Hewlett-Packard Company

TPC Benchmark™ C
Full Disclosure Report
for
HP ProLiant ML350 G5
using
Microsoft SQL Server 2005 Standard x64 Edition SP1
and
Windows Server 2003 Standard x64 Edition SP1

Second Edition
Submitted for Review
October 17, 2007

Second Edition –October 2007

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

All performance data contained in this report were obtained in a rigorously controlled environment. Results obtained in other operating environments may vary significantly. HP does not warrant or represent that a user can or will achieve similar performance expressed in transactions per minute (tpmC) or normalized price/performance ($/tpmC). No warranty of system performance or price/performance is expressed or implied in this report.

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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 5.8.

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 ML350 G5. The operating system used for the benchmark was Windows Server 2003 Standard x64 Edition (SP1). The DBMS used was Microsoft SQL Server 2005 Standard x64 Edition (SP1).

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:

82,774tpmC
USD $0.84 per tpmC

The availability date is March 27, 2007.

Standard and Executive Summary Statements

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

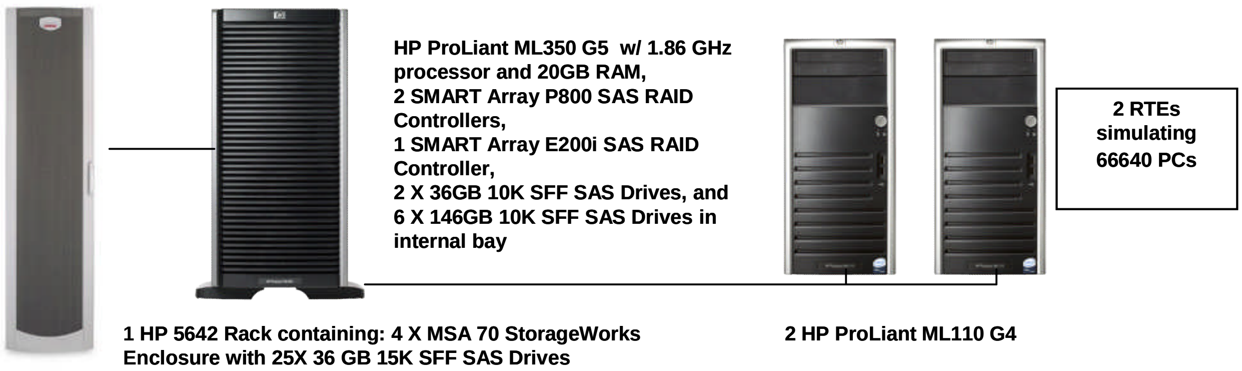
Auditor

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	HP ProLiant ML350 G5 1.86 GHz/2X2MB C/S with 2 HP ProLiant ML110G4	TPC-C Rev. 5.8 **Report Date: March 27, 2007** **Revised Oct 17, 2007**

Total System Cost	TPC-C Throughput	Price/Performance	Availability Date
USD $68,814	**82,774**	**USD $0.84**	**Mar. 27, 2007**

Database Server Processors /Cores/Threads	Database Manager	Operating System	Other Software	Number of Users
1/4/4 Intel E5320 1.86 GHz QC	Microsoft SQL Server 2005 Standard x64 Edition SP1	Windows Server 2003 Standard x64 Edition SP1	Microsoft Visual C++ Microsoft COM+	**66,640**


HP ProLiant ML350 G5 w/ 1.86 GHz processor and 20GB RAM,
2 SMART Array P800 SAS RAID Controllers,
1 SMART Array E200i SAS RAID Controller,
2 X 36GB 10K SFF SAS Drives, and
6 X 146GB 10K SFF SAS Drives in internal bay
2 RTEs simulating 66640 PCs
1 HP 5642 Rack containing: 4 X MSA 70 StorageWorks Enclosure with 25X 36 GB 15K SFF SAS Drives
2 HP ProLiant ML110 G4

	Server		**Each Client**	
System Components	Quantity	Description	Quantity	Description
Processors/Cores/Threads	1/4/4	Intel E5320 QC 1.86 GHz 8MB cache	1/1/2	Intel Pentium D 915 DC 2.8 GHz 2MB cache
Memory	20GB	2X4GB and 6X2GB FBDIMM	1GB	2 X 512 MB
Disk Controllers	2 1	Smart P800 Controller Smart E200i Controller	1	4 Port SATA controller with Embedded RAID
Disk Drives	6 100 2	146GB 15K SFF SAS Drives (log) 36 GB 15K LFF SAS Drives (data) 36 GB 10K SFF SAS Drives (internal, os)	1	160GB NHP SATA
Total Storage		4267.80GB		160 GB

Hewlett-Packard Company	**HP ProLiant ML350G5**	**TPC-C Rev. 5.8**	
		Report Date	**27-Mar-07**

Description	Part Number	Pricing	Unit Price	Qty	Extended Price	3 yr. Maint. Price
Server Hardware						
HP ML350T05 E5320 SAS SFF Array US Svr (Embedded NC373i Gigabit Adapter)	438730-001	1	1,689	1	1,689	
8 GB FBD PC2-5300 2 x 4 GB Kit	397415-B21	1	2,149	1	2,149	
4 GB FBD PC2-5300 2 x 2 GB Kit	397413-B21	1	649	3	1,947	
HP Smart Array P800 Controller	381513-B21	1	1,099	2	2,198	
HP NC7170 PCI-X Dp Gigabit Svr Adapter	313881-B21	1	269	1	269	
HP s7540 17in. CRT Monitor	PF997AA#ABA	1	139	1	139	
HP 5642 Pallet Unassembled Rack	358254-B21	1	865	1	865	
T1000 UPS	AF403A	1	395	1	395	
36GB 15Krpm SFF SAS HDD	431933-B21	1	349	100	34,900	
146GB 10K SAS 2.5 HP HDD	431958-B21	1	389	6	2,334	
HP 36GB 10K SAS 2.5 Hot Plug Hard Drive	375859-B21	1	269	2	538	
HP StorageWorks MSA-70 Storage	418800-B21	1	3,199	4	12,796	
HP 3y 4h 24x7 MSA60/70 HW Support	UF303E	1	1,850	4		7,400
HP 3y 4h 24x7 ProLiant ML350 HW Support	U4513E	1	449	1		449
				Subtotal	**60,219**	**7,849**
Server Software						
Microsoft SQL Server 2005 Standard X64 Edition(per processor)	228-04026	2	5,999	1	5,999	Incl Below
Microsoft Visual C++ Standard	254-00170	2	109	1	109	Incl Below
Windows Server 2003, Standard x64 Edition SP1	P73-00295	2	719	1	719	Incl Below
Microsoft Problem Resolution Services		2	245	1		245
				Subtotal	**6,827**	**245**
Client Hardware						
HP ML110G4 P915 NHP-SATA US Svr	417248-001	1	799	2	1,598	
512MB, NHP 160GB SATA, single port nic,(1P)						
HP 512MB UB PC2-5300 1x512MB Kit	432803-B21	1	54	2	108	
HP NC110T PCIe Gigabit Server Adapter	434905-B21	1	99	2	198	
HP 4y 4h 24x7 ProLiant ML110 HW Support	U4435E	1	366	2		732
				Subtotal	**1,904**	**732**
Client Software						
Windows Server 2003, Standard Edition SP1	P73-00295	2	719	2	1,438	Incl. Above
				Subtotal	**1,438**	**0**
User Connectivity						
4 port KVM switch	NW0099	4	66	3	198	
10 foot Cat5E Non Booted Network Patch Cables (plus 10% spares)	415-1003	3	1	6	8	
				Subtotal	**205**	**0**
Large Purchase and Net 30 discount (See Note 1)	15.0%	1			**($9,318)**	**($1,287)**
				Total	**$61,275**	**$7,539**

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	**$68,814**
tpmC Rating:	**82,774**
$ / tpmC: USD	**$0.84**

Pricing: 1=HP Direct 800-203-6748 2= Microsoft 3= http://store.graycables.com 4= www.serversdirect.com

Note 1 = Discount based on HP Direct guidence applies to all lines where pricing = 1

* = These components are not immediately orderable. See the FDR for more information.

Note 2 = The benchmark results were audited by Lorna Livingtree of Performance Metrics

Numerical Quantities Summary

MQTH, Computed Maximum Qualified Throughput **82,774 tpmC**

Response Times (in seconds)	Average	90%	Maximum
New-Order	0.53	0.93	6.80
Payment	0.44	0.84	6.70
Order-Status	0.52	0.92	6.72
Delivery (interactive portion)	0.17	0.33	6.19
Delivery (deferred portion)	0.32	0.47	4.73
Stock-Level	0.56	0.96	6.73
Menu	0.17	0.35	6.22

Transaction Mix, in percent of total transaction	
New-Order	44.93%
Payment	43.03%
Order-Status	4.03%
Delivery	4.01%
Stock-Level	4.01%

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	18.03/12.04	18.87/120.32
Payment	3.02/0.00	3.03/12.04	3.86/120.32
Order-Status	2.02/0.00	2.03/10.05	2.84/100.32
Delivery (interactive)	2.02/0.00	2.03/5.05	2.85/50.32
Stock-Level	2.02/0.00	2.03/5.04	2.86/50.32

Test Duration	
Ramp-up time	23 minutes
Measurement interval	120 minutes
Transactions (all types) completed during measurement interval	22,993,790
Ramp down time	32 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 included on the following page.

Figure 1. Benchmarked Configuration

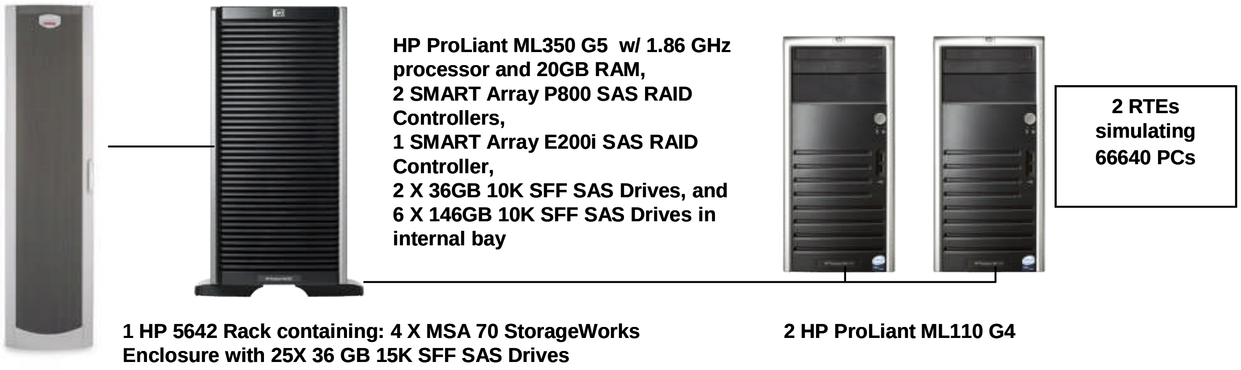

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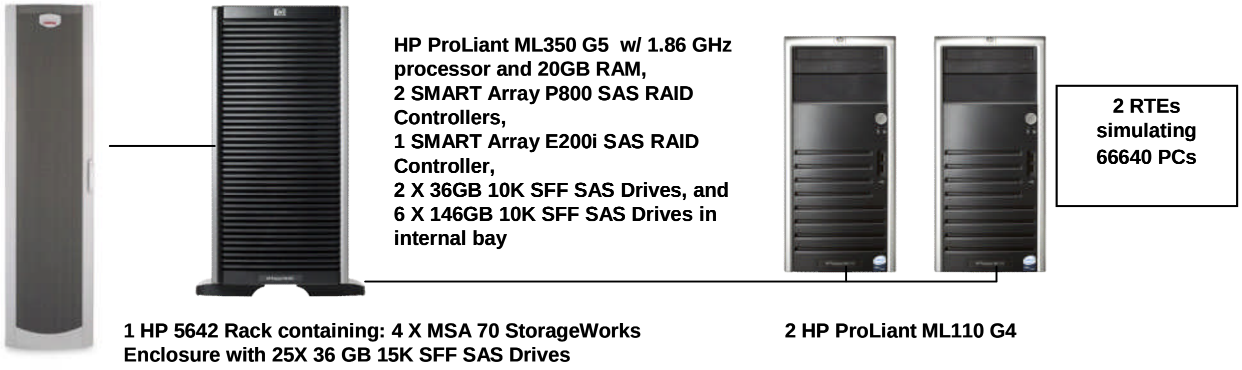
Figure 2. Priced Configuration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Clause 1 Related Items

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 100 drives at 36GB for database data, two 36GB drives for the operating system, and 6 drives at 146GB for database log. The drives for database data located in 4 MSA 70 Modular Smart Arrays were connected to 2 SMART P800 Smart Array controllers. The drives for log and operating system were in the internal drive bay of the ML350 G5 connected through the SMART E200i controller.

Benchmarked Configuration:

SMART-E200i Controller, Array A

LOGICAL DRIVE C: Microsoft Windows Server 2003 Standard X64 Edition (SP1)	Total Capacity = 33.91 GB	RAID 0+1

SMART-E200i Controller, Array B

LOGICAL DRIVE E: MSSQL_tpcc_log	Total Capacity = 410.10 GB	RAID 0+1

SMART-P800 Controller, Slot 4A, Array A

LOGICAL DRIVE F: MSSQL_stk1	Total Capacity = 70.31GB	RAID 0
LOGICAL DRIVE J: MSSQL_cust1	Total Capacity = 50.78GB	RAID 0
LOGICAL DRIVE N: MSSQL_OL1	Total Capacity = 48.38GB	RAID 0
LOGICAL DRIVE R: MSSQL_misc1	Total Capacity = 11.71GB	RAID 0
LOGICAL DRIVE W: Tpccback1	Total Capacity = 612.29GB	RAID 6

SMART-P800 Controller, Slot 4B, Array A

LOGICAL DRIVE G: MSSQL_stk2	Total Capacity = 70.31GB	RAID 0
LOGICAL DRIVE K: MSSQL_cust2	Total Capacity = 50.78GB	RAID 0
LOGICAL DRIVE O: MSSQL_OL2	Total Capacity = 48.38GB	RAID 0
LOGICAL DRIVE S: MSSQL_misc2	Total Capacity = 11.71GB	RAID 0
LOGICAL DRIVE X: Tpccback2	Total Capacity = 612.29GB	RAID 6

SMART-P800 Controller, Slot 5A, Array A

LOGICAL DRIVE H:	Total Capacity = 70.31GB	RAID 0
MSSQL_stk3		
LOGICAL DRIVE L:	Total Capacity = 50.78GB	RAID 0
MSSQL_cust3		
LOGICAL DRIVE P:	Total Capacity = 48.38GB	RAID 0
MSSQL_OL3		
LOGICAL DRIVE T:	Total Capacity = 11.71GB	RAID 0
MSSQL_misc3		
LOGICAL DRIVE Y:	Total Capacity = 612.29GB	RAID 6
Tpccback3		

SMART-P800 Controller, Slot 5B, Array A

LOGICAL DRIVE I:	Total Capacity = 70.31GB	RAID 0
MSSQL_stk4		
LOGICAL DRIVE M:	Total Capacity = 50.78GB	RAID 0
MSSQL_cust4		
LOGICAL DRIVE Q:	Total Capacity = 48.38GB	RAID 0
MSSQL_OL4		
LOGICAL DRIVE U:	Total Capacity = 11.71GB	RAID 0
MSSQL_misc4		
LOGICAL DRIVE Z:	Total Capacity = 612.29GB	RAID 6
Tpccback4		

Priced Configuration vs. Measured Configuration:

The benchmarked configuration and the priced configuration 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 was 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%

Statistic		Value
	Remote warehouse payments Accessed by last name	15.00% 60.00%
Order Status	Accessed by last name	60.08%
Transaction Mix	New Order Payment Order status Delivery Stock level	44.93% 43.03% 4.03% 4.01% 4.01%

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 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. This test was executed on a fully scaled database of 6664 warehouses of which 700 were used under a load of 7000 users.

- 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 7000 users.
- The test was allowed to run for a minimum of 10 minutes.
- One disk was removed from the internal drive cage containing the log disks.
- Since the disk was mirrored, processing was not interrupted. This was verified by checking the user's status on the RTE.
- Then one of the data disks was removed from one of the MSA 70 Modular Smart Arrays.
- When Microsoft SQL Server recorded errors about not being able to access the database, the RTE was shut down, and a database transaction log dump was taken.
- Microsoft SQL Server was shutdown, and the system rebooted after replacing the pulled drives with new drives.
- After the RAID recovery process finished 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 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 steps 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 6664 warehouses under a full load of 66640 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 66640 users.
- The test was allowed to run at steady state for a minimum of 10 minutes.
- Pulling the power cord from the SUT induced system crash and loss of memory. No battery backup or Uninterruptible Power Supply (UPS) were used to preserve the contents of memory.
- The RTE was paused then stopped.
- 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 9 and 10 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	6,664
District	66,640
Customer	199,920,000
History	199,920,000
Orders	199,920,000
New Order	59,976,000
Order Line	1,999,189,809
Stock	666,400,000
Item	100,000
Deleted Warehouses	0

Database Layout

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

The benchmarked configuration used 100 SAS drives at 36GB for database data, two 36GB SAS drives for the operating system, and 6 SAS drives at 146GB for database log. Two SMART P800 controllers connected to 4 MSA 70 Smart Arrays at one drive array per port. Each MSA 70 Smart Array contained (25) 36GB SAS drives. Each port was configured in an array. Each array had 4 RAID 0 logical drives for data and 1 RAID 6 (ADG) logical drive for database backup files. The SMART E200i controller was connected to the internal drive cage of the ML350 G5. It was configured with 2 RAID 0+1 logical drives. One array of (6) 146GB drives for the database log and one array of (2) 36GB drives for the operating system. The Array Accelerators on the SMART P800 data controllers were configured as 100% write cache and were enabled for all logical drives except the backup and miscellaneous logical drives. The SMART E200i controller had cache disabled. 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 file groups 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 Standard x64 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.

Details of both the 8-hour transaction log space requirements and the 60-day space requirements are shown in Appendix D.

Clause 5 Related Items

Throughput

Measured tpmC must be reported

Measured tpmC 82,774tpmC
Price per tpmC USD $0.84

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	0.53	0.93	6.80
Payment	0.44	0.84	6.70
Order-Status	0.52	0.92	6.72
Interactive Delivery	0.17	0.33	6.19
Deferred Delivery	0.32	0.47	4.73
Stock-Level	0.56	0.96	6.73
Menu	0.17	0.35	6.22

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	18.87
Payment	3.02	3.03	3.86
Order-Status	2.02	2.03	2.84
Interactive Delivery	2.02	2.03	2.85
Stock-Level	2.02	2.03	2.86

Table 5.4: Think Times

Type	Minimum	Average	Maximum
New-Order	0.00	12.04	120.32
Payment	0.00	12.04	120.32
Order-Status	0.00	10.05	100. 32
Interactive Delivery	0.00	5.05	50. 32
Stock-Level	0.00	5.04	50. 32

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 3. New Order Response Time Distribution

