Adapter
Installed True
PNP Device ID       Not Available
Last Reset          9/19/2005 4:42:12 AM
Index     5
Service Name        q57w2k
IP Address          130.168.40.55
IP Subnet 255.255.0.0
Default IP Gateway  Not Available
DHCP Enabled        True
DHCP Server         130.168.253.2
DHCP Lease Expires  9/16/2002 7:03:07 PM
DHCP Lease Obtained 9/15/2002 7:03:07 PM
MAC Address         00:13:21:B1:EE:17
Service Name        Not Available

Name      [00000006] Compaq NC7780 Gigabit Server
Adapter
Adapter Type        Not Available
Product Name        Compaq NC7780 Gigabit Server
Adapter
Installed True
PNP Device ID       Not Available
Last Reset          9/19/2005 4:42:12 AM
Index     6
Service Name        q57w2k
IP Address          130.168.40.55
IP Subnet 255.255.0.0
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         00:13:21:B1:EE:17
Service Name        Not Available

Name      [00000007] Compaq NC3123 Fast Ethernet NIC
Adapter Type        Not Available
Product Name        Compaq NC3123 Fast Ethernet NIC
Installed True
PNP Device ID       Not Available
Last Reset          9/19/2005 4:42:12 AM
Index     7
Service Name        N100
IP Address          130.168.40.55
IP Subnet 255.255.0.0
Default IP Gateway  Not Available
DHCP Enabled        True
DHCP Server         130.168.253.2
DHCP Lease Expires  9/16/2002 3:58:55 PM
DHCP Lease Obtained 9/15/2002 3:58:55 PM
MAC Address         00:13:21:B1:EE:17
Service Name        Not Available

Name      [00000008] Compaq NC7781 Gigabit Server
Adapter
Adapter Type        Not Available
Product Name        Compaq NC7781 Gigabit Server
Adapter
Installed True
PNP Device ID       Not Available
Last Reset          9/19/2005 4:42:12 AM
Index     8
Service Name        q57w2k
IP Address          130.168.40.55
IP Subnet 255.255.0.0
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         00:13:21:B1:EE:17
Service Name        Not Available

Name      [00000009] Compaq NC7781 Gigabit Server
Adapter
Adapter Type        Not Available
Product Name        Compaq NC7781 Gigabit Server
Adapter
Installed True
PNP Device ID       Not Available
Last Reset          9/19/2005 4:42:12 AM
Index     9
Service Name        q57w2k
IP Address          130.168.40.55
IP Subnet 255.255.0.0
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         00:13:21:B1:EE:17
Service Name        Not Available

Name      [00000010] HP NC7782 Gigabit Server Adapter
Adapter Type        Ethernet 802.3
Product Name        HP NC7782 Gigabit Server Adapter
Installed True
PNP Device ID
         PCI\VEN_14E4&DEV_1648&SUBSYS_00D00E11&REV_1
0\4&19638ECB&0&10E0
Last Reset          9/19/2005 4:42:12 AM
Index     10
Service Name        q57w2k
IP Address          130.172.11.55
IP Subnet 255.255.0.0
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         00:13:21:B1:EE:18
Service Name        q57w2k
IRQ Number          25
Driver    c:\winnt\system32\drivers\q57w2k.sys
(192247, 7.80.0.0)

Name      [00000011] HP NC7782 Gigabit Server Adapter
Adapter Type        Ethernet 802.3
Product Name        HP NC7782 Gigabit Server Adapter
Installed True
PNP Device ID
         PCI\VEN_14E4&DEV_1648&SUBSYS_00D00E11&REV_1
0\4&19638ECB&0&11E0
Last Reset          9/19/2005 4:42:12 AM
Index     11
Service Name        q57w2k
IP Address          130.168.40.55
IP Subnet 255.255.0.0
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         00:13:21:B1:EE:17
Service Name        q57w2k
IRQ Number          26
Driver    c:\winnt\system32\drivers\q57w2k.sys
(192247, 7.80.0.0)


[Protocol]

Item      Value
```

```
Name      MSAFD Tcpip [TCP/IP]
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  16 bytes
MaximumMessageSize  0 bytes
MessageOriented     False
MinimumAddressSize  16 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         True
SupportsGracefulClosing       True
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD Tcpip [UDP/IP]
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  16 bytes
MaximumMessageSize  65467 bytes
MessageOriented     True
MinimumAddressSize  16 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          True

Name      RSVP UDP Service Provider
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  16 bytes
MaximumMessageSize  65467 bytes
MessageOriented     True
MinimumAddressSize  16 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  True
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          True

Name      RSVP TCP Service Provider
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  16 bytes
MaximumMessageSize  0 bytes
MessageOriented     False
MinimumAddressSize  16 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  True
SupportsExpeditedData         True
SupportsGracefulClosing       True
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{37E5A54E-FF18-486C-B3AD-
E80449420A01}] SEQPACKET 8
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{37E5A54E-FF18-486C-B3AD-
E80449420A01}] DATAGRAM 8
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{4D85C014-5E76-48CF-93EA-
317E0F725486}] SEQPACKET 7
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{4D85C014-5E76-48CF-93EA-
317E0F725486}] DATAGRAM 7
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{2D8AA674-9F13-43EE-9055-
F9ECADD87F7F}] SEQPACKET 6
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{2D8AA674-9F13-43EE-9055-
F9ECADD87F7F}] DATAGRAM 6
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
```

```
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{EFD5741D-3A14-456C-98EB-
17ABC580A075}] SEQPACKET 5
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{EFD5741D-3A14-456C-98EB-
17ABC580A075}] DATAGRAM 5
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{4249431A-469E-4735-A292-
01AA526741FC}] SEQPACKET 4
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{4249431A-469E-4735-A292-
01AA526741FC}] DATAGRAM 4
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{3B09DDB7-7EB8-4941-8121-
52DC6359F5A6}] SEQPACKET 3
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{3B09DDB7-7EB8-4941-8121-
52DC6359F5A6}] DATAGRAM 3
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{684FA660-D082-4A8C-AC8C-
C9D449B21686}] SEQPACKET 0
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{684FA660-D082-4A8C-AC8C-
C9D449B21686}] DATAGRAM 0
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{D90E04F2-3AD9-4F98-9464-
751E106D7E6A}] SEQPACKET 1
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{D90E04F2-3AD9-4F98-9464-
751E106D7E6A}] DATAGRAM 1
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
```

```
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{3F1BA297-E685-416B-82D7-
70E771CC8745}] SEQPACKET 2
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{3F1BA297-E685-416B-82D7-
70E771CC8745}] DATAGRAM 2
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False


[WinSock]

Item      Value
File      c:\winnt\system32\winsock.dll
Version   3.10
Size      2.80 KB (2,864 bytes)

File      c:\winnt\system32\wsock32.dll
Version   5.00.2195.6603
Size      21.27 KB (21,776 bytes)


[Ports]

[ Following are sub-categories of this main category
]

[Serial]

Item      Value
Name      COM1
Status    OK
PNP Device ID       ACPI\PNP0501\0
Maximum Input Buffer Size     0
Maximum Output Buffer Size    False
Settable Baud Rate  True
Settable Data Bits  True
Settable Flow Control         True
Settable Parity     True
Settable Parity Check         True
Settable Stop Bits  True
Settable RLSD       True
Supports RLSD       True
Supports 16 Bit Mode          False
Supports Special Characters   False
Baud Rate 9600
Bits/Byte 8
Stop Bits 1
Parity    None
Busy      0
Abort Read/Write on Error     0
Binary Mode Enabled -1
Continue XMit on XOff         0
CTS Outflow Control 0
Discard NULL Bytes  0
DSR Outflow Control 0
DSR Sensitivity     0
DTR Flow Control Type         Enable
EOF Character       0
Error Replace Character       0
Error Replacement Enabled     0
Event Character     0
Parity Check Enabled          0
RTS Flow Control Type         Enable
XOff Character      19
XOffXMit Threshold  512
XOn Character       17
XOnXMit Threshold   2048
XOnXOff InFlow Control        0
XOnXOff OutFlow Control       0
IRQ Number          4
I/O Port  0x03F8-0x03FF
Driver    c:\winnt\system32\drivers\serial.sys
(62736, 5.00.2195.6655)


[Parallel]

Item      Value
No parallel port information


[Storage]

[ Following are sub-categories of this main category
]

[Drives]

Item      Value
Drive     A:
Description         3 1/2 Inch Floppy Drive

Drive     C:
Description         Local Fixed Disk
Compressed          False
File System         NTFS
Size      33.91 GB (36,414,734,336 bytes)
Free Space          16.26 GB (17,455,595,520 bytes)
Volume Name
Volume Serial Number          C8B488FA
Partition Disk #0, Partition #0
Partition Size      33.91 GB (36,414,734,336 bytes)
Starting Offset     16384 bytes
Drive Description   Disk drive
Drive Manufacturer  (Standard disk drives)
Drive Model         HP LOGICAL VOLUME SCSI Disk
Device
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       0
Drive SCSILogicalUnit         0
Drive SCSIPort      2
Drive SCSITargetId  4
Drive SectorsPerTrack         32
Drive Size          36414750720 bytes
Drive TotalCylinders          8716
Drive TotalSectors  71122560
Drive TotalTracks   2222580
Drive TracksPerCylinder       255


[SCSI]

Item      Value
Name      Smart Array 6i
Caption   Smart Array 6i
Driver    cpqcissm
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_40910E11&REV_0
1\4&19638ECB&0&08E0
Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_40910E11&REV_0
1\4&19638ECB&0&08E0
Device Map          Not Available
Index     Not Available
Max Number Controlled         Not Available
IRQ Number          24
I/O Port  0x4000-0x4FFF
Driver    c:\winnt\system32\drivers\cpqcissm.sys
(16512, 5.64.0.32 Build 7 (x86))
```

```
[Printing]

Name      Port Name Server Name
No printing information

[Problem Devices]

Device    PNP Device ID       Error Code
Universal Serial Bus (USB) Controller
          PCI\VEN_8086&DEV_25AD&SUBSYS_32010E11&REV_0
2\3&61AAA01&0&EF    28
Base System Device
          PCI\VEN_0E11&DEV_B203&SUBSYS_B2060E11&REV_0
1\4&2183A681&0&20F0 28
Base System Device
          PCI\VEN_0E11&DEV_B204&SUBSYS_B2060E11&REV_0
1\4&2183A681&0&22F0 28

[USB]

Device    PNP Device ID
Standard Universal PCI to USB Host Controller
          PCI\VEN_8086&DEV_25A9&SUBSYS_32010E11&REV_0
2\3&61AAA01&0&E8
USB Root Hub        USB\ROOT_HUB\4&312B1C17&0
Standard Universal PCI to USB Host Controller
          PCI\VEN_8086&DEV_25AA&SUBSYS_32010E11&REV_0
2\3&61AAA01&0&E9
USB Root Hub        USB\ROOT_HUB\4&24B43ADC&0

[Software Environment]

[ Following are sub-categories of this main category
]

[Drivers]

Name      Description         File      Type
          Started   Start Mode          State
          Status    Error Control       Accept Pause
          Accept Stop
abiosdsk  Abiosdsk  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Ignore    False     False
abp480n5  abp480n5  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
acpi      Microsoft ACPI Driver
          c:\winnt\system32\drivers\acpi.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
acpiec    ACPIEC
          c:\winnt\system32\drivers\acpiec.sys
          Kernel Driver       False     Disabled
          Stopped   OK        Normal    False
          False
adpu160m  adpu160m  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
afd       AFD Networking Support Environment
          c:\winnt\system32\drivers\afd.sys
          Kernel Driver       True      Auto
          Running   OK        Normal    False
          True
aha154x   Aha154x   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
aic116x   aic116x   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
aic78u2   aic78u2   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
aic78xx   aic78xx   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
alkernel  Altiris Kernel Driver
          c:\winnt\system32\drivers\alkernel.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ami0nt    ami0nt    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
amsint    amsint    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
asc       asc       Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
asc3350p  asc3350p  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
asc3550   asc3550   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
asyncmac  RAS Asynchronous Media Driver
          c:\winnt\system32\drivers\asyncmac.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
atapi     Standard IDE/ESDI Hard Disk Controller
          c:\winnt\system32\drivers\atapi.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
atdisk    Atdisk    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Ignore    False     False
atirage3  atirage3
          c:\winnt\system32\drivers\atimpab.sys
          Kernel Driver       True      Manual
          Running   OK        Ignore    False
          True
atmarpc   ATM ARP Client Protocol
          c:\winnt\system32\drivers\atmarpc.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
audstub   Audio Stub Driver
          c:\winnt\system32\drivers\audstub.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
beep      Beep
          c:\winnt\system32\drivers\beep.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
buslogic  BusLogic  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
cd20xrnt  cd20xrnt  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
cdaudio   Cdaudio
          c:\winnt\system32\drivers\cdaudio.sys
          Kernel Driver       False     System
          Stopped   OK        Ignore    False
          False
cdfs      Cdfs
          c:\winnt\system32\drivers\cdfs.sys
          File System Driver  True      Disabled
          Running   OK        Normal    False
          True
cdrom     CD-ROM Driver
          c:\winnt\system32\drivers\cdrom.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
changer   Changer   Not Available       Kernel Driver
          False     System    Stopped   OK
          Ignore    False     False
cpqarray  Cpqarray  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
cpqarry2  cpqarry2  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
cpqcissm  cpqcissm
          c:\winnt\system32\drivers\cpqcissm.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
cpqfcalm  cpqfcalm  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
cpqfws2e  cpqfws2e  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
dac960nt  dac960nt  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
deckzpsx  deckzpsx  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
dfsdriver DfsDriver c:\winnt\system32\drivers\dfs.sys
          File System Driver  True      Boot
          Running   OK        Normal    False
          True
disk      Disk Driver
          c:\winnt\system32\drivers\disk.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
diskperf  Diskperf
          c:\winnt\system32\drivers\diskperf.sys
```

```
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
dmboot    dmboot
          c:\winnt\system32\drivers\dmboot.sys
          Kernel Driver       False     Disabled
          Stopped   OK        Normal    False
          False
dmio      Logical Disk Manager Driver
          c:\winnt\system32\drivers\dmio.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
dmload    dmload
          c:\winnt\system32\drivers\dmload.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
efs       EFS       c:\winnt\system32\drivers\efs.sys
          File System Driver  True      Disabled
          Running   OK        Normal    False
          True
fastfat   Fastfat
          c:\winnt\system32\drivers\fastfat.sys
          File System Driver  True      Disabled
          Running   OK        Normal    False
          True
fd16_700  Fd16_700  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
fdc       Floppy Disk Controller Driver
          c:\winnt\system32\drivers\fdc.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
fips      Fips
          c:\winnt\system32\drivers\fips.sys
          Kernel Driver       True      Auto
          Running   OK        Normal    False
          True
fireport  fireport  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
flashpnt  flashpnt  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
flpydisk  Floppy Disk Driver
          c:\winnt\system32\drivers\flpydisk.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ftdisk    Volume Manager Driver
          c:\winnt\system32\drivers\ftdisk.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
gpc       Generic Packet Classifier
          c:\winnt\system32\drivers\msgpc.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
i8042prt  i8042 Keyboard and PS/2 Mouse Port Driver
          c:\winnt\system32\drivers\i8042prt.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
ini910u   ini910u   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
intelide  IntelIde  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ipfilterdriver      IP Traffic Filter Driver
          c:\winnt\system32\drivers\ipfltdrv.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
ipinip    IP in IP Tunnel Driver
          c:\winnt\system32\drivers\ipinip.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
ipnat     IP Network Address Translator
          c:\winnt\system32\drivers\ipnat.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
ipsec     IPSEC driver
          c:\winnt\system32\drivers\ipsec.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ipsraidn  ipsraidn  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
irenum    IR Enumerator Service
          c:\winnt\system32\drivers\irenum.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
isapnp    PnP ISA/EISA Bus Driver
          c:\winnt\system32\drivers\isapnp.sys
          Kernel Driver       True      Boot
          Running   OK        Critical  False
          True
kbdclass  Keyboard Class Driver
          c:\winnt\system32\drivers\kbdclass.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
ksecdd    KSecDD
          c:\winnt\system32\drivers\ksecdd.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
lbrtfdc   lbrtfdc   Not Available       Kernel Driver
          False     System    Stopped   OK
          Ignore    False     False
lp6nds35  lp6nds35  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
mnmdd     mnmdd
          c:\winnt\system32\drivers\mnmdd.sys
          Kernel Driver       True      System
          Running   OK        Ignore    False
          True
modem     Modem
          c:\winnt\system32\drivers\modem.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
mouclass  Mouse Class Driver
          c:\winnt\system32\drivers\mouclass.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
mountmgr  MountMgr
          c:\winnt\system32\drivers\mountmgr.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
mraid35x  mraid35x  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
mrxsmb    MRXSMB
          c:\winnt\system32\drivers\mrxsmb.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
msfs      Msfs
          c:\winnt\system32\drivers\msfs.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
mskssrv   Microsoft Streaming Service Proxy
          c:\winnt\system32\drivers\mskssrv.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
mspclock  Microsoft Streaming Clock Proxy
          c:\winnt\system32\drivers\mspclock.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
mspqm     Microsoft Streaming Quality Manager Proxy
          c:\winnt\system32\drivers\mspqm.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
mup       Mup       c:\winnt\system32\drivers\mup.sys
          File System Driver  True      Boot
          Running   OK        Normal    False
          True
n100      Compaq Ethernet or Fast Ethernet NIC NT
Driver    c:\winnt\system32\drivers\n100nt5.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
ncrc710   Ncrc710   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ndis      NDIS System Driver
          c:\winnt\system32\drivers\ndis.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
ndistapi  Remote Access NDIS TAPI Driver
          c:\winnt\system32\drivers\ndistapi.sys
          Kernel Driver       True      Manual
```