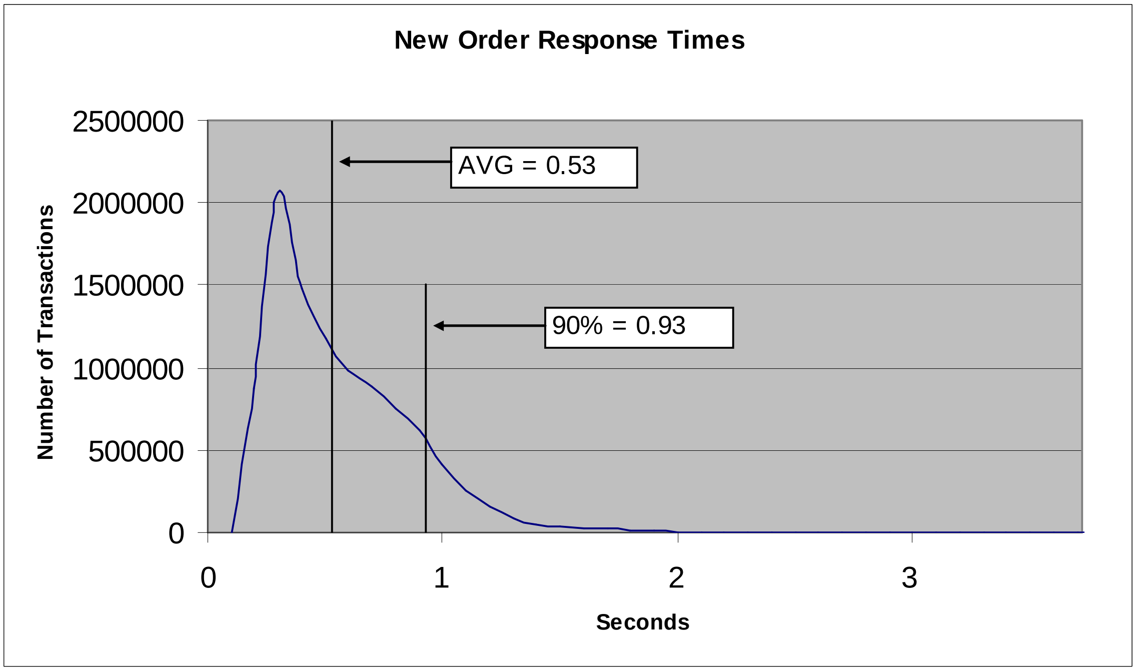


Figure 4. Payment Response Time Distribution

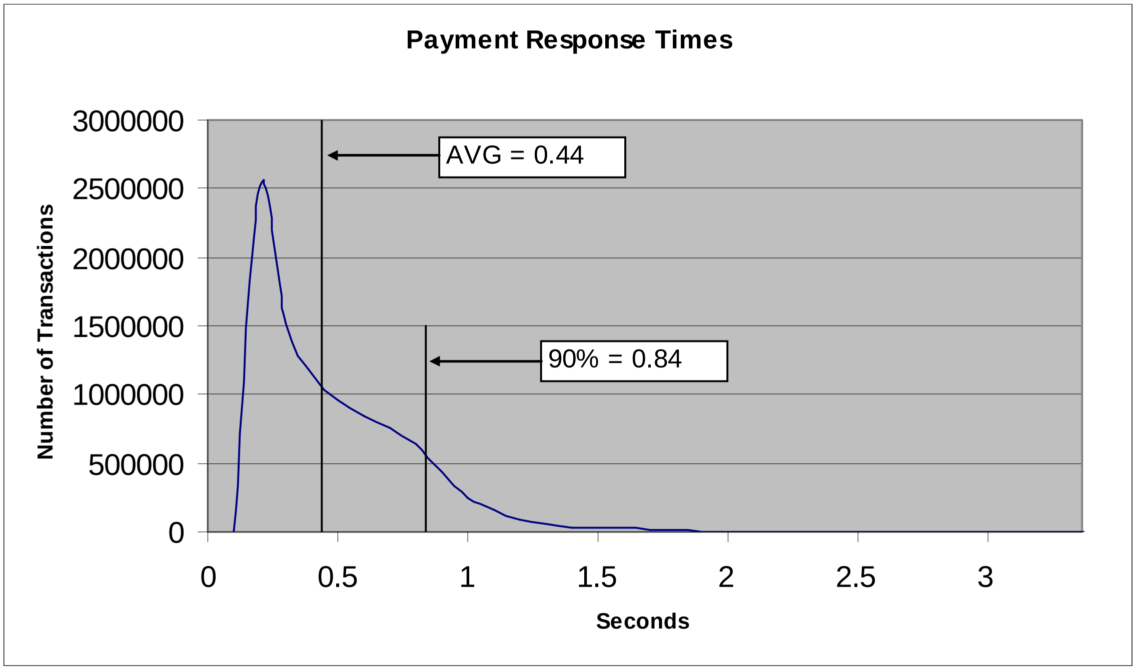


Figure 5. Order Status Response Time Distribution

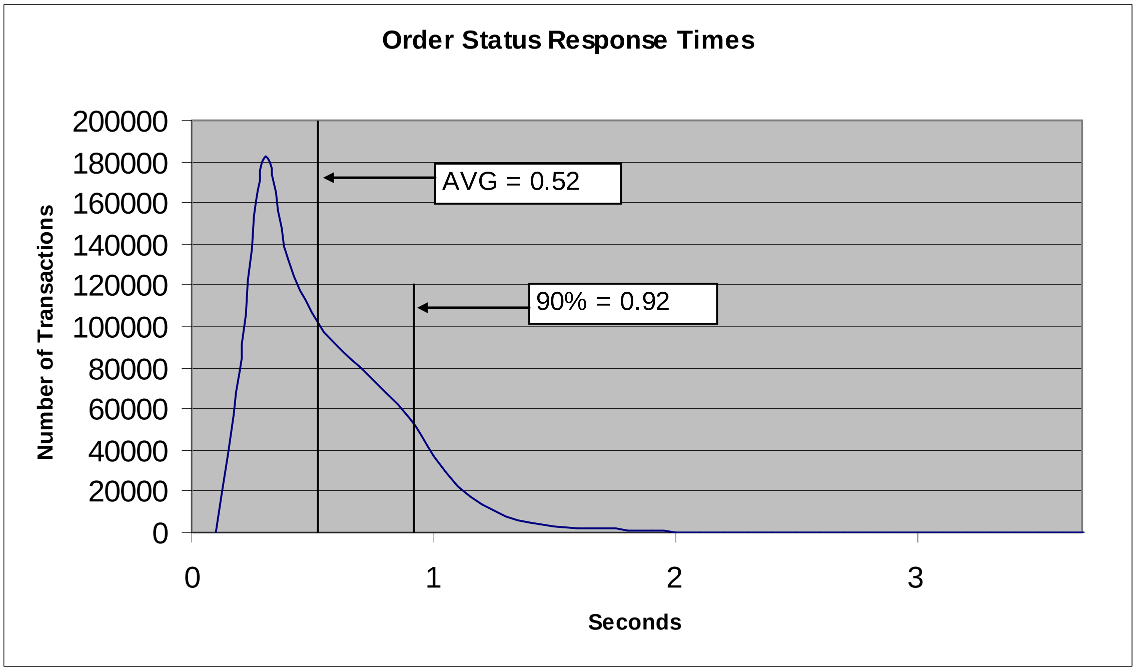


Figure 6. Delivery Response Time Distribution

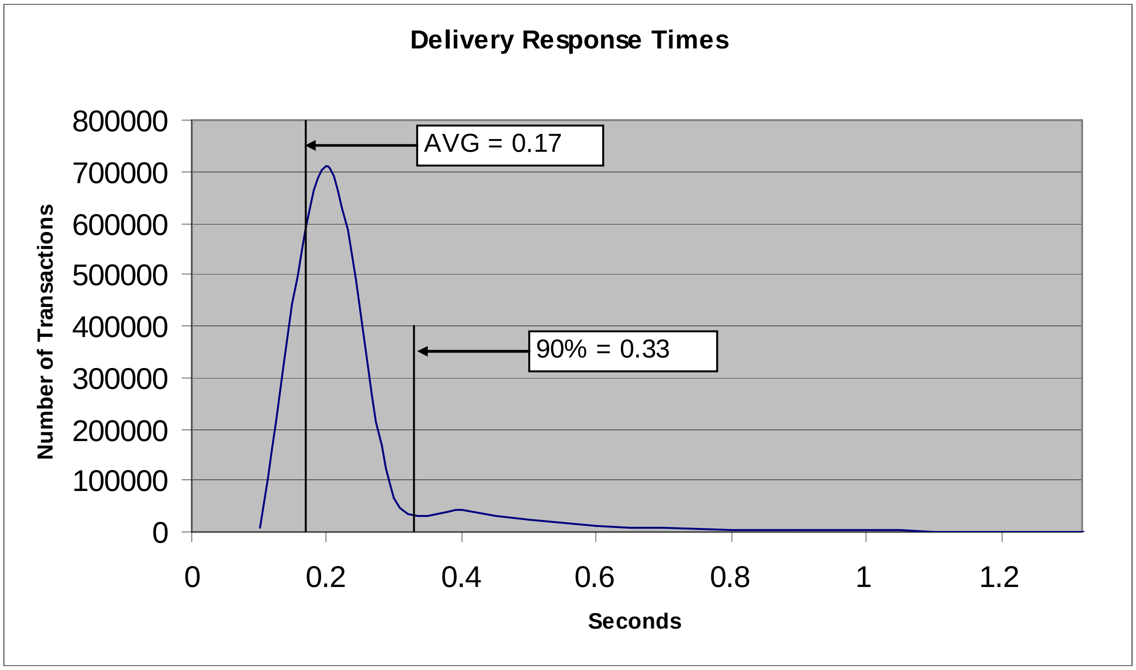


Figure 7. Stock Level Response Time Distribution

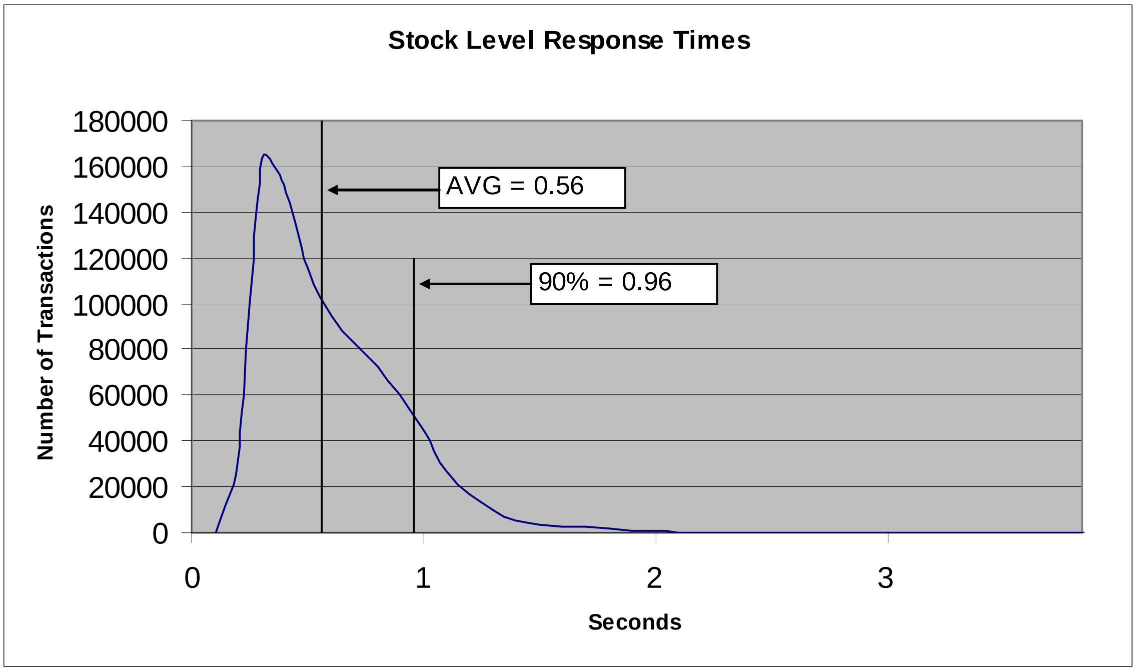


Figure 8. Response Time vs. Throughput

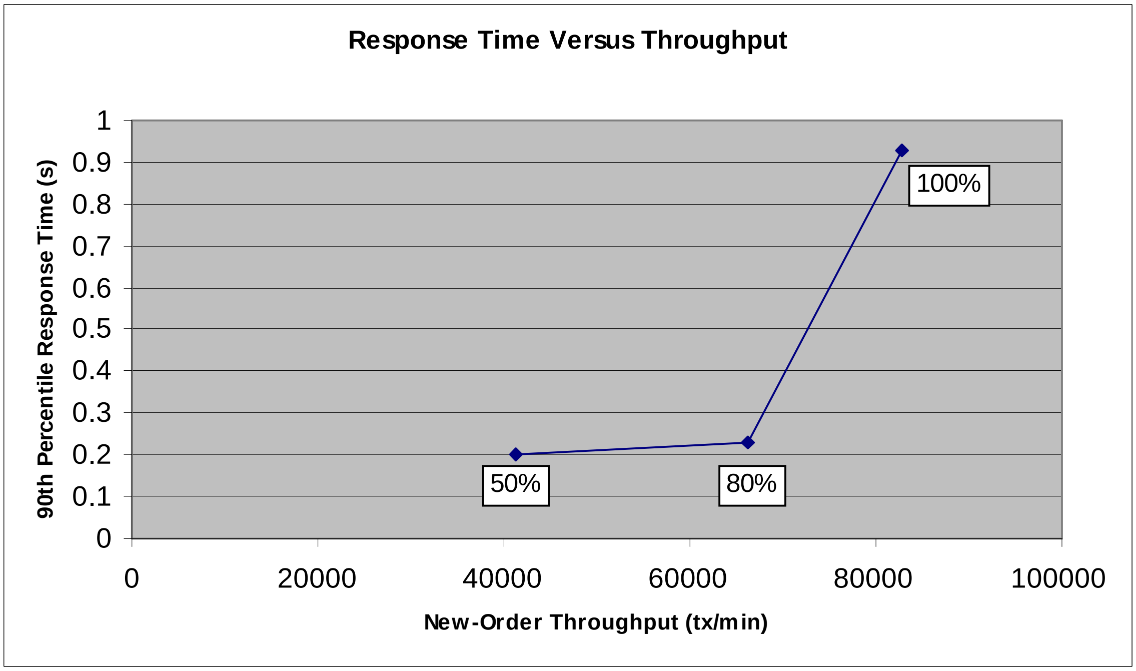


Figure 9. New Order Think Time Distribution

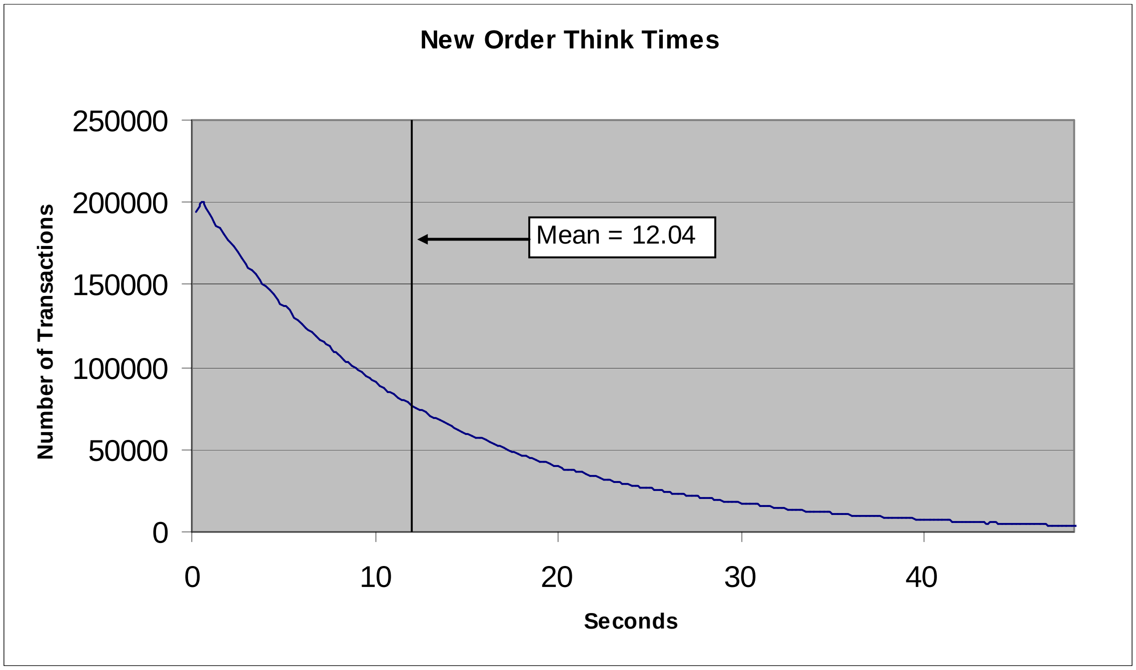
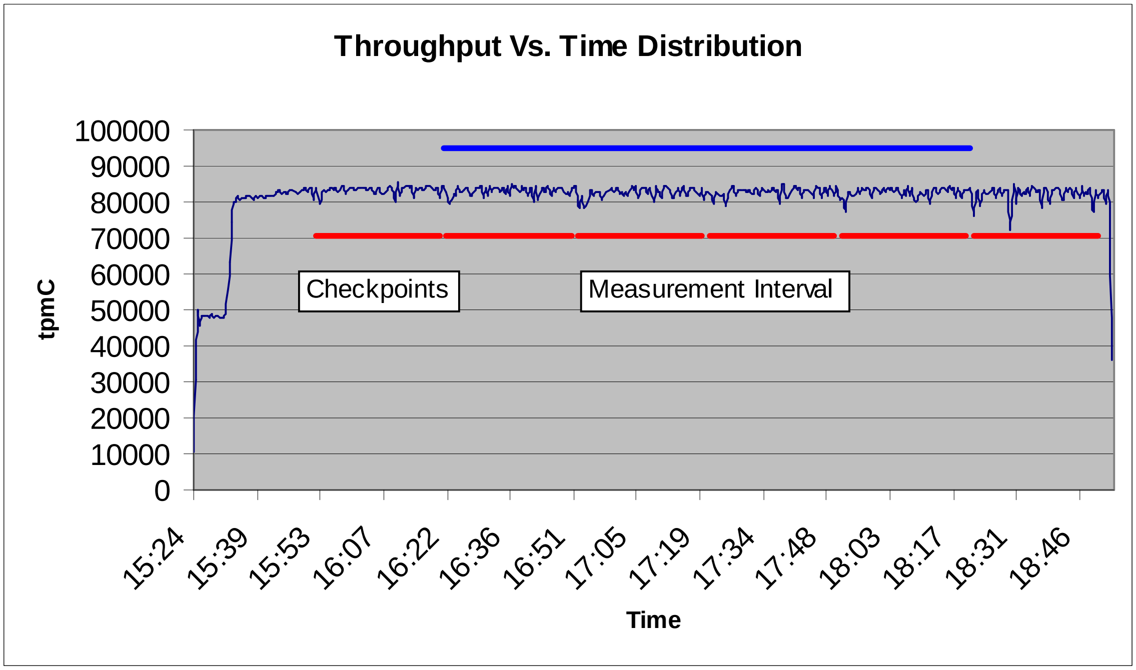


Figure 10. Throughput vs. Time Distribution



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 10.

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 timestamped. 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 timestamped. The return of the screen with the required response data was timestamped. 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 gigabit Ethernet LANs using ODBC and RPC calls.

To perform checkpoints at specific intervals, the SQL Server *recovery interval* was set to 32767 and a script was written to schedule multiple checkpoints at specific intervals. The script included a wait time between each checkpoint equal to 30 minutes. The measurement interval 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 10.

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 Remote warehouse order lines Rolled back transactions Average items per order	99.00% 1.00% 1.00% 10.00
Payment	Home warehouse payments Remote warehouse payments Accessed by last name	85.00% 15.00% 60.00%
Delivery	Skipped transactions (interactive) Skipped transactions (deferred)	0 0
Order Status	Accessed by last name	60.08%
Transaction Mix	New Order Payment Order status Delivery Stock level	44.93% 43.03% 4.03% 4.01% 4.01%

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 28 minutes after the start of the ramp-up. Subsequent checkpoints occurred every 30 minutes. Each checkpoint in the measurement interval lasted 28 minutes and 20 seconds. 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
16:22:16.10 pm	28 minutes, 20 seconds
16:52:13.12 pm	28 minutes, 20 seconds
17:22:10.09 pm	28 minutes, 20 seconds
17:52:07.17 pm	28 minutes, 20 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, 2 driver (RTE) machines were connected through a gigabit Ethernet switch to the client machines at 1Gbps, thus providing the path from the RTEs to the clients. The server (SUT) was connected to the clients through 2 Cat5e cables.

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**	**82,774tpmC**
• **Price per tpmC**	**USD $0.84 per tpmC**
• **Availability**	**March 27, 2007**

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:

- 2 Microsoft Windows Server 2003 Standard Edition
- 1 Microsoft Windows Server 2003 Standard x64 Edition (SP1)
- 1 Microsoft SQL Server 2005 Standard x64 Edition (SP1) (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) 707-482-0523
(fax) 707-482-0575
e-mail: lornaL@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:

TPC
Presidio of San Francisco
Building 572B Ruger St. (surface)
P.O. Box 29920 (mail)
San Francisco, CA 94129-0920

or

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

March 21, 2007

Mr. David Adams
Database Performance Engineer
Hewlett-Packard Company
20555 SH 249
Houston, TX 77070

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

Platform:	HP ProLiant ML350 G5
Database Manager:	Microsoft SQL Server 2005 Standard X64 Edition
Operating System:	Microsoft Windows Server 2003 Standard X64 Edition
Transaction Monitor:	Microsoft COM+

System Under Test:				
CPU's	Memory	Disks (total)	90% Response	TpmC
1 Intel E5320 @ 1.86 GHz	Main: 20 GB	102 @ 36 GB 6 @ 146 GB	0.93	82,774

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.
- The database files were properly sized.
- The database was properly scaled with 6,664 warehouses, all of which were active during the measured interval.

- The ACID properties were successfully demonstrated.
- 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 steady state portion of the test was 120 minutes.
- There was one complete checkpoint in steady state before the measured interval.
- There were 4 checkpoints started and 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

Appendix A: Source Code

The client source code is listed below.

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 */
```

error.h

```
/*        FILE:               ERROR.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 error exception
classes.
 *
 *  Change history:
 *                  4.20.000 - updated rev number to
match kit
 *                  4.21.000 - fixed bug: ~CBaseErr
needed to be declared virtual
 */

#pragma once

#ifndef _INC_STRING
          #include <string.h>
#endif

const int m_szMsg_size = 512;
const int m_szApp_size = 64;
const int m_szLoc_size = 64;

//error message structure used in ErrorText routines
typedef struct _SERRORMSG
{
          int                 iError;
                    //error id of message
          char      szMsg[256];
          //message to sent to browser
} SERRORMSG;

typedef enum _ErrorLevel
{
          ERR_FATAL_LEVEL                         =
1,
          ERR_WARNING_LEVEL             = 2,
          ERR_INFORMATION_LEVEL         = 3
} ErrorLevel;


#define ERR_TYPE_LOGIC
                                        -1
          //logic error in program; internal error
#define ERR_SUCCESS
                                        0
          //success (a non-error error)
#define ERR_BAD_ITEM_ID
                                        1
          //expected abort record in txnRecord
#define ERR_TYPE_DELIVERY_POST
                              2
          //expected delivery post failed
#define   ERR_TYPE_WEBDLL
                                        3
          //tpcc web generated error
#define   ERR_TYPE_SQL
                                        4
          //sql server generated error
#define   ERR_TYPE_DBLIB
                                        5
          //dblib generated error
#define   ERR_TYPE_ODBC
                                        6
          //odbc generated error
#define ERR_TYPE_SOCKET
                                        7
          //error on communication socket client rte
only
#define ERR_TYPE_DEADLOCK
                              8
          //dblib and odbc only deadlock condition
#define ERR_TYPE_COM
                                        9
          //error from COM call
#define ERR_TYPE_TUXEDO
                                        10
          //tuxedo error
#define ERR_TYPE_OS
                                        11
          //operating system error
#define ERR_TYPE_MEMORY
                                        12
          //memory allocation error
#define ERR_TYPE_TPCC_ODBC
                              13
          //error from tpcc odbc txn module
#define ERR_TYPE_TPCC_DBLIB
                              14
          //error from tpcc dblib txn module
#define ERR_TYPE_DELISRV
                              15
          //delivery server error
#define ERR_TYPE_TXNLOG
                                        16
          //txn log error
#define ERR_TYPE_BCCONN
                                        17
          //Benchcraft connection class
#define ERR_TYPE_TPCC_CONN
                              18
          //Benchcraft connection class
#define ERR_TYPE_ENCINA
                                        19
          //Encina error
#define ERR_TYPE_COMPONENT
                              20
          //error from COM component
#define ERR_TYPE_RTE
                                        21
          //Benchcraft rte
```

```
#define ERR_TYPE_AUTOMATION
                              22
          //Benchcraft automation errors
#define ERR_TYPE_DRIVER
                                        23
          //Driver engine errors
#define ERR_TYPE_RTE_BASE
                              24
          //Framework errors
#define   ERR_BUF_OVERFLOW
                              25
          //Buffer overflow during receive
#define ERR_TYPE_SOAP_HTTP
                              26
          //HTTP/SOAP dll generated error
#define ERR_TYPE_OLEDB
                                        27
          //OLE-DB generated error
#define ERR_TYPE_TPCC_OLEDB
                              28
          //error from tpcc ole-db txn module
// TPC-W error types
#define ERR_TYPE_TPCW_CONN
                              50
          //Benchcraft connection class
#define ERR_TYPE_TPCW_HTML
                              51
          //error from TpcwHtml dll
#define ERR_TYPE_TPCW_USER
                              52
          //error from TPC-W user class
#define ERR_TYPE_TPCW_ENG_BASE
                              53
#define ERR_TYPE_TPCW_ENG_OS
                    54
#define ERR_TYPE_HTML_RESP
                              55
#define ERR_TYPE_TPCW_ODBC
                              56
#define ERR_TYPE_SCHANNEL
                              57
#define ERR_TYPE_THINK_LIST
                              58
//------ end TPC-W ----------
#define ERR_TYPE_XML_PROFILE
                    59
// TPC-E error types
#define ERR_TYPE_TPCE_CONN
                              60
          //TPC-E pipe connection errors
#define ERR_TYPE_TPCE_RTE
                              61
          //TPC-E Rte errors
#define ERR_TYPE_TPCE_ENG_BASE
                              62
          //Tpce Driver engine errors
#define ERR_TYPE_TPCE_ENG_OS
                    63                  //Tpce Driver
engine system errors
//#define ERR_TYPE_TPCE_MEE_ENG_BASE
                    64                  //Tpce MEE
Driver engine errors
```

```
//#define ERR_TYPE_TPCE_MEE_ENG_OS
                    65                  //Tpce MEE
Driver engine system errors

#define ERR_INS_MEMORY
          "Insufficient Memory to continue."
#define ERR_UNKNOWN
          "Unknown error."
#define ERR_MSG_BUF_SIZE                512
#define INV_ERROR_CODE                            -1
#define ERR_INS_BUF_OVERFLOW    "Insufficient Buffer
size to receive HTML pages."



class CBaseErr
{
public:
          enum Action
          {
                    eNone = 0
          };

          CBaseErr(LPCTSTR szLoc = NULL)
          {
                    m_idMsg             =
GetLastError();     //take the error code
immediatelly before it is reset by other functions


                    if (szLoc)
                    {
                              m_szLoc = new
char[strlen(szLoc)+1/*m_szLoc_size*/];
                              strcpy(m_szLoc, szLoc);
                    }
                    else
                              m_szLoc   = NULL;

                    m_szApp             = new
char[m_szApp_size];

          GetModuleFileName(GetModuleHandle(NULL),
m_szApp, m_szApp_size);
          }




          CBaseErr(int idMsg, LPCTSTR szLoc = NULL)
          {
                    m_idMsg             = idMsg;


                    if (szLoc)
                    {
                              m_szLoc = new
char[strlen(szLoc)+1/*m_szLoc_size*/];
                              strcpy(m_szLoc, szLoc);
                    }
                    else
                              m_szLoc   = NULL;
```

```
                    m_szApp             = new
char[m_szApp_size];

          GetModuleFileName(GetModuleHandle(NULL),
m_szApp, m_szApp_size);
          }

          virtual ~CBaseErr(void)
          {
                    if (m_szApp)
                              delete [] m_szApp;
                    if (m_szLoc)
                              delete [] m_szLoc;
          };

          virtual void Draw(HWND hwnd, LPCTSTR szStr
= NULL)
          {
                    int                 j = 0;
                    char      szTmp[512];

                    if (szStr)
                              j = wsprintf(szTmp,
"%s\n",szStr);
                    if (ErrorNum() != INV_ERROR_CODE)
                              j += wsprintf(szTmp+j,
"Error = %d\n", ErrorNum());
                    if (m_szLoc)
                              j += wsprintf(szTmp+j,
"Location = %s\n", GetLocation());

                    j += wsprintf(szTmp+j, "%s\n",
ErrorText());

                    MessageBox(hwnd, szTmp, m_szApp,
MB_OK);
          }

          char *GetApp(void) { return m_szApp; }
          char *GetLocation(void) { return m_szLoc; }
          virtual int ErrorNum() { return m_idMsg; }



          virtual int ErrorType() = 0;  // a value
which distinguishes the kind of error that occurred
          virtual char *ErrorTypeStr() = 0; // text
representation of the error type
          virtual char *ErrorText() = 0; // a string
(i.e., human readable) representation of the error
          virtual int ErrorAction() { return eNone; }
          // the function call that caused the error


protected:
          char      *m_szApp;
          char      *m_szLoc; // code location where
the error occurred
          int                 m_idMsg;

          //short   m_errType;
};
```

```
class CSocketErr : public CBaseErr
{
public:
          enum Action
          {
                    eNone = 0,
                    eSend,
                    eSocket,
                    eBind,
                    eConnect,
                    eListen,
                    eHost,
                    eRecv,
                    eGetHostByName,
                    eWSACreateEvent,
                    eWSASend,
                    eWSAGetOverlappedResult,
                    eWSARecv,
                    eWSAWaitForMultipleEvents,
                    eWSAStartup,
                    eWSAResetEvent,
                    eWSAEnumNetworkEvents,
                    eWSAEventSelect,
                    eSelect,
                    eAccept,
                    eNonRetryable
          };

          CSocketErr(Action eAction, LPCTSTR
szLocation = NULL);

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

          Action    m_eAction;
          char      *m_szErrorText;

          int                 ErrorType() { return
ERR_TYPE_SOCKET;};
          char*     ErrorTypeStr() { return "SOCKET";
}
          char*     ErrorText(void);
          int                 ErrorAction() { return
(int)m_eAction; }

};

class CSystemErr : public CBaseErr
{
public:
          enum Action
          {
                    eNone = 0,
                    eTransactNamedPipe,
                    eWaitNamedPipe,
                    eSetNamedPipeHandleState,
                    eCreateFile,
                    eCreateProcess,
                    eCallNamedPipe,
                    eCreateEvent,
                    eCreateThread,
                    eVirtualAlloc,
                    eReadFile = 10,
                    eWriteFile,
                    eMapViewOfFile,
                    eCreateFileMapping,
                    eInitializeSecurityDescriptor,
                    eSetSecurityDescriptorDacl,
                    eCreateNamedPipe,
                    eConnectNamedPipe,
                    eWaitForSingleObject,
                    eRegOpenKeyEx,
                    eRegQueryValueEx = 20,
                    ebeginthread,
                    eRegEnumValue,
                    eRegSetValueEx,
                    eRegCreateKeyEx,
                    eWaitForMultipleObjects,
                    eRegisterClassEx,
                    eCreateWindow,
                    eCreateSemaphore,
                    eReleaseSemaphore,
                    eFSeek,
                    eFRead,
                    eFWrite,
                    eTmpFile,
                    eSetFilePointer,
                    eNew,
                    eCloseHandle,
                    eGetOverlappedResult
          };

                              CSystemErr(Action
eAction, LPCTSTR szLocation);
                              CSystemErr(int iError,
Action eAction, LPCTSTR szLocation);
          int                 ErrorType() { return
ERR_TYPE_OS;};
          char*     ErrorTypeStr() { return "SYSTEM";
}
          char      *ErrorText(void);
          int                 ErrorAction() { return
(int)m_eAction; }
          void      Draw(HWND hwnd, LPCTSTR szStr =
NULL);

          Action    m_eAction;

private:
          char m_szMsg[ERR_MSG_BUF_SIZE];
};

class CMemoryErr : public CBaseErr
{
public:
          CMemoryErr();

          int                 ErrorType() {return
ERR_TYPE_MEMORY;}
          char*     ErrorTypeStr() { return "OUT OF
MEMORY"; }
          char*     ErrorText() {return
ERR_INS_MEMORY;}
};


class CBufferOverflowErr : public CBaseErr
{
          public:
          CBufferOverflowErr(int,LPTSTR);

          int                 ErrorType() {return
ERR_BUF_OVERFLOW;}
          char*     ErrorTypeStr() { return "BUFFER
OVERFLOW"; }
          char*     ErrorText() {return
ERR_INS_BUF_OVERFLOW;}
};

// Exception type for XML profiles
class CXMLProfileErr : public CBaseErr
{
          public:
                    enum Action
                    {
                              LoadProfile = 1,
                              LoadSchema,
                              ValidateProfile,
                              SaveProfile,
                              LoadFromXML,
                              SaveToXML,

          ApplyProcessingInstruction,
                              ApplyAttribute,
                              ApplyNode
                    };

                    CXMLProfileErr(Action eAction,
int eCode, LPCTSTR szLocation)
                    {
                              m_eAction = eAction;
                              m_eCode = eCode;
                              m_bOverload = true;
                    };
                    CXMLProfileErr(Action eAction,
int eCode, LPCTSTR szLocation, char * szMsg)
                    {
                              m_eAction = eAction;
                              m_eCode = eCode;
                              strcpy(m_szMsg, szMsg);
                              m_bOverload = false;
                    };

                    virtual int
          ErrorType() { return
ERR_TYPE_XML_PROFILE;};
                    virtual char
          *ErrorTypeStr() { return "XML PROFILE"; };
                    virtual char        *ErrorText();

                    virtual int
          ErrorCode() { return m_eCode; };
                    int
          ErrorAction() { return (int)m_eAction; }
```

```
                    //virtual void      Draw(HWND
hwnd, LPCTSTR szStr = NULL)
                    //{
                    //        ::MessageBox(hwnd,
szStr, m_szLoc, MB_OK);
                    //};
          private:
                    char
          m_szMsg[ERR_MSG_BUF_SIZE];
                    LPCTSTR m_szLoc;
                    int                 m_eCode;
                    bool      m_bOverload;
                    Action    m_eAction;

};
```

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 <tchar.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 =
ODBC;
                              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);

                              // 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_MTS,    0);
                              switch (Reg.eTxnMon)
                              {
                              case None:

          CheckDlgButton(hwnd, IDC_TM_NONE,   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 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];

          // Check whether Service Pack 1 has been
installed if
          // running on Windows Server 2003. The RTM
version has
          // a limitation on the number of concurrent
HTTP connections.
          //
          OSVERSIONINFOEX               VersionInfo;

          VersionInfo.dwOSVersionInfoSize =
sizeof(OSVERSIONINFOEX);
          if
(GetVersionEx((LPOSVERSIONINFO)&VersionInfo))
          {
                    if (VersionInfo.dwMajorVersion ==
5 &&      // Windows 2000/2003 Server?

          VersionInfo.dwMinorVersion == 2 &&      //
Windows 2003 Server?

          VersionInfo.wServicePackMajor == 0)     //
Service Pack installed?
                    {
                              TCHAR szMsg[256];

                              _sntprintf(szMsg,
sizeof(szMsg),
```

```
                                        "Warning:
running on Windows Server 2003 without at least
Service Pack 1\n"
                                        "limits the
number of concurrent HTTP connections to around
8000.");
                              MessageBox(hwnd, szMsg,
_T("Service Pack not Installed"), MB_ICONEXCLAMATION
| MB_OK);
                    }
          }

          // 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_TM_NONE)
)
                    Reg.eTxnMon = None;
          else if ( IsDlgButtonChecked(hwnd,
IDC_TM_MTS) )
                    Reg.eTxnMon = COM;

          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, 13));
                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 MSVCR71.DLL
          strcpy( szLastFileName, "msvcr71.dll" );
          if (!FileFromResource( "MSVCR71",
IDR_MSVCR71, szWindowsPath, 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 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_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, 324
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,43,104,33,10
    CONTROL
"COM",IDC_TM_MTS,"Button",BS_AUTORADIOBUTTON |
                    WS_TABSTOP,94,104,32,10
    EDITTEXT
ED_DB_SERVER,131,145,67,12,ES_AUTOHSCROLL
    EDITTEXT
ED_DB_USER_ID,131,158,67,12,ES_AUTOHSCROLL
    EDITTEXT
ED_DB_PASSWORD,131,171,67,12,ES_AUTOHSCROLL
    EDITTEXT
ED_DB_NAME,131,184,67,12,ES_AUTOHSCROLL
    EDITTEXT
ED_IIS_MAX_THEAD_POOL_LIMIT,164,226,34,12,ES_RIGHT |
                    ES_NUMBER,WS_EX_RTLREADING
    EDITTEXT
ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE,164,240,34,12,ES_RI
GHT |
                    ES_NUMBER,WS_EX_RTLREADING
    EDITTEXT
ED_IIS_THREAD_TIMEOUT,164,254,34,12,ES_RIGHT |
ES_NUMBER,
                    WS_EX_RTLREADING
```

```
    EDITTEXT
ED_IIS_LISTEN_BACKLOG,164,268,34,12,ES_RIGHT |
ES_NUMBER,
                    WS_EX_RTLREADING
    DEFPUSHBUTTON   "OK",IDOK,53,296,50,14
    PUSHBUTTON      "Cancel",IDCANCEL,119,296,50,14
    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,36,226,115,12
    LTEXT           "Web Service Backlog Queue
Size:",IDC_STATIC,36,240,115,
                    12
    LTEXT           "IIS Thread Timeout
(seconds):",IDC_STATIC,36,254,115,12
    LTEXT           "IIS Listen
Backlog:",IDC_STATIC,36,270,115,10
    LTEXT           "Installation
directory:",IDC_STATIC,35,29,71,10
    GROUPBOX        "Transaction
Monitor",IDC_STATIC,33,90,165,33
    LTEXT           "Server
Name:",IDC_STATIC,35,148,56,8
    LTEXT           "User ID:",IDC_STATIC,35,161,60,8
    LTEXT           "User
Password:",IDC_STATIC,35,174,83,8
    LTEXT           "Database
Name:",IDC_STATIC,35,187,54,8
    GROUPBOX        "SQL Server Connection
Properties",IDC_STATIC,22,132,187,
                    74
    GROUPBOX        "Web Client
Properties",IDC_STATIC,22,15,187,113
    GROUPBOX        "IIS
Settings",IDC_STATIC,22,210,187,79
    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, 318
    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"

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

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

/////////////////////////////////////////////////////
////////////////////////
//
// MSVCRT71
//

IDR_MSVCR71           MSVCR71
"C:\\WINDOWS\\system32\\msvcr71.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,
         ERR_MEM_ALLOC_FAILED
};

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;}
};
```

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 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;
always has to be ODBC
          pReg->eDB_Protocol = ODBC;
          size = sizeof(szTmp);
          //if ( RegQueryValueEx(hKey, "DB_Protocol",
0, &type, (BYTE *)&szTmp, &size) == ERROR_SUCCESS )
          //{
                    //if ( !stricmp(szTmp,
szDBNames[ODBC]) )
                    //        pReg->eDB_Protocol =
ODBC;
          //}

          pReg->eTxnMon = None;
          // determine txn monitor to use; may be
either COM, or blank
          size = sizeof(szTmp);
          if ( RegQueryValueEx(hKey, "TxnMonitor", 0,
&type, (BYTE *)&szTmp, &size) == ERROR_SUCCESS )
          {
                    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 };
const char *szDBNames[] = { "Unspecified", "ODBC" };

enum TXNMON { None, COM };
const char *szTxnMonNames[] = { "NONE", "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_ODBC_DLL                    123
#define IDR_COM_DLL                     126
#define IDR_COMPS_DLL                   127
#define IDR_COMALL_DLL                  128
#define IDR_COMTYPLIB_DLL               129
#define IDR_MSVCR71                     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
```

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_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 "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_ODBC               *pCTPCC_ODBC_new;
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();


                                        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 == 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() );


                                                  }
                                        }

                                        // Check
whether Service Pack 1 has been installed if
                                        // running on
Windows Server 2003. The RTM version has
                                        // a
limitation on concurrent HTTP connections.
                                        //

          OSVERSIONINFOEX               VersionInfo;


          VersionInfo.dwOSVersionInfoSize =
sizeof(OSVERSIONINFOEX);
                                        if
(GetVersionEx((LPOSVERSIONINFO)&VersionInfo))
                                        {
                                                  if
(VersionInfo.dwMajorVersion == 5 &&     // Windows
2000/2003 Server?

          VersionInfo.dwMinorVersion == 2 &&      //
Windows 2003 Server?

          VersionInfo.wServicePackMajor == 0)     //
Service Pack installed?
                                                  {

          TCHAR szMsg[256];


          _sntprintf(szMsg, sizeof(szMsg),

                                        "\nRunning on
Windows Server 2003 without at least Service Pack
1\n"

                                        "limits the
number of concurrent HTTP connections to around
8000");


          // Use event logging to log the error.

          //

          HANDLE    hEventSource =
RegisterEventSource(NULL, TEXT("TPCC.DLL"));

          LPTSTR  lpszStrings[1] = { szMsg };



          if (hEventSource != NULL)
```

```

          {

                    ReportEvent(hEventSource, //
handle of event source

                              EVENTLOG_WARNING_TYPE,
// event type

                              0,
// event category

                              0,
// event ID

                              NULL,
// current user's SID

                              1,
// strings in lpszStrings

                              0,
// no bytes of raw data

                              (LPCTSTR *)lpszStrings,
// array of error strings


                              NULL);
// no raw data


                    (VOID)
DeregisterEventSource(hEventSource);

          }

                                                  }
                                        }

                                        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);

          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                            TermId,
iSyncId;
          char                szBuffer[4096];

          int                            lpbSize;
          static char         szHeader[] = "200 Ok";
          DWORD               dwSize = 6;
          // initial value is strlen(szHeader)
          char                szHeader1[4096];
          DWORD               dwAddr;   // used to
store Win32 exception address
```

```
          LPEXCEPTION_POINTERS
          pExceptionInfo;     // pointer to Win32
exception info


#ifdef ICECAP
          StartCAP();
#endif

          // Use structured exception handling for
Win32 exceptions
          //
          __try
          {
                    ProcessCommand(pECB, szBuffer,
TermId, iSyncId);
          }
          __except (          pExceptionInfo =
GetExceptionInformation(), // can call
GetExceptionInformation only in filter (not handler)
                                        dwAddr =
(DWORD)pExceptionInfo->ExceptionRecord-
>ExceptionAddress,  // save the address

          EXCEPTION_EXECUTE_HANDLER)    // handle all
exceptions
          {
                    char
          szMsg[512];
                    int
          iLen;

                    MEMORY_BASIC_INFORMATION mbi ;
                    VirtualQuery( (void*)dwAddr,
&mbi, sizeof( mbi ) ) ;
                    DWORD hInstance =
(DWORD)mbi.AllocationBase ;

                    iLen = wsprintf(szMsg,
TEXT("Unhandled exception (%#x) in Web Client's
HttpExtensionProc. "
                                        "Occured at
address %#x, base %#x, tpcc_com.dll at %#x, tpcc.dll
at %#x, tpcc_com_all.dll at %#x"),

          GetExceptionCode(), dwAddr, hInstance,

          GetModuleHandle("tpcc_com.dll"),
GetModuleHandle("tpcc.dll"),
GetModuleHandle("tpcc_com_all.dll"));

                    if (txnDelilog != NULL)
                    {
                              txnDelilog-
>WriteCtrlRecToLog(TXN_EVENT_WARNING, szMsg, iLen +
1);

                    }
                    ErrorForm( pECB, ERR_TYPE_WEBDLL,
GetExceptionCode(), TermId, iSyncId, szMsg, szBuffer
);
          }
```

```
#ifdef ICECAP
          StopCAP();
#endif

          lpbSize = strlen(szBuffer);
          dwSize += lpbSize;
          dwSize += 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;
}

/* FUNCTION: ProcessCommand
 *
 * PURPOSE:         This function parses the commands
from the driver and executes corresponding
transactions.
 *
 * ARGUMENTS:       EXTENSION_CONTROL_BLOCK
          *pECB     structure pointer to passed in
internet
 *


                    service information.
 *
 * RETURNS:                    None (outputs into the
szBuffer parameter).
 *
 * COMMENTS:        Separated from HttpExtensionProc
to be able to use structured exception handling in
 *
          HttpExtensionProc (cannot mix C++ and Win32
exceptions in one functions).
 *
 */
void ProcessCommand(EXTENSION_CONTROL_BLOCK *pECB,
char* szBuffer, int& TermId, int& iSyncId)
{
          int                            iCmd, FormId;

          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;
          }
}

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);


          LeaveCriticalSection(&hConnectCriticalSecti
on);
                              }

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

          szMyComputerName, Reg.szDbName,

          Reg.szSPPrefix,
Reg.bCallNoDuplicatesNewOrder );

                    }
                    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;

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

          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 == 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 );
          }
          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.def

```
LIBRARY TPCC.DLL

EXPORTS

          GetExtensionVersion @1
          HttpExtensionProc   @2
          TerminateExtension  @3
```

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);
// Separate function to be able to use Win32
exception handling in
// HttpExtensionProc.
void ProcessCommand(EXTENSION_CONTROL_BLOCK *pECB,
char* szBuffer, int& TermId, int& iSyncId);
```

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\0"
            VALUE "CompanyName", "Microsoft\0"
            VALUE "FileDescription", "TPC-C HTML DLL
Server\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 "..\..\common\src\tpcc_com_errorcode.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) && hr != E_TPCCCOM)
		throw new CCOMERR( hr );	// 
COM call didn't succeed and there is no output 
structure

	memcpy(m_pTxn, (void *)vTxn_out.parray-
>pvData,vTxn_out.parray->rgsabound[0].cElements);
	hr = SafeArrayDestroy(vTxn_out.parray);
	if (hr != S_OK)
		throw new CCOMERR( hr );

	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) && hr != E_TPCCCOM)
		throw new CCOMERR( hr );	// 
COM call didn't succeed and there is no output 
structure

	memcpy(m_pTxn, (void *)vTxn_out.parray-
>pvData,vTxn_out.parray->rgsabound[0].cElements);
	hr = SafeArrayDestroy(vTxn_out.parray);
	if (hr != S_OK)
		throw new CCOMERR( hr );

	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) && hr != E_TPCCCOM)
		throw new CCOMERR( hr );	// 
COM call didn't succeed and there is no output 
structure

	memcpy(m_pTxn, (void *)vTxn_out.parray-
>pvData,vTxn_out.parray->rgsabound[0].cElements);
	hr = SafeArrayDestroy(vTxn_out.parray);
	if (hr != S_OK)
		throw new CCOMERR( hr );

	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) && hr != E_TPCCCOM)
		throw new CCOMERR( hr );	// 
COM call didn't succeed and there is no output 
structure

	memcpy(m_pTxn, (void *)vTxn_out.parray-
>pvData,vTxn_out.parray->rgsabound[0].cElements);
	hr = SafeArrayDestroy(vTxn_out.parray);
	if (hr != S_OK)
		throw new CCOMERR( hr );

	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()
                    {
                              if (m_iErrorType == 0)
                                        return m_hr;
                    // return COM error
                              else
                                        return
m_iError; // return impersonated error
                    }

                    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
 *              All Rights Reserved
 *
 *                                      Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 *        PURPOSE:  Implementation for TPC-C 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 definations of structures specific to
TPC-C
#include "..\..\common\src\txn_base.h"
#include "..\..\common\src\error.h"
#include "..\..\common\src\ReadRegistry.h"
#include "..\..\common\src\tpcc_com_errorcode.h"
#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_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 ==
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);


          LeaveCriticalSection(&hConnectCriticalSecti
on);
          }

          if (m_pTxn)
          {
                    delete m_pTxn;
          }
}

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);
```

```
        LeaveCriticalSection(&hConnectCriticalSecti
on);
                }

                if (Reg.eDB_Protocol == ODBC)
                        m_pTxn =
pCTPCC_ODBC_new(    Reg.szDbServer, Reg.szDbUser,
Reg.szDbPassword,


        szMyComputerName, Reg.szDbName,


        Reg.szSPPrefix,
Reg.bCallNoDuplicatesNewOrder );
        }
        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;
        COM_DATA                *pOutData;

        try
        {
                // Allocate output structure
first because it is also used in the catch clauses.
                //
                VariantInit(txn_out);
                txn_out->vt = VT_SAFEARRAY;
                txn_out->parray =
SafeArrayCreateVector( VT_UI1,

                txn_in.parray->rgsabound-
>cElements,

                txn_in.parray->rgsabound-
>cElements);
```

```
                if (txn_out->parray == NULL)  //
sanity error checking - for very rare case, but to be
sure
                {
                        return E_OUTOFMEMORY;
                }

                pOutData = (COM_DATA*)txn_out-
>parray->pvData;

                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

                memcpy( &pOutData->u.NewOrder,
pNewOrder, sizeof(NEW_ORDER_DATA));

                pOutData->retval = ERR_SUCCESS;
                pOutData->error = 0;
                return S_OK;
        }
        catch (CBaseErr *e)
        {
                // check for lost database
connection; if yes, component is toast
                if ( ((e->ErrorType() ==
ERR_TYPE_ODBC) && (e->ErrorNum() == 10054)) )
                        m_bCanBePooled = FALSE;

                pOutData->retval = e-
>ErrorType();
                pOutData->error = e->ErrorNum();
                delete e;
                return E_TPCCCOM;
        }
        catch (...)
        {

        WriteMessageToEventLog(TEXT("Unhandled
exception in CTPCC_Common::NewOrder."));
                pOutData->retval =
ERR_TYPE_LOGIC;
                pOutData->error = 0;
                m_bCanBePooled = FALSE;
                return E_TPCCCOM;
        }
}

HRESULT CTPCC_Common::Payment(VARIANT txn_in,
VARIANT* txn_out)
{
        PPAYMENT_DATA           pPayment;
        COM_DATA                *pData;
        COM_DATA                *pOutData;

        try
```

```
        {
                // Allocate output structure
first because it is also used in the catch clauses.
                //
                VariantInit(txn_out);
                txn_out->vt = VT_SAFEARRAY;
                txn_out->parray =
SafeArrayCreateVector( VT_UI1,

                txn_in.parray->rgsabound-
>cElements,

                txn_in.parray->rgsabound-
>cElements);
                if (txn_out->parray == NULL)  //
sanity error checking - for very rare case, but to be
sure
                {
                        return E_OUTOFMEMORY;
                }

                pOutData = (COM_DATA*)txn_out-
>parray->pvData;

                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

                memcpy( &pOutData->u.Payment,
pPayment, sizeof(PAYMENT_DATA));

                pOutData->retval = ERR_SUCCESS;
                pOutData->error = 0;
                return S_OK;
        }
        catch (CBaseErr *e)
        {
                // check for lost database
connection; if yes, component is toast
                if ( ((e->ErrorType() ==
ERR_TYPE_ODBC) && (e->ErrorNum() == 10054)) )
                        m_bCanBePooled = FALSE;

                pOutData->retval = e-
>ErrorType();
                pOutData->error = e->ErrorNum();
                delete e;
                return E_TPCCCOM;
        }
        catch (...)
        {