```
          Running   OK        Normal    False
          True
ndisuio   NDIS Usermode I/O Protocol
          c:\winnt\system32\drivers\ndisuio.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
ndiswan   Remote Access NDIS WAN Driver
          c:\winnt\system32\drivers\ndiswan.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ndproxy   NDIS Proxy
          c:\winnt\system32\drivers\ndproxy.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
netbios   NetBIOS Interface
          c:\winnt\system32\drivers\netbios.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
netbt     NetBios over Tcpip
          c:\winnt\system32\drivers\netbt.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
netdetect NetDetect
          c:\winnt\system32\drivers\netdtect.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
npfs      Npfs
          c:\winnt\system32\drivers\npfs.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
ntfs      Ntfs
          c:\winnt\system32\drivers\ntfs.sys
          File System Driver  True      Disabled
          Running   OK        Normal    False
          True
null      Null
          c:\winnt\system32\drivers\null.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
nwlnkflt  IPX Traffic Filter Driver
          c:\winnt\system32\drivers\nwlnkflt.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
nwlnkfwd  IPX Traffic Forwarder Driver
          c:\winnt\system32\drivers\nwlnkfwd.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
openhci   Microsoft USB Open Host Controller Driver
          c:\winnt\system32\drivers\openhci.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
parallel  Parallel
          c:\winnt\system32\drivers\parallel.sys
          Kernel Driver       False     Auto
          Stopped   OK        Ignore    False
          False
parport   Parport
          c:\winnt\system32\drivers\parport.sys
          Kernel Driver       False     Auto
          Stopped   OK        Ignore    False
          False
partmgr   PartMgr
          c:\winnt\system32\drivers\partmgr.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
parvdm    ParVdm
          c:\winnt\system32\drivers\parvdm.sys
          Kernel Driver       False     Auto
          Stopped   OK        Ignore    False
          False
pci       PCI Bus Driver
          c:\winnt\system32\drivers\pci.sys
          Kernel Driver       True      Boot
          Running   OK        Critical  False
          True
pcidump   PCIDump   Not Available       Kernel Driver
          False     System    Stopped   OK
          Ignore    False     False
pciide    PCIIde
          c:\winnt\system32\drivers\pciide.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
pcmcia    Pcmcia
          c:\winnt\system32\drivers\pcmcia.sys
          Kernel Driver       False     Disabled
          Stopped   OK        Normal    False
          False
pdcomp    PDCOMP    Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False
pdframe   PDFRAME   Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False
pdreli    PDRELI    Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False
pdrframe  PDRFRAME  Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False
pptpminiport        WAN Miniport (PPTP)
          c:\winnt\system32\drivers\raspptp.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ptilink   Direct Parallel Link Driver
          c:\winnt\system32\drivers\ptilink.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
q57w2k    HP NC7782 Gigabit Server Adapter
          c:\winnt\system32\drivers\q57w2k.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ql1080    ql1080    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ql10wnt   Ql10wnt   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ql1240    ql1240    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ql2100    ql2100    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
rasacd    Remote Access Auto Connection Driver
          c:\winnt\system32\drivers\rasacd.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
rasl2tp   WAN Miniport (L2TP)
          c:\winnt\system32\drivers\rasl2tp.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
raspti    Direct Parallel
          c:\winnt\system32\drivers\raspti.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
rca       Microsoft Streaming Network Raw Channel
Access    c:\winnt\system32\drivers\rca.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
rdbss     Rdbss
          c:\winnt\system32\drivers\rdbss.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
rdpdr     Terminal Server Device Redirector Driver
          c:\winnt\system32\drivers\rdpdr.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
rdpwd     RDPWD
          c:\winnt\system32\drivers\rdpwd.sys
          Kernel Driver       True      Manual
          Running   OK        Ignore    False
          True
redbook   Digital CD Audio Playback Filter Driver
          c:\winnt\system32\drivers\redbook.sys
          Kernel Driver       False     System
          Stopped   OK        Normal    False
          False
serenum   Serenum Filter Driver
          c:\winnt\system32\drivers\serenum.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
serial    Serial port driver
          c:\winnt\system32\drivers\serial.sys
          Kernel Driver       True      System
```

```
          Running   OK        Ignore    False
          True
sfloppy   Sfloppy
          c:\winnt\system32\drivers\sfloppy.sys
          Kernel Driver       False     System
          Stopped   OK        Ignore    False
          False
sglfb     sglfb     Not Available       Kernel Driver
          False     System    Stopped   OK
          Normal    False     False
simbad    Simbad    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
sparrow   Sparrow   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
spud      Special Purpose Utility Driver
          c:\winnt\system32\drivers\spud.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
srv       Srv       c:\winnt\system32\drivers\srv.sys
          File System Driver  True      Manual
          Running   OK        Normal    False
          True
swenum    Software Bus Driver
          c:\winnt\system32\drivers\swenum.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
symc810   symc810   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
symc8xx   symc8xx   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
sym_hi    sym_hi    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
tcpip     TCP/IP Protocol Driver
          c:\winnt\system32\drivers\tcpip.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
tdasync   TDASYNC
          c:\winnt\system32\drivers\tdasync.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
tdipx     TDIPX
          c:\winnt\system32\drivers\tdipx.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
tdnetb    TDNETB
          c:\winnt\system32\drivers\tdnetb.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
tdpipe    TDPIPE
          c:\winnt\system32\drivers\tdpipe.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
tdspx     TDSPX
          c:\winnt\system32\drivers\tdspx.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
tdtcp     TDTCP
          c:\winnt\system32\drivers\tdtcp.sys
          Kernel Driver       True      Manual
          Running   OK        Ignore    False
          True
termdd    Terminal Device Driver
          c:\winnt\system32\drivers\termdd.sys
          Kernel Driver       True      Auto
          Running   OK        Normal    False
          True
tga       tga       Not Available       Kernel Driver
          False     System    Stopped   OK
          Ignore    False     False
udfs      Udfs
          c:\winnt\system32\drivers\udfs.sys
          File System Driver  False     Disabled
          Stopped   OK        Normal    False
          False
uhcd      Microsoft USB Universal Host Controller
Driver    c:\winnt\system32\drivers\uhcd.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ultra66   ultra66   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
update    Microcode Update Driver
          c:\winnt\system32\drivers\update.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
usbhub    Microsoft USB Standard Hub Driver
          c:\winnt\system32\drivers\usbhub.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
vgasave   VgaSave   c:\winnt\system32\drivers\vga.sys
          Kernel Driver       True      System
          Running   OK        Ignore    False
          True
wanarp    Remote Access IP ARP Driver
          c:\winnt\system32\drivers\wanarp.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
wdica     WDICA     Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False

[Environment Variables]

Variable  Value     User Name
ComSpec   %SystemRoot%\system32\cmd.exe <SYSTEM>
Os2LibPath          %SystemRoot%\system32\os2\dll;
          <SYSTEM>
Path
          %SystemRoot%\system32;%SystemRoot%;%SystemR
oot%\System32\Wbem;C:\Program Files\Microsoft SQL
Server\90\Tools\binn\         <SYSTEM>
windir    %SystemRoot%        <SYSTEM>
OS        Windows_NT          <SYSTEM>
PROCESSOR_ARCHITECTURE        x86       <SYSTEM>
PROCESSOR_LEVEL     15        <SYSTEM>
PROCESSOR_IDENTIFIER          x86 Family 15 Model 4
Stepping 1, GenuineIntel      <SYSTEM>
PROCESSOR_REVISION  0401      <SYSTEM>
NUMBER_OF_PROCESSORS          2         <SYSTEM>
PATHEXT
          .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF
;.WSH     <SYSTEM>
TEMP      %SystemRoot%\TEMP   <SYSTEM>
TMP       %SystemRoot%\TEMP   <SYSTEM>
lib       C:\Program Files\SQLXML 4.0\bin\
          <SYSTEM>
TEMP      %USERPROFILE%\Local Settings\Temp
          CL55\Administrator
TMP       %USERPROFILE%\Local Settings\Temp
          CL55\Administrator

[Jobs]

[ Following are sub-categories of this main category
]

[Print]

Document  Size      Owner     Notify    Status
          Time Submitted      Start Time
          Until Time          Elapsed Time
          Pages Printed       Job ID    Priority
          Parameters          Driver Name
          Print Processor     Host Print Queue
          Data Type Name
Unknown   Unknown   Unknown   Unknown   Unknown
          Unknown   Unknown   Unknown   Unknown
          Unknown   Unknown   Unknown   Unknown
          Unknown   Unknown   Unknown   Unknown
          Unknown

[Network Connections]

Local Name          Remote Name         Type
          Status    User Name
E:        \\inforb\audit_fdr  Disk      OK

[Running Tasks]

Name      Path      Process ID          Priority  Min
Working Set         Max Working Set     Start Time
          Version   Size      File Date
system idle process Not Available       0         0
          Not Available       Not Available       Not
Available Unknown   Unknown   Unknown
system    Not Available       8         8         0
          1413120   Not Available       Unknown
          Unknown   Unknown
smss.exe  c:\winnt\system32\smss.exe    184       11
          204800    1413120   9/19/2005 9:42:23 AM
```

```
          5.00.2195.6601      44.77 KB (45,840 bytes)
          8/16/2005 2:52:28 PM
csrss.exe Not Available       208       13        Not
Available Not Available       9/19/2005 9:42:25 AM
          Unknown   Unknown   Unknown
winlogon.exe        c:\winnt\system32\winlogon.exe
          204       13        204800    1413120
          9/19/2005 9:42:25 AM
          5.00.2195.6714      176.77 KB (181,008
bytes)    8/16/2005 3:14:25 PM
services.exe        c:\winnt\system32\services.exe
          260       9         204800    1413120
          9/19/2005 9:42:26 AM
          5.00.2195.6700      87.27 KB (89,360 bytes)
          8/16/2005 2:52:28 PM
lsass.exe c:\winnt\system32\lsass.exe   272       9
          204800    1413120   9/19/2005 9:42:26 AM
          5.00.2195.6695      32.77 KB (33,552 bytes)
          8/16/2005 2:52:28 PM
termsrv.exe         c:\winnt\system32\termsrv.exe 388
          10        204800    1413120   9/19/2005
9:42:27 AM          5.00.2195.6696      139.27 KB
(142,608 bytes)     8/16/2005 3:14:23 PM
aclient.exe         c:\program
files\altiris\aclient\aclient.exe       480       8
          204800    1413120   9/19/2005 9:42:27 AM
          6.1.401   4.63 MB (4,857,932 bytes)
          6/5/2003 1:55:46 PM
regsvc.exe          c:\winnt\system32\regsvc.exe  512
          8         204800    1413120   9/19/2005
9:42:28 AM          5.00.2195.6701      66.77 KB
(68,368 bytes)      8/16/2005 3:14:19 PM
rsys.exe  c:\benchcraft\rsys.exe        528       8
          204800    1413120   9/19/2005 9:42:28 AM
          Not Available       32.00 KB (32,768 bytes)
          9/13/2002 6:30:57 PM
svchost.exe         c:\winnt\system32\svchost.exe 556
          8         204800    1413120   9/19/2005
9:42:28 AM          5.00.2134.1         7.77 KB
(7,952 bytes)       12/7/1999 7:00:00 AM
svchost.exe         c:\winnt\system32\svchost.exe 636
          8         204800    1413120   9/19/2005
9:42:31 AM          5.00.2134.1         7.77 KB
(7,952 bytes)       12/7/1999 7:00:00 AM
svchost.exe         c:\winnt\system32\svchost.exe 664
          8         204800    1413120   9/19/2005
9:42:31 AM          5.00.2134.1         7.77 KB
(7,952 bytes)       12/7/1999 7:00:00 AM
mstask.exe          c:\winnt\system32\mstask.exe  692
          8         204800    1413120   9/19/2005
9:42:31 AM          4.71.2195.6704      116.77 KB
(119,568 bytes)     8/16/2005 3:14:14 PM
winmgmt.exe
          c:\winnt\system32\wbem\winmgmt.exe      740
          8         204800    1413120   9/19/2005
9:42:32 AM          1.50.1085.0100      192.10 KB
(196,706 bytes)     8/16/2005 3:14:30 PM
inetinfo.exe
          c:\winnt\system32\inetsrv\inetinfo.exe  764
          8         204800    1413120   9/19/2005
9:42:32 AM          5.00.0984 14.27 KB (14,608 bytes)
          8/16/2005 3:15:30 PM
dfssvc.exe          c:\winnt\system32\dfssvc.exe  876
          8         204800    1413120   9/19/2005
9:42:40 AM          5.00.2195.6664      88.77 KB
(90,896 bytes)      8/16/2005 3:14:02 PM
svchost.exe         c:\winnt\system32\svchost.exe
          1088      8         204800    1413120
          9/19/2005 9:42:49 AM          5.00.2134.1
          7.77 KB (7,952 bytes)         12/7/1999
7:00:00 AM
logon.scr c:\winnt\system32\logon.scr   684       4
          204800    1413120   9/19/2005 9:57:38 AM
          5.00.2195.6601      127.77 KB (130,832
bytes)    8/16/2005 3:14:09 PM
csrss.exe Not Available       1168      13        Not
Available Not Available       9/19/2005 12:13:55 PM
          Unknown   Unknown   Unknown
winlogon.exe        c:\winnt\system32\winlogon.exe
          1108      13        204800    1413120
          9/19/2005 12:13:55 PM
          5.00.2195.6714      176.77 KB (181,008
bytes)    8/16/2005 3:14:25 PM
rdpclip.exe         c:\winnt\system32\rdpclip.exe
          1080      8         204800    1413120
          9/19/2005 12:13:57 PM         5.00.2174.1
          39.77 KB (40,720 bytes)       9/13/2002
5:45:10 PM
explorer.exe        c:\winnt\explorer.exe         996
          8         204800    1413120   9/19/2005
12:13:57 PM         5.00.3700.6690      237.77 KB
(243,472 bytes)     8/16/2005 3:14:26 PM
aclntusr.exe        c:\program
files\altiris\aclient\aclntusr.exe       944       8
          204800    1413120   9/19/2005 12:13:57 PM
          6, 1, 401 180.00 KB (184,320 bytes)
          6/5/2003 1:55:47 PM
tardis.exe          c:\program files\tardis 2000
v1.4\tardis.exe     1232      8         204800
          1413120   9/19/2005 12:13:58 PM         5,
0, 1, 4   308.00 KB (315,392 bytes)     9/13/2002
6:21:25 PM
mmc.exe   c:\winnt\system32\mmc.exe     1280      8
          204800    1413120   9/19/2005 12:14:30 PM
          5.00.2195.6601      589.27 KB (603,408
bytes)    8/16/2005 3:14:10 PM
rsvp.exe  c:\winnt\system32\rsvp.exe    1452      8
          204800    1413120   9/19/2005 12:15:13 PM
          5.00.2195.6663      172.77 KB (176,912
bytes)    8/16/2005 3:14:20 PM

[Loaded Modules]