        WriteMessageToEventLog(TEXT("Unhandled
exception in CTPCC_Common::Payment."));
                pOutData->retval =
ERR_TYPE_LOGIC;
```

```
                    pOutData->error = 0;
                    m_bCanBePooled = FALSE;
                    return E_TPCCCOM;
          }
}

HRESULT CTPCC_Common::StockLevel(VARIANT txn_in,
VARIANT* txn_out)
{
          PSTOCK_LEVEL_DATA   pStockLevel;
          COM_DATA                      *pData;
          COM_DATA                      *pOutData;

          try
          {
                    // Allocate output structure
first because it is also used in the catch clauses.
                    //
                    VariantInit(txn_out);
                    txn_out->vt = VT_SAFEARRAY;
                    txn_out->parray =
SafeArrayCreateVector( VT_UI1,

                    txn_in.parray->rgsabound-
>cElements,

                    txn_in.parray->rgsabound-
>cElements);
                    if (txn_out->parray == NULL)  //
sanity error checking - for very rare case, but to be
sure
                    {
                              return E_OUTOFMEMORY;
                    }

                    pOutData = (COM_DATA*)txn_out-
>parray->pvData;

                    pData = (COM_DATA*)txn_in.parray-
>pvData;
                    pStockLevel = m_pTxn-
>BuffAddr_StockLevel();

                    memcpy(pStockLevel, &pData-
>u.StockLevel, sizeof(STOCK_LEVEL_DATA));

                    m_pTxn->StockLevel();

                    memcpy( &pOutData->u.StockLevel,
pStockLevel, sizeof(STOCK_LEVEL_DATA));

                    pOutData->retval = ERR_SUCCESS;
                    pOutData->error = 0;
                    return S_OK;
          }
          catch (CBaseErr *e)
          {
                    // check for lost database
connection; if yes, component is toast
                    if ( ((e->ErrorType() ==
ERR_TYPE_ODBC) && (e->ErrorNum() == 10054)) )
                              m_bCanBePooled = FALSE;
                    pOutData->retval = e-
>ErrorType();
                    pOutData->error = e->ErrorNum();
                    delete e;
                    return E_TPCCCOM;
          }
          catch (...)
          {

          WriteMessageToEventLog(TEXT("Unhandled
exception in CTPCC_Common::StockLevel."));
                    pOutData->retval =
ERR_TYPE_LOGIC;
                    pOutData->error = 0;
                    m_bCanBePooled = FALSE;
                    return E_TPCCCOM;
          }
}

HRESULT CTPCC_Common::OrderStatus(VARIANT txn_in,
VARIANT* txn_out)
{
          PORDER_STATUS_DATA  pOrderStatus;
          COM_DATA                      *pData;
          COM_DATA                      *pOutData;
          try
          {
                    // Allocate output structure
first because it is also used in the catch clauses.
                    //
                    VariantInit(txn_out);
                    txn_out->vt = VT_SAFEARRAY;
                    txn_out->parray =
SafeArrayCreateVector( VT_UI1,

                    txn_in.parray->rgsabound-
>cElements,

                    txn_in.parray->rgsabound-
>cElements);
                    if (txn_out->parray == NULL)  //
sanity error checking - for very rare case, but to be
sure
                    {
                              return E_OUTOFMEMORY;
                    }

                    pOutData = (COM_DATA*)txn_out-
>parray->pvData;

                    pData = (COM_DATA*)txn_in.parray-
>pvData;
                    pOrderStatus = m_pTxn-
>BuffAddr_OrderStatus();

                    memcpy(pOrderStatus, &pData-
>u.OrderStatus, sizeof(ORDER_STATUS_DATA));

                    m_pTxn->OrderStatus();

                    memcpy( &pOutData->u.OrderStatus,
pOrderStatus, sizeof(ORDER_STATUS_DATA));
                    pOutData->retval = ERR_SUCCESS;
                    pOutData->error = 0;
                    return S_OK;
          }
          catch (CBaseErr *e)
          {
                    // check for lost database
connection; if yes, component is toast
                    if ( ((e->ErrorType() ==
ERR_TYPE_ODBC) && (e->ErrorNum() == 10054)) )
                              m_bCanBePooled = FALSE;

                    pOutData->retval = e-
>ErrorType();
                    pOutData->error = e->ErrorNum();
                    delete e;
                    return E_TPCCCOM;
          }
          catch (...)
          {

          WriteMessageToEventLog(TEXT("Unhandled
exception in CTPCC_Common::OrderStatus."));
                    pOutData->retval =
ERR_TYPE_LOGIC;
                    pOutData->error = 0;
                    m_bCanBePooled = FALSE;
                    return E_TPCCCOM;
          }
}
```

tpcc_com_all.def

```
; tpcc_com_all.def : Declares the module parameters.

LIBRARY      "tpcc_com_all.dll"

EXPORTS
          DllCanUnloadNow     PRIVATE
          DllGetClassObject   PRIVATE
          DllRegisterServer   PRIVATE
          DllUnregisterServer PRIVATE
```

tpcc_com_all.h

```
/* this ALWAYS GENERATED file contains the
definitions for the interfaces */


 /* File created by MIDL compiler version 6.00.0361
*/
/* at Thu Mar 16 18:21:15 2006
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf, W1, Zp8, env=Win32 (32b run)
    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(  )

#pragma warning( disable: 4049 )  /* more than 64k
source lines */


/* verify that the <rpcndr.h> version is high enough
to compile this file*/
#ifndef __REQUIRED_RPCNDR_H_VERSION__
#define __REQUIRED_RPCNDR_H_VERSION__ 475
#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 __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_i.c

```
/* 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 6.00.0361
*/
/* at Thu Mar 16 18:21:15 2006
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf, W1, Zp8, env=Win32 (32b run)
    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)


#pragma warning( disable: 4049 )  /* more than 64k
source lines */


#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)*/



/* 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 6.00.0361
*/
/* at Thu Mar 16 18:21:15 2006
 */
/* 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)


#pragma warning( disable: 4049 )  /* more than 64k
source lines */


#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_errorcode.h

```
/*        FILE:              TPCC_COM_ERRORCODE.H
 *                                     Microsoft
TPC-C Kit Ver. 4.20.000
 *                                     Copyright
Microsoft, 1999
 *               All Rights Reserved
 *
 *                                     not yet
audited
 *
 *        PURPOSE:  Header file defining the error
code returned from ITPCC COM interface.
 *
 *  Change history:
 *                   4.20.000 - first version
 */

// Error return value for methods in ITPCC interface.
//
// Define as 0x80042345 (decimal -2147212475 ).
//
const HRESULT E_TPCCCOM = MAKE_HRESULT
(SEVERITY_ERROR, FACILITY_ITF, 0x2345);
```

tpcc_com_ps.def

```
LIBRARY      "tpcc_com_ps"

EXPORTS
          DllGetClassObject       PRIVATE
          DllCanUnloadNow         PRIVATE
          GetProxyDllInfo         PRIVATE
          DllRegisterServer             PRIVATE
          DllUnregisterServer           PRIVATE
```

tpcc_com_ps.h

```
/* this ALWAYS GENERATED file contains the
definitions for the interfaces */


 /* File created by MIDL compiler version 6.00.0361
*/
/* at Thu Mar 16 18:21:12 2006
 */
/* 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(  )

#pragma warning( disable: 4049 )  /* more than 64k
source lines */


/* 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.idl

```
/*        FILE:              ITPCC.IDL
 *                                    Microsoft
TPC-C Kit Ver. 4.20.000
 *                                    Copyright
Microsoft, 1999
 *             All Rights Reserved
 *
 *                                    not yet
audited
 *
 *        PURPOSE:  Defines the interface used by
TPCC. This interface can be implemented by C++
components.
 *
 *  Change history:
 *                  4.20.000 - first version
 */

// Forward declare all types defined
interface ITPCC;
import "oaidl.idl";
import "ocidl.idl";

          [
                    object,
                    oleautomation,
                    uuid(FEEE6AA2-84B1-11d2-BA47-
00C04FBFE08B),
                    helpstring("ITPCC Interface"),
                    pointer_default(unique)
          ]
          interface ITPCC : IUnknown
          {

        HRESULT _stdcall NewOrder

          (

          [in] VARIANT  txn_in,

          [out] VARIANT *txn_out

          );

        HRESULT _stdcall Payment

          (

          [in] VARIANT txn_in,

          [out] VARIANT *txn_out

          );

        HRESULT _stdcall Delivery

          (

          [in] VARIANT txn_in,

          [out] VARIANT *txn_out

          );

        HRESULT _stdcall StockLevel

          (

          [in] VARIANT txn_in,

          [out] VARIANT *txn_out

          );

        HRESULT _stdcall OrderStatus

          (

          [in] VARIANT txn_in,

          [out] VARIANT *txn_out

          );

        HRESULT _stdcall CallSetComplete

          (

          );

    };    // interface ITPCC
```

tpcc_com_ps_i.c

```
/* 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 6.00.0361
*/
/* at Thu Mar 16 18:21:12 2006
 */
/* 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)


#pragma warning( disable: 4049 )  /* more than 64k
source lines */


#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)*/



/* 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 6.00.0361
*/
/* at Thu Mar 16 18:21:12 2006
 */
/* 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)


#pragma warning( disable: 4049 )  /* more than 64k
source lines */


#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

```
/* this ALWAYS GENERATED file contains the proxy stub
code */
```

```
 /* File created by MIDL compiler version 6.00.0361
*/
/* at Thu Mar 16 18:21:12 2006
 */
/* 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)


#pragma warning( disable: 4049 )  /* more than 64k
source lines */
#if _MSC_VER >= 1200
#pragma warning(push)
#endif
#pragma warning( disable: 4100 ) /* unreferenced
arguments in x86 call */
#pragma warning( disable: 4211 )  /* redefine extent
to static */
#pragma warning( disable: 4232 )  /* dllimport
identity*/
#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( 0xffff ),         /* 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( 0xfff2 ),         /* 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( 0xffff ),         /* 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( 0xff6e ),         /* 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( 0xffd4 ),         /* 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( 0xff50 ),         /* 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( 0xffe0 ),         /* 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( 0xff40 ),         /* 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( 0xffe0 ),         /* 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( 0xffd4 ),         /* 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( 0xffd8 ),         /* Offset= -
40 (608) */
/* 650 */ 0x36,               /* FC_POINTER */
                              0x5b,               /*
FC_END */
/* 652 */
                              0x12, 0x0,          /*
FC_UP */
/* 654 */ NdrFcShort( 0xffe4 ),         /* 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( 0xffd4 ),         /* 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( 0xffd4 ),         /* 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( 0xfff1 ),
          /* 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( 0xffe8 ),         /* Offset= -
24 (708) */
/* 734 */ 0x5c,               /* FC_PAD */
                              0x5b,               /*
FC_END */
/* 736 */
                              0x11, 0x0,          /*
FC_RP */
/* 738 */ NdrFcShort( 0xff0c ),         /* 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( 0xffe8 ),         /* 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( 0xffe8 ),         /* 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( 0xffe8 ),         /* 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( 0xffe8 ),         /* 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( 0xffee ),         /* Offset= -
18 (860) */
/* 880 */ 0x5c,               /* FC_PAD */
                              0x5b,               /*
FC_END */
/* 882 */
                              0x1a,               /*
FC_BOGUS_STRUCT */
                              0x3,                /*
3 */
/* 884 */ NdrFcShort( 0x28 ), /* 40 */
/* 886 */ NdrFcShort( 0xffee ),         /* 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( 0xfdf8 ),         /* Offset= -
520 (376) */
/* 898 */ 0x5c,               /* FC_PAD */
                              0x5b,               /*
FC_END */
/* 900 */
                              0x12, 0x0,          /*
FC_UP */
/* 902 */ NdrFcShort( 0xfef6 ),         /* 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( 0xfd8c ),         /* Offset= -
628 (302) */
/* 932 */
                              0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 934 */ NdrFcShort( 0xfd8e ),         /* Offset= -
626 (308) */
/* 936 */
                              0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 938 */ NdrFcShort( 0xfda2 ),         /* Offset= -
606 (332) */
/* 940 */
```

```
                              0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 942 */ NdrFcShort( 0xfdb0 ),         /* Offset= -
592 (350) */
/* 944 */
                              0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 946 */ NdrFcShort( 0xfdbe ),         /* 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( 0xfff4 ),         /* 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( 0xfc28 ),         /* 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( 0xfc18 ),         /*
Offset= -1000 (2) */
/* 1004 */
                              0x11, 0x4,          /*
FC_RP [alloced_on_stack] */
/* 1006 */          NdrFcShort( 0x6 ),  /* Offset= 6
(1012) */
/* 1008 */
                              0x13, 0x0,          /*
FC_OP */
/* 1010 */          NdrFcShort( 0xffdc ),         /*
Offset= -36 (974) */
/* 1012 */          0xb4,               /*
FC_USER_MARSHAL */
                              0x83,               /*
131 */
/* 1014 */          NdrFcShort( 0x0 ),  /* 0 */
/* 1016 */          NdrFcShort( 0x10 ), /* 16 */
/* 1018 */          NdrFcShort( 0x0 ),  /* 0 */
/* 1020 */          NdrFcShort( 0xfff4 ),         /*
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,
    0x6000169, /* MIDL Version 6.0.361 */
    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 */
};
#if _MSC_VER >= 1200
#pragma warning(pop)
#endif


#endif /* !defined(_M_IA64) && !defined(_M_AMD64)*/



/* this ALWAYS GENERATED file contains the proxy stub
code */


 /* File created by MIDL compiler version 6.00.0361
*/
/* at Thu Mar 16 18:21:12 2006
 */
/* 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)


#pragma warning( disable: 4049 )  /* more than 64k
source lines */
#if _MSC_VER >= 1200
#pragma warning(push)
#endif
```

```
#pragma warning( disable: 4211 )  /* redefine extent
to static */
#pragma warning( disable: 4232 )  /* dllimport
identity*/
#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( 0xffff ),         /* 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( 0xfff0 ),         /* 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( 0xffff ),         /* 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( 0xff74 ),         /* 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( 0xffdc ),         /* 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( 0xff58 ),         /* 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( 0xffdc ),         /* 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( 0xff44 ),         /* 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( 0xffdc ),         /* 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( 0xffdc ),         /* 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( 0xffd6 ),         /* Offset= -
42 (600) */
/* 644 */ 0x36,               /* FC_POINTER */
                              0x5b,               /*
FC_END */
/* 646 */
                              0x12, 0x0,          /*
FC_UP */
/* 648 */ NdrFcShort( 0xffe2 ),         /* 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( 0xffda ),         /* 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( 0xffdc ),         /* 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( 0xfff1 ),
          /* 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( 0xffe7 ),
          /* Offset= -25 (694) */
                              0x5b,               /*
FC_END */
/* 722 */
                              0x11, 0x0,          /*
FC_RP */
/* 724 */ NdrFcShort( 0xff12 ),         /* 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( 0xffe6 ),         /* 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( 0xffe6 ),         /* 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( 0xffe6 ),         /* 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( 0xffe6 ),         /* 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( 0xffec ),         /* Offset= -
20 (838) */
/* 860 */ 0x5c,               /* FC_PAD */
                              0x5b,               /*
FC_END */
/* 862 */
                              0x1a,               /*
FC_BOGUS_STRUCT */
                              0x3,                /*
3 */
/* 864 */ NdrFcShort( 0x38 ), /* 56 */
/* 866 */ NdrFcShort( 0xffec ),         /* 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( 0xfe0f ),
          /* Offset= -497 (380) */
                              0x5b,               /*
FC_END */
/* 880 */
                              0x12, 0x0,          /*
FC_UP */
```

```
/* 882 */ NdrFcShort( 0xff04 ),         /* 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( 0xfda2 ),         /* Offset= -
606 (304) */
/* 912 */
                              0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 914 */ NdrFcShort( 0xfda4 ),         /* Offset= -
604 (310) */
/* 916 */
                              0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 918 */ NdrFcShort( 0xfdba ),         /* Offset= -
582 (336) */
/* 920 */
                              0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 922 */ NdrFcShort( 0xfdc8 ),         /* Offset= -
568 (354) */
/* 924 */
                              0x12, 0x10,         /*
FC_UP [pointer_deref] */
/* 926 */ NdrFcShort( 0xfdd6 ),         /* 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( 0xfff4 ),         /* 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( 0xfc3c ),         /* 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( 0xfc2c ),         /* Offset= -
980 (2) */
/* 984 */
                              0x11, 0x4,          /*
FC_RP [alloced_on_stack] */
/* 986 */ NdrFcShort( 0x6 ),  /* Offset= 6 (992) */
/* 988 */
                              0x13, 0x0,          /*
FC_OP */
/* 990 */ NdrFcShort( 0xffdc ),         /* Offset= -
36 (954) */
/* 992 */ 0xb4,               /* FC_USER_MARSHAL */
                              0x83,               /*
131 */
/* 994 */ NdrFcShort( 0x0 ),  /* 0 */
/* 996 */ NdrFcShort( 0x18 ), /* 24 */
/* 998 */ NdrFcShort( 0x0 ),  /* 0 */
/* 1000 */          NdrFcShort( 0xfff4 ),         /*
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,
    0x6000169, /* MIDL Version 6.0.361 */
    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 */
};
#if _MSC_VER >= 1200
#pragma warning(pop)
#endif


#endif /* defined(_M_IA64) || defined(_M_AMD64)*/
```

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 =
daterec.minute;

          m_txn.Payment.c_since.second =
daterec.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_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 = 3;                  // how many
retries on deadlock
//const iMaxRetries = 0;                // for
debugging

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."
                              },
                    { ERR_INVALID_NEW_ORDER_PARAM,
          "New Order parameter invalid."
                                        },
                    { 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 )
void CTPCC_ODBC::ThrowError( RETCODE 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_eAction =
(CODBCERR::ACTION)eAction;
          pODBCErr->m_bDeadLock = FALSE;

          szTmp[0] = 0;
          szMsg[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;
                    }

                    if (rc != SQL_SUCCESS)
                    {
                              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

                                                    //
012345678901234567890123456789
        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
                                                   //
0123456789012345678901234567890123
          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 ( (rc =
SQLFetch(m_hstmt)) == SQL_ERROR)

          ThrowError(CODBCERR::eFetch);

                              SQLFreeStmt(m_hstmt,
SQL_CLOSE);

                              // Check Fetch return
code for no rows returned.
                              // It means customer id
or warehouse id were invalid.
                              //
                              if (rc == SQL_NO_DATA)
```

```
                                        throw new
CTPCC_ODBC_ERR(CTPCC_ODBC_ERR::ERR_INVALID_NEW_ORDER_
PARAM);

                              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 (m_txn.OrderStatus.c_id != 0)
                    m_txn.OrderStatus.c_last[0] = 0;

          while (TRUE)
          {
                    try
                    {
                              if ( SQLSetStmtAttrW(
m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descOrderStatusCols1, SQL_IS_POINTER ) !=
SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

                              // 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
&& rc != SQL_SUCCESS_WITH_INFO)

          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) || ((rc == SQL_SUCCESS_WITH_INFO) &&
(m_RowsFetched != 0))) )
                              if ( (rc !=
SQL_SUCCESS) )

          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 )
                                        if ( (rc =
SQLMoreResults(m_hstmt)) != SQL_SUCCESS )
                                        {

          ThrowError(CODBCERR::eMoreResults);
                                        }

//                                        if ( (rc =
SQLFetch(m_hstmt)) == SQL_ERROR)

                                        if ( (rc =
SQLFetch(m_hstmt)) != SQL_SUCCESS)

          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."

          ERR_INVALID_NEW_ORDER_PARAM   // "New Order
parameter invalid."
                    };

                    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 ThrowError( RETCODE 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_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 pErrorInfoAll. Simply
test the pointer.
          GetErrorInfo(0, &pErrorInfoAll);

          if (pErrorInfoAll != NULL)
          {
                    // Test to see if it's a valid
OLE DB IErrorInfo interface
                    // exposing a list of records.
                    if (SUCCEEDED(pErrorInfoAll-
>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);
```

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;
```

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;
};
```

_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_SYMBO
LS
#define
_APS_NEXT_RESOURCE_VALU
E         202
#define
_APS_NEXT_COMMAND_VALUE
32768
#define
_APS_NEXT_CONTROL_VALUE
201
#define
_APS_NEXT_SYMED_VALUE
106
#endif
#endif
```

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. 4.68             --
--          Copyright Microsoft, 2005                           --
--                                                              --
------------------------------------------------------------------
USE master
GO

------------------------------------------------------------------
-- remove any existing database and backup files
------------------------------------------------------------------
EXEC sp_dbremove tpcc, dropdev
GO

EXEC sp_dropdevice 'tpccback5'
GO
EXEC sp_dropdevice 'tpccback6'
GO
EXEC sp_dropdevice 'tpccback7'
GO
EXEC sp_dropdevice 'tpccback8'
GO
```

backupdev.sql

```
------------------------------------------------------------------
--                                                              --
--  File:   BACKUPDEV.SQL                                       --
--          Microsoft TPC-C Benchmark Kit Ver. 4.68             --
--          Copyright Microsoft, 2005                           --
--                                                              --
------------------------------------------------------------------

USE master
GO

------------------------
-- create backup devices
------------------------
EXEC sp_addumpdevice 'disk','tpccback5','W:\tpccback5.dmp'
GO
EXEC sp_addumpdevice 'disk','tpccback6','X:\tpccback6.dmp'
GO
EXEC sp_addumpdevice 'disk','tpccback7','Y:\tpccback7.dmp'
GO
EXEC sp_addumpdevice 'disk','tpccback8','Z:\tpccback8.dmp'
GO
```

version.sql

```
------------------------------------------------------------------
--                                                              --
--  File:   VERSION.SQL                                         --
--          Microsoft TPC-C Benchmark Kit Ver. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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. 4.68             --
--          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  = 'c:\MSSQL_tpcc_root.mdf',
          SIZE                = 8MB,
          FILEGROWTH          = 0),


FILEGROUP MSSQL_stk_fg
(         NAME                = MSSQL_stk1,
          FILENAME  = 'F:',
          SIZE                = 71000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_stk2,
          FILENAME  = 'G:',
          SIZE                = 71000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_stk3,
          FILENAME  = 'H:',
          SIZE                = 71000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_stk4,
          FILENAME  = 'I:',
          SIZE                = 71000MB,
          FILEGROWTH          = 0),

FILEGROUP MSSQL_cust_fg
(         NAME                = MSSQL_cust1,
          FILENAME  = 'J:',
          SIZE                = 51000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cust2,
          FILENAME  = 'K:',
          SIZE                = 51000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cust3,
          FILENAME  = 'L:',
          SIZE                = 51000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cust4,
          FILENAME  = 'M:',
          SIZE                = 51000MB,
          FILEGROWTH          = 0),

FILEGROUP MSSQL_OL_fg
(         NAME                = MSSQL_OL1,
          FILENAME  = 'N:',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_OL2,
          FILENAME  = 'O:',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_OL3,
          FILENAME  = 'P:',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_OL4,
          FILENAME  = 'Q:',
          SIZE                = 49000MB,
          FILEGROWTH          = 0),

FILEGROUP MSSQL_misc_fg
(         NAME                = MSSQL_misc1,
          FILENAME  = 'R:',
          SIZE                = 11000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc2,
          FILENAME  = 'S:',
          SIZE                = 11000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc3,
          FILENAME  = 'T:',
          SIZE                = 11000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc4,
          FILENAME  = 'U:',
          SIZE                = 11000MB,
          FILEGROWTH          = 0)


LOG ON
(         NAME                = MSSQL_tpcc_log,
          FILENAME  = 'E:',
          SIZE                = 320000MB,
          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. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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',    TRUE
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. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
------------------------------------------------------------------
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  'Order Line 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  'History 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. 4.61             --
--          Copyright Microsoft, 2005                           --
--                                                              --
------------------------------------------------------------------

DECLARE @startdate  DATETIME,
              @enddate        DATETIME

SELECT  @startdate = GETDATE()
SELECT  'Start date:',
                    CONVERT(VARCHAR(30),@startdate, 21)

DUMP DATABASE tpcc TO tpccback5, tpccback6, tpccback7, tpccback8 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. 4.61             --
--          Copyright Microsoft, 2005                           --
--                                                              --
------------------------------------------------------------------

DECLARE @startdate  DATETIME,
        @enddate    DATETIME

SELECT  @startdate = GETDATE()
SELECT  'Start date:',
                    CONVERT(VARCHAR(30),@startdate, 21)

LOAD DATABASE tpcc FROM tpccback5, tpccback6, tpccback7, tpccback8 WITH stats = 1,
replace

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. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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_cust_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. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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_cust_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. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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
```

idxhiscl.sql

```
------------------------------------------------------------------
--                                                              --
--  File:   IDXHISCL.SQL                                        --
--          Microsoft TPC-C Benchmark Kit Ver. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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
```

idxnodcl.sql

```
------------------------------------------------------------------
--                                                              --
--  File:   IDXNODCL.SQL                                        --
--          Microsoft TPC-C Benchmark Kit Ver. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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_OL_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. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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
```

idxordnc.sql

```
------------------------------------------------------------------
--                                                              --
--  File:   IDXORDNC.SQL                                        --
--          Microsoft TPC-C Benchmark Kit Ver. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          Creates non-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_nc1' )
    DROP INDEX orders.orders_nc1

CREATE INDEX orders_nc1 ON orders(o_w_id, o_d_id, o_c_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. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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_stk_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. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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
```

tables.sql

```
------------------------------------------------------------------
--                                                              --
--  File:   TABLES.SQL                                          --
--          Microsoft TPC-C Benchmark Kit Ver. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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_cust_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_OL_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_stk_fg
go
```

neword.sql

```
------------------------------------------------------------------
--                                                              --
--  File:   NEWORD.SQL                                          --
--          Microsoft TPC-C Benchmark Kit Ver. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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
```

Tpcc_neworder_new.sql

```
------------------------------------------------------------------
------------------------------------------------------------------
--                                                              --
--  File:   TPCC_NEWORDER_NEW.SQL                               --
--          Microsoft TPC-C Benchmark Kit Ver. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          This acid stored procedure implements the neworder  --
--          transaction.  It outputs timestamps at the          --
--          beginning of the transaction, before the commit     --
--          delay, and after the commit.                        --
--                                                              --
------------------------------------------------------------------
SET QUOTED_IDENTIFIER OFF
GO
SET ANSI_NULLS OFF
GO

USE tpcc
GO

IF EXISTS ( SELECT name FROM sysobjects WHERE name = 'tpcc_neworder_new' )
    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 PROCEDURE    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  AND -- filters
out invalid items
                                                     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 (@@rowcount = 0)
    BEGIN
                    RAISERROR( 'Invalid Customer ID', 11, 1 )
        ROLLBACK TRANSACTION n
    END
          ELSE IF (@commit_flag = 1)
        COMMIT TRANSACTION n
    ELSE    -- all that work for nothing.
        ROLLBACK TRANSACTION  n

END
GO
```

delivery.sql

```
------------------------------------------------------------------
--                                                              --
--  File:   DELIVERY.SQL                                        --
--          Microsoft TPC-C Benchmark Kit Ver. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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
```

null-txns.sql

```
------------------------------------------------------------------
--                                                              --
--  File:   NULL-TXNS.SQL                                       --
--          Microsoft TPC-C Benchmark Kit Ver. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          This script will create stored procs which          --
--          accept the same parameters and return correctly     --
--          formed results sets to match the standard TPC-C     --
--          stored procs.  Of course, the advantage is that     --
--          these stored procs place almost no load on          --
--          SQL Server and do not require a database.           --
--                                                              --
--          Interface Level:    4.10.000                        --
--                                                              --
------------------------------------------------------------------
USE tpcc
GO

IF EXISTS ( SELECT name FROM sysobjects WHERE name = 'tpcc_delivery' )
    DROP PROCEDURE tpcc_delivery
GO
IF EXISTS ( SELECT name FROM sysobjects WHERE name = 'tpcc_neworder' )
    DROP PROCEDURE tpcc_neworder
GO
IF EXISTS ( SELECT name FROM sysobjects WHERE name = 'tpcc_orderstatus' )
    DROP PROCEDURE tpcc_orderstatus
GO
IF EXISTS ( SELECT name FROM sysobjects WHERE name = 'tpcc_payment' )
    DROP PROCEDURE tpcc_payment
```

```
GO
IF EXISTS ( SELECT name FROM sysobjects WHERE name = 'tpcc_stocklevel' )
    DROP PROCEDURE tpcc_stocklevel
GO
IF EXISTS ( SELECT name FROM sysobjects WHERE name = 'tpcc_version' )
    DROP PROCEDURE tpcc_version
GO
IF EXISTS ( SELECT name FROM sysobjects WHERE name = 'order_line_null' )
    DROP PROCEDURE order_line_null
GO

CREATE PROCEDURE    tpcc_delivery
                        @w_id           int,

                        @o_carrier_id   smallint

AS
DECLARE @d_id       tinyint,
        @o_id       int,
        @c_id       int,
        @total      numeric(12,2),
        @oid1       int,
        @oid2       int,
        @oid3       int,
        @oid4       int,
        @oid5       int,
        @oid6       int,
        @oid7       int,
        @oid8       int,
        @oid9       int,
        @oid10      int,
        @delaytime  varchar(30)

---------------------------------------------------
-- uniform random delay of 0 - 1 second; avg = 0.50
---------------------------------------------------
SELECT  @delaytime = '00:00:0' + CAST(CAST((RAND()*1.00) AS decimal(4,3)) AS
char(5))

WAITFOR delay @delaytime

SELECT  3001, 3001, 3001, 3001, 3001, 3001, 3001, 3001, 3001, 3001
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          numeric(4,4),
        @d_tax          numeric(4,4),
        @c_last         char(16),
        @c_credit       char(2),
        @c_discount     numeric(4,4),
        @i_price        numeric(5,2),
        @i_name         char(24),
        @o_entry_d      datetime,
        @li_no          int,
        @o_id           int,
        @commit_flag    tinyint,
        @li_id          int,
        @li_qty         smallint,
        @delaytime      varchar(30)

BEGIN
    ----------------------------------------------------
    -- uniform random delay of 0 - 0.6 second; avg = 0.3
    ----------------------------------------------------
    SELECT  @delaytime  = '00:00:0' + CAST(CAST((RAND()*0.60) AS decimal(4,3)) AS
char(5))

    WAITFOR delay @delaytime

    ----------------------
    --  process orderlines
    ----------------------
    SELECT  @commit_flag    = 1,
            @li_no          = 0

    WHILE (@li_no < @o_ol_cnt)
    BEGIN
        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

        SELECT  @li_no      = @li_no + 1

        SELECT  @i_price    = 23.45, @li_qty = @li_no

        IF (@li_id = 999999)
        BEGIN
            SELECT  '',0,'',0,0
            SELECT  @commit_flag = 0
        END
        ELSE
        BEGIN
            SELECT  'Item Name blah',
                    17,
                    'G',
                    @i_price,
                    @i_price * @li_qty
        END
    END

    ------------------------------
    --  return order data to client
    ------------------------------
    SELECT  @w_tax      = 0.1234,
            @d_tax      = 0.0987,
            @o_id       = 3001,
            @c_last     = 'BAROUGHTABLE',
            @c_discount = 0.2198,
            @c_credit   = 'GC',
            @o_entry_d  = GETDATE()

    SELECT  @w_tax,
            @d_tax,
            @o_id,
            @c_last,
            @c_discount,
            @c_credit,
            @o_entry_d,
            @commit_flag

END
GO

CREATE PROCEDURE    tpcc_orderstatus
                        @w_id       int,
                        @d_id       tinyint,

                        @c_id       int,
                        @c_last     char(16) = ''

AS
DECLARE @c_balance      numeric(12,2),
        @c_first        char(16),
        @c_middle       char(2),
        @o_id           int,
        @o_entry_d      datetime,
        @o_carrier_id   smallint,
        @ol_cnt         smallint,
        @delaytime      varchar(30)

----------------------------------------------------
-- uniform random delay of 0 - 0.2 second; avg = 0.1
----------------------------------------------------
SELECT  @delaytime  = '00:00:0' + CAST(CAST((RAND()*0.20) AS decimal(4,3)) AS
char(5))

WAITFOR delay @delaytime

SELECT  @c_id       = 113,
        @c_balance  = -10.00,
        @c_first    = '8YCodgytqCj8',
```

```
        @c_middle   = 'OE',
        @c_last     = 'OUGHTOUGHTABLE',
        @o_id       = 3456,
        @o_entry_d  = GETDATE(),
        @o_carrier_id   = 1

SELECT  @ol_cnt = (RAND() * 11) + 5

SET     ROWCOUNT @ol_cnt

SELECT  ol_supply_w_id,
        ol_i_id,
        ol_quantity,
        ol_amount,
        ol_delivery_d
FROM    order_line_null

SELECT  @c_id,
        @c_last,
        @c_first,
        @c_middle,
        @o_entry_d,
        @o_carrier_id,
        @c_balance,
        @o_id
GO

CREATE PROCEDURE    tpcc_payment
                        @w_id       int,
                        @c_w_id     int,
                        @h_amount   numeric(6,2),
                        @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   numeric(12,2),
        @c_balance      numeric(12,2),
        @c_discount     numeric(4,4),
        @data           char(500),
        @c_data         char(500),
        @datetime       datetime,
        @w_ytd          numeric(12,2),
        @d_ytd          numeric(12,2),
        @cnt            smallint,
        @val            smallint,
        @screen_data          char(200),
        @d_id_local     tinyint,
        @w_id_local     int,
        @c_id_local     int,
        @delaytime      varchar(30)

-----------------------------------------------------
-- uniform random delay of 0 - 0.3 second; avg = 0.15
-----------------------------------------------------
SELECT  @delaytime  = '00:00:0' + CAST(CAST((RAND()*0.20) AS decimal(4,3)) AS
char(5))

WAITFOR delay @delaytime

SELECT  @screen_data    = ''

-----------------------------------------
--  get customer info and update balances
-----------------------------------------
SELECT  @d_street_1 = 'rqSHHakqyV',
        @d_street_2 = 'zZ98nW3BR2s',
        @d_city     = 'ArNr4GNFV9',
        @d_state    = 'aV',
        @d_zip      = '453511111'

----------------------------------------------
--  get warehouse data and update year-to-date
----------------------------------------------
SELECT  @w_street_1 = 'rqSHHakqyV',
        @w_street_2 = 'zZ98nW3BR2s',
        @w_city     = 'ArNr4GNFV9',
        @w_state    = 'aV',
        @w_zip      = '453511111'

SELECT  @c_id             = 123,
        @c_balance     = -10000.00,
        @c_first       = 'KmR03Xureb',
        @c_middle      = 'OE',
        @c_last        = 'BAROUGHTBAR',
        @c_street_1    = 'QpGdOHjv8mR9vNI8V',
        @c_street_2    = 'dzKoCObBqbC3yu',
        @c_city        = 'zAKZXdC037FQxq',
        @c_state       = 'QA',
        @c_zip         = '700311111',
        @c_phone       = '2967264064528555',
        @c_credit      = 'GC',
        @c_credit_lim  = 50000.00,
        @c_discount    = 0.3069,
        @c_since       = GETDATE(),
        @datetime      = GETDATE()

-------------------------
--  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

CREATE PROCEDURE    tpcc_stocklevel
                        @w_id           int,
                        @d_id           tinyint,
                        @threshhold     smallint
AS
DECLARE @delaytime  varchar(30)

---------------------------------------------------
-- uniform random delay of 0 - 3.6 second; avg = 1.8
---------------------------------------------------
SELECT  @delaytime  = '00:00:0' + CAST(CAST((RAND()*0.20) AS decimal(4,3)) AS
char(5))

WAITFOR delay @delaytime

SELECT  49
GO

CREATE PROCEDURE tpcc_version

AS
DECLARE @version    char(8)

BEGIN
    SELECT  @version = '4.10.000'

    SELECT  @version AS 'Version'
END
GO

CREATE TABLE    order_line_null (
                                    [ol_i_id] [int] NOT NULL ,
                                    [ol_supply_w_id] [int] NOT NULL ,
                                    [ol_delivery_d] [datetime] NOT NULL ,
                                    [ol_quantity] [smallint] NOT NULL ,
                                    [ol_amount] [numeric](6, 2) NOT NULL
) ON [PRIMARY]
```

```
GO

INSERT INTO order_line_null VALUES ( 101, 1, GETDATE(), 1, 123.45 )
INSERT INTO order_line_null VALUES ( 102, 1, GETDATE(), 2, 123.45 )
INSERT INTO order_line_null VALUES ( 103, 1, GETDATE(), 3, 123.45 )
INSERT INTO order_line_null VALUES ( 104, 1, GETDATE(), 4, 123.45 )
INSERT INTO order_line_null VALUES ( 105, 1, GETDATE(), 5, 123.45 )
INSERT INTO order_line_null VALUES ( 106, 1, GETDATE(), 1, 123.45 )
INSERT INTO order_line_null VALUES ( 107, 1, GETDATE(), 2, 123.45 )
INSERT INTO order_line_null VALUES ( 108, 1, GETDATE(), 3, 123.45 )
INSERT INTO order_line_null VALUES ( 109, 1, GETDATE(), 4, 123.45 )
INSERT INTO order_line_null VALUES ( 110, 1, GETDATE(), 5, 123.45 )
INSERT INTO order_line_null VALUES ( 111, 1, GETDATE(), 1, 123.45 )
INSERT INTO order_line_null VALUES ( 112, 1, GETDATE(), 2, 123.45 )
INSERT INTO order_line_null VALUES ( 113, 1, GETDATE(), 3, 123.45 )
INSERT INTO order_line_null VALUES ( 114, 1, GETDATE(), 4, 123.45 )
INSERT INTO order_line_null VALUES ( 115, 1, GETDATE(), 5, 123.45 )
GO
```

ordstat.sql

```
------------------------------------------------------------------
--                                                              --
--  File:   ORDSTAT.SQL                                         --
--          Microsoft TPC-C Benchmark Kit Ver. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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. 4.68             --
--          Copyright Microsoft, 2006                           --
--                                                              --
--          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. 4.68            --
--          Copyright Microsoft, 2006                          --
--                                                             --
--          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
```

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 Standard x64 Edition Installation Procedures

```
Microsoft SQL Server 2005 Standard (x64) Edition
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 2005 Standard x64 Edition Startup Commands

```
start sqlservr.exe -c -x -T3502 -T8011 -T8012 -T8018
-T8019 -T661 -T836 -T834

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
-T8011–Disable diagnostics for resource monitor
-T8012–Disable ring buffer for scheduler
-T8018-Disable exceptions ring buffer
-T8019-Disable stack collection for exception ring
buffer
-T661-Disable ghost writer
-T836-Make use of all physical memory
-T834-Large Pages

File locations:
sqlserver.exe- C:\Program Files\Microsoft SQL
Server\MSSQL.1\MSSQL\Binn
ERRORLOG-C:\Program Files\Microsoft SQL
Server\MSSQL.1\MSSQL\LOG
```

Microsoft SQL Server Configuration Parameters

```
1> 2> 3> 4> 5> 6> 7> 8> 9> 10> 11> 12> --------------
-----------------------------------------------------
-----------
--
--
--  File:   VERSION.SQL
--
--          Microsoft TPC-C Benchmark Kit Ver. 4.62
--
--          Copyright Microsoft, 2005
--
--
--
--          - Extracts current version of SQL Server
--
--
--
-----------------------------------------------------
------------------------

USE master
1> 2> 3> 4> 5>
SELECT  CONVERT(char(20),
SERVERPROPERTY('ProductVersion')),
        CONVERT(char(20),
SERVERPROPERTY('ProductLevel')),
        CONVERT(char(29), SERVERPROPERTY('Edition'))

 -------------------- -------------------- ----------
-------------------
 9.00.1399.06         RTM                  Standard
Edition (64-bit)

(1 row affected)
1> 2> 3>
SELECT  CONVERT(char(30), GETDATE(), 21)

 ------------------------------
 2007-03-02 17:02:37.357

(1 row affected)
1>
1> 2> 3> 4> 5> 6> 7> 8> 9> 10> 11> 12> 13> 14>
-----------------------------------------------------
------------------------
--
--
--  File:   CONFIG.SQL
--
--          Microsoft TPC-C Benchmark Kit Ver. 4.62
--
--          Copyright Microsoft, 2005
--
--
--
--          - Collects SQL Server configuration
parameters                  --
--
--
-----------------------------------------------------
------------------------

PRINT   ' '
SELECT  CONVERT(char(30), GETDATE(), 21)
PRINT   ' '

 ------------------------------
 2007-03-02 17:02:37.467

(1 row affected)

1> 2> 3> Configuration option 'show advanced options'
changed from 1 to 1. Run the RECONFIGURE statement to
install.

sp_configure 'show advanced',1
1> 2> 3>
RECONFIGURE WITH OVERRIDE
1> 2> 3>
sp_configure
 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
 affinity64 I/O mask                 -2147483648
2147483647            0           0
 affinity64 mask                     -2147483648
2147483647            0           0
 Agent XPs                                     0
1            0           0
 allow updates                                 0
1            0           0
 awe enabled                                   0
1            0           0
 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            1           1
 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          704         704
 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        19456       19456
 max text repl size (B)                         0
2147483647        65536       65536
 max worker threads                           128
32767          600         600
 media retention                                0
365            0           0
 min memory per query (KB)                    512
2147483647          512         512
 min server memory (MB)                         0
2147483647           0           0
 nested triggers                                0
1            1           1
 network packet size (B)                      512
32767         2048        2048
 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

1>
```

Database Server System Configuration

```
System Information report written at: 03/14/07
16:45:45
System Name: HOPE
[System Summary]
```

```
Item      Value
OS Name   Microsoft(R) Windows(R) Server 2003
Standard x64 Edition
Version   5.2.3790 Service Pack 1 Build 3790
Other OS Description          Not Available
OS Manufacturer     Microsoft Corporation
System Name         HOPE
System Manufacturer HP
System Model        ProLiant ML350 G5
System Type         x64-based PC
Processor EM64T Family 6 Model 15 Stepping 7
GenuineIntel ~1867 Mhz
Processor EM64T Family 6 Model 15 Stepping 7
GenuineIntel ~1867 Mhz
Processor EM64T Family 6 Model 15 Stepping 7
GenuineIntel ~1867 Mhz
Processor EM64T Family 6 Model 15 Stepping 7
GenuineIntel ~1867 Mhz
BIOS Version/Date   HP D21, 12/26/2006
SMBIOS Version      2.3
Windows Directory   C:\WINDOWS
System Directory    C:\WINDOWS\system32
Boot Device         \Device\HarddiskVolume21
Locale    United States
Hardware Abstraction Layer    Version =
"5.2.3790.1830 (srv03_sp1_rtm.050324-1447)"
User Name Not Available
Time Zone Central Daylight Time
Total Physical Memory         20,477.67 MB
Available Physical Memory     19.11 GB
Total Virtual Memory          21.32 GB
Available Virtual Memory      21.14 GB
Page File Space     2.00 GB
Page File C:\pagefile.sys

[Hardware Resources]



[Conflicts/Sharing]

Resource  Device
Memory Address 0xF0000000-0xFEBFFFFF    PCI bus
Memory Address 0xF0000000-0xFEBFFFFF    Standard VGA
Graphics Adapter

I/O Port 0x00000000-0x00000CF7          PCI bus
I/O Port 0x00000000-0x00000CF7          Direct memory
access controller

Memory Address 0xFDA00000-0xFDDFFFFF    PCI standard
PCI-to-PCI bridge
Memory Address 0xFDA00000-0xFDDFFFFF    PCI standard
PCI-to-PCI bridge

IRQ 10    Base System Device
IRQ 10    PCI Device

Memory Address 0xFDE00000-0xFDFFFFFF    PCI standard
PCI-to-PCI bridge
Memory Address 0xFDE00000-0xFDFFFFFF    PCI standard
PCI-to-PCI bridge
```

```
I/O Port 0x00006000-0x00007FFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00006000-0x00007FFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00006000-0x00007FFF          Smart Array
E200I Controller

IRQ 16    PCI standard PCI-to-PCI bridge
IRQ 16    Smart Array P800 Controller
IRQ 16    Intel(R) PRO/1000 MT Dual Port Network
Connection #2
IRQ 16    PCI standard PCI-to-PCI bridge
IRQ 16    HP NC373i Virtual Bus Device
IRQ 16    Standard Universal PCI to USB Host
Controller
IRQ 16    Standard Enhanced PCI to USB Host
Controller

IRQ 17    PCI standard PCI-to-PCI bridge
IRQ 17    Smart Array P800 Controller
IRQ 17    Standard Universal PCI to USB Host
Controller

I/O Port 0x00005000-0x00005FFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00005000-0x00005FFF          Smart Array
P800 Controller

IRQ 19    Intel(R) PRO/1000 MT Dual Port Network
Connection
IRQ 19    Smart Array E200I Controller
IRQ 19    Standard Universal PCI to USB Host
Controller

Memory Address 0xA0000-0xBFFFF          PCI bus
Memory Address 0xA0000-0xBFFFF          Standard VGA
Graphics Adapter

Memory Address 0xFA000000-0xFBFFFFFF    PCI standard
PCI-to-PCI bridge
Memory Address 0xFA000000-0xFBFFFFFF    PCI standard
PCI-to-PCI bridge
Memory Address 0xFA000000-0xFBFFFFFF    HP NC373i
Virtual Bus Device

I/O Port 0x00007000-0x00007FFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00007000-0x00007FFF          Intel(R)
PRO/1000 MT Dual Port Network Connection

I/O Port 0x00004000-0x00005FFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00004000-0x00005FFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00004000-0x00005FFF          PCI standard
PCI-to-PCI bridge
I/O Port 0x00004000-0x00005FFF          Smart Array
P800 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
0x00000000-0x00000CF7         PCI bus   OK
0x00000000-0x00000CF7         Direct memory access
controller          OK
0x00000D00-0x0000FFFF         PCI bus   OK
0x00004000-0x00005FFF         PCI standard PCI-to-PCI
bridge    OK
0x00004000-0x00005FFF         PCI standard PCI-to-PCI
bridge    OK
0x00004000-0x00005FFF         PCI standard PCI-to-PCI
bridge    OK
0x00004000-0x00005FFF         Smart Array P800
Controller          OK
0x00005000-0x00005FFF         PCI standard PCI-to-PCI
bridge    OK
0x00005000-0x00005FFF         Smart Array P800
Controller          OK
0x00006000-0x00007FFF         PCI standard PCI-to-PCI
bridge    OK
0x00006000-0x00007FFF         PCI standard PCI-to-PCI
bridge    OK
0x00006000-0x00007FFF         Smart Array E200I
Controller          OK
0x00007000-0x00007FFF         PCI standard PCI-to-PCI
bridge    OK
0x00007000-0x00007FFF         Intel(R) PRO/1000 MT
Dual Port Network Connection  OK
0x00007040-0x0000707F         Intel(R) PRO/1000 MT
Dual Port Network Connection #2         OK
0x00001000-0x0000101F         Standard Universal PCI
to USB Host Controller        OK
0x00001020-0x0000103F         Standard Universal PCI
to USB Host Controller        OK
0x00001040-0x0000105F         Standard Universal PCI
to USB Host Controller        OK
0x00001060-0x0000107F         Standard Universal PCI
to USB Host Controller        OK
0x00003000-0x000030FF         Standard VGA Graphics
Adapter   OK
0x000003B0-0x000003BB         Standard VGA Graphics
Adapter   OK
0x000003C0-0x000003DF         Standard VGA Graphics
Adapter   OK
0x00002800-0x000028FF         Base System Device  OK