Name      Version   Size      File Date Manufacturer
          Path
traffic.dll         5.00.2195.6613      30.77 KB
(31,504 bytes)      8/16/2005 3:14:23 PM
          Microsoft Corporation
          c:\winnt\system32\traffic.dll
rsvp.exe  5.00.2195.6663      172.77 KB (176,912
bytes)    8/16/2005 3:14:20 PM          Microsoft
Corporation         c:\winnt\system32\rsvp.exe
wbemprox.dll        1.50.1085.0100      40.10 KB
(41,061 bytes)      8/16/2005 3:14:29 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\wbemprox.dll
mlang.dll 5.00.3700.6655      510.77 KB (523,024
bytes)    8/16/2005 3:14:10 PM          Microsoft
Corporation         c:\winnt\system32\mlang.dll
cabinet.dll         5.00.2147.1         54.77 KB
(56,080 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\cabinet.dll
msinfo32.dll        5.00.2195.6601      312.27 KB
(319,760 bytes)     8/16/2005 3:14:31 PM
          Microsoft Corporation         c:\program
files\common files\microsoft
shared\msinfo\msinfo32.dll
mmcndmgr.dll        5.00.2195.6601      816.27 KB
(835,856 bytes)     8/16/2005 3:14:10 PM
          Microsoft Corporation
          c:\winnt\system32\mmcndmgr.dll
msvcp50.dll         5.00.7051 552.50 KB (565,760
bytes)    12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\msvcp50.dll
mmc.exe   5.00.2195.6601      589.27 KB (603,408
bytes)    8/16/2005 3:14:10 PM          Microsoft
Corporation         c:\winnt\system32\mmc.exe
rapilib.dll         5.00.2195.6601      24.77 KB
(25,360 bytes)      8/16/2005 3:14:19 PM
          Microsoft Corporation
          c:\winnt\system32\rapilib.dll
rsvpsp.dll          5.00.2195.6611      75.27 KB
(77,072 bytes)      8/16/2005 3:14:20 PM
          Microsoft Corporation
          c:\winnt\system32\rsvpsp.dll
tardis.exe          5, 0, 1, 4          308.00 KB
(315,392 bytes)     9/13/2002 6:21:25 PM
          H.C.Mingham-Smith Ltd.        c:\program
files\tardis 2000 v1.4\tardis.exe
aclntusr.exe        6, 1, 401 180.00 KB (184,320
bytes)    6/5/2003 1:55:47 PM           c:\program
files\altiris\aclient\aclntusr.exe
shdoclc.dll         5.00.3700.6668      324.50 KB
(332,288 bytes)     8/16/2005 3:14:21 PM
          Microsoft Corporation
          c:\winnt\system32\shdoclc.dll
netplwiz.dll        5.00.2195.6601      169.77 KB
(173,840 bytes)     8/16/2005 3:14:16 PM
          Microsoft Corporation
          c:\winnt\system32\netplwiz.dll
netmsg.dll          5.00.2137.1         152.50 KB
(156,160 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\netmsg.dll
netui2.dll          5.00.2134.1         280.27 KB
(286,992 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\netui2.dll
mprui.dll 5.00.2195.6601      54.77 KB (56,080 bytes)
          8/16/2005 3:14:10 PM          Microsoft
Corporation         c:\winnt\system32\mprui.dll
urlmon.dll          5.00.3700.6705      442.77 KB
(453,392 bytes)     8/16/2005 3:14:24 PM
          Microsoft Corporation
          c:\winnt\system32\urlmon.dll
```

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faxshell.dll        5.00.2134.1         8.27 KB
(8,464 bytes)       12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\faxshell.dll
msacm32.dll         5.00.2134.1         65.27 KB
(66,832 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msacm32.dll
avifil32.dll        5.00.2195.6612      76.77 KB
(78,608 bytes)      8/16/2005 3:13:57 PM
          Microsoft Corporation
          c:\winnt\system32\avifil32.dll
msvfw32.dll         5.00.2195.6612      113.77 KB
(116,496 bytes)     8/16/2005 3:14:14 PM
          Microsoft Corporation
          c:\winnt\system32\msvfw32.dll
docprop2.dll        5.00.2178.1         297.77 KB
(304,912 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\docprop2.dll
linkinfo.dll        5.00.2134.1         15.77 KB
(16,144 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\linkinfo.dll
browselc.dll        5.00.3700.6661      34.50 KB
(35,328 bytes)      8/16/2005 3:13:57 PM
          Microsoft Corporation
          c:\winnt\system32\browselc.dll
powrprof.dll        5.00.3502.6601      13.27 KB
(13,584 bytes)      8/16/2005 3:14:18 PM
          Microsoft Corporation
          c:\winnt\system32\powrprof.dll
batmeter.dll        5.00.3502.6601      20.27 KB
(20,752 bytes)      8/16/2005 3:13:57 PM
          Microsoft Corporation
          c:\winnt\system32\batmeter.dll
stobject.dll        5.00.2195.6601      79.27 KB
(81,168 bytes)      8/16/2005 3:14:23 PM
          Microsoft Corporation
          c:\winnt\system32\stobject.dll
msi.dll   3.1.4000.2435       2.76 MB (2,890,240
bytes)    9/13/2002 6:08:04 PM          Microsoft
Corporation         c:\winnt\system32\msi.dll
webcheck.dll        5.00.3502.6601      251.77 KB
(257,808 bytes)     8/16/2005 3:14:25 PM
          Microsoft Corporation
          c:\winnt\system32\webcheck.dll
ntshrui.dll         5.00.2134.1         46.77 KB
(47,888 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\ntshrui.dll
mydocs.dll          5.00.3502.6601      55.77 KB
(57,104 bytes)      8/16/2005 3:14:15 PM
          Microsoft Corporation
          c:\winnt\system32\mydocs.dll
browseui.dll        5.00.3700.6661      789.27 KB
(808,208 bytes)     8/16/2005 3:13:57 PM
          Microsoft Corporation
          c:\winnt\system32\browseui.dll
shdocvw.dll         5.00.3700.6668      1.06 MB
(1,107,728 bytes)   8/16/2005 3:14:21 PM
          Microsoft Corporation
          c:\winnt\system32\shdocvw.dll
```

```
explorer.exe        5.00.3700.6690      237.77 KB
(243,472 bytes)     8/16/2005 3:14:26 PM
          Microsoft Corporation
          c:\winnt\explorer.exe
rdpclip.exe         5.00.2174.1         39.77 KB
(40,720 bytes)      9/13/2002 5:45:10 PM
          Microsoft Corporation
          c:\winnt\system32\rdpclip.exe
wzcsapi.dll         5.00.2195.6604      29.27 KB
(29,968 bytes)      8/16/2005 3:14:36 PM
          Microsoft Corporation
          c:\winnt\system32\wzcsapi.dll
wzcdlg.dll          5.00.2195.6604      51.27 KB
(52,496 bytes)      8/16/2005 3:14:36 PM
          Microsoft Corporation
          c:\winnt\system32\wzcdlg.dll
cscui.dll 5.00.2195.6705      237.27 KB (242,960
bytes)    8/16/2005 3:14:01 PM          Microsoft
Corporation         c:\winnt\system32\cscui.dll
logon.scr 5.00.2195.6601      127.77 KB (130,832
bytes)    8/16/2005 3:14:09 PM          Microsoft
Corporation         c:\winnt\system32\logon.scr
h323.tsp  5.00.2195.6699      248.77 KB (254,736
bytes)    8/16/2005 3:14:06 PM          Microsoft
Corporation         c:\winnt\system32\h323.tsp
ipconf.tsp          5.00.2143.1         10.77 KB
(11,024 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\ipconf.tsp
ndptsp.tsp          5.00.2143.1         38.27 KB
(39,184 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\ndptsp.tsp
kmddsp.tsp          5.00.2150.1         17.77 KB
(18,192 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\kmddsp.tsp
uniplat.dll         5.00.2195.6601      14.27 KB
(14,608 bytes)      8/16/2005 3:14:24 PM
          Microsoft Corporation
          c:\winnt\system32\uniplat.dll
unimdm.tsp          5.00.2195.6601      199.27 KB
(204,048 bytes)     8/16/2005 3:14:24 PM
          Microsoft Corporation
          c:\winnt\system32\unimdm.tsp
tapisrv.dll         5.00.2195.6666      169.27 KB
(173,328 bytes)     8/16/2005 3:14:23 PM
          Microsoft Corporation
          c:\winnt\system32\tapisrv.dll
dfssvc.exe          5.00.2195.6664      88.77 KB
(90,896 bytes)      8/16/2005 3:14:02 PM
          Microsoft Corporation
          c:\winnt\system32\dfssvc.exe
httpext.dll         5.00.0984 240.77 KB (246,544
bytes)    8/16/2005 3:15:31 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\httpext.dll
msvcr80.dll         8.00.50215.312      600.00 KB
(614,400 bytes)     5/22/2005 11:47:14 PM
          Microsoft Corporation
          c:\winnt\microsoft.net\framework\v2.0.50215
\msvcr80.dll
```

```
aspnet_filter.dll   2.0.50215.312 (beta2PLUS.050215-
3100)     8.50 KB (8,704 bytes)         5/23/2005
12:36:36 AM         Microsoft Corporation
          c:\winnt\microsoft.net\framework\v2.0.50215
\aspnet_filter.dll
md5filt.dll         5.00.0984 32.77 KB (33,552 bytes)
          8/16/2005 3:15:10 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\md5filt.dll
gzip.dll  5.00.0984 30.27 KB (30,992 bytes)
          8/16/2005 3:14:54 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\gzip.dll
compfilt.dll        5.00.0984 22.77 KB (23,312 bytes)
          8/16/2005 3:15:30 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\compfilt.dll
sspifilt.dll        5.00.0984 42.77 KB (43,792 bytes)
          8/16/2005 3:14:58 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\sspifilt.dll
iscomlog.dll        5.00.0984 24.27 KB (24,848 bytes)
          8/16/2005 3:15:26 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\iscomlog.dll
lonsint.dll         5.00.0984 11.77 KB (12,048 bytes)
          8/16/2005 3:14:57 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\lonsint.dll
inetsloc.dll        5.00.0984 20.27 KB (20,752 bytes)
          8/16/2005 3:15:30 PM          Microsoft
Corporation         c:\winnt\system32\inetsloc.dll
iisfecnv.dll        5.00.0984 7.27 KB (7,440 bytes)
          8/16/2005 3:43:34 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\iisfecnv.dll
isatq.dll 5.00.0984 61.27 KB (62,736 bytes)
          8/16/2005 3:15:03 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\isatq.dll
infocomm.dll        5.00.0984 242.27 KB (248,080
bytes)    8/16/2005 3:15:30 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\infocomm.dll
w3svc.dll 5.00.0984 338.27 KB (346,384 bytes)
          8/16/2005 3:15:05 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\w3svc.dll
security.dll        5.00.2154.1         5.77 KB
(5,904 bytes)       12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\security.dll
svcext.dll          5.00.0984 39.77 KB (40,720 bytes)
          8/16/2005 3:15:11 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\svcext.dll
admexs.dll          5.00.0984 27.77 KB (28,432 bytes)
          8/16/2005 3:15:32 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\admexs.dll
wamreg.dll          5.00.0984 45.77 KB (46,864 bytes)
          8/16/2005 3:15:09 PM          Microsoft
```

```
Corporation
         c:\winnt\system32\inetsrv\wamreg.dll
metadata.dll        5.00.0984 68.77 KB (70,416 bytes)
          8/16/2005 3:15:17 PM          Microsoft
Corporation
         c:\winnt\system32\inetsrv\metadata.dll
iismap.dll          5.00.0984 56.27 KB (57,616 bytes)
          8/16/2005 3:15:24 PM          Microsoft
Corporation         c:\winnt\system32\iismap.dll
nsepm.dll 5.00.0984 43.27 KB (44,304 bytes)
          8/16/2005 3:15:01 PM          Microsoft
Corporation
         c:\winnt\system32\inetsrv\nsepm.dll
admwprox.dll        5.00.0984 31.77 KB (32,528 bytes)
          8/16/2005 3:43:34 PM          Microsoft
Corporation         c:\winnt\system32\admwprox.dll
coadmin.dll         5.00.0984 39.77 KB (40,720 bytes)
          8/16/2005 3:15:30 PM          Microsoft
Corporation
         c:\winnt\system32\inetsrv\coadmin.dll
iisadmin.dll        5.00.0984 15.77 KB (16,144 bytes)
          8/16/2005 3:15:25 PM          Microsoft
Corporation
         c:\winnt\system32\inetsrv\iisadmin.dll
rpcref.dll          5.00.0984 4.27 KB (4,368 bytes)
          8/16/2005 3:15:12 PM          Microsoft
Corporation
         c:\winnt\system32\inetsrv\rpcref.dll
iisrtl.dll          5.00.0984 121.27 KB (124,176
bytes)    8/16/2005 3:15:23 PM          Microsoft
Corporation         c:\winnt\system32\iisrtl.dll
inetinfo.exe        5.00.0984 14.27 KB (14,608 bytes)
          8/16/2005 3:15:30 PM          Microsoft
Corporation
         c:\winnt\system32\inetsrv\inetinfo.exe
netui1.dll          5.00.2134.1         210.27 KB
(215,312 bytes)     12/7/1999 7:00:00 AM
         Microsoft Corporation
         c:\winnt\system32\netui1.dll
netui0.dll          5.00.2195.6601      70.27 KB
(71,952 bytes)      8/16/2005 3:14:16 PM
         Microsoft Corporation
         c:\winnt\system32\netui0.dll
ntlanman.dll        5.00.2195.6601      35.27 KB
(36,112 bytes)      8/16/2005 2:52:28 PM
         Microsoft Corporation
         c:\winnt\system32\ntlanman.dll
wshnetbs.dll        5.00.2134.1         7.77 KB
(7,952 bytes)       12/7/1999 7:00:00 AM
         Microsoft Corporation
         c:\winnt\system32\wshnetbs.dll
provthrd.dll        1.50.1085.0000      68.07 KB
(69,708 bytes)      9/13/2002 5:45:53 PM
         Microsoft Corporation
         c:\winnt\system32\wbem\provthrd.dll
ntevt.dll 1.50.1085.0072      192.06 KB (196,671
bytes)    8/16/2005 3:14:29 PM          Microsoft
Corporation         c:\winnt\system32\wbem\ntevt.dll
perfos.dll          5.00.2155.1         21.27 KB
(21,776 bytes)      12/7/1999 7:00:00 AM
         Microsoft Corporation
         c:\winnt\system32\perfos.dll

framedyn.dll        1.50.1085.0076      164.07 KB
(168,009 bytes)     8/16/2005 3:14:28 PM
         Microsoft Corporation
         c:\winnt\system32\wbem\framedyn.dll
cimwin32.dll        1.50.1085.0103      1.04 MB
(1,089,637 bytes)   8/16/2005 3:14:28 PM
         Microsoft Corporation
         c:\winnt\system32\wbem\cimwin32.dll
wbemsvc.dll         1.50.1085.0007      40.07 KB
(41,036 bytes)      8/16/2005 3:14:29 PM
         Microsoft Corporation
         c:\winnt\system32\wbem\wbemsvc.dll
wbemess.dll         1.50.1085.0100      364.09 KB
(372,825 bytes)     8/16/2005 3:14:29 PM
         Microsoft Corporation
         c:\winnt\system32\wbem\wbemess.dll
fastprox.dll        1.50.1085.0100      152.10 KB
(155,749 bytes)     8/16/2005 3:14:28 PM
         Microsoft Corporation
         c:\winnt\system32\wbem\fastprox.dll
wbemcore.dll        1.50.1085.0100      632.09 KB
(647,257 bytes)     8/16/2005 3:14:29 PM
         Microsoft Corporation
         c:\winnt\system32\wbem\wbemcore.dll
wbemcomn.dll        1.50.1085.0100      692.09 KB
(708,696 bytes)     8/16/2005 3:14:29 PM
         Microsoft Corporation
         c:\winnt\system32\wbem\wbemcomn.dll
winmgmt.exe         1.50.1085.0100      192.10 KB
(196,706 bytes)     8/16/2005 3:14:30 PM
         Microsoft Corporation
         c:\winnt\system32\wbem\winmgmt.exe
msidle.dll          5.00.2920.0000      6.27 KB
(6,416 bytes)       12/7/1999 7:00:00 AM
         Microsoft Corporation
         c:\winnt\system32\msidle.dll
mstask.exe          4.71.2195.6704      116.77 KB
(119,568 bytes)     8/16/2005 3:14:14 PM
         Microsoft Corporation
         c:\winnt\system32\mstask.exe
wmi.dll   5.00.2191.1         6.27 KB (6,416 bytes)
          12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\wmi.dll
netshell.dll        5.00.2195.6604      466.27 KB
(477,456 bytes)     8/16/2005 3:14:16 PM
         Microsoft Corporation
         c:\winnt\system32\netshell.dll
netman.dll          5.00.2195.6660      93.27 KB
(95,504 bytes)      8/16/2005 3:14:15 PM
         Microsoft Corporation
         c:\winnt\system32\netman.dll
resutils.dll        5.00.2195.6702      39.77 KB
(40,720 bytes)      8/16/2005 3:14:20 PM
         Microsoft Corporation
         c:\winnt\system32\resutils.dll
clusapi.dll         5.00.2195.6683      54.27 KB
(55,568 bytes)      8/16/2005 3:13:59 PM
         Microsoft Corporation
         c:\winnt\system32\clusapi.dll
mtxclu.dll          2000.2.3504.0       51.27 KB
(52,496 bytes)      8/16/2005 3:14:15 PM
         Microsoft Corporation
         c:\winnt\system32\mtxclu.dll

msdtcprx.dll        2000.2.3504.0       690.77 KB
(707,344 bytes)     8/16/2005 3:14:11 PM
         Microsoft Corporation
         c:\winnt\system32\msdtcprx.dll
comsvcs.dll         2000.2.3504.0       1.38 MB
(1,448,208 bytes)   8/16/2005 3:14:00 PM
         Microsoft Corporation
         c:\winnt\system32\comsvcs.dll
ntmsdba.dll         5.00.2195.6655      169.27 KB
(173,328 bytes)     8/16/2005 3:14:17 PM
         Microsoft Corporation
         c:\winnt\system32\ntmsdba.dll
ipbootp.dll         5.00.2168.1         33.77 KB
(34,576 bytes)      12/7/1999 7:00:00 AM
         Microsoft Corporation
         c:\winnt\system32\ipbootp.dll
cryptui.dll         5.131.2195.6628     433.27 KB
(443,664 bytes)     8/16/2005 3:14:01 PM
         Microsoft Corporation
         c:\winnt\system32\cryptui.dll
rastls.dll          5.00.2195.6680      98.27 KB
(100,624 bytes)     8/16/2005 3:14:19 PM
         Microsoft Corporation
         c:\winnt\system32\rastls.dll
raschap.dll         5.00.2195.6663      59.27 KB
(60,688 bytes)      8/16/2005 3:14:19 PM
         Microsoft Corporation
         c:\winnt\system32\raschap.dll
rasppp.dll          5.00.2195.6626      194.27 KB
(198,928 bytes)     8/16/2005 3:14:19 PM
         Microsoft Corporation
         c:\winnt\system32\rasppp.dll
rastapi.dll         5.00.2195.6604      52.77 KB
(54,032 bytes)      8/16/2005 2:52:28 PM
         Microsoft Corporation
         c:\winnt\system32\rastapi.dll
rasdlg.dll          5.00.2195.6625      516.77 KB
(529,168 bytes)     8/16/2005 2:52:28 PM
         Microsoft Corporation
         c:\winnt\system32\rasdlg.dll
netcfgx.dll         5.00.2195.6604      534.77 KB
(547,600 bytes)     8/16/2005 3:14:15 PM
         Microsoft Corporation
         c:\winnt\system32\netcfgx.dll
rasmans.dll         5.00.2195.6696      149.77 KB
(153,360 bytes)     8/16/2005 3:14:19 PM
         Microsoft Corporation
         c:\winnt\system32\rasmans.dll
sens.dll  5.00.2195.6627      37.27 KB (38,160 bytes)
          8/16/2005 3:14:21 PM          Microsoft
Corporation         c:\winnt\system32\sens.dll
ntmssvc.dll         5.00.2195.6655      391.77 KB
(401,168 bytes)     8/16/2005 3:14:17 PM
         Microsoft Corporation
         c:\winnt\system32\ntmssvc.dll
sensapi.dll         5.00.2195.6627      7.27 KB
(7,440 bytes)       8/16/2005 3:14:21 PM
         Microsoft Corporation
         c:\winnt\system32\sensapi.dll
winhttp.dll         5.1.2600.1188 (xpsp2.030318-2132)
          303.50 KB (310,784 bytes)     8/16/2005
3:14:38 PM          Microsoft Corporation
         c:\winnt\system32\winhttp.dll
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txfaux.dll          2000.2.3504.0       388.27 KB
(397,584 bytes)     8/16/2005 3:14:24 PM
          Microsoft Corporation
          c:\winnt\system32\txfaux.dll
es.dll    2000.2.3504.0       227.77 KB (233,232
bytes)    8/16/2005 3:14:04 PM          Microsoft
Corporation         c:\winnt\system32\es.dll
wininet.dll         5.00.3700.6713      455.77 KB
(466,704 bytes)     8/16/2005 3:14:25 PM
          Microsoft Corporation
          c:\winnt\system32\wininet.dll
utildll.dll         5.00.2195.6701      25.77 KB
(26,384 bytes)      8/16/2005 3:14:24 PM
          Microsoft Corporation
          c:\winnt\system32\utildll.dll
wtsapi32.dll        5.00.2134.1         14.27 KB
(14,608 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\wtsapi32.dll