0x00003400-0x000034FF         Base System Device  OK

0x00003800-0x0000381F         Standard Universal PCI
to USB Host Controller        OK
0x00000070-0x00000077         Motherboard resources
          OK
```

```
0x00000408-0x0000040F         Motherboard resources
          OK
0x000004D0-0x000004D1         Motherboard resources
          OK
0x00000020-0x0000003F         Motherboard resources
          OK
0x000000A0-0x000000BF         Motherboard resources
          OK
0x00000090-0x0000009F         Motherboard resources
          OK
0x00000050-0x00000053         Motherboard resources
          OK
0x00000700-0x0000071F         Motherboard resources
          OK
0x00000800-0x0000083F         Motherboard resources
          OK
0x00000900-0x0000097F         Motherboard resources
          OK
0x00000010-0x0000001F         Motherboard resources
          OK
0x00000C80-0x00000C83         Motherboard resources
          OK
0x00000CD4-0x00000CD7         Motherboard resources
          OK
0x00000F50-0x00000F58         Motherboard resources
          OK
0x000000F0-0x000000F0         Motherboard resources
          OK
0x00000CA0-0x00000CA1         Motherboard resources
          OK
0x00000CA4-0x00000CA5         Motherboard resources
          OK
0x00000CA2-0x00000CA3                   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

0x0000004E-0x0000004F         Extended IO Bus     OK

0x00000620-0x0000065F         Extended IO Bus     OK

0x00000680-0x0000069F         Extended IO Bus     OK

0x00000600-0x0000061F         Extended IO Bus     OK

0x00000660-0x0000067F         Extended IO Bus     OK

0x00000300-0x0000030F         Extended IO Bus     OK

0x000003F0-0x000003F5         Standard floppy disk
controller          OK
0x000003F7-0x000003F7         Standard floppy disk
controller          OK
```

```
0x00000500-0x0000050F         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

[IRQs]

Resource  Device    Status
IRQ 9     Microsoft ACPI-Compliant System         OK

IRQ 16    PCI standard PCI-to-PCI bridge          OK

IRQ 16    Smart Array P800 Controller   OK
IRQ 16    Intel(R) PRO/1000 MT Dual Port Network
Connection #2       OK
IRQ 16    PCI standard PCI-to-PCI bridge          OK

IRQ 16    HP NC373i Virtual Bus Device  OK
IRQ 16    Standard Universal PCI to USB Host
Controller          OK
IRQ 16    Standard Enhanced PCI to USB Host
Controller          OK
IRQ 17    PCI standard PCI-to-PCI bridge          OK

IRQ 17    Smart Array P800 Controller   OK
IRQ 17    Standard Universal PCI to USB Host
Controller          OK
IRQ 19    Intel(R) PRO/1000 MT Dual Port Network
Connection          OK
IRQ 19    Smart Array E200I Controller  OK
IRQ 19    Standard Universal PCI to USB Host
Controller          OK
IRQ 18    Standard Universal PCI to USB Host
Controller          OK
IRQ 10    Base System Device  OK
IRQ 10    PCI Device          OK
IRQ 7     Base System Device  OK
IRQ 22    Standard Universal PCI to USB Host
Controller          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 6     Standard floppy disk controller         OK

IRQ 14    Primary IDE Channel OK

[Memory]

Resource  Device    Status
0xA0000-0xBFFFF     PCI bus   OK
0xA0000-0xBFFFF     Standard VGA Graphics Adapter OK

0xF0000000-0xFEBFFFFF         PCI bus   OK
0xF0000000-0xFEBFFFFF         Standard VGA Graphics
Adapter   OK
```

```
0xFD900000-0xFDDFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xFDA00000-0xFDDFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xFDA00000-0xFDDFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xFDB00000-0xFDBFFFFF         Smart Array P800
Controller          OK
0xFDAF0000-0xFDAF0FFF         Smart Array P800
Controller          OK
0xFDC00000-0xFDDFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xFDD00000-0xFDDFFFFF         Smart Array P800
Controller          OK
0xFDCF0000-0xFDCF0FFF         Smart Array P800
Controller          OK
0xFDE00000-0xFDFFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xFDE00000-0xFDFFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xFDF00000-0xFDFFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xFDFE0000-0xFDFFFFFF         Intel(R) PRO/1000 MT
Dual Port Network Connection  OK
0xFDF80000-0xFDFBFFFF         Intel(R) PRO/1000 MT
Dual Port Network Connection  OK
0xFDF60000-0xFDF7FFFF         Intel(R) PRO/1000 MT
Dual Port Network Connection #2         OK
0xFDE80000-0xFDEFFFFF         Smart Array E200I
Controller          OK
0xFDE70000-0xFDE77FFF         Smart Array E200I
Controller          OK
0xFA000000-0xFBFFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xFA000000-0xFBFFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xFA000000-0xFBFFFFFF         HP NC373i Virtual Bus
Device    OK
0xF9DF0000-0xF9DF03FF         Standard Enhanced PCI
to USB Host Controller        OK
0xF9FF0000-0xF9FFFFFF         Standard VGA Graphics
Adapter   OK
0xF9FE0000-0xF9FE01FF         Base System Device  OK

0xF9FD0000-0xF9FD07FF         Base System Device  OK

0xF9FC0000-0xF9FC1FFF         Base System Device  OK

0xF9F00000-0xF9F7FFFF         Base System Device  OK

0xF9EF0000-0xF9EF00FF         PCI Device          OK

0xE0000000-0xEFFFFFFF         Motherboard resources
          OK
0xFE000000-0xFEBFFFFF         Motherboard resources
          OK
0xFED00000-0xFED003FF         High precision event
timer     OK

[Components]
```

```
[Multimedia]



[Audio Codecs]

CODEC     Manufacturer        Description
          Status    File      Version   Size
          Creation Date
c:\windows\system32\msg711.acm          Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSG711.ACM
          5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          13.50 KB (13,824 bytes)       3/25/2005
7:00 AM
c:\windows\system32\tssoft32.acm        DSP GROUP,
INC.                OK
          C:\WINDOWS\system32\TSSOFT32.ACM
          1.01      13.50 KB (13,824 bytes)
          3/25/2005 7:00 AM
c:\windows\system32\msgsm32.acm         Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSGSM32.ACM
          5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          34.50 KB (35,328 bytes)       3/25/2005
7:00 AM
c:\windows\system32\msadp32.acm         Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSADP32.ACM
          5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          23.50 KB (24,064 bytes)       3/25/2005
7:00 AM
c:\windows\system32\imaadp32.acm        Microsoft
Corporation                   OK
          C:\WINDOWS\system32\IMAADP32.ACM
          5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          24.00 KB (24,576 bytes)       3/25/2005
7:00 AM

[Video Codecs]

CODEC     Manufacturer        Description
          Status    File      Version   Size
          Creation Date
c:\windows\system32\msyuv.dll Microsoft Corporation
                    OK
          C:\WINDOWS\system32\MSYUV.DLL 5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   21.00 KB (21,504 bytes)
          3/24/2005 12:21 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)
          52.50 KB (53,760 bytes)       3/24/2005
12:19 PM
c:\windows\system32\msvidc32.dll        Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSVIDC32.DLL
          5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          43.00 KB (44,032 bytes)       3/25/2005
7:00 AM
c:\windows\system32\msrle32.dll         Microsoft
Corporation                   OK
```

```
          C:\WINDOWS\system32\MSRLE32.DLL
          5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          15.50 KB (15,872 bytes)       3/25/2005
7:00 AM
c:\windows\system32\tsbyuv.dll          Microsoft
Corporation                   OK
          C:\WINDOWS\system32\TSBYUV.DLL
          5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          12.50 KB (12,800 bytes)       3/24/2005
12:34 PM

[CD-ROM]

Item      Value
Drive     D:
Description         CD-ROM Drive
Media Loaded        No
Media Type          CD-ROM
Name      HL-DT-ST DVD-ROM GDR8164B
Manufacturer        (Standard CD-ROM drives)
Status    OK
Transfer Rate       Not Available
SCSI Target ID      0
PNP Device ID       IDE\CDROMHL-DT-ST_DVD-
ROM_GDR8164B_______________0E07____\5&5FD9AC6&0&0.0.0

Driver    c:\windows\system32\drivers\cdrom.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 75.50 KB
(77,312 bytes), 3/25/2005 7:00 AM)

[Sound Device]

Item      Value

[Display]

Item      Value
Name      Standard VGA Graphics Adapter
PNP Device ID
          PCI\VEN_1002&DEV_515E&SUBSYS_31FB103C&REV_0
2\4&2014205D&0&18F0
Adapter Type        ATI ES1000, (Standard display
types) compatible
Adapter Description Standard VGA Graphics Adapter
Adapter RAM         32.00 MB (33,554,432 bytes)
Installed Drivers
          vga.dll,framebuf.dll,vga256,vga64k
Driver Version      5.2.3790.1830
INF File  display.inf (vga section)
Color Planes        1
Color Table Entries 4294967296
Resolution          800 x 600 x 1 hertz
Bits/Pixel          32
Memory Address      0xF0000000-0xFEBFFFFF
I/O Port  0x00003000-0x000030FF
Memory Address      0xF9FF0000-0xF9FFFFFF
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), 33.00 KB
(33,792 bytes), 12/11/2006 6:13 AM)
```

```
[Infrared]

Item      Value

[Input]



[Keyboard]

Item      Value
Description         USB Human Interface Device
Name      Enhanced (101- or 102-key)
Layout    00000409
PNP Device ID
          USB\VID_03F0&PID_1027&MI_00\7&2CD6FDA9&0&00
00
Number of Function Keys       12
Driver    c:\windows\system32\drivers\hidusb.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 18.50 KB
(18,944 bytes), 3/25/2005 7:00 AM)

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&2AA4AD3D&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), 91.00 KB
(93,184 bytes), 3/25/2005 7:00 AM)

[Pointing Device]

Item      Value
Hardware Type       USB Human Interface Device
Number of Buttons   5
Status    OK
PNP Device ID
          USB\VID_03F0&PID_1027&MI_01\7&2CD6FDA9&0&00
01
Power Management Supported    No
Double Click Threshold        6
Handedness          Right Handed Operation
Driver    c:\windows\system32\drivers\hidusb.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 18.50 KB
(18,944 bytes), 3/25/2005 7:00 AM)

Hardware Type       PS/2 Compatible Mouse
Number of Buttons   5
Status    OK
PNP Device ID       ACPI\PNP0F13\4&2AA4AD3D&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), 91.00 KB
(93,184 bytes), 3/25/2005 7:00 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          3/14/2007 4:20 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          3/14/2007 4:20 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), 132.00 KB
(135,168 bytes), 3/25/2005 7:00 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          3/14/2007 4:20 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), 117.50 KB
(120,320 bytes), 3/25/2005 7:00 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          3/14/2007 4:20 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), 67.50 KB
(69,120 bytes), 3/25/2005 7:00 AM)

Name      [00000005] Direct Parallel
Adapter Type        Not Available
Product Type        Direct Parallel
Installed Yes
PNP Device ID       ROOT\MS_PTIMINIPORT\0000
Last Reset          3/14/2007 4:20 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), 30.50 KB
(31,232 bytes), 3/25/2005 7:00 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          3/14/2007 4:20 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), 157.50 KB
(161,280 bytes), 3/25/2005 7:00 AM)

Name      [00000007] HP NC373i Multifunction Gigabit
Server Adapter
Adapter Type        Ethernet 802.3
Product Type        HP NC373i Multifunction Gigabit
Server Adapter
Installed Yes
PNP Device ID
          B06BDRV\L2ND&PCI_164C14E4&SUBSYS_7038103C&R
EV_12\6&183F41DD&0&20050300
Last Reset          3/14/2007 4:20 PM
Index     7
Service Name        l2nd
IP Address          130.168.208.40
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         00:19:BB:33:B6:4C
Driver    c:\windows\system32\drivers\bxnd52a.sys
(2.8.13.0 built by: WinDDK, 81.00 KB (82,944 bytes),
12/12/2006 11:42 AM)

Name      [00000008] Intel(R) PRO/1000 MT Dual Port
Network Connection
Adapter Type        Ethernet 802.3
Product Type        Intel(R) PRO/1000 MT Dual Port
Network Connection
Installed Yes
PNP Device ID
          PCI\VEN_8086&DEV_1010&SUBSYS_00DB0E11&REV_0
1\6&C5AC841&0&08200028
Last Reset          3/14/2007 4:20 PM
Index     8
Service Name        E1000
IP Address          130.120.208.41
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         00:02:A5:48:9D:AC
Memory Address      0xFDFE0000-0xFDFFFFFF
Memory Address      0xFDF80000-0xFDFBFFFF
I/O Port  0x00007000-0x00007FFF
IRQ Channel         IRQ 19
Driver    c:\windows\system32\drivers\e1g5132e.sys
(8.1.8.0 built by: WinDDK, 227.50 KB (232,960 bytes),
12/13/2006 10:35 AM)

Name      [00000009] Intel(R) PRO/1000 MT Dual Port
Network Connection
Adapter Type        Ethernet 802.3
Product Type        Intel(R) PRO/1000 MT Dual Port
Network Connection
Installed Yes
```

```
PNP Device ID
          PCI\VEN_8086&DEV_1010&SUBSYS_00DB0E11&REV_0
1\6&C5AC841&0&09200028
Last Reset          3/14/2007 4:20 PM
Index     9
Service Name        E1000
IP Address          130.121.208.42
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         00:02:A5:48:9D:AD
Memory Address      0xFDF60000-0xFDF7FFFF
I/O Port  0x00007040-0x0000707F
IRQ Channel         IRQ 16
Driver    c:\windows\system32\drivers\e1g5132e.sys
(8.1.8.0 built by: WinDDK, 227.50 KB (232,960 bytes),
12/13/2006 10:35 AM)

[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

[WinSock]

Item      Value
File      c:\windows\system32\wsock32.dll
Size      24.50 KB (25,088 bytes)
Version   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)


[Ports]



[Serial]

Item      Value

[Parallel]

Item      Value

[Storage]



[Drives]

Item      Value
Drive     C:
```

```
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size      33.88 GB (36,381,306,880 bytes)
Free Space          26.02 GB (27,935,277,056 bytes)

Volume Name
Volume Serial Number          009EF61B

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     F:
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     G:
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     H:
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     I:
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     J:
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     K:
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     L:
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     M:
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     N:
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     O:
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     P:
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     Q:
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     R:
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     S:
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     T:
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     U:
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     W:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size      612.29 GB (657,446,596,608 bytes)
Free Space          354.46 GB (380,601,753,600 bytes)

Volume Name         back1
Volume Serial Number          506CAD00

Drive     X:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size      612.29 GB (657,446,596,608 bytes)
Free Space          353.18 GB (379,222,249,472 bytes)

Volume Name         back2
Volume Serial Number          00893F9F

Drive     Y:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
```

```
Size      612.29 GB (657,446,596,608 bytes)
Free Space          354.46 GB (380,601,856,000 bytes)

Volume Name         back3
Volume Serial Number          08DC8063

Drive     Z:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size      612.29 GB (657,446,596,608 bytes)
Free Space          354.46 GB (380,601,892,864 bytes)

Volume Name         back4
Volume Serial Number          58F6D94B

[Disks]

Item      Value
Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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 3
SCSI Target ID      4
Sectors/Track       32
Size      33.89 GB (36,385,505,280 bytes)
Total Cylinders     8,709
Total Sectors       71,065,440
Total Tracks        2,220,795
Tracks/Cylinder     255
Partition Disk #10, Partition #0
Partition Size      33.88 GB (36,381,310,976 bytes)

Partition Starting Offset     16,384 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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 3
SCSI Target ID      5
Sectors/Track       32
Size      410.10 GB (440,344,412,160 bytes)
Total Cylinders     105,398
Total Sectors       860,047,680
Total Tracks        26,876,490
Tracks/Cylinder     255
Partition Disk #11, Partition #0
Partition Size      410.10 GB (440,340,054,016 bytes)

Partition Starting Offset     65,536 bytes
```

```
Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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 4
SCSI Target ID      4
Sectors/Track       63
Size      50.78 GB (54,525,381,120 bytes)
Total Cylinders     6,629
Total Sectors       106,494,885
Total Tracks        1,690,395
Tracks/Cylinder     255
Partition Disk #12, Partition #0
Partition Size      50.78 GB (54,524,903,424 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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 4
SCSI Target ID      5
Sectors/Track       63
Size      70.31 GB (75,491,619,840 bytes)
Total Cylinders     9,178
Total Sectors       147,444,570
Total Tracks        2,340,390
Tracks/Cylinder     255
Partition Disk #13, Partition #0
Partition Size      70.31 GB (75,491,180,544 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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 4
SCSI Target ID      6
Sectors/Track       63
Size      48.83 GB (52,427,934,720 bytes)
Total Cylinders     6,374
Total Sectors       102,398,310
Total Tracks        1,625,370
Tracks/Cylinder     255
Partition Disk #14, Partition #0
Partition Size      48.83 GB (52,427,751,424 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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 4
SCSI Target ID      7
Sectors/Track       63
Size      11.71 GB (12,576,453,120 bytes)
Total Cylinders     1,529
Total Sectors       24,563,385
Total Tracks        389,895
Tracks/Cylinder     255
Partition Disk #15, Partition #0
Partition Size      11.71 GB (12,575,571,968 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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 4
SCSI Target ID      8
Sectors/Track       63
Size      612.29 GB (657,446,630,400 bytes)
Total Cylinders     79,930
Total Sectors       1,284,075,450
Total Tracks        20,382,150
Tracks/Cylinder     255
Partition Disk #16, Partition #0
Partition Size      612.29 GB (657,446,598,144 bytes)

Partition Starting Offset     32,256 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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 4
SCSI Target ID      9
Sectors/Track       63
Size      50.78 GB (54,525,381,120 bytes)
Total Cylinders     6,629
Total Sectors       106,494,885
Total Tracks        1,690,395
Tracks/Cylinder     255
Partition Disk #17, Partition #0
Partition Size      50.78 GB (54,524,903,424 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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 4
SCSI Target ID      10
Sectors/Track       63
Size      70.31 GB (75,491,619,840 bytes)
Total Cylinders     9,178
Total Sectors       147,444,570
Total Tracks        2,340,390
Tracks/Cylinder     255
Partition Disk #18, Partition #0
Partition Size      70.31 GB (75,491,180,544 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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 4
SCSI Target ID      11
Sectors/Track       63
Size      48.83 GB (52,427,934,720 bytes)
Total Cylinders     6,374
Total Sectors       102,398,310
Total Tracks        1,625,370
Tracks/Cylinder     255
Partition Disk #19, Partition #0
Partition Size      48.83 GB (52,427,751,424 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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 4
SCSI Target ID      12
Sectors/Track       63
Size      11.71 GB (12,576,453,120 bytes)
Total Cylinders     1,529
Total Sectors       24,563,385
Total Tracks        389,895
Tracks/Cylinder     255
Partition Disk #20, Partition #0
Partition Size      11.71 GB (12,575,571,968 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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 4
SCSI Target ID      13
Sectors/Track       63
Size      612.29 GB (657,446,630,400 bytes)
Total Cylinders     79,930
Total Sectors       1,284,075,450
Total Tracks        20,382,150
Tracks/Cylinder     255
Partition Disk #21, Partition #0
Partition Size      612.29 GB (657,446,598,144 bytes)

Partition Starting Offset     32,256 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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      50.78 GB (54,526,033,920 bytes)
Total Cylinders     13,051
Total Sectors       106,496,160
Total Tracks        3,328,005
Tracks/Cylinder     255
Partition Disk #0, Partition #0
Partition Size      50.78 GB (54,524,903,424 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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      5
Sectors/Track       32
Size      70.31 GB (75,495,014,400 bytes)
Total Cylinders     18,070
Total Sectors       147,451,200
Total Tracks        4,607,850
Tracks/Cylinder     255
Partition Disk #1, Partition #0
Partition Size      70.31 GB (75,491,180,544 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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      6
Sectors/Track       32
Size      48.83 GB (52,428,718,080 bytes)
Total Cylinders     12,549
Total Sectors       102,399,840
Total Tracks        3,199,995
Tracks/Cylinder     255
Partition Disk #2, Partition #0
Partition Size      48.83 GB (52,427,751,424 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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      7
Sectors/Track       32
Size      11.72 GB (12,583,895,040 bytes)
Total Cylinders     3,012
Total Sectors       24,577,920
Total Tracks        768,060
Tracks/Cylinder     255
Partition Disk #3, Partition #0
Partition Size      11.71 GB (12,575,571,968 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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      8
Sectors/Track       32
Size      612.29 GB (657,445,847,040 bytes)
Total Cylinders     157,362
Total Sectors       1,284,073,920
Total Tracks        40,127,310
Tracks/Cylinder     255
Partition Disk #4, Partition #0
Partition Size      612.29 GB (657,446,598,144 bytes)

Partition Starting Offset     32,256 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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      9
Sectors/Track       32
Size      50.78 GB (54,526,033,920 bytes)
Total Cylinders     13,051
Total Sectors       106,496,160
Total Tracks        3,328,005
Tracks/Cylinder     255
Partition Disk #5, Partition #0
Partition Size      50.78 GB (54,524,903,424 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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      10
Sectors/Track       63
Size      70.31 GB (75,491,619,840 bytes)
Total Cylinders     9,178
Total Sectors       147,444,570
Total Tracks        2,340,390
Tracks/Cylinder     255
Partition Disk #6, Partition #0
Partition Size      70.31 GB (75,491,180,544 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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      11
Sectors/Track       63
Size      48.83 GB (52,427,934,720 bytes)
Total Cylinders     6,374
Total Sectors       102,398,310
Total Tracks        1,625,370
Tracks/Cylinder     255
Partition Disk #7, Partition #0
Partition Size      48.83 GB (52,427,751,424 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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      12
Sectors/Track       63
Size      11.71 GB (12,576,453,120 bytes)
Total Cylinders     1,529
Total Sectors       24,563,385
Total Tracks        389,895
Tracks/Cylinder     255
Partition Disk #8, Partition #0
Partition Size      11.71 GB (12,575,571,968 bytes)

Partition Starting Offset     65,536 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     HP 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      13
Sectors/Track       63
Size      612.29 GB (657,446,630,400 bytes)
Total Cylinders     79,930
Total Sectors       1,284,075,450
Total Tracks        20,382,150
Tracks/Cylinder     255
Partition Disk #9, Partition #0
Partition Size      612.29 GB (657,446,598,144 bytes)

Partition Starting Offset     32,256 bytes
```

```
[SCSI]

Item      Value
Name      Smart Array P800 Controller
Manufacturer        Hewlett-Packard Company
Status    OK
PNP Device ID
          PCI\VEN_103C&DEV_3230&SUBSYS_3223103C&REV_0
3\6&305972A8&0&00000010
Memory Address      0xFDB00000-0xFDBFFFFF
I/O Port  0x00004000-0x00005FFF
Memory Address      0xFDAF0000-0xFDAF0FFF
IRQ Channel         IRQ 16
Driver    c:\windows\system32\drivers\hpcisss2.sys
(6.2.0.64 Build 8 (x86-64) built by: buildsrv, 59.80
KB (61,240 bytes), 12/12/2006 8:31 PM)

Name      Smart Array P800 Controller
Manufacturer        Hewlett-Packard Company
Status    OK
PNP Device ID
          PCI\VEN_103C&DEV_3230&SUBSYS_3223103C&REV_0
3\6&ABADBB5&0&00080010
Memory Address      0xFDD00000-0xFDDFFFFF
I/O Port  0x00005000-0x00005FFF
Memory Address      0xFDCF0000-0xFDCF0FFF
IRQ Channel         IRQ 17
Driver    c:\windows\system32\drivers\hpcisss2.sys
(6.2.0.64 Build 8 (x86-64) built by: buildsrv, 59.80
KB (61,240 bytes), 12/12/2006 8:31 PM)

Name      Smart Array E200I Controller
Manufacturer        Hewlett-Packard Company
Status    OK
PNP Device ID
          PCI\VEN_103C&DEV_3238&SUBSYS_3211103C&REV_0
0\5&32CF3F35&0&400028
Memory Address      0xFDE80000-0xFDEFFFFF
I/O Port  0x00006000-0x00007FFF
Memory Address      0xFDE70000-0xFDE77FFF
IRQ Channel         IRQ 19
Driver    c:\windows\system32\drivers\hpcisss2.sys
(6.2.0.64 Build 8 (x86-64) built by: buildsrv, 59.80
KB (61,240 bytes), 12/12/2006 8:31 PM)

[IDE]

Item      Value
Name      Standard Dual Channel PCI IDE Controller

Manufacturer        (Standard IDE ATA/ATAPI
controllers)
Status    OK
PNP Device ID
          PCI\VEN_8086&DEV_269E&SUBSYS_31FE103C&REV_0
9\3&61AAA01&0&F9
I/O Port  0x00000500-0x0000050F
Driver    c:\windows\system32\drivers\pciide.sys
(5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 6.00 KB
(6,144 bytes), 3/25/2005 7:00 AM)

Name      Primary IDE Channel
Manufacturer        (Standard IDE ATA/ATAPI
controllers)
Status    OK
PNP Device ID       PCIIDE\IDECHANNEL\4&56E2F28&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), 145.00 KB
(148,480 bytes), 3/25/2005 7:00 AM)

Name      Secondary IDE Channel
Manufacturer        (Standard IDE ATA/ATAPI
controllers)
Status    OK
PNP Device ID       PCIIDE\IDECHANNEL\4&56E2F28&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), 145.00 KB
(148,480 bytes), 3/25/2005 7:00 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_3305103C&REV_0
3\4&2014205D&0&20F0 The drivers for this device are
not installed.
Base System Device
          PCI\VEN_0E11&DEV_B204&SUBSYS_3305103C&REV_0
3\4&2014205D&0&22F0 The drivers for this device are
not installed.
PCI Device
          PCI\VEN_103C&DEV_3302&SUBSYS_3305103C&REV_0
0\4&2014205D&0&26F0 The drivers for this device are
not installed.
Not Available       ACPI\IPI0001\0      The drivers
for this device are not installed.

[USB]

Device    PNP Device ID
Standard Universal PCI to USB Host Controller
          PCI\VEN_8086&DEV_2688&SUBSYS_31FE103C&REV_0
9\3&61AAA01&0&E8
Standard Universal PCI to USB Host Controller
          PCI\VEN_8086&DEV_2689&SUBSYS_31FE103C&REV_0
9\3&61AAA01&0&E9
Standard Universal PCI to USB Host Controller
          PCI\VEN_8086&DEV_268A&SUBSYS_31FE103C&REV_0
9\3&61AAA01&0&EA
Standard Universal PCI to USB Host Controller
          PCI\VEN_8086&DEV_268B&SUBSYS_31FE103C&REV_0
9\3&61AAA01&0&EB
Standard Enhanced PCI to USB Host Controller
          PCI\VEN_8086&DEV_268C&SUBSYS_31FE103C&REV_0
9\3&61AAA01&0&EF
Standard Universal PCI to USB Host Controller
          PCI\VEN_103C&DEV_3300&SUBSYS_3305103C&REV_0
0\4&2014205D&0&24F0

[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
afd       AFD
          c:\windows\system32\drivers\afd.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

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
amdide    AmdIde    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
arc       arc       Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
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
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

b06bdrv   HP Virtual Bus Device
          c:\windows\system32\drivers\bxvbda.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

beep      Beep
          c:\windows\system32\drivers\beep.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

cdac15ba  CdaC15BA
          c:\windows\system32\drivers\cdac15ba.sys
          Kernel Driver       Yes       Auto
          Running   OK        Normal    No        Yes

cdad10ba  CdaD10BA
          c:\windows\system32\drivers\cdad10ba.sys
          Kernel Driver       Yes       Auto
          Running   OK        Normal    No        Yes

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
cpqcissm  cpqcissm  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
cpqteam   HP Network Configuration Utility
          c:\windows\system32\drivers\cpqteam.sys
          Kernel Driver       No        Manual
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          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

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
e1000     Intel(R) PRO/1000 Device Driver
          c:\windows\system32\drivers\e1g5132e.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

elxstor   elxstor   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  Flpydisk
          c:\windows\system32\drivers\flpydisk.sys
          Kernel Driver       No        System
          Stopped   OK        Ignore    No        No
```

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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

hidusb    Microsoft HID Class Driver
          c:\windows\system32\drivers\hidusb.sys
          Kernel Driver       Yes       Manual
          Running   OK        Ignore    No        Yes

hpcisss   hpcisss
          c:\windows\system32\drivers\hpcisss.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

hpcisss2  HpCISSs2
          c:\windows\system32\drivers\hpcisss2.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

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

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
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
```

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intelide  IntelIde  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
intelppm  Intel Processor Driver
          c:\windows\system32\drivers\intelppm.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

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

ipsec     IPSEC driver
          c:\windows\system32\drivers\ipsec.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

irenum    IR Enumerator Service
          c:\windows\system32\drivers\irenum.sys
          Kernel Driver       No        Manual
          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

kbdhid    Keyboard HID Driver
          c:\windows\system32\drivers\kbdhid.sys
          Kernel Driver       Yes       System
          Running   OK        Ignore    No        Yes

ksecdd    KSecDD
          c:\windows\system32\drivers\ksecdd.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

ksthunk   Kernel Streaming WOW64 Thunk Service
          c:\windows\system32\drivers\ksthunk.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes
```

```
l2nd      HP NC370 Multifunction Gigabit Server
Adapter   c:\windows\system32\drivers\bxnd52a.sys
          Kernel Driver       Yes       Manual
          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

mouhid    Mouse HID Driver
          c:\windows\system32\drivers\mouhid.sys
          Kernel Driver       Yes       Manual
          Running   OK        Ignore    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
          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

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
pptpminiport        WAN Miniport (PPTP)
          c:\windows\system32\drivers\raspptp.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

ptilink   Direct Parallel Link Driver
          c:\windows\system32\drivers\ptilink.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

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
          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    Security Driver
          c:\windows\system32\drivers\secdrv.sys
          Kernel Driver       Yes       Auto
          Running   OK        Normal    No        Yes

serial    Serial
          c:\windows\system32\drivers\serial.sys
          Kernel Driver       No        Auto
          Stopped   OK        Ignore    No        No

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
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

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
```

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          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

usbccgp   Microsoft USB Generic Parent Driver
          c:\windows\system32\drivers\usbccgp.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

usbehci   Microsoft USB 2.0 Enhanced Host Controller
Miniport Driver
          c:\windows\system32\drivers\usbehci.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

usbstor   USB Mass Storage Driver
          c:\windows\system32\drivers\usbstor.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

usbuhci   Microsoft USB Universal Host Controller
Miniport Driver
          c:\windows\system32\drivers\usbuhci.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

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
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ROOT\SYSTEM\0001
Plug and Play Software Device Enumerator          Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available       ROOT\SYSTEM\0000
Terminal Server Mouse Driver  Yes       SYSTEM
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ROOT\RDP_MOU\0000
Terminal Server Keyboard Driver         Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available       ROOT\RDP_KBD\0000
Terminal Server Device Redirector       Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available       ROOT\RDPDR\0000
Direct Parallel     Yes       NET       5.2.3790.1830
          10/1/2002 Microsoft netrasa.inf         Not
Available ROOT\MS_PTIMINIPORT\0000
```

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WAN Miniport (PPTP) Yes       NET       5.2.3790.1830
          10/1/2002 Microsoft netrasa.inf         Not
Available ROOT\MS_PPTPMINIPORT\0000
WAN Miniport (PPPOE)          Yes       NET
          5.2.3790.1830       10/1/2002 Microsoft
          netrasa.inf         Not Available
          ROOT\MS_PPPOEMINIPORT\0000
WAN Miniport (IP)   Yes       NET       5.2.3790.1830
          10/1/2002 Microsoft netrasa.inf         Not
Available ROOT\MS_NDISWANIP\0000
WAN Miniport (L2TP) Yes       NET       5.2.3790.1830
          10/1/2002 Microsoft netrasa.inf         Not
Available ROOT\MS_L2TPMINIPORT\0000
Video Codecs        Yes       MEDIA     5.2.3790.1830
          10/1/2002 (Standard system devices)
          wave.inf  Not Available
          ROOT\MEDIA\MS_MMVID
Legacy Video Capture Devices  Yes       MEDIA
          5.2.3790.1830       10/1/2002 (Standard
system devices)     wave.inf  Not Available
          ROOT\MEDIA\MS_MMVCD
Media Control Devices         Yes       MEDIA
          5.2.3790.1830       10/1/2002 (Standard
system devices)     wave.inf  Not Available
          ROOT\MEDIA\MS_MMMCI
Legacy Audio Drivers          Yes       MEDIA
          5.2.3790.1830       10/1/2002 (Standard
system devices)     wave.inf  Not Available
          ROOT\MEDIA\MS_MMDRV
Audio Codecs        Yes       MEDIA     5.2.3790.1830
          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
Security Driver     Not Available       LEGACYDRIVER
          Not Available       Not Available       Not
Available Not Available       Not Available
          ROOT\LEGACY_SECDRV\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
```

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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
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
IP Network Address Translator Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_IPNAT\0000
hpcisss   Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available
          ROOT\LEGACY_HPCISSS\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
```

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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
CdaD10BA  Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available
          ROOT\LEGACY_CDAD10BA\0000
CdaC15BA  Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available
          ROOT\LEGACY_CDAC15BA\0000
Beep      Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_BEEP\0000

AFD       Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_AFD\0000

Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE70EDC4
93OFFSET10000LENGTH6686500000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATUREA716A7
16OFFSET4000LENGTH8787EC000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
32OFFSET7E00LENGTH9912DEF600
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
33OFFSET10000LENGTH2ED900000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
3COFFSET10000LENGTHC34F00000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
3DOFFSET10000LENGTH1193A00000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
3EOFFSET10000LENGTHCB1F00000
```

```
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
3FOFFSET7E00LENGTH9912DEF600
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
38OFFSET10000LENGTH2ED900000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
39OFFSET10000LENGTHC34F00000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
3AOFFSET10000LENGTH1193A00000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
3BOFFSET10000LENGTHCB1F00000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
24OFFSET7E00LENGTH9912DEF600
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
25OFFSET10000LENGTH2ED900000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
26OFFSET10000LENGTHC34F00000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
27OFFSET10000LENGTH1193A00000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
20OFFSET10000LENGTHCB1F00000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
21OFFSET7E00LENGTH9912DEF600
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
22OFFSET10000LENGTH2ED900000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
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          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
23OFFSET10000LENGTHC34F00000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
2COFFSET10000LENGTH1193A00000
Generic volume      Yes       VOLUME    5.2.3790.1830
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE884B05
2DOFFSET10000LENGTHCB1F00000
Volume Manager      Yes       SYSTEM    5.2.3790.1830
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ROOT\FTDISK\0000
Logical Disk Manager          Yes       SYSTEM
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ROOT\DMIO\0000
ACPI Fixed Feature Button     Yes       SYSTEM
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ACPI\FIXEDBUTTON\2&DABA3FF&0
ACPI Thermal Zone   Yes       SYSTEM    5.2.3790.1830
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\THERMALZONE\THM0
Secondary IDE Channel         Yes       HDC
          5.2.3790.1830       10/1/2002 (Standard IDE
ATA/ATAPI controllers)        mshdc.inf Not Available
          PCIIDE\IDECHANNEL\4&56E2F28&0&1
CD-ROM Drive        Yes       CDROM     5.2.3790.1830
          10/1/2002 (Standard CD-ROM drives)
          cdrom.inf Not Available       IDE\CDROMHL-
DT-ST_DVD-
ROM_GDR8164B_______________0E07____\5&5FD9AC6&0&0.0.0

Primary IDE Channel Yes       HDC       5.2.3790.1830
          10/1/2002 (Standard IDE ATA/ATAPI
controllers)        mshdc.inf Not Available
          PCIIDE\IDECHANNEL\4&56E2F28&0&0
Standard Dual Channel PCI IDE Controller          Yes
          HDC       5.2.3790.1830       10/1/2002
          (Standard IDE ATA/ATAPI controllers)
          mshdc.inf Not Available
          PCI\VEN_8086&DEV_269E&SUBSYS_31FE103C&REV_0
9\3&61AAA01&0&F9
Standard floppy disk controller         Yes       FDC
          5.2.3790.1830       10/1/2002 (Standard
floppy disk controllers)      fdc.inf   Not Available
          ACPI\PNP0700\5&33D3B1FA&0
Extended IO Bus     Yes       SYSTEM    5.2.3790.1830
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0A06\4&2AA4AD3D&0
PS/2 Compatible Mouse         Yes       MOUSE
          5.2.3790.1830       10/1/2002 Microsoft
          msmouse.inf         Not Available
          ACPI\PNP0F13\4&2AA4AD3D&0
Standard 101/102-Key or Microsoft Natural PS/2
Keyboard  Yes       KEYBOARD  5.2.3790.1830
          10/1/2002 (Standard keyboards)
          keyboard.inf        Not Available
          ACPI\PNP0303\4&2AA4AD3D&0
System speaker      Yes       SYSTEM    5.2.3790.1830
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0800\4&2AA4AD3D&0
Direct memory access controller         Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          ACPI\PNP0200\4&2AA4AD3D&0
High precision event timer    Yes       SYSTEM
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ACPI\PNP0103\0
System timer        Yes       SYSTEM    5.2.3790.1830
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0100\4&2AA4AD3D&0
Not Available       Not Available       Not Available
          Not Available       Not Available       Not
Available Not Available       Not Available
          ACPI\IPI0001\0
Motherboard resources         Yes       SYSTEM
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ACPI\PNP0C02\0
PCI standard ISA bridge       Yes       SYSTEM
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          PCI\VEN_8086&DEV_2670&SUBSYS_00000000&REV_0
9\3&61AAA01&0&F8
PCI Device          Not Available       UNKNOWN   Not
Available Not Available       Not Available       Not
Available Not Available
          PCI\VEN_103C&DEV_3302&SUBSYS_3305103C&REV_0
0\4&2014205D&0&26F0
Generic USB Hub     Yes       USB       5.2.3790.1830
          10/1/2002 (Generic USB Hub)   usb.inf   Not
Available USB\VID_03F0&PID_1327\6&18FFBC52&0&2
HID-compliant mouse Yes       MOUSE     5.2.3790.1830
          10/1/2002 Microsoft msmouse.inf         Not
Available
          HID\VID_03F0&PID_1027&MI_01\8&25B103E6&0&00
00
USB Human Interface Device    Yes       HIDCLASS
          5.2.3790.1830       10/1/2002 (Standard
system devices)     input.inf Not Available
          USB\VID_03F0&PID_1027&MI_01\7&2CD6FDA9&0&00
01
HID Keyboard Device Yes       KEYBOARD  5.2.3790.1830
          10/1/2002 (Standard keyboards)
          keyboard.inf        Not Available
          HID\VID_03F0&PID_1027&MI_00\8&DED77A1&0&000
0
USB Human Interface Device    Yes       HIDCLASS
          5.2.3790.1830       10/1/2002 (Standard
system devices)     input.inf Not Available
          USB\VID_03F0&PID_1027&MI_00\7&2CD6FDA9&0&00
00
USB Composite Device          Yes       USB
          5.2.3790.1830       10/1/2002 (Standard USB
```

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Host Controller)    usb.inf   Not Available
          USB\VID_03F0&PID_1027\6&18FFBC52&0&1
USB Root Hub        Yes       USB       5.2.3790.1830
          10/1/2002 (Standard USB Host Controller)
          usbport.inf         Not Available
          USB\ROOT_HUB\5&26BC3420&0
Standard Universal PCI to USB Host Controller     Yes
          USB       5.2.3790.1830       10/1/2002
          (Standard USB Host Controller)
          usbport.inf         Not Available
          PCI\VEN_103C&DEV_3300&SUBSYS_3305103C&REV_0
0\4&2014205D&0&24F0
Base System Device  Not Available       UNKNOWN   Not
Available Not Available       Not Available       Not
Available Not Available
          PCI\VEN_0E11&DEV_B204&SUBSYS_3305103C&REV_0
3\4&2014205D&0&22F0
Base System Device  Not Available       UNKNOWN   Not
Available Not Available       Not Available       Not
Available Not Available
          PCI\VEN_0E11&DEV_B203&SUBSYS_3305103C&REV_0
3\4&2014205D&0&20F0
Plug and Play Monitor         Yes       MONITOR
          5.2.3790.1830       10/1/2002 (Standard
monitor types)      monitor.inf         Not Available
          DISPLAY\AVO0402\5&E64F3B&0&12345678&01&03

Standard VGA Graphics Adapter Yes       DISPLAY
          5.2.3790.1830       10/1/2002 (Standard
display types)      display.inf         Not Available
          PCI\VEN_1002&DEV_515E&SUBSYS_31FB103C&REV_0
2\4&2014205D&0&18F0
Intel(R) 82801 PCI Bridge - 244E        Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          Intel     machine.inf         Not Available
          PCI\VEN_8086&DEV_244E&SUBSYS_00000000&REV_D
9\3&61AAA01&0&F0
USB Root Hub        Yes       USB       5.2.3790.1830
          10/1/2002 (Standard USB Host Controller)
          usbport.inf         Not Available
          USB\ROOT_HUB20\4&392538C3&0
Standard Enhanced PCI to USB Host Controller      Yes
          USB       5.2.3790.1830       10/1/2002
          (Standard USB Host Controller)
          usbport.inf         Not Available
          PCI\VEN_8086&DEV_268C&SUBSYS_31FE103C&REV_0
9\3&61AAA01&0&EF
USB Root Hub        Yes       USB       5.2.3790.1830
          10/1/2002 (Standard USB Host Controller)
          usbport.inf         Not Available
          USB\ROOT_HUB\4&41C0314&0
Standard Universal PCI to USB Host Controller     Yes
          USB       5.2.3790.1830       10/1/2002
          (Standard USB Host Controller)
          usbport.inf         Not Available
          PCI\VEN_8086&DEV_268B&SUBSYS_31FE103C&REV_0
9\3&61AAA01&0&EB
USB Root Hub        Yes       USB       5.2.3790.1830
          10/1/2002 (Standard USB Host Controller)
          usbport.inf         Not Available
          USB\ROOT_HUB\4&A54F890&0
Standard Universal PCI to USB Host Controller     Yes
          USB       5.2.3790.1830       10/1/2002
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          (Standard USB Host Controller)
          usbport.inf         Not Available
          PCI\VEN_8086&DEV_268A&SUBSYS_31FE103C&REV_0
9\3&61AAA01&0&EA
USB Root Hub        Yes       USB       5.2.3790.1830
          10/1/2002 (Standard USB Host Controller)
          usbport.inf         Not Available
          USB\ROOT_HUB\4&37897620&0
Standard Universal PCI to USB Host Controller     Yes
          USB       5.2.3790.1830       10/1/2002
          (Standard USB Host Controller)
          usbport.inf         Not Available
          PCI\VEN_8086&DEV_2689&SUBSYS_31FE103C&REV_0
9\3&61AAA01&0&E9
USB Root Hub        Yes       USB       5.2.3790.1830
          10/1/2002 (Standard USB Host Controller)
          usbport.inf         Not Available
          USB\ROOT_HUB\4&7353027&0
Standard Universal PCI to USB Host Controller     Yes
          USB       5.2.3790.1830       10/1/2002
          (Standard USB Host Controller)
          usbport.inf         Not Available
          PCI\VEN_8086&DEV_2688&SUBSYS_31FE103C&REV_0
9\3&61AAA01&0&E8
HP NC373i Multifunction Gigabit Server Adapter    No
          NET       2.8.13.0  6/30/2006 Hewlett-
Packard Company     oem1.inf  Not Available
          B06BDRV\L2ND&PCI_164C14E4&SUBSYS_7038103C&R
EV_12\6&183F41DD&0&20050300
HP NC373i Virtual Bus Device  No        SYSTEM
          2.8.15.0  7/12/2006 Hewlett-Packard Company
          oem4.inf  Not Available
          PCI\VEN_14E4&DEV_164C&SUBSYS_7038103C&REV_1
2\5&43097C6&0&0000E0
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_1166&DEV_0103&SUBSYS_00000000&REV_C
3\4&187919FE&0&00E0
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_8086&DEV_2690&SUBSYS_00000000&REV_0
9\3&61AAA01&0&E0
PCI standard host CPU bridge  Yes       SYSTEM
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          PCI\VEN_8086&DEV_25F6&SUBSYS_00000000&REV_B
1\3&61AAA01&0&B0
PCI standard host CPU bridge  Yes       SYSTEM
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          PCI\VEN_8086&DEV_25F5&SUBSYS_00000000&REV_B
1\3&61AAA01&0&A8
PCI standard host CPU bridge  Yes       SYSTEM
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          PCI\VEN_8086&DEV_25F3&SUBSYS_00000000&REV_B
1\3&61AAA01&0&98
PCI standard host CPU bridge  Yes       SYSTEM
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          PCI\VEN_8086&DEV_25F1&SUBSYS_00000000&REV_B
1\3&61AAA01&0&88
PCI standard host CPU bridge  Yes       SYSTEM
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          PCI\VEN_8086&DEV_25F0&SUBSYS_00000000&REV_B
1\3&61AAA01&0&82
PCI standard host CPU bridge  Yes       SYSTEM
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          PCI\VEN_8086&DEV_25F0&SUBSYS_00000000&REV_B
1\3&61AAA01&0&81
PCI standard host CPU bridge  Yes       SYSTEM
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          PCI\VEN_8086&DEV_25F0&SUBSYS_00000000&REV_B
1\3&61AAA01&0&80
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_1.
20\6&6FC9EBA&0&050
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_1.
20\6&6FC9EBA&0&040
HP Virtual LUN      Yes       SYSTEM    5.2.3790.1830
          10/1/2002 Compaq    scsidev.inf         Not
Available
          SCSI\OTHER&VEN_COMPAQ&PROD_SCSI_COMMUNICATE
&REV_CIS2\6&6FC9EBA&0&000
Smart Array E200I Controller  Yes       SCSIADAPTER
          6.2.0.64  11/1/2006 Hewlett-Packard Company
          oem10.inf Not Available
          PCI\VEN_103C&DEV_3238&SUBSYS_3211103C&REV_0
0\5&32CF3F35&0&400028
Intel(R) PRO/1000 MT Dual Port Network Connection Yes
          NET       8.1.8.0   10/1/2002 Intel
          nete1g3e.inf        Not Available
          PCI\VEN_8086&DEV_1010&SUBSYS_00DB0E11&REV_0
1\6&C5AC841&0&09200028
Intel(R) PRO/1000 MT Dual Port Network Connection Yes
          NET       8.1.8.0   10/1/2002 Intel
          nete1g3e.inf        Not Available
          PCI\VEN_8086&DEV_1010&SUBSYS_00DB0E11&REV_0
1\6&C5AC841&0&08200028
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_1166&DEV_0104&SUBSYS_00000000&REV_B
2\5&32CF3F35&0&200028
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_1166&DEV_0103&SUBSYS_00000000&REV_B
4\4&1AB8B18D&0&0028
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
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          Not Available
          PCI\VEN_8086&DEV_25E5&SUBSYS_00000000&REV_B
1\3&61AAA01&0&28
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_8086&DEV_25E4&SUBSYS_00000000&REV_B
1\3&61AAA01&0&20
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_8086&DEV_25E3&SUBSYS_00000000&REV_B
1\3&61AAA01&0&18
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_8086&DEV_350C&SUBSYS_00000000&REV_0
1\4&1EE18D9A&0&0310
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&27135226&0&0D0
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&27135226&0&0C0
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&27135226&0&0B0
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&27135226&0&0A0
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&27135226&0&090
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&27135226&0&080
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&27135226&0&070
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&27135226&0&060
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
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          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&27135226&0&050
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&27135226&0&040
HP Virtual LUN      Yes       SYSTEM    5.2.3790.1830
          10/1/2002 Compaq    scsidev.inf         Not
Available
          SCSI\OTHER&VEN_COMPAQ&PROD_SCSI_COMMUNICATE
&REV_CIS2\7&27135226&0&000
Smart Array P800 Controller   Yes       SCSIADAPTER
          6.2.0.64  11/1/2006 Hewlett-Packard Company
          oem10.inf Not Available
          PCI\VEN_103C&DEV_3230&SUBSYS_3223103C&REV_0
3\6&ABADBB5&0&00080010
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_8086&DEV_3514&SUBSYS_00000000&REV_0
1\5&1AA5474&0&080010
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&302311DB&0&0D0
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&302311DB&0&0C0
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&302311DB&0&0B0
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&302311DB&0&0A0
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&302311DB&0&090
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
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08\7&302311DB&0&080
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&302311DB&0&070
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&302311DB&0&060
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&302311DB&0&050
Disk drive          Yes       DISKDRIVE 5.2.3790.1830
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
08\7&302311DB&0&040
HP Virtual LUN      Yes       SYSTEM    5.2.3790.1830
          10/1/2002 Compaq    scsidev.inf         Not
Available
          SCSI\OTHER&VEN_COMPAQ&PROD_SCSI_COMMUNICATE
&REV_CIS2\7&302311DB&0&000
Smart Array P800 Controller   Yes       SCSIADAPTER
          6.2.0.64  11/1/2006 Hewlett-Packard Company
          oem10.inf Not Available
          PCI\VEN_103C&DEV_3230&SUBSYS_3223103C&REV_0
3\6&305972A8&0&00000010
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_8086&DEV_3510&SUBSYS_00000000&REV_0
1\5&1AA5474&0&000010
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_8086&DEV_3500&SUBSYS_00000000&REV_0
1\4&1EE18D9A&0&0010
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_8086&DEV_25F7&SUBSYS_00000000&REV_B
1\3&61AAA01&0&10
PCI standard host CPU bridge  Yes       SYSTEM
          5.2.3790.1830       10/1/2002 (Standard
system devices)     machine.inf         Not Available
          PCI\VEN_8086&DEV_25D0&SUBSYS_00000000&REV_B
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PCI bus   Yes       SYSTEM    5.2.3790.1830
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0A03\2&DABA3FF&0
Intel Processor     Yes       PROCESSOR 5.2.3790.1830
          10/1/2002 Intel     cpu.inf   Not Available
          ACPI\GENUINEINTEL_-
_EM64T_FAMILY_6_MODEL_15\_3
Intel Processor     Yes       PROCESSOR 5.2.3790.1830
          10/1/2002 Intel     cpu.inf   Not Available
          ACPI\GENUINEINTEL_-
_EM64T_FAMILY_6_MODEL_15\_2
Intel Processor     Yes       PROCESSOR 5.2.3790.1830
          10/1/2002 Intel     cpu.inf   Not Available
          ACPI\GENUINEINTEL_-
_EM64T_FAMILY_6_MODEL_15\_1
Intel Processor     Yes       PROCESSOR 5.2.3790.1830
          10/1/2002 Intel     cpu.inf   Not Available
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          ACPI\GENUINEINTEL_-
_EM64T_FAMILY_6_MODEL_15\_0
Microsoft ACPI-Compliant System         Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          Microsoft acpi.inf  Not Available
          ACPI_HAL\PNP0C08\0
ACPI Multiprocessor x64-based PC        Yes
          COMPUTER  5.2.3790.1830       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
ComSpec   %SystemRoot%\system32\cmd.exe <SYSTEM>
Path
          %SystemRoot%\system32;%SystemRoot%;%SystemR
oot%\System32\Wbem;C:\Program Files (x86)\Microsoft
SQL Server\80\Tools\Binn\;C:\Program Files\Microsoft
SQL Server\90\Tools\binn\;C:\Program Files
(x86)\Microsoft SQL Server\90\Tools\binn\;C:\Program
Files (x86)\Microsoft SQL
Server\90\DTS\Binn\;C:\Program Files (x86)\Microsoft
SQL
Server\90\Tools\Binn\VSShell\Common7\IDE\;C:\Program
Files (x86)\Microsoft Visual Studio
8\Common7\IDE\PrivateAssemblies\        <SYSTEM>
windir    %SystemRoot%        <SYSTEM>
FP_NO_HOST_CHECK    NO        <SYSTEM>
OS        Windows_NT          <SYSTEM>
PROCESSOR_ARCHITECTURE        AMD64     <SYSTEM>
PROCESSOR_LEVEL     6         <SYSTEM>
PROCESSOR_IDENTIFIER          EM64T Family 6 Model 15
Stepping 7, GenuineIntel      <SYSTEM>
PROCESSOR_REVISION  0f07      <SYSTEM>
NUMBER_OF_PROCESSORS          4         <SYSTEM>
ClusterLog          C:\WINDOWS\Cluster\cluster.log
          <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       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
          HOPE\Administrator
```

```
TMP       %USERPROFILE%\Local Settings\Temp
          HOPE\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

[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       380       11
          204800    1413120   3/14/2007 4:20 PM   Not
Available Not Available       Not Available
csrss.exe Not Available       220       13        Not
Available Not Available       3/14/2007 4:20 PM   Not
Available Not Available       Not Available
winlogon.exe        c:\windows\system32\winlogon.exe
          456       13        204800    1413120
          3/14/2007 4:21 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   901.00 KB (922,624
bytes)    3/25/2005 7:00 AM
services.exe        c:\windows\system32\services.exe
          524       9         204800    1413120
          3/14/2007 4:21 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   216.50 KB (221,696
bytes)    3/25/2005 7:00 AM
lsass.exe c:\windows\system32\lsass.exe 560       9
          204800    1413120   3/14/2007 4:21 PM
          5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          14.00 KB (14,336 bytes)       3/25/2005
7:00 AM
svchost.exe         c:\windows\system32\svchost.exe
          772       8         204800    1413120
          3/14/2007 4:21 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   24.50 KB (25,088 bytes)
          3/25/2005 7:00 AM
svchost.exe         Not Available       876       8
          Not Available       Not Available
          3/14/2007 4:21 PM   Not Available       Not
Available Not Available
svchost.exe         Not Available       956       8
          Not Available       Not Available
          3/14/2007 4:21 PM   Not Available       Not
Available Not Available
```

```
svchost.exe         c:\windows\system32\svchost.exe
          996       8         204800    1413120
          3/14/2007 4:21 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   24.50 KB (25,088 bytes)
          3/25/2005 7:00 AM
msdtc.exe Not Available       1676      8         Not
Available Not Available       3/14/2007 4:21 PM   Not
Available Not Available       Not Available
svchost.exe         c:\windows\system32\svchost.exe
          1848      8         204800    1413120
          3/14/2007 4:21 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   24.50 KB (25,088 bytes)
          3/25/2005 7:00 AM
svchost.exe         Not Available       1920      8
          Not Available       Not Available
          3/14/2007 4:21 PM   Not Available       Not
Available Not Available
svchost.exe         c:\windows\system32\svchost.exe
          1076      8         204800    1413120
          3/14/2007 4:21 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   24.50 KB (25,088 bytes)
          3/25/2005 7:00 AM
wmiprvse.exe        Not Available       788       8
          Not Available       Not Available
          3/14/2007 4:22 PM   Not Available       Not
Available Not Available
csrss.exe Not Available       532       13        Not
Available Not Available       3/14/2007 4:30 PM   Not
Available Not Available       Not Available
winlogon.exe        c:\windows\system32\winlogon.exe
          604       13        204800    1413120
          3/14/2007 4:30 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   901.00 KB (922,624
bytes)    3/25/2005 7:00 AM
rdpclip.exe         c:\windows\system32\rdpclip.exe
          1572      8         204800    1413120
          3/14/2007 4:30 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   99.00 KB (101,376
bytes)    12/12/2006 8:46 AM
explorer.exe        c:\windows\explorer.exe
          1308      8         204800    1413120
          3/14/2007 4:30 PM   6.00.3790.1830
(srv03_sp1_rtm.050324-1447)   1.30 MB (1,364,480
bytes)    3/25/2005 7:00 AM
cpqteam.exe         c:\windows\system32\cpqteam.exe
          764       8         204800    1413120
          3/14/2007 4:30 PM   8.40.0.24 59.50 KB
(60,928 bytes)      7/19/2006 6:13 AM
logon.scr Not Available       1844      4         Not
Available Not Available       3/14/2007 4:31 PM   Not
Available Not Available       Not Available
helpctr.exe
          c:\windows\pchealth\helpctr\binaries\helpct
r.exe     1336      8         204800    1413120
          3/14/2007 4:44 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   1.30 MB (1,363,456
bytes)    12/12/2006 8:48 AM
helpsvc.exe
          c:\windows\pchealth\helpctr\binaries\helpsv
c.exe     824       8         204800    1413120
          3/14/2007 4:44 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   1.52 MB (1,591,296
bytes)    12/12/2006 8:48 AM
```