advpack.dll         5.00.3502.6601      86.77 KB
(88,848 bytes)      8/16/2005 3:13:56 PM
          Microsoft Corporation
          c:\winnt\system32\advpack.dll
wuaueng.dll         5.4.3630.2554 built by: lab04_n
          188.00 KB (192,512 bytes)     8/16/2005
3:14:38 PM          Microsoft Corporation
          c:\winnt\system32\wuaueng.dll
wuauserv.dll        5.4.3630.2554 built by: lab04_n
          9.00 KB (9,216 bytes)         8/16/2005
3:14:38 PM          Microsoft Corporation
          c:\winnt\system32\wuauserv.dll
clbcatq.dll         2000.2.3504.0       498.27 KB
(510,224 bytes)     8/16/2005 3:13:59 PM
          Microsoft Corporation
          c:\winnt\system32\clbcatq.dll
rpcss.dll 5.00.2195.6702      233.77 KB (239,376
bytes)    8/16/2005 3:14:20 PM          Microsoft
Corporation         c:\winnt\system32\rpcss.dll
svchost.exe         5.00.2134.1         7.77 KB
(7,952 bytes)       12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\svchost.exe
rsys.exe  Not Available       32.00 KB (32,768 bytes)
          9/13/2002 6:30:57 PM          Not Available
          c:\benchcraft\rsys.exe
regsvc.exe          5.00.2195.6701      66.77 KB
(68,368 bytes)      8/16/2005 3:14:19 PM
          Microsoft Corporation
          c:\winnt\system32\regsvc.exe
ntmarta.dll         5.00.2195.6666      100.27 KB
(102,672 bytes)     8/16/2005 3:14:17 PM
          Microsoft Corporation
          c:\winnt\system32\ntmarta.dll
psapi.dll 5.00.2134.1         28.27 KB (28,944 bytes)
          12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\psapi.dll
riched20.dll        5.30.23.1215        421.77 KB
(431,888 bytes)     8/16/2005 3:14:20 PM
          Microsoft Corporation
          c:\winnt\system32\riched20.dll
riched32.dll        5.00.2134.1         3.77 KB
(3,856 bytes)       12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\riched32.dll
comdlg32.dll        5.00.3700.6693      235.77 KB
(241,424 bytes)     8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\comdlg32.dll
aclient.exe         6.1.401   4.63 MB (4,857,932
bytes)    6/5/2003 1:55:46 PM Altiris, Inc.
          c:\program
files\altiris\aclient\aclient.exe
rdpwsx.dll          5.00.2195.6697      97.90 KB
(100,248 bytes)     8/16/2005 3:14:19 PM
          Microsoft Corporation
          c:\winnt\system32\rdpwsx.dll
ntlsapi.dll         5.00.2195.6601      6.77 KB
(6,928 bytes)       8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\ntlsapi.dll
mstlsapi.dll        5.00.2195.6659      25.77 KB
(26,384 bytes)      8/16/2005 3:14:14 PM
          Microsoft Corporation
          c:\winnt\system32\mstlsapi.dll
icaapi.dll          5.00.2195.6654      122.77 KB
(125,712 bytes)     8/16/2005 3:14:06 PM
          Microsoft Corporation
          c:\winnt\system32\icaapi.dll
regapi.dll          5.00.2195.6602      35.27 KB
(36,112 bytes)      8/16/2005 3:14:19 PM
          Microsoft Corporation
          c:\winnt\system32\regapi.dll
termsrv.exe         5.00.2195.6696      139.27 KB
(142,608 bytes)     8/16/2005 3:14:23 PM
          Microsoft Corporation
          c:\winnt\system32\termsrv.exe
dssenh.dll          5.00.2195.6612      143.77 KB
(147,216 bytes)     8/16/2005 3:14:35 PM
          Microsoft Corporation
          c:\winnt\system32\dssenh.dll
oakley.dll          5.00.2195.6662      435.77 KB
(446,224 bytes)     8/16/2005 3:14:17 PM
          Microsoft Corporation
          c:\winnt\system32\oakley.dll
mfc42u.dll          6.00.9586.0         988.05 KB
(1,011,764 bytes)   8/16/2005 3:14:09 PM
          Microsoft Corporation
          c:\winnt\system32\mfc42u.dll
polagent.dll        5.00.2195.6655      109.27 KB
(111,888 bytes)     8/16/2005 3:14:18 PM
          Microsoft Corporation
          c:\winnt\system32\polagent.dll
scecli.dll          5.00.2195.6704      111.77 KB
(114,448 bytes)     8/16/2005 3:14:20 PM
          Microsoft Corporation
          c:\winnt\system32\scecli.dll
esent.dll 6.1.3940.31         1.08 MB (1,135,376
bytes)    8/16/2005 3:14:04 PM          Microsoft
Corporation         c:\winnt\system32\esent.dll
mswsock.dll         5.00.2195.6603      62.77 KB
(64,272 bytes)      8/16/2005 3:14:14 PM
          Microsoft Corporation
          c:\winnt\system32\mswsock.dll
ntdsatq.dll         5.00.2195.6620      31.27 KB
(32,016 bytes)      8/16/2005 3:14:16 PM
          Microsoft Corporation
          c:\winnt\system32\ntdsatq.dll
ntdsa.dll 5.00.2195.6697      1016.27 KB (1,040,656
bytes)    8/16/2005 3:14:16 PM          Microsoft
Corporation         c:\winnt\system32\ntdsa.dll
kdcsvc.dll          5.00.2195.6627      144.77 KB
(148,240 bytes)     8/16/2005 3:14:09 PM
          Microsoft Corporation
          c:\winnt\system32\kdcsvc.dll
sfmapi.dll          5.00.2134.1         38.77 KB
(39,696 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\sfmapi.dll
rassfm.dll          5.00.2195.6604      21.27 KB
(21,776 bytes)      8/16/2005 3:14:19 PM
          Microsoft Corporation
          c:\winnt\system32\rassfm.dll
rsabase.dll         5.00.2195.6619      129.27 KB
(132,368 bytes)     6/19/2003 12:05:04 PM
          Microsoft Corporation
          c:\winnt\system32\rsabase.dll
schannel.dll        5.00.2195.6705      144.27 KB
(147,728 bytes)     8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\schannel.dll
netlogon.dll        5.00.2195.6695      363.27 KB
(371,984 bytes)     8/16/2005 3:14:15 PM
          Microsoft Corporation
          c:\winnt\system32\netlogon.dll
kerberos.dll        5.00.2195.6666      207.77 KB
(212,752 bytes)     8/16/2005 3:14:09 PM
          Microsoft Corporation
          c:\winnt\system32\kerberos.dll
msprivs.dll         5.00.2195.6695      46.00 KB
(47,104 bytes)      8/16/2005 3:14:13 PM
          Microsoft Corporation
          c:\winnt\system32\msprivs.dll
samsrv.dll          5.00.2195.6697      380.77 KB
(389,904 bytes)     8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\samsrv.dll
lsasrv.dll          5.00.2195.6695      506.77 KB
(518,928 bytes)     8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\lsasrv.dll
lsass.exe 5.00.2195.6695      32.77 KB (33,552 bytes)
          8/16/2005 2:52:28 PM          Microsoft
Corporation         c:\winnt\system32\lsass.exe
wmicore.dll         5.00.2195.6611      72.77 KB
(74,512 bytes)      8/16/2005 3:14:26 PM
          Microsoft Corporation
          c:\winnt\system32\wmicore.dll
browser.dll         5.00.2195.6693      67.27 KB
(68,880 bytes)      8/16/2005 3:13:57 PM
          Microsoft Corporation
          c:\winnt\system32\browser.dll
trkwks.dll          5.00.2195.6623      88.27 KB
(90,384 bytes)      8/16/2005 3:14:24 PM
          Microsoft Corporation
          c:\winnt\system32\trkwks.dll
psbase.dll          5.00.2195.6661      112.77 KB
(115,472 bytes)     8/16/2005 3:14:18 PM
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          Microsoft Corporation
          c:\winnt\system32\psbase.dll
cryptsvc.dll        5.00.2195.6661      74.27 KB
(76,048 bytes)      8/16/2005 3:14:01 PM
          Microsoft Corporation
          c:\winnt\system32\cryptsvc.dll
cfgmgr32.dll        5.00.2134.1         16.77 KB
(17,168 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\cfgmgr32.dll
dmserver.dll        2195.6605.297.3     11.77 KB
(12,048 bytes)      8/16/2005 3:14:03 PM
          VERITAS Software Corp.
          c:\winnt\system32\dmserver.dll
seclogon.dll        5.00.2195.6707      16.77 KB
(17,168 bytes)      8/16/2005 3:14:21 PM
          Microsoft Corporation
          c:\winnt\system32\seclogon.dll
cryptdll.dll        5.00.2195.6607      43.27 KB
(44,304 bytes)      8/16/2005 3:14:01 PM
          Microsoft Corporation
          c:\winnt\system32\cryptdll.dll
wkssvc.dll          5.00.2195.6692      95.77 KB
(98,064 bytes)      8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\wkssvc.dll
srvsvc.dll          5.00.2195.6697      81.77 KB
(83,728 bytes)      8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\srvsvc.dll
lmhsvc.dll          5.00.2195.6601      9.77 KB
(10,000 bytes)      8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\lmhsvc.dll
eventlog.dll        5.00.2195.6716      46.77 KB
(47,888 bytes)      8/16/2005 3:14:05 PM
          Microsoft Corporation
          c:\winnt\system32\eventlog.dll
ntdsapi.dll         5.00.2195.6666      56.27 KB
(57,616 bytes)      8/16/2005 3:14:16 PM
          Microsoft Corporation
          c:\winnt\system32\ntdsapi.dll
scesrv.dll          5.00.2195.6704      248.77 KB
(254,736 bytes)     8/16/2005 3:14:20 PM
          Microsoft Corporation
          c:\winnt\system32\scesrv.dll
umpnpmgr.dll        5.00.2182.1         86.27 KB
(88,336 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\umpnpmgr.dll
services.exe        5.00.2195.6700      87.27 KB
(89,360 bytes)      8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\services.exe
msv1_0.dll          5.00.2195.6680      114.77 KB
(117,520 bytes)     8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\msv1_0.dll
rasadhlp.dll        5.00.2168.1         7.27 KB
(7,440 bytes)       12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\rasadhlp.dll
winrnr.dll          5.00.2160.1         18.77 KB
(19,216 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\winrnr.dll
rnr20.dll 5.00.2195.6603      35.77 KB (36,624 bytes)
          8/16/2005 3:14:20 PM          Microsoft
Corporation         c:\winnt\system32\rnr20.dll
dhcpcsvc.dll        5.00.2195.6685      90.77 KB
(92,944 bytes)      8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\dhcpcsvc.dll
tapi32.dll          5.00.2195.6664      123.77 KB
(126,736 bytes)     8/16/2005 3:14:23 PM
          Microsoft Corporation
          c:\winnt\system32\tapi32.dll
rasman.dll          5.00.2195.6604      54.77 KB
(56,080 bytes)      8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\rasman.dll
rasapi32.dll        5.00.2195.6625      192.77 KB
(197,392 bytes)     8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\rasapi32.dll
rtutils.dll         5.00.2168.1         43.77 KB
(44,816 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\rtutils.dll
adsldpc.dll         5.00.2195.6701      130.77 KB
(133,904 bytes)     8/16/2005 3:13:56 PM
          Microsoft Corporation
          c:\winnt\system32\adsldpc.dll
activeds.dll        5.00.2195.6601      177.77 KB
(182,032 bytes)     8/16/2005 3:13:54 PM
          Microsoft Corporation
          c:\winnt\system32\activeds.dll
oleaut32.dll        2.40.4522 612.27 KB (626,960
bytes)    8/16/2005 2:52:28 PM          Microsoft
Corporation         c:\winnt\system32\oleaut32.dll
mprapi.dll          5.00.2181.1         79.27 KB
(81,168 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mprapi.dll
icmp.dll  5.00.2134.1         7.27 KB (7,440 bytes)
          12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\icmp.dll
iphlpapi.dll        5.00.2195.6602      68.27 KB
(69,904 bytes)      8/16/2005 3:14:07 PM
          Microsoft Corporation
          c:\winnt\system32\iphlpapi.dll
wshtcpip.dll        5.00.2195.6601      17.27 KB
(17,680 bytes)      8/16/2005 3:14:26 PM
          Microsoft Corporation
          c:\winnt\system32\wshtcpip.dll
msafd.dll 5.00.2195.6602      106.27 KB (108,816
bytes)    8/16/2005 3:14:10 PM          Microsoft
Corporation         c:\winnt\system32\msafd.dll
mpr.dll   5.00.2195.6611      53.77 KB (55,056 bytes)
          8/16/2005 3:14:10 PM          Microsoft
Corporation         c:\winnt\system32\mpr.dll
winspool.drv        5.00.2195.6659      111.27 KB
(113,936 bytes)     8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\winspool.drv
winscard.dll        5.00.2195.6609      77.27 KB
(79,120 bytes)      8/16/2005 3:14:26 PM
          Microsoft Corporation
          c:\winnt\system32\winscard.dll
atl.dll   3.00.9435 73.06 KB (74,810 bytes)
          8/16/2005 3:13:57 PM          Microsoft
Corporation         c:\winnt\system32\atl.dll
certcli.dll         5.00.2195.6619      132.27 KB
(135,440 bytes)     8/16/2005 3:13:59 PM
          Microsoft Corporation
          c:\winnt\system32\certcli.dll
wlnotify.dll        5.00.2195.6706      56.27 KB
(57,616 bytes)      8/16/2005 3:14:26 PM
          Microsoft Corporation
          c:\winnt\system32\wlnotify.dll
cscdll.dll          5.00.2195.6713      98.77 KB
(101,136 bytes)     8/16/2005 3:14:01 PM
          Microsoft Corporation
          c:\winnt\system32\cscdll.dll
lz32.dll  5.00.2195.6611      9.77 KB (10,000 bytes)
          8/16/2005 3:14:09 PM          Microsoft
Corporation         c:\winnt\system32\lz32.dll
version.dll         5.00.2195.6623      15.77 KB
(16,144 bytes)      8/16/2005 3:14:25 PM
          Microsoft Corporation
          c:\winnt\system32\version.dll
rsaenh.dll          5.00.2195.6611      131.77 KB
(134,928 bytes)     8/16/2005 3:14:36 PM
          Microsoft Corporation
          c:\winnt\system32\rsaenh.dll
mscat32.dll         5.131.2134.1        7.77 KB
(7,952 bytes)       12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mscat32.dll
ole32.dll 5.00.2195.6692      972.77 KB (996,112
bytes)    8/16/2005 3:14:17 PM          Microsoft
Corporation         c:\winnt\system32\ole32.dll
imagehlp.dll        5.00.2195.6613      125.77 KB
(128,784 bytes)     8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\imagehlp.dll
msasn1.dll          5.00.2195.6666      51.77 KB
(53,008 bytes)      8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\msasn1.dll
crypt32.dll         5.131.2195.6661     468.27 KB
(479,504 bytes)     8/16/2005 3:14:00 PM
          Microsoft Corporation
          c:\winnt\system32\crypt32.dll
wintrust.dll        5.131.2195.6624     162.27 KB
(166,160 bytes)     8/16/2005 3:14:26 PM
          Microsoft Corporation
          c:\winnt\system32\wintrust.dll
shlwapi.dll         5.00.3502.6601      282.77 KB
(289,552 bytes)     8/16/2005 3:14:22 PM
          Microsoft Corporation
          c:\winnt\system32\shlwapi.dll
shell32.dll         5.00.3700.6705      2.27 MB
(2,383,632 bytes)   8/16/2005 3:14:21 PM
          Microsoft Corporation
          c:\winnt\system32\shell32.dll
msgina.dll          5.00.2195.6669      326.27 KB
(334,096 bytes)     8/16/2005 3:14:12 PM
```

```
          Microsoft Corporation
          c:\winnt\system32\msgina.dll
comctl32.dll        5.81      537.77 KB (550,672
bytes)    8/16/2005 2:52:28 PM          Microsoft
Corporation         c:\winnt\system32\comctl32.dll
setupapi.dll        5.00.2195.6622      556.77 KB
(570,128 bytes)     8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\setupapi.dll
winmm.dll 5.00.2161.1         184.77 KB (189,200
bytes)    12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\winmm.dll
winsta.dll          5.00.2195.6701      38.27 KB
(39,184 bytes)      8/16/2005 3:14:26 PM
          Microsoft Corporation
          c:\winnt\system32\winsta.dll
wsock32.dll         5.00.2195.6603      21.27 KB
(21,776 bytes)      8/16/2005 3:14:26 PM
          Microsoft Corporation
          c:\winnt\system32\wsock32.dll
dnsapi.dll          5.00.2195.6680      131.77 KB
(134,928 bytes)     8/16/2005 3:14:03 PM
          Microsoft Corporation
          c:\winnt\system32\dnsapi.dll
wldap32.dll         5.00.2195.6666      158.27 KB
(162,064 bytes)     8/16/2005 3:14:26 PM
          Microsoft Corporation
          c:\winnt\system32\wldap32.dll
ws2help.dll         5.00.2134.1         17.77 KB
(18,192 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\ws2help.dll
ws2_32.dll          5.00.2195.6601      68.27 KB
(69,904 bytes)      8/16/2005 3:14:26 PM
          Microsoft Corporation
          c:\winnt\system32\ws2_32.dll
samlib.dll          5.00.2195.6666      48.77 KB
(49,936 bytes)      8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\samlib.dll
netrap.dll          5.00.2134.1         11.27 KB
(11,536 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\netrap.dll
netapi32.dll        5.00.2195.6601      304.27 KB
(311,568 bytes)     8/16/2005 3:14:15 PM
          Microsoft Corporation
          c:\winnt\system32\netapi32.dll
profmap.dll         5.00.2195.6610      29.27 KB
(29,968 bytes)      8/16/2005 3:14:18 PM
          Microsoft Corporation
          c:\winnt\system32\profmap.dll
secur32.dll         5.00.2195.6695      47.77 KB
(48,912 bytes)      8/16/2005 3:14:21 PM
          Microsoft Corporation
          c:\winnt\system32\secur32.dll
sfc.dll   5.00.2195.6673      92.80 KB (95,024 bytes)
          8/16/2005 3:14:21 PM          Microsoft
Corporation         c:\winnt\system32\sfc.dll
nddeapi.dll         5.00.2195.6661      15.77 KB
(16,144 bytes)      8/16/2005 3:14:15 PM
          Microsoft Corporation
          c:\winnt\system32\nddeapi.dll
```

```
userenv.dll         5.00.2195.6711      380.77 KB
(389,904 bytes)     8/16/2005 3:14:24 PM
          Microsoft Corporation
          c:\winnt\system32\userenv.dll
user32.dll          5.00.2195.6688      393.77 KB
(403,216 bytes)     8/16/2005 3:14:24 PM
          Microsoft Corporation
          c:\winnt\system32\user32.dll
gdi32.dll 5.00.2195.6660      228.27 KB (233,744
bytes)    8/16/2005 3:14:05 PM          Microsoft
Corporation         c:\winnt\system32\gdi32.dll
rpcrt4.dll          5.00.2195.6701      443.77 KB
(454,416 bytes)     8/16/2005 3:14:20 PM
          Microsoft Corporation
          c:\winnt\system32\rpcrt4.dll
advapi32.dll        5.00.2195.6710      378.27 KB
(387,344 bytes)     8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\advapi32.dll
kernel32.dll        5.00.2195.6688      725.77 KB
(743,184 bytes)     8/16/2005 2:52:28 PM
          Microsoft Corporation
          c:\winnt\system32\kernel32.dll
msvcrt.dll          6.10.9844.0         280.05 KB
(286,773 bytes)     6/19/2003 12:05:04 PM
          Microsoft Corporation
          c:\winnt\system32\msvcrt.dll
winlogon.exe        5.00.2195.6714      176.77 KB
(181,008 bytes)     8/16/2005 3:14:25 PM
          Microsoft Corporation
          c:\winnt\system32\winlogon.exe
sfcfiles.dll        5.00.2195.6717      948.27 KB
(971,024 bytes)     8/16/2005 3:14:21 PM
          Microsoft Corporation
          c:\winnt\system32\sfcfiles.dll
ntdll.dll 5.00.2195.6685      480.27 KB (491,792
bytes)    8/16/2005 2:52:28 PM          Microsoft
Corporation         c:\winnt\system32\ntdll.dll
smss.exe  5.00.2195.6601      44.77 KB (45,840 bytes)
          8/16/2005 2:52:28 PM          Microsoft
Corporation         c:\winnt\system32\smss.exe

[Services]

Display Name        Name      State     Start Mode
          Service Type        Path      Error Control
          Start Name          Tag ID
Altiris Client Service        AClient   Running
          Auto      Own Process         c:\program
files\altiris\aclient\aclient.exe -service
          Normal    LocalSystem         0
Alerter   Alerter   Stopped   Manual    Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Application Management        AppMgmt   Stopped
          Manual    Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
ASP.NET State Service         aspnet_state
          Stopped   Manual    Own Process
          c:\winnt\microsoft.net\framework\v2.0.50215
\aspnet_state.exe   Normal    .\ASPNET  0
```

```
Background Intelligent Transfer Service BITS
          Stopped   Manual    Share Process
          c:\winnt\system32\svchost.exe -k bitsgroup
          Normal    LocalSystem         0
Computer Browser    Browser   Running   Auto
          Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Indexing Service    cisvc     Stopped   Manual
          Share Process
          c:\winnt\system32\cisvc.exe   Normal
          LocalSystem         0
ClipBook  ClipSrv   Stopped   Manual    Own Process
          c:\winnt\system32\clipsrv.exe Normal
          LocalSystem         0
.NET Runtime Optimization Service v2.0.50215_X86
          clr_optimization_v2.0.50215_32
          Stopped   Manual    Own Process
          c:\winnt\microsoft.net\framework\v2.0.50215
\mscorsvw.exe       Ignore    LocalSystem         0
Distributed File System       Dfs       Running
          Auto      Own Process
          c:\winnt\system32\dfssvc.exe  Normal
          LocalSystem         0
DHCP Client         Dhcp      Running   Auto
          Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Logical Disk Manager Administrative Service
          dmadmin   Stopped   Manual    Share Process
          c:\winnt\system32\dmadmin.exe /com
          Normal    LocalSystem         0
Logical Disk Manager          dmserver  Running
          Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
DNS Client          Dnscache  Stopped   Manual
          Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Event Log Eventlog  Running   Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
COM+ Event System   EventSystem         Running
          Manual    Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Fax Service         Fax       Stopped   Manual    Own
Process   c:\winnt\system32\faxsvc.exe  Normal
          LocalSystem         0
IIS Admin Service   IISADMIN  Running   Auto
          Share Process
          c:\winnt\system32\inetsrv\inetinfo.exe
          Normal    LocalSystem         0
Intersite Messaging IsmServ   Stopped   Disabled  Own
Process   c:\winnt\system32\ismserv.exe Normal
          LocalSystem         0
Kerberos Key Distribution Center        kdc
          Stopped   Disabled  Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
Server    lanmanserver        Running   Auto
          Share Process
```

```
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Workstation         lanmanworkstation   Running
          Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
License Logging Service       LicenseService
          Stopped   Manual    Own Process
          c:\winnt\system32\llssrv.exe  Normal
          LocalSystem         0
TCP/IP NetBIOS Helper Service LmHosts   Running
          Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Messenger Messenger Stopped   Manual    Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
NetMeeting Remote Desktop Sharing       mnmsrvc
          Stopped   Manual    Own Process
          c:\winnt\system32\mnmsrvc.exe Normal
          LocalSystem         0
Distributed Transaction Coordinator     MSDTC
          Stopped   Manual    Own Process
          c:\winnt\system32\msdtc.exe   Normal
          LocalSystem         0
Windows Installer   MSIServer Stopped   Manual
          Share Process
          c:\winnt\system32\msiexec.exe /v
          Normal    LocalSystem         0
Network DDE         NetDDE    Stopped   Manual
          Share Process
          c:\winnt\system32\netdde.exe  Normal
          LocalSystem         0
Network DDE DSDM    NetDDEdsdm          Stopped
          Manual    Share Process
          c:\winnt\system32\netdde.exe  Normal
          LocalSystem         0
Net Logon Netlogon  Stopped   Manual    Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
Network Connections Netman    Running   Manual
          Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
File Replication    NtFrs     Stopped   Manual    Own
Process   c:\winnt\system32\ntfrs.exe   Ignore
          LocalSystem         0
NT LM Security Support Provider         NtLmSsp
          Stopped   Manual    Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
Removable Storage   NtmsSvc   Running   Auto
          Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Plug and Play       PlugPlay  Running   Auto
          Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
IPSEC Policy Agent  PolicyAgent         Running
          Auto      Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
Protected Storage   ProtectedStorage    Running
          Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Remote Access Auto Connection Manager   RasAuto
          Stopped   Manual    Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Remote Access Connection Manager        RasMan
          Running   Manual    Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Routing and Remote Access     RemoteAccess
          Stopped   Disabled  Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Remote Registry Service       RemoteRegistry
          Running   Auto      Own Process
          c:\winnt\system32\regsvc.exe  Normal
          LocalSystem         0
Remote Command Service        RMSYS     Running
          Auto      Own Process
          c:\benchcraft\rsys.exe        Normal
          LocalSystem         0
Remote Procedure Call (RPC) Locator     RpcLocator
          Stopped   Manual    Own Process
          c:\winnt\system32\locator.exe Normal
          LocalSystem         0
Remote Procedure Call (RPC)   RpcSs     Running
          Auto      Share Process
          c:\winnt\system32\svchost -k rpcss
          Normal    LocalSystem         0
QoS RSVP  RSVP      Running   Manual    Own Process
          c:\winnt\system32\rsvp.exe -s Normal
          LocalSystem         0
Security Accounts Manager     SamSs     Running
          Auto      Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
Smart Card Helper   SCardDrv  Stopped   Manual
          Share Process
          c:\winnt\system32\scardsvr.exe
          Ignore    LocalSystem         0
Smart Card          SCardSvr  Stopped   Manual
          Share Process
          c:\winnt\system32\scardsvr.exe
          Ignore    LocalSystem         0
Task Scheduler      Schedule  Running   Auto
          Share Process
          c:\winnt\system32\mstask.exe  Normal
          LocalSystem         0
RunAs Service       seclogon  Running   Auto
          Share Process
          c:\winnt\system32\services.exe
          Ignore    LocalSystem         0
System Event Notification     SENS      Running
          Auto      Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Internet Connection Sharing   SharedAccess
          Stopped   Manual    Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Print Spooler       Spooler   Stopped   Manual    Own
Process   c:\winnt\system32\spoolsv.exe Normal
          LocalSystem         0
Performance Logs and Alerts   SysmonLog Stopped
          Manual    Own Process
          c:\winnt\system32\smlogsvc.exe
          Normal    LocalSystem         0
Telephony TapiSrv   Running   Manual    Share Process
          c:\winnt\system32\svchost.exe -k tapisrv
          Normal    LocalSystem         0
Terminal Services   TermService         Running
          Auto      Own Process
          c:\winnt\system32\termsrv.exe Normal
          LocalSystem         0
Telnet    TlntSvr   Stopped   Manual    Own Process
          c:\winnt\system32\tlntsvr.exe Normal
          LocalSystem         0
Distributed Link Tracking Server        TrkSvr
          Stopped   Manual    Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Distributed Link Tracking Client        TrkWks
          Running   Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Uninterruptible Power Supply  UPS       Stopped
          Manual    Own Process
          c:\winnt\system32\ups.exe     Normal
          LocalSystem         0
Utility Manager     UtilMan   Stopped   Manual    Own
Process   c:\winnt\system32\utilman.exe Normal
          LocalSystem         0
Windows Time        W32Time   Stopped   Manual
          Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
World Wide Web Publishing Service       W3SVC
          Running   Auto      Share Process
          c:\winnt\system32\inetsrv\inetinfo.exe
          Normal    LocalSystem         0
Windows Management Instrumentation      WinMgmt
          Running   Auto      Own Process
          c:\winnt\system32\wbem\winmgmt.exe
          Ignore    LocalSystem         0
Windows Management Instrumentation Driver Extensions
          Wmi       Running   Manual    Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Automatic Updates   wuauserv  Running   Auto
          Share Process
          c:\winnt\system32\svchost.exe -k wugroup
          Normal    LocalSystem         0
Wireless Configuration        WZCSVC    Stopped
          Manual    Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0

[Program Groups]

Group Name          Name      User Name
Accessories         Default User:Accessories
          Default User
```

```
Accessories\Accessibility     Default
User:Accessories\Accessibility          Default User
Accessories\Entertainment     Default
User:Accessories\Entertainment          Default User
Accessories\System Tools      Default
User:Accessories\System Tools Default User
Startup   Default User:Startup          Default User
Accessories         All Users:Accessories         All
Users
Accessories\Communications    All
Users:Accessories\Communications        All Users
Accessories\Entertainment     All
Users:Accessories\Entertainment         All Users
Accessories\Microsoft Script Debugger   All
Users:Accessories\Microsoft Script Debugger       All
Users
Accessories\System Tools      All
Users:Accessories\System Tools          All Users
Administrative Tools          All
Users:Administrative Tools    All Users
Microsoft SQL Server 2005 CTP All Users:Microsoft SQL
Server 2005 CTP     All Users
Microsoft SQL Server 2005 CTP\Configuration Tools All
Users:Microsoft SQL Server 2005 CTP\Configuration
Tools     All Users
Microsoft SQL Server 2005 CTP\Documentation and
Tutorials All Users:Microsoft SQL Server 2005
CTP\Documentation and Tutorials         All Users
Microsoft SQL Server 2005 CTP\Documentation and
Tutorials\Tutorials All Users:Microsoft SQL Server
2005 CTP\Documentation and Tutorials\Tutorials    All
Users
Startup   All Users:Startup   All Users
Tardis    All Users:Tardis    All Users
Accessories         CL55\Administrator:Accessories
          CL55\Administrator
Accessories\Accessibility
          CL55\Administrator:Accessories\Accessibilit
y         CL55\Administrator
Accessories\Entertainment
          CL55\Administrator:Accessories\Entertainmen
t         CL55\Administrator
Accessories\System Tools
          CL55\Administrator:Accessories\System Tools
          CL55\Administrator
Administrative Tools
          CL55\Administrator:Administrative Tools
          CL55\Administrator
Startup   CL55\Administrator:Startup
          CL55\Administrator

[Startup Programs]

Program   Command   User Name Location
Tardis 2000         c:\progra~1\tardis~1.4\tardis.exe
          All Users Common Startup
AClntUsr  c:\program
files\altiris\aclient\aclntusr.exe      All Users
          HKLM\SOFTWARE\Microsoft\Windows\CurrentVers
ion\Run

[OLE Registration]

Object    Local Server
Sound (OLE2)        sndrec32.exe
Media Clip          mplay32.exe
Video Clip          mplay32.exe /avi
MIDI Sequence       mplay32.exe /mid
Sound     Not Available
Media Clip          Not Available
Image Document      "C:\Program Files\Windows
NT\Accessories\ImageVue\KodakImg.exe"
WordPad Document    "%ProgramFiles%\Windows
NT\Accessories\WORDPAD.EXE"
Windows Media Services DRM Storage object         Not
Available
DDSContainerCtl Class         Not Available
Bitmap Image        mspaint.exe

[Internet Explorer 5]

[ Following are sub-categories of this main category
]

[Summary]

Item      Value
Version   5.00.3700.1000
Build     53700.1000
Product ID          51876-270-9567332-05753
Application Path    C:\Program Files\Internet
Explorer
Language  English (United States)
Active Printer      Not Available

Cipher Strength     168-bit
Content Advisor     Disabled
IEAK Install        No

[File Versions]

File      Version   Size      Date      Path
          Company
advapi32.dll        5.0.2195.6710       378 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
advpack.dll         5.0.3502.6601       87 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
browselc.dll        5.0.3700.6661       35 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
browseui.dll        5.0.3700.6661       789 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
ckcnv.exe 5.0.2189.1          9 KB      12/7/1999
8:00:00 AM          C:\WINNT\system32   Microsoft
Corporation
comctl32.dll        5.81.3502.6601      538 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
crypt32.dll         5.131.2195.6661     468 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation

enhsig.dll          <File Missing>      Not Available
          Not Available       Not Available       Not
Available
iemigrat.dll        <File Missing>      Not Available
          Not Available       Not Available       Not
Available
iesetup.dll         5.0.3502.6601       57 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
iexplore.exe        5.0.2920.0          59 KB
          12/7/1999 8:00:00 AM          C:\Program
Files\Internet Explorer       Microsoft Corporation
imagehlp.dll        5.0.2195.6613       126 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
imghelp.dll         <File Missing>      Not Available
          Not Available       Not Available       Not
Available
inseng.dll          5.0.3502.6601       72 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
jobexec.dll         5.0.0.1   47 KB     12/7/1999
8:00:00 AM          C:\WINNT\system32   Microsoft
Corporation
jscript.dll         5.1.0.8513          476 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
jsproxy.dll         5.0.2920.0          13 KB
          12/7/1999 8:00:00 AM
          C:\WINNT\system32   Microsoft Corporation
msaahtml.dll        <File Missing>      Not Available
          Not Available       Not Available       Not
Available
mshtml.dll          5.0.3700.6699       2299 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
msoss.dll <File Missing>      Not Available       Not
Available Not Available       Not Available
msxml.dll 8.0.6730.0          502 KB    6/19/2003
12:05:04 PM         C:\WINNT\system32   Microsoft
Corporation
occache.dll         5.0.3502.6601       86 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
ole32.dll 5.0.2195.6692       973 KB    6/19/2003
12:05:04 PM         C:\WINNT\system32   Microsoft
Corporation
oleaut32.dll        2.40.4522.0         612 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
olepro32.dll        5.0.4522.0          160 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
rsabase.dll         5.0.2195.6619       129 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
rsaenh.dll          5.0.2195.6611       132 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
rsapi32.dll         <File Missing>      Not Available
          Not Available       Not Available       Not
Available
```

```
rsasig.dll          <File Missing>      Not Available
          Not Available       Not Available       Not
Available
schannel.dll        5.1.2195.6705       144 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
shdoc401.dll        <File Missing>      Not Available
          Not Available       Not Available       Not
Available
shdocvw.dll         5.0.3700.6668       1082 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
shell32.dll         5.0.3700.6705       2328 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
shlwapi.dll         5.0.3502.6601       283 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
url.dll   5.0.3502.6601       82 KB     6/19/2003
12:05:04 PM         C:\WINNT\system32   Microsoft
Corporation
urlmon.dll          5.0.3700.6705       443 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
vbscript.dll        5.1.0.7426          428 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
webcheck.dll        5.0.3502.6601       252 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
win.com   5.0.2134.1          24 KB     12/7/1999
8:00:00 AM          C:\WINNT\system32   Microsoft
Corporation
wininet.dll         5.0.3700.6713       456 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
winsock.dll         3.10.0.103          3 KB
          12/7/1999 8:00:00 AM
          C:\WINNT\system32   Microsoft Corporation
wintrust.dll        5.131.2195.6624     162 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
wsock.vxd <File Missing>      Not Available       Not
Available Not Available       Not Available
wsock32.dll         5.0.2195.6603       21 KB
          6/19/2003 12:05:04 PM
          C:\WINNT\system32   Microsoft Corporation
wsock32n.dll        <File Missing>      Not Available
          Not Available       Not Available       Not
Available

[Connectivity]

Item      Value
Connection Preference         Never dial
EnableHttp1.1       1
ProxyHttp1.1        0

LAN Settings

AutoConfigProxy     wininet.dll
AutoProxyDetectMode Disabled
AutoConfigURL
Proxy     Disabled
ProxyServer
ProxyOverride

[Cache]

[ Following are sub-categories of this main category
]

[Summary]

Item      Value
Page Refresh Type   Automatic
Temporary Internet Files Folder         C:\Documents
and Settings\Administrator\Local Settings\Temporary
Internet Files
Total Disk Space    34727 MB
Available Disk Space          16646 MB
Maximum Cache Size  542 MB
Available Cache Size          542 MB

[List of Objects]

Program File        Status    CodeBase
No cached object information available

[Content]

[ Following are sub-categories of this main category
]

[Summary]

Item      Value
Content Advisor     Disabled

[Personal Certificates]

Issued To Issued By Validity  Signature Algorithm
Administrator       Administrator       9/13/2002 to
8/20/2102 sha1RSA

[Other People Certificates]

Issued To Issued By Validity  Signature Algorithm
No other people certificate information available


[Publishers]

Name
No publisher information available

[Security]

Zone      Security Level
Local intranet      Medium-low
Trusted sites       Low
Internet  Medium
Restricted sites    High
```

Microsoft COM Component Configuration Parameters

The component services tool in Windows 2000 was used to change the queue settings for the TPCC COM+ queue components. All tpcc queue components were set to enable object pooling, object construction, just in time activation, and component supports events and statistics. The construction string was Server = myserver; UID= sa; pwd=; DATABASE= tpcc; The single queue TpccAllTxn object was used, with the Min and Max both being set to 40 queues. Delivery threads were set under the TPCC key in the registry.

Internet Information Server Registry Parameters

```
REGEDIT4

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\InetInfo]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\InetInfo\Parameters]
"ListenBackLog"=dword:00000019
"DispatchEntries"=hex(7):4c,44,41,50,53,56,43,00,00
"PoolThreadLimit"=dword:000007fe
"ThreadTimeout"=dword:00015180

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\InetInfo\Performance]
"Library"="infoctrs.dll"
"Open"="OpenINFOPerformanceData"
"Close"="CloseINFOPerformanceData"
"Collect"="CollectINFOPerformanceData"
"Last Counter"=dword:00000842
"Last Help"=dword:00000843
"First Counter"=dword:00000802
"First Help"=dword:00000803
"Library Validation
Code"=hex:02,2e,64,8f,95,a2,c5,01,10,25,00,00,00,00,0
0,00
"WbemAdapFileTime"=hex:00,a0,38,ed,84,36,c3,01
"WbemAdapFileSize"=dword:00002510
"WbemAdapStatus"=dword:00000000
```

World Wide Web Service Registry Parameters

```
REGEDIT4

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC]
"Type"=dword:00000020
"Start"=dword:00000002
"ErrorControl"=dword:00000001
"ImagePath"=hex(2):43,3a,5c,57,49,4e,4e,54,5c,53,79,7
3,74,65,6d,33,32,5c,69,6e,\

65,74,73,72,76,5c,69,6e,65,74,69,6e,66,6f,2e,65,78,65
,00
"DisplayName"="World Wide Web Publishing Service"
"DependOnService"=hex(7):49,49,53,41,44,4d,49,4e,00,0
0
"DependOnGroup"=hex(7):00
"ObjectName"="LocalSystem"
"Description"="Provides Web connectivity and
administration through the Internet Information
Services snap-in."
"FailureActions"=hex:ff,ff,ff,ff,00,00,00,00,00,00,00
,00,03,00,00,00,70,57,0c,\

00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00
,00,00,00,00,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\ASP]
"NOTE"="This is for backward compatibility only."

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\ASP\Parameters]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters]
"MajorVersion"=dword:00000005
"MinorVersion"=dword:00000000
"InstallPath"="C:\\WINNT\\System32\\inetsrv"
"CertMapList"="C:\\WINNT\\System32\\inetsrv\\iiscrmap
.dll"
"AccessDeniedMessage"="Error: Access is Denied."
"Filter DLLs"=""
"LogFileDirectory"="C:\\WINNT\\System32\\LogFiles"
"AcceptExOutstanding"=dword:00000028

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\ADCLaunch]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\ADCLaunch\AdvancedDataFactory]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\ADCLaunch\RDSServer.DataFactory]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\Script Map]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\Virtual Roots]
"/"="c:\\inetpub\\wwwroot,,207"
"/Scripts"="c:\\inetpub\\scripts,,1"
"/IISHelp"="c:\\winnt\\help\\iishelp,,1"
"/IISAdmin"="C:\\WINNT\\System32\\inetsrv\\iisadmin,,
1"
"/IISSamples"="c:\\inetpub\\iissamples,,1"
"/MSADC"="c:\\program files\\common
files\\system\\msadc,,1"
"/_vti_bin"="C:\\Program Files\\Common
Files\\Microsoft Shared\\Web Server
Extensions\\40\\isapi,,1"
"/Printers"="C:\\WINNT\\web\\printers,,201"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Performance]
"Library"="w3ctrs.dll"
"Open"="OpenW3PerformanceData"
"Close"="CloseW3PerformanceData"
"Collect"="CollectW3PerformanceData"
"Last Counter"=dword:000008e6
"Last Help"=dword:000008e7
"First Counter"=dword:00000844
"First Help"=dword:00000845
"Library Validation
Code"=hex:ec,84,5e,90,95,a2,c5,01,10,1d,00,00,00,00,0
0,00
"WbemAdapFileTime"=hex:00,a0,38,ed,84,36,c3,01
"WbemAdapFileSize"=dword:00001d10
"WbemAdapStatus"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Security]
"Security"=hex:01,00,14,80,a0,00,00,00,ac,00,00,00,14
,00,00,00,30,00,00,00,02,\

00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00
,00,00,00,00,01,00,00,\

00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,74,00,6f,00,00,00,1c,00,ff,01,0f,00,01
,02,00,00,00,00,00,05,\

20,00,00,00,20,02,00,00,72,00,73,00,00,00,18,00,8d,01
,02,00,01,01,00,00,00,\

00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02
,00,01,02,00,00,00,00,\

00,05,20,00,00,00,23,02,00,00,72,00,73,00,01,01,00,00
,00,00,00,05,12,00,00,\
  00,01,01,00,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Enum]
"0"="Root\\LEGACY_W3SVC\\0000"
"Count"=dword:00000001
"NextInstance"=dword:00000001
```

TPCC Application Registry Parameters

```
REGEDIT4

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\TPCC]
"Path"="C:\\Inetpub\\wwwroot\\"
"NumberOfDeliveryThreads"=dword:0000000a
"MaxConnections"=dword:000059d8
"MaxPendingDeliveries"=dword:000007d0
"DB_Protocol"="ODBC"
"TxnMonitor"="COM"
"DbName"="tpcc"
"DbUser"="sa"
"DbPassword"=""
"COM_SinglePool"="YES"
"CallNoDuplicatesNewOrder"=dword:00000001
"DbServer"="mesa_ip"
"ConnectDelay"=dword:00000001
```

Benchcraft Profile

```
Profile:  mesa_11104_8cl_bal
File Path:          C:\Program
Files\BenchCraft\mesa_11104_8cl_bal.xml
Version:  5

          Number of Engines: 8

                    Name: N31
                    Description:
                    Directory: c:\blog\rte1.log
                    Machine: n31
                    Parameter Set: FullSpeed
                    Index: 700000000
                    Seed: 4678
                    Configured Users: 13830
                    Pipe Name: DRIVER44265281
                    Connect Rate: 5000
                    Start Rate: 5000
                    Max. Concurrency: 14080
                    Concurrency Rate: 20
                    CLIENT_NURAND: 25
```

```
CPU: 0
Additional Options:

Name: N32
Description:
Directory: c:\blog\rte2.log
Machine: n32
Parameter Set: FullSpeed
Index: 100000000
Seed: 4678
Configured Users: 13830
Pipe Name: DRIVER2356275906
Connect Rate: 5000
Start Rate: 5000
Max. Concurrency: 14080
Concurrency Rate: 20
CLIENT_NURAND: 25
CPU: 0
Additional Options:

Name: N33
Description:
Directory: c:\blog\rte3.log
Machine: n33
Parameter Set: FullSpeed
Index: 200000000
Seed: 4678
Configured Users: 13930
Pipe Name: DRIVER3356313875
Connect Rate: 5000
Start Rate: 5000
Max. Concurrency: 14080
Concurrency Rate: 20
CLIENT_NURAND: 25
CPU: 0
Additional Options:

Name: N34
Description:
Directory: c:\blog\rte4.log
Machine: n34
Parameter Set: FullSpeed
Index: 300000000
Seed: 4678
Configured Users: 13930
Pipe Name: DRIVER4356346296
Connect Rate: 5000
Start Rate: 5000
Max. Concurrency: 14080
Concurrency Rate: 20
CLIENT_NURAND: 25
CPU: 0
Additional Options:

Name: N35
Description:
Directory: c:\blog\rte5.log
Machine: N35
Parameter Set: FullSpeed
Index: 400000000
Seed: 4678
Configured Users: 13680
Pipe Name: DRIVER5325359
Connect Rate: 5000
Start Rate: 5000
Max. Concurrency: 14080
Concurrency Rate: 20
CLIENT_NURAND: 25
CPU: 0
Additional Options:

Name: N44
Description:
Directory: c:\blog\rte6.log
Machine: N44
Parameter Set: FullSpeed
Index: 500000000
Seed: 4678
Configured Users: 13680
Pipe Name: DRIVER6362078
Connect Rate: 5000
Start Rate: 5000
Max. Concurrency: 14080
Concurrency Rate: 20
CLIENT_NURAND: 25
CPU: 0
Additional Options:

Name: xN21
Description:
Directory: c:\blog\rte7.log
Machine: N21
Parameter Set: FullSpeed
Index: 600000000
Seed: 4678
Configured Users: 14080
Pipe Name: DRIVER7388671
Connect Rate: 5000
Start Rate: 5000
Max. Concurrency: 14080
Concurrency Rate: 20
CLIENT_NURAND: 25
CPU: 0
Additional Options:

Name: xN22
Description:
Directory: c:\blog\rte8.log
Machine: N22
Parameter Set: FullSpeed
Index: 800000000
Seed: 4678
Configured Users: 14080
Pipe Name: DRIVER8434562
Connect Rate: 5000
Start Rate: 5000
Max. Concurrency: 14080
Concurrency Rate: 20
CLIENT_NURAND: 25
CPU: 0
Additional Options:

Number of User groups: 8

Driver Engine: N31
IIS Server: cr55
SQL Server: mesa
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1 - 1383
w_id Min Warehouse: 1
w_id Max Warehouse: 11104
Scale: Normal
User Count: 13830
District id: 1
Scale Down: No

Driver Engine: N32
IIS Server: cr56
SQL Server: mesa
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1384 - 2766
w_id Min Warehouse: 1
w_id Max Warehouse: 11104
Scale: Normal
User Count: 13830
District id: 1
Scale Down: No

Driver Engine: N33
IIS Server: cr57
SQL Server: mesa
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 2767 - 4159
w_id Min Warehouse: 1
w_id Max Warehouse: 11104
Scale: Normal
User Count: 13930
District id: 1
Scale Down: No

Driver Engine: N34
IIS Server: cr58
SQL Server: mesa
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 4160 - 5552
w_id Min Warehouse: 1
w_id Max Warehouse: 11104
Scale: Normal
User Count: 13930
District id: 1
Scale Down: No

Driver Engine: N35
IIS Server: cr59
SQL Server: mesa
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 5553 - 6920
w_id Min Warehouse: 1
w_id Max Warehouse: 11104
```

```
Scale: Normal
User Count: 13680
District id: 1
Scale Down: No

Driver Engine: N44
IIS Server: cr60
SQL Server: mesa
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 6921 - 8288
w_id Min Warehouse: 1
w_id Max Warehouse: 11104
Scale: Normal
User Count: 13680
District id: 1
Scale Down: No

Driver Engine: xN21
IIS Server: cr79
SQL Server: mesa
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 8289 - 9696
w_id Min Warehouse: 1
w_id Max Warehouse: 11104
Scale: Normal
User Count: 14080
District id: 1
Scale Down: No

Driver Engine: xN22
IIS Server: cr80
SQL Server: mesa
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 9697 - 11104
w_id Min Warehouse: 1
w_id Max Warehouse: 11104
Scale: Normal
User Count: 14080
District id: 1
Scale Down: No

Number of Parameter Sets: 63


~Default
Default Parameter Set
                                Txn     Think
Key     RT      RT      Menu
                                Weight  Time
Time    Delay   Fence   Delay
                New Order         10.00
12.05       18.01      0.10      5.00      0.10
                Payment           10.00
12.05        3.01      0.10      5.00      0.10
                Delivery           1.00
5.05         2.01      0.10      5.00      0.10
                Stock Level        1.00
5.05         2.01      0.10     20.00      0.10
                Order Status       1.00
10.05        2.01      0.10      5.00      0.10

                Tuned Distribution

                                Txn     Think
Key     RT      RT      Menu
                                Weight  Time
Time    Delay   Fence   Delay
                New Order         44.75
12.05       18.01      0.10      5.00      0.10
                Payment           43.10
12.05        3.01      0.10      5.00      0.10
                Delivery           4.05
5.05         2.01      0.10      5.00      0.10
                Stock Level        4.05
5.05         2.01      0.10     20.00      0.10
                Order Status       4.05
10.05        2.01      0.10      5.00      0.10

                No Think

                                Txn     Think
Key     RT      RT      Menu
                                Weight  Time
Time    Delay   Fence   Delay
                New Order         10.00
0.00         0.00      0.00      5.00      0.00
                Payment           10.00
0.00         0.00      0.00      5.00      0.00
                Delivery           1.00
0.00         0.00      0.00      5.00      0.00
                Stock Level        1.00
0.00         0.00      0.00     20.00      0.00
                Order Status       1.00
0.00         0.00      0.00      5.00      0.00

                95%

                                Txn     Think
Key     RT      RT      Menu
                                Weight  Time
Time    Delay   Fence   Delay
                New Order         44.75
13.00       18.01      0.10      5.00      0.10
                Payment           43.10
13.00        3.01      0.10      5.00      0.10
                Delivery           4.05
6.00         2.01      0.10      5.00      0.10
                Stock Level        4.05
6.00         2.01      0.10     20.00      0.10
                Order Status       4.05
11.00        2.01      0.10      5.00      0.10

                90%

                                Txn     Think
Key     RT      RT      Menu
                                Weight  Time
Time    Delay   Fence   Delay
                New Order         44.83
16.00       18.01      0.10      5.00      0.10
                Payment           43.05
16.00        3.01      0.10      5.00      0.10
                Delivery           4.04
9.00         2.01      0.10      5.00      0.10
                Stock Level        4.04
9.00         2.01      0.10     20.00      0.10
                Order Status       4.04
14.00        2.01      0.10      5.00      0.10

                3.0

                                Txn     Think
Key     RT      RT      Menu
                                Weight  Time
Time    Delay   Fence   Delay
                New Order         44.75
36.15        0.00      0.10      5.00      0.10
                Payment           43.10
36.15        0.00      0.10      5.00      0.10
                Delivery           4.05
15.15        0.00      0.10      5.00      0.10
                Stock Level        4.05
15.15        0.00      0.10     20.00      0.10
                Order Status       4.05
30.15        0.00      0.10      5.00      0.10

                4.0
                4.0 tt
                                Txn     Think
Key     RT      RT      Menu
                                Weight  Time
Time    Delay   Fence   Delay
                New Order         44.75
48.20       18.01      0.10      5.00      0.10
                Payment           43.10
48.20        3.01      0.10      5.00      0.10
                Delivery           4.05
20.20        2.01      0.10      5.00      0.10
                Stock Level        4.05
20.20        2.01      0.10     20.00      0.10
                Order Status       4.05
40.20        2.01      0.10      5.00      0.10

                3.8
                3.8 tt
                                Txn     Think
Key     RT      RT      Menu
                                Weight  Time
Time    Delay   Fence   Delay
                New Order         44.75
45.70       18.01      0.10      5.00      0.10
                Payment           43.10
45.70        3.01      0.10      5.00      0.10
                Delivery           4.05
19.10        2.01      0.10      5.00      0.10
                Stock Level        4.05
19.10        2.01      0.10     20.00      0.10
                Order Status       4.05
38.10        2.01      0.10      5.00      0.10

                3.6
```

```
                3.6 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                New Order           44.75
43.30      18.01      0.10      5.00      0.10
                Payment             43.10
43.30       3.01      0.10      5.00      0.10
                Delivery             4.05
18.10       2.01      0.10      5.00      0.10
                Stock Level          4.05
18.10       2.01      0.10     20.00      0.10
                Order Status         4.05
36.18       2.01      0.10      5.00      0.10

                3.4
                3.4 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                New Order           44.75
40.90      18.01      0.10      5.00      0.10
                Payment             43.10
40.90       3.01      0.10      5.00      0.10
                Delivery             4.05
17.10       2.01      0.10      5.00      0.10
                Stock Level          4.05
17.10       2.01      0.10     20.00      0.10
                Order Status         4.05
17.10       2.01      0.10      5.00      0.10

                3.2
                3.2 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                New Order           44.75
38.50      18.01      0.10      5.00      0.10
                Payment             43.10
38.50       3.01      0.10      5.00      0.10
                Delivery             4.05
16.10       2.01      0.10      5.00      0.10
                Stock Level          4.05
16.10       2.01      0.10     20.00      0.10
                Order Status         4.05
32.10       2.01      0.10      5.00      0.10

                2.8
                2.8 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                New Order           44.75
33.74      18.01      0.10      5.00      0.10
                Payment             43.10
33.74       3.01      0.10      5.00      0.10
                Delivery             4.05
14.14       2.01      0.10      5.00      0.10
                Stock Level          4.05
14.14       2.01      0.10     20.00      0.10
                Order Status         4.05
28.14       2.01      0.10      5.00      0.10

                2.6
                2.6 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                New Order           44.75
31.30      18.01      0.10      5.00      0.10
                Payment             43.10
31.30       3.01      0.10      5.00      0.10
                Delivery             4.05
13.10       2.01      0.10      5.00      0.10
                Stock Level          4.05
13.10       2.01      0.10     20.00      0.10
                Order Status         4.05
26.10       2.01      0.10      5.00      0.10

                2.4
                2.4 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                New Order           44.75
28.90      18.01      0.10      5.00      0.10
                Payment             43.10
28.90       3.01      0.10      5.00      0.10
                Delivery             4.05
12.10       2.01      0.10      5.00      0.10
                Stock Level          4.05
12.10       2.01      0.10     20.00      0.10
                Order Status         4.05
24.10       2.01      0.10      5.00      0.10

                2.2
                2.2 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                New Order           44.75
28.90      18.01      0.10      5.00      0.10
                Payment             43.10
28.90       3.01      0.10      5.00      0.10
                Delivery             4.05
12.10       2.01      0.10      5.00      0.10
                Stock Level          4.05
12.10       2.01      0.10     20.00      0.10
                Order Status         4.05
24.12       2.01      0.10      5.00      0.10

                2.0
                2.0 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                New Order           44.75
24.10      18.01      0.10      5.00      0.10
                Payment             43.10
24.10       3.01      0.10      5.00      0.10
                Delivery             4.05
10.10       2.01      0.10      5.00      0.10
                Stock Level          4.05
10.10       2.01      0.10     20.00      0.10
                Order Status         4.05
20.10       2.01      0.10      5.00      0.10

                5.0
                5.0 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                New Order           44.75
60.25      18.01      0.10      5.00      0.10
                Payment             43.10
60.25       3.01      0.10      5.00      0.10
                Delivery             4.05
25.25       2.01      0.10      5.00      0.10
                Stock Level          4.05
25.25       2.01      0.10     20.00      0.10
                Order Status         4.05
50.25       2.01      0.10      5.00      0.10

                4.5
                4.5 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                New Order           44.75
54.20      18.01      0.10      5.00      0.10
                Payment             43.10
54.20       3.01      0.10      5.00      0.10
                Delivery             4.05
22.70       2.01      0.10      5.00      0.10
                Stock Level          4.05
22.70       2.01      0.10     20.00      0.10
                Order Status         4.05
45.20       2.01      0.10      5.00      0.10

                3.5
                3.5 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                New Order           44.75
42.10      18.01      0.10      5.00      0.10
                Payment             43.10
42.10       3.01      0.10      5.00      0.10
                Delivery             4.05
17.60       2.01      0.10      5.00      0.10
                Stock Level          4.05
17.60       2.01      0.10     20.00      0.10
                Order Status         4.05
35.10       2.01      0.10      5.00      0.10

                1.8
```

1.8 tt

Key Time	RT Delay	RT Fence	Menu Delay	Txn Weight	Think Time
			New Order	44.75	
21.60	18.01	0.10	5.00	0.10	
			Payment	43.10	
21.60	3.01	0.10	5.00	0.10	
			Delivery	4.05	
9.09	2.01	0.10	5.00	0.10	
			Stock Level	4.05	
9.09	2.01	0.10	20.00	0.10	
			Order Status	4.05	
18.09	2.01	0.10	5.00	0.10	

4.2

4.2 tt

Key Time	RT Delay	RT Fence	Menu Delay	Txn Weight	Think Time
			New Order	44.75	
54.20	18.01	0.10	5.00	0.10	
			Payment	43.10	
54.20	3.01	0.10	5.00	0.10	
			Delivery	4.05	
22.70	2.01	0.10	5.00	0.10	
			Stock Level	4.05	
22.70	2.01	0.10	20.00	0.10	
			Order Status	4.05	
45.20	2.01	0.10	5.00	0.10	

1.6

1.6 tt

Key Time	RT Delay	RT Fence	Menu Delay	Txn Weight	Think Time
			New Order	44.75	
19.20	18.01	0.10	5.00	0.10	
			Payment	43.10	
19.20	3.01	0.10	5.00	0.10	
			Delivery	4.05	
8.08	2.01	0.10	5.00	0.10	
			Stock Level	4.05	
8.08	2.01	0.10	20.00	0.10	
			Order Status	4.05	
16.08	2.01	0.10	5.00	0.10	

1.4

1.4 tt

Key Time	RT Delay	RT Fence	Menu Delay	Txn Weight	Think Time
			New Order	44.75	
16.87	18.01	0.10	5.00	0.10	
			Payment	43.10	
16.87	3.01	0.10	5.00	0.10	
			Delivery	4.05	
7.07	2.01	0.10	5.00	0.10	
			Stock Level	4.05	
7.07	2.01	0.10	20.00	0.10	
			Order Status	4.05	
14.07	2.01	0.10	5.00	0.10	

1.2

1.2 tt

Key Time	RT Delay	RT Fence	Menu Delay	Txn Weight	Think Time
			New Order	44.83	
14.46	18.01	0.10	5.00	0.10	
			Payment	43.05	
14.46	3.01	0.10	5.00	0.10	
			Delivery	4.04	
6.06	2.01	0.10	5.00	0.10	
			Stock Level	4.04	
6.06	2.01	0.10	20.00	0.10	
			Order Status	4.04	
12.06	2.01	0.10	5.00	0.10	

3.5

3.5 tt

Key Time	RT Delay	RT Fence	Menu Delay	Txn Weight	Think Time
			New Order	44.75	
42.10	18.01	0.10	5.00	0.10	
			Payment	43.10	
42.10	3.01	0.10	5.00	0.10	
			Delivery	4.05	
17.60	2.01	0.10	5.00	0.10	
			Stock Level	4.05	
17.60	2.01	0.10	20.00	0.10	
			Order Status	4.05	
35.10	2.01	0.10	5.00	0.10	

1.9

1.9 tt

Key Time	RT Delay	RT Fence	Menu Delay	Txn Weight	Think Time
			New Order	44.75	
22.89	18.01	0.10	5.00	0.10	
			Payment	43.10	
22.89	3.01	0.10	5.00	0.10	
			Delivery	4.05	
9.59	2.01	0.10	5.00	0.10	
			Stock Level	4.05	
9.59	2.01	0.10	20.00	0.10	
			Order Status	4.05	
19.09	2.01	0.10	5.00	0.10	

1.1

1.1 tt

Key Time	RT Delay	RT Fence	Menu Delay	Txn Weight	Think Time
			New Order	44.83	
13.25	18.01	0.10	5.00	0.10	
			Payment	43.05	
13.25	3.01	0.10	5.00	0.10	
			Delivery	4.04	
5.55	2.01	0.10	5.00	0.10	
			Stock Level	4.04	
5.55	2.01	0.10	20.00	0.10	
			Order Status	4.04	
11.05	2.01	0.10	5.00	0.10	

1.05 better

1.05 tt better

Key Time	RT Delay	RT Fence	Menu Delay	Txn Weight	Think Time
			New Order	44.92	
12.65	18.01	0.10	5.00	0.10	
			Payment	43.01	
12.65	3.01	0.10	5.00	0.10	
			Delivery	4.02	
5.30	2.01	0.10	5.00	0.10	
			Stock Level	4.03	
5.30	2.01	0.10	20.00	0.10	
			Order Status	4.02	
10.55	2.01	0.10	5.00	0.10	

1.09

1.09 tt

Key Time	RT Delay	RT Fence	Menu Delay	Txn Weight	Think Time
			New Order	44.83	
13.13	18.01	0.10	5.00	0.10	
			Payment	43.05	
13.13	3.01	0.10	5.00	0.10	
			Delivery	4.04	
5.50	2.01	0.10	5.00	0.10	
			Stock Level	4.04	
5.50	2.01	0.10	20.00	0.10	
			Order Status	4.04	
10.95	2.01	0.10	5.00	0.10	

1.08

1.08 tt

Key Time	RT Delay	RT Fence	Menu Delay	Txn Weight	Think Time
			New Order	44.83	
13.01	18.01	0.10	5.00	0.10	
			Payment	43.05	
13.01	3.01	0.10	5.00	0.10	
			Delivery	4.04	
5.45	2.01	0.10	5.00	0.10	
			Stock Level	4.04	
5.45	2.01	0.10	20.00	0.10	
			Order Status	4.04	
10.85	2.01	0.10	5.00	0.10	

1.07

```
                    1.07 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.83
12.89       18.01       0.10       5.00       0.10
                    Payment            43.05
12.89        3.01       0.10       5.00       0.10
                    Delivery            4.04
5.40         2.01       0.10       5.00       0.10
                    Stock Level         4.04
5.40         2.01       0.10      20.00       0.10
                    Order Status        4.04
10.75        2.01       0.10       5.00       0.10

                    1.06
                    1.06 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.83
12.77       18.01       0.10       5.00       0.10
                    Payment            43.05
12.77        3.01       0.10       5.00       0.10
                    Delivery            4.04
5.35         2.01       0.10       5.00       0.10
                    Stock Level         4.04
5.35         2.01       0.10      20.00       0.10
                    Order Status        4.04
10.65        2.01       0.10       5.00       0.10

                    1.15
                    1.15 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.75
13.85       18.01       0.10       5.00       0.10
                    Payment            43.10
13.85        3.01       0.10       5.00       0.10
                    Delivery            4.05
5.80         2.01       0.10       5.00       0.10
                    Stock Level         4.05
5.80         2.01       0.10      20.00       0.10
                    Order Status        4.05
11.55        2.01       0.10       5.00       0.10

                    1.25
                    1.25 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.83
15.06       18.01       0.10       5.00       0.10
                    Payment            43.05
15.06        3.01       0.10       5.00       0.10
                    Delivery            4.04
6.31         2.01       0.10       5.00       0.10
                    Stock Level         4.04
6.31         2.01       0.10      20.00       0.10
                    Order Status        4.04
12.56        2.01       0.10       5.00       0.10

                    1.3
                    1.3 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.83
15.66       18.01       0.10       5.00       0.10
                    Payment            43.05
15.66        3.01       0.10       5.00       0.10
                    Delivery            4.04
6.56         2.01       0.10       5.00       0.10
                    Stock Level         4.04
6.56         2.01       0.10      20.00       0.10
                    Order Status        4.04
13.06        2.01       0.10       5.00       0.10

                    1.12
                    1.12 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.75
13.49       18.01       0.10       5.00       0.10
                    Payment            43.10
13.49        3.01       0.10       5.00       0.10
                    Delivery            4.05
5.65         2.01       0.10       5.00       0.10
                    Stock Level         4.05
5.65         2.01       0.10      20.00       0.10
                    Order Status        4.05
11.25        2.01       0.10       5.00       0.10

                    1.18
                    1.18 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.75
14.21       18.01       0.10       5.00       0.10
                    Payment            43.10
14.21        3.01       0.10       5.00       0.10
                    Delivery            4.05
5.95         2.01       0.10       5.00       0.10
                    Stock Level         4.05
5.95         2.01       0.10      20.00       0.10
                    Order Status        4.05
11.85        2.01       0.10       5.00       0.10

                    1.22
                    1.22 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.75
14.70       18.01       0.10       5.00       0.10
                    Payment            43.10
14.70        3.01       0.10       5.00       0.10
                    Delivery            4.05
6.16         2.01       0.10       5.00       0.10
                    Stock Level         4.05
6.16         2.01       0.10      20.00       0.10
                    Order Status        4.05
12.26        2.01       0.10       5.00       0.10

                    1.28
                    1.28 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.75
15.42       18.01       0.10       5.00       0.10
                    Payment            43.10
15.42        3.01       0.10       5.00       0.10
                    Delivery            4.05
6.46         2.01       0.10       5.00       0.10
                    Stock Level         4.05
6.46         2.01       0.10      20.00       0.10
                    Order Status        4.05
12.86        2.01       0.10       5.00       0.10

                    1.04
                    1.04 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.83
12.53       18.01       0.10       5.00       0.10
                    Payment            43.05
12.53        3.01       0.10       5.00       0.10
                    Delivery            4.04
5.25         2.01       0.10       5.00       0.10
                    Stock Level         4.04
5.25         2.01       0.10      20.00       0.10
                    Order Status        4.04
10.45        2.01       0.10       5.00       0.10

                    1.03
                    1.03 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.83
12.41       18.01       0.10       5.00       0.10
                    Payment            43.05
12.41        3.01       0.10       5.00       0.10
                    Delivery            4.04
5.20         2.01       0.10       5.00       0.10
                    Stock Level         4.04
5.20         2.01       0.10      20.00       0.10
                    Order Status        4.04
10.35        2.01       0.10       5.00       0.10

                    1.02
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```
                    1.02 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.83
12.29       18.01       0.10       5.00       0.10
                    Payment            43.05
12.29        3.01       0.10       5.00       0.10
                    Delivery            4.04
5.15         2.01       0.10       5.00       0.10
                    Stock Level         4.04
5.15         2.01       0.10      20.00       0.10
                    Order Status        4.04
10.25        2.01       0.10       5.00       0.10

                    1.01
                    1.01 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.83
12.17       18.01       0.10       5.00       0.10
                    Payment            43.05
12.17        3.01       0.10       5.00       0.10
                    Delivery            4.04
5.10         2.01       0.10       5.00       0.10
                    Stock Level         4.04
5.10         2.01       0.10      20.00       0.10
                    Order Status        4.04
10.15        2.01       0.10       5.00       0.10

                    1.005_best
                    1.005 tt best
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.92
12.11       18.02       0.10       5.00       0.10
                    Payment            43.01
12.11        3.01       0.10       5.00       0.10
                    Delivery            4.02
5.07         2.01       0.10       5.00       0.10
                    Stock Level         4.03
5.07         2.01       0.10      20.00       0.10
                    Order Status        4.02
10.10        2.01       0.10       5.00       0.10

                    1.03 better
                    1.03 tt more aggressive
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.92
12.41       18.01       0.10       5.00       0.10
                    Payment            43.01
12.41        3.01       0.10       5.00       0.10
                    Delivery            4.02
5.20         2.01       0.10       5.00       0.10
                    Stock Level         4.03
5.20         2.01       0.10      20.00       0.10
                    Order Status        4.02
10.35        2.01       0.10       5.00       0.10

                    1.02 better
                    1.02 tt more aggressive
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.92
12.29       18.01       0.10       5.00       0.10
                    Payment            43.01
12.29        3.01       0.10       5.00       0.10
                    Delivery            4.02
5.15         2.01       0.10       5.00       0.10
                    Stock Level         4.03
5.15         2.01       0.10      20.00       0.10
                    Order Status        4.02
10.25        2.01       0.10       5.00       0.10

                    1.01 best
                    1.01 tt best
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.90
12.17       18.01       0.10       5.00       0.10
                    Payment            43.05
12.17        3.01       0.10       5.00       0.10
                    Delivery            4.01
5.10         2.01       0.10       5.00       0.10
                    Stock Level         4.03
5.10         2.01       0.10      20.00       0.10
                    Order Status        4.01
10.15        2.01       0.10       5.00       0.10

                    1.02 best
                    1.02 tt best
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.96
12.29       18.01       0.10       5.00       0.10
                    Payment            43.00
12.29        3.01       0.10       5.00       0.10
                    Delivery            4.00
5.15         2.01       0.10       5.00       0.10
                    Stock Level         4.03
5.15         2.01       0.10      20.00       0.10
                    Order Status        4.01
10.25        2.01       0.10       5.00       0.10

                    1.03 best
                    1.03 tt best
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.96
12.41       18.01       0.10       5.00       0.10
                    Payment            43.01
12.41        3.01       0.10       5.00       0.10
                    Delivery            4.01
5.20         2.01       0.10       5.00       0.10
                    Stock Level         4.01
5.20         2.01       0.10      20.00       0.10
                    Order Status        4.01
10.35        2.01       0.10       5.00       0.10

                    5.5
                    5.5 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.83
66.28       18.01       0.10       5.00       0.10
                    Payment            43.05
66.28        3.01       0.10       5.00       0.10
                    Delivery            4.04
27.77        2.01       0.10       5.00       0.10
                    Stock Level         4.04
27.77        2.01       0.10      20.00       0.10
                    Order Status        4.04
55.27        2.01       0.10       5.00       0.10

                    6.0
                    6.0 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.83
72.30       18.01       0.10       5.00       0.10
                    Payment            43.05
72.30        3.01       0.10       5.00       0.10
                    Delivery            4.04
30.30        2.01       0.10       5.00       0.10
                    Stock Level         4.04
30.30        2.01       0.10      20.00       0.10
                    Order Status        4.04
60.30        2.01       0.10       5.00       0.10

                    6.5
                    6.5 tt
                                        Txn     Think
Key     RT      RT      Menu
                                     Weight  Time
Time    Delay   Fence   Delay
                    New Order          44.83
79.53       18.01       0.10       5.00       0.10
                    Payment            43.05
79.53        3.01       0.10       5.00       0.10
                    Delivery            4.04
33.33        2.01       0.10       5.00       0.10
                    Stock Level         4.04
33.33        2.01       0.10      20.00       0.10
                    Order Status        4.04
66.33        2.01       0.10       5.00       0.10

                    7.0
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                    7.0 tt
                                        Txn     Think
Key     RT      RT      Menu
                                      Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.83
84.35      18.01      0.10      5.00      0.10
                    Payment           43.05
84.35       3.01      0.10      5.00      0.10
                    Delivery           4.04
35.35       2.01      0.10      5.00      0.10
                    Stock Level        4.04
35.35       2.01      0.10     20.00      0.10
                    Order Status       4.04
70.35       2.01      0.10      5.00      0.10

                    7.5
                    7.5 tt
                                        Txn     Think
Key     RT      RT      Menu
                                      Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.83
90.38      18.01      0.10      5.00      0.10
                    Payment           43.05
90.38       3.01      0.10      5.00      0.10
                    Delivery           4.04
37.88       2.01      0.10      5.00      0.10
                    Stock Level        4.04
37.88       2.01      0.10     20.00      0.10
                    Order Status       4.04
75.38       2.01      0.10      5.00      0.10

                    8.0
                    8.0 tt
                                        Txn     Think
Key     RT      RT      Menu
                                      Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.83
96.40      18.01      0.10      5.00      0.10
                    Payment           43.05
96.40       3.01      0.10      5.00      0.10
                    Delivery           4.04
40.40       2.01      0.10      5.00      0.10
                    Stock Level        4.04
40.40       2.01      0.10     20.00      0.10
                    Order Status       4.04
80.40       2.01      0.10      5.00      0.10

                    8.5
                    8.5 tt
                                        Txn     Think
Key     RT      RT      Menu
                                      Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.83
102.43     18.01      0.10      5.00      0.10
                    Payment           43.05
192.43      3.01      0.10      5.00      0.10
                    Delivery           4.04
42.92       2.01      0.10      5.00      0.10
                    Stock Level        4.04
42.92       2.01      0.10     20.00      0.10
                    Order Status       4.04
85.42       2.01      0.10      5.00      0.10

                    9.0
                    9.0 tt
                                        Txn     Think
Key     RT      RT      Menu
                                      Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.83
108.45     18.01      0.10      5.00      0.10
                    Payment           43.05
108.45      3.01      0.10      5.00      0.10
                    Delivery           4.04
45.45       2.01      0.10      5.00      0.10
                    Stock Level        4.04
45.45       2.01      0.10     20.00      0.10
                    Order Status       4.04
90.45       2.01      0.10      5.00      0.10

                    9.5
                    9.5 tt
                                        Txn     Think
Key     RT      RT      Menu
                                      Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.83
114.47     18.01      0.10      5.00      0.10
                    Payment           43.05
114.47      3.01      0.10      5.00      0.10
                    Delivery           4.04
47.98       2.01      0.10      5.00      0.10
                    Stock Level        4.04
47.98       2.01      0.10     20.00      0.10
                    Order Status       4.04
95.47       2.01      0.10      5.00      0.10

                    10
                    10 tt
                                        Txn     Think
Key     RT      RT      Menu
                                      Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.83
120.50     18.01      0.10      5.00      0.10
                    Payment           43.05
120.50      3.01      0.10      5.00      0.10
                    Delivery           4.04
50.50       2.01      0.10      5.00      0.10
                    Stock Level        4.04
50.50       2.01      0.10     20.00      0.10
                    Order Status       4.04
100.50      2.01      0.10      5.00      0.10

                    1.02 better
                    1.02 more agressive
                                        Txn     Think
Key     RT      RT      Menu
                                      Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.92
12.05      18.01      0.10      5.00      0.10
                    Payment           43.01
12.05       3.01      0.10      5.00      0.10
                    Delivery           4.02
5.05        2.01      0.10      5.00      0.10
                    Stock Level        4.03
5.05        2.01      0.10     20.00      0.10
                    Order Status       4.02
10.05       2.01      0.10      5.00      0.10

                    1.01 better
                    1.01 more aggressive
                                        Txn     Think
Key     RT      RT      Menu
                                      Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.92
12.17      18.01      0.10      5.00      0.10
                    Payment           43.01
12.17       3.01      0.10      5.00      0.10
                    Delivery           4.02
5.10        2.01      0.10      5.00      0.10
                    Stock Level        4.03
5.10        2.01      0.10     20.00      0.10
                    Order Status       4.02
10.15       2.01      0.10      5.00      0.10

                    1.001 better
                    1.001 more aggressive
                                        Txn     Think
Key     RT      RT      Menu
                                      Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.92
12.06      18.01      0.10      5.00      0.10
                    Payment           43.01
12.06       3.01      0.10      5.00      0.10
                    Delivery           4.02
5.06        2.01      0.10      5.00      0.10
                    Stock Level        4.03
5.06        2.01      0.10     20.00      0.10
                    Order Status       4.02
10.06       2.01      0.10      5.00      0.10

                    FullSpeed
                    1.000 tt
                                        Txn     Think
Key     RT      RT      Menu
                                      Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.92
12.05      18.01      0.10      5.00      0.10
                    Payment           43.01
12.05       3.01      0.10      5.00      0.10
                    Delivery           4.02
5.05        2.01      0.10      5.00      0.10
                    Stock Level        4.03
5.05        2.01      0.10     20.00      0.10
                    Order Status       4.02
10.05       2.01      0.10      5.00      0.10
```

HP Specific Drivers

The following Microsoft Windows 2003 Server device drivers were replaced with HP-specific device drivers:

· The Microsoft SMART-64x Array Controller default device driver (CPQCISSM.SYS) was replaced with the HP SMART-64x Array Controller Non-miniport Performance Drivers for Microsoft Windows 2003 Server (hpqcissb.sys and hpqcissd.sys).

Appendix D: 60-Day Space

TPC-C 60 Day Space Requirements						
Warehouses	11300				TpmC	**138,845.56**
Table	Rows	Data KB	Index KB	Extra 5% KB	8hr Space	Total Space KB
Warehouse	11,300	1,208	120	66		1394
District	113,000	12,560	144	635		13339
Customer	339,000,000	246,545,456	15,382,864	13,096,416		275024736
History	339,000,000	19,795,640	74,024		4,367,901	19869664
NewOrder	101,700,000	1,812,032	4,624	90,833		1907489
Orders	339,000,000	11,069,392	25,280		6,605,384	11094672
OrderLine	3,389,994,271	222,294,712	523,624		81,484,819	222818336
Item	100,000	9,416	136	478		10030
Stock	1,130,000,000	361,600,000	762,504	18,118,125		380480629
Total		863,140,416	16,773,320	31,306,553	92,458,104	911,220,289
	MB					
Dynamic Space	247,226	Sum of Data for Order, Orderline and History				
Static Space	642,637	Sum of Data+Index+5%-Dynamic Space				
Free Space	na	Total Allocated Spac - (Dynamic + Static Space)				
Daily Growth	48,604	(Dynamic Space/(W*62.5))*tpmc				
Daily Spread	-	(Free Space -1.5*Daily Growth) Zero Assumed				
60 Day Space MB	3,558,852					
60 Day Space GB	3,475.44	GB				
Log Size	480,000.00	MB				
KB Per New Order	6.48	KB				
8 hr log MB	421,753	MB				
8 hr log GB	411.8678	GB				
		Disks	Disks	Formatted Size	Space	
Space Usage	GB Needed	Measured	Size	Size	Available	
180 Day Space DB	3,475.44	0	18GB	16.900	0.00	
		0	9GB	8.473	0.00	
		392	36GB	33.914	13294.29	
Total DB		392.00			**13294.29**	
8-hr log + mirror	823.7355	0	18GB	16.900	**949.76**	
		14	72GB	67.84		
OS, Swap	3	1	36GB	33.914	33.91	
Total Storage	4,302.18	GB			14,277.96	

tpmC	138,845.56										
	Data Before KB	Index Before KB	Data After KB	Index After KB	Data Grow KB	Index Grow KB	Total Grow KB	KB/New-Order	8-Hr Growth KB	8-Hr Growth MB
History	19,795,640	74,024	21441648	148032	1,646,008	74,008	1,720,016	0.0655	4,367,901.37	4,265.53
Order	11,069,392	25,280	13645840	49936	2,576,448	24,656	2,601,104	0.0991	6,605,383.75	6,450.57
Order-Line	222,294,712	523,624	253862488	1043384	31,567,776	519,760	32,087,536	1.2227	81,484,819.07	79,575.02
										90,291.12

	sum(*) Before
d_next_o_id	339,113,000

	sum(*) After
d_next_o_id	365,357,173

	Num New-Order
	26,244,173

	Before MB	After MB	Grow MB	KB/New-Order	8-Hr Growth MB	8-Hr Growth GB
Log	24739.79	190819.83	166080.04	6.4801	421,752.60	411.87
				6,635.6650	bytes	

Database tpcc log used (%)		
480000	5.1541233	39.754131

Appendix E:
Third Party Letters

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

Tel 425 882 8080
Fax 425 936 7329
http://www.microsoft.com/

Microsoft

September 20, 2005

Hewlett-Packard Company
Brean Campbell
20555 SH 249
MS 150402
Houston, TX 77040

Mr. Campbell:

Here is the information you requested regarding pricing for several Microsoft products to be used in conjunction with your TPC-C benchmark testing.

All pricing shown is in US Dollars ($).

Part Number	Description	Unit Price	Quantity	Price
810-00846	**SQL Server 2005 Enterprise (x86) Edition** *Per Processor Licensing* *Discount Schedule: Open Program - Level C* *Unit Price reflects a 15% discount from the retail unit price of $23,424.*	$19,909	4	$79,636
P73-00295	**Windows Server 2003, Enterprise Edition** *Discount Schedule: Open Program - No Level* *Unit Price reflects a 41% discount from the retail unit price of $3,999.*	$2,334	1	$2,334
C11-00821	**Windows 2000 Server** *Server License Only - No CALs* *Discount Schedule: No Level* *Unit Price reflects a 8% discount from the retail unit price of $799.*	$738	8	$5,904
254-00170	**Visual C++ Standard Edition** *Discount Schedule: No Discounts Applied*	$109	1	$109
	Microsoft Problem Resolution Services *Professional Support* *(1 incident)*	$245	1	$245

Some products may not be currently orderable but will be available through Microsoft's normal distribution channels by November 8, 2005.

This quote is valid for the next 90 days.

If we can be of any further assistance, please contact Jamie Reding at (425) 703-0510 or jamiere@microsoft.com.

If we can be of any further assistance, please contact Jamie Reding at (425) 703-0510 or jamiere@microsoft.com.

Reference ID: PCbrca0507028263.
Please include this Reference ID in any correspondence regarding this price quote.