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wmiprvse.exe        Not Available       1428      8
          Not Available       Not Available
          3/14/2007 4:44 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)
          901.00 KB (922,624 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\winlogon.exe
ntdll     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.20 MB (1,257,472 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\ntdll.dll
kernel32  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.43 MB (1,500,160 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\kernel32.dll
advapi32  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.00 MB (1,051,136 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\advapi32.dll
rpcrt4    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.63 MB (1,714,176 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\rpcrt4.dll
crypt32   5.131.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.36 MB (1,428,992 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\crypt32.dll
msasn1    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          152.50 KB (156,160 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\msasn1.dll
msvcrt    7.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          508.00 KB (520,192 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\msvcrt.dll
user32    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.04 MB (1,085,952 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\user32.dll
gdi32     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          592.00 KB (606,208 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\gdi32.dll
nddeapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          25.00 KB (25,600 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\nddeapi.dll
profmap   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          36.00 KB (36,864 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\profmap.dll
netapi32  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          589.00 KB (603,136 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\netapi32.dll
userenv   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.02 MB (1,069,056 bytes)     3/25/2005
```

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7:00 AM   Microsoft Corporation
          c:\windows\system32\userenv.dll
psapi     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          29.00 KB (29,696 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\psapi.dll
regapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          108.50 KB (111,104 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\regapi.dll
secur32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          120.00 KB (122,880 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\secur32.dll
setupapi  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.45 MB (1,523,200 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\setupapi.dll
version   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          28.00 KB (28,672 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\version.dll
winsta    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          89.00 KB (91,136 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\winsta.dll
ws2_32    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          176.50 KB (180,736 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\ws2_32.dll
ws2help   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          30.50 KB (31,232 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\ws2help.dll
msgina    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.14 MB (1,193,472 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\msgina.dll
shsvcs    6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          193.50 KB (198,144 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\shsvcs.dll
shlwapi   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          606.50 KB (621,056 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\shlwapi.dll
sfc       5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          6.00 KB (6,144 bytes)         3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\sfc.dll
sfc_os    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          183.50 KB (187,904 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\sfc_os.dll
wintrust  5.131.3790.1830 (srv03_sp1_rtm.050324-1447)
          297.50 KB (304,640 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\wintrust.dll
imagehlp  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          57.50 KB (58,880 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\imagehlp.dll
```

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ole32     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          2.43 MB (2,543,616 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\ole32.dll
comctl32  6.0 (srv03_sp1_rtm.050324-1447)
          1.51 MB (1,584,128 bytes)     12/11/2006
6:10 AM   Microsoft Corporation
          c:\windows\winsxs\amd64_microsoft.windows.c
ommon-controls_6595b64144ccf1df_6.0.3790.1830_x-
ww_aced72af\comctl32.dll
winscard  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          230.00 KB (235,520 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\winscard.dll
wtsapi32  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          29.00 KB (29,696 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\wtsapi32.dll
winmm     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          303.50 KB (310,784 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\winmm.dll
shell32   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          10.01 MB (10,492,416 bytes)   3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\shell32.dll
sxs       5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.91 MB (2,003,968 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\sxs.dll
rsaenh    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          241.96 KB (247,768 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\rsaenh.dll
wldap32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          390.00 KB (399,360 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\wldap32.dll
cscdll    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          151.50 KB (155,136 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\cscdll.dll
dimsntfy  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          28.00 KB (28,672 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\dimsntfy.dll
wlnotify  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          148.00 KB (151,552 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\wlnotify.dll
mpr       5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          115.00 KB (117,760 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\mpr.dll
oleaut32  5.2.3790.1830       1.06 MB (1,116,160
bytes)    3/25/2005 7:00 AM   Microsoft Corporation
          c:\windows\system32\oleaut32.dll
winspool  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          247.00 KB (252,928 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\winspool.drv
comctl32  5.82 (srv03_sp1_rtm.050324-1447)
          934.50 KB (956,928 bytes)     12/11/2006
6:10 AM   Microsoft Corporation
          c:\windows\winsxs\amd64_microsoft.windows.c
ommon-controls_6595b64144ccf1df_5.82.3790.1830_x-
ww_4d792d2a\comctl32.dll
uxtheme   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          494.50 KB (506,368 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\uxtheme.dll
services  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          216.50 KB (221,696 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\services.exe
ncobjapi  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          80.00 KB (81,920 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\ncobjapi.dll
msvcp60   7.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          919.50 KB (941,568 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\msvcp60.dll
scesrv    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          594.50 KB (608,768 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\scesrv.dll
authz     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          167.00 KB (171,008 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\authz.dll
umpnpmgr  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          205.00 KB (209,920 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\umpnpmgr.dll
eventlog  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          127.00 KB (130,048 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\eventlog.dll
lsass     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          14.00 KB (14,336 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\lsass.exe
lsasrv    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.50 MB (1,568,256 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\lsasrv.dll
ntdsapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          127.50 KB (130,560 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\ntdsapi.dll
dnsapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          297.50 KB (304,640 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\dnsapi.dll
samlib    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          69.00 KB (70,656 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\samlib.dll
samsrv    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.01 MB (1,059,328 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\samsrv.dll
cryptdll  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          47.00 KB (48,128 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\cryptdll.dll
msprivs   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          47.50 KB (48,640 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\msprivs.dll
kerberos  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          698.00 KB (714,752 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\kerberos.dll
msv1_0    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          253.00 KB (259,072 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\msv1_0.dll
iphlpapi  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          177.00 KB (181,248 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\iphlpapi.dll
netlogon  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          666.00 KB (681,984 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\netlogon.dll
w32time   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          400.50 KB (410,112 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\w32time.dll
schannel  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          248.00 KB (253,952 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\schannel.dll
wdigest   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          130.50 KB (133,632 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\wdigest.dll
rassfm    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          36.00 KB (36,864 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\rassfm.dll
kdcsvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          409.00 KB (418,816 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\kdcsvc.dll
ntdsa     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          2.81 MB (2,948,096 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\ntdsa.dll
esent     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          2.26 MB (2,366,976 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\esent.dll
ntdsatq   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          51.00 KB (52,224 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\ntdsatq.dll
mswsock   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          478.00 KB (489,472 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\mswsock.dll
scecli    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          308.00 KB (315,392 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\scecli.dll
```

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ws03res   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          794.00 KB (813,056 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\ws03res.dll
hnetcfg   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          561.00 KB (574,464 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\hnetcfg.dll
wshtcpip  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          29.00 KB (29,696 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\wshtcpip.dll
pstorsvc  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          36.00 KB (36,864 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\pstorsvc.dll
psbase    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          124.00 KB (126,976 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\psbase.dll
dssenh    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          226.96 KB (232,408 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\dssenh.dll
svchost   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          24.50 KB (25,088 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\svchost.exe
rpcss     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          672.00 KB (688,128 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\rpcss.dll
xpsp2res  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          2.77 MB (2,899,456 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\xpsp2res.dll
clbcatq   2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     865.00 KB (885,760 bytes)     12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\clbcatq.dll
comres    2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     779.50 KB (798,208 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\comres.dll
ntmarta   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          222.50 KB (227,840 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\ntmarta.dll
wkssvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          221.00 KB (226,304 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\wkssvc.dll
wiarpc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          57.00 KB (58,368 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\wiarpc.dll
aelupsvc  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          31.50 KB (32,256 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\aelupsvc.dll
apphelp   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          241.00 KB (246,784 bytes)     3/25/2005
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7:00 AM   Microsoft Corporation
          c:\windows\system32\apphelp.dll
dmserver  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          36.50 KB (37,376 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\dmserver.dll
es        2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     357.00 KB (365,568 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\es.dll
pchsvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          76.00 KB (77,824 bytes)       12/12/2006
8:48 AM   Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\pchsvc
.dll
srvsvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          156.50 KB (160,256 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\srvsvc.dll
cryptsvc  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          114.00 KB (116,736 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\cryptsvc.dll
certcli   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          372.00 KB (380,928 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\certcli.dll
atl       3.05.2284 96.50 KB (98,816 bytes)
          3/25/2005 7:00 AM   Microsoft Corporation
          c:\windows\system32\atl.dll
vssapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.26 MB (1,320,960 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\vssapi.dll
wmisvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          227.00 KB (232,448 bytes)     12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\wbem\wmisvc.dll
sens      5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          63.50 KB (65,024 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\sens.dll
comsvcs   2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     2.06 MB (2,156,544 bytes)     12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\comsvcs.dll
browser   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          125.50 KB (128,512 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\browser.dll
netrap    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          26.00 KB (26,624 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\netrap.dll
wbemcore  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.24 MB (1,299,968 bytes)     12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\wbem\wbemcore.dll
esscli    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          626.50 KB (641,536 bytes)     12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\wbem\esscli.dll
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wbemcomn  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          524.00 KB (536,576 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\wbem\wbemcomn.dll
fastprox  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          866.50 KB (887,296 bytes)     12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\wbem\fastprox.dll
wmiutils  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          171.00 KB (175,104 bytes)     12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\wbem\wmiutils.dll
repdrvfs  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          353.50 KB (361,984 bytes)     12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\wbem\repdrvfs.dll
wmiprvsd  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          743.00 KB (760,832 bytes)     12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\wbem\wmiprvsd.dll
wbemess   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          532.50 KB (545,280 bytes)     12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\wbem\wbemess.dll
ncprov    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          73.00 KB (74,752 bytes)       12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\wbem\ncprov.dll
wbemsvc   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          58.00 KB (59,392 bytes)       12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\wbem\wbemsvc.dll
netman    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          457.00 KB (467,968 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\netman.dll
mprapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          154.50 KB (158,208 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\mprapi.dll
activeds  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          348.50 KB (356,864 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\activeds.dll
adsldpc   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          240.50 KB (246,272 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\adsldpc.dll
credui    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          202.00 KB (206,848 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\credui.dll
rtutils   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          66.00 KB (67,584 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\rtutils.dll
netshell  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          2.32 MB (2,437,120 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\netshell.dll
clusapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          127.00 KB (130,048 bytes)     3/25/2005
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7:00 AM   Microsoft Corporation
          c:\windows\system32\clusapi.dll
rasapi32  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          410.00 KB (419,840 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\rasapi32.dll
rasman    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          95.50 KB (97,792 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\rasman.dll
tapi32    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          332.50 KB (340,480 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\tapi32.dll
wininet   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.13 MB (1,186,304 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\wininet.dll
wzcsapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          49.00 KB (50,176 bytes)       3/24/2005
12:35 PM  Microsoft Corporation
          c:\windows\system32\wzcsapi.dll
wzcsvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          492.00 KB (503,808 bytes)     3/24/2005
12:35 PM  Microsoft Corporation
          c:\windows\system32\wzcsvc.dll
wmi       5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          5.50 KB (5,632 bytes)         3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\wmi.dll
dhcpcsvc  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          219.00 KB (224,256 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\dhcpcsvc.dll
rasdlg    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          859.50 KB (880,128 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\rasdlg.dll
ntlsapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          11.00 KB (11,264 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\ntlsapi.dll
ersvc     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          31.00 KB (31,744 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\ersvc.dll
termsrv   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          354.50 KB (363,008 bytes)     12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\termsrv.dll
icaapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          27.50 KB (28,160 bytes)       12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\icaapi.dll
mstlsapi  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          187.00 KB (191,488 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\mstlsapi.dll
rdpwsx    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          170.13 KB (174,216 bytes)     12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\rdpwsx.dll
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rdpsnd    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          25.00 KB (25,600 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\rdpsnd.dll
scredir   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          38.50 KB (39,424 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\scredir.dll
cscui     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          441.00 KB (451,584 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\cscui.dll
msacm32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          31.00 KB (31,744 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\msacm32.drv
msacm32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          112.00 KB (114,688 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\msacm32.dll
imaadp32  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          24.00 KB (24,576 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\imaadp32.acm
msadp32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          23.50 KB (24,064 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\msadp32.acm
msg711    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          13.50 KB (13,824 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\msg711.acm
msgsm32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          34.50 KB (35,328 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\msgsm32.acm
tssoft32  1.01      13.50 KB (13,824 bytes)
          3/25/2005 7:00 AM   DSP GROUP, INC.
          c:\windows\system32\tssoft32.acm
tsd32     1.03      24.50 KB (25,088 bytes)
          3/25/2005 7:00 AM   DSP GROUP, INC.
          c:\windows\system32\tsd32.dll
rdpclip   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          99.00 KB (101,376 bytes)      12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\rdpclip.exe
wsock32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          24.50 KB (25,088 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\wsock32.dll
urlmon    6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.02 MB (1,074,176 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\urlmon.dll
explorer  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.30 MB (1,364,480 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\explorer.exe
browseui  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.53 MB (1,601,536 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\browseui.dll
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shdocvw   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          2.30 MB (2,416,128 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\shdocvw.dll
cryptui   5.131.3790.1830 (srv03_sp1_rtm.050324-1447)
          705.50 KB (722,432 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\cryptui.dll
themeui   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          530.50 KB (543,232 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\themeui.dll
msimg32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          6.50 KB (6,656 bytes)         3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\msimg32.dll
actxprxy  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          220.50 KB (225,792 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\actxprxy.dll
linkinfo  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          30.00 KB (30,720 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\linkinfo.dll
ntshrui   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          184.00 KB (188,416 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\ntshrui.dll
webcheck  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          439.00 KB (449,536 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\webcheck.dll
stobject  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          142.50 KB (145,920 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\stobject.dll
batmeter  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          41.50 KB (42,496 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\batmeter.dll
powrprof  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          32.50 KB (33,280 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\powrprof.dll
drprov    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          24.00 KB (24,576 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\drprov.dll
ntlanman  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          71.50 KB (73,216 bytes)       3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\ntlanman.dll
netui0    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          130.00 KB (133,120 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\netui0.dll
netui1    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          338.50 KB (346,624 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\netui1.dll
davclnt   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          38.00 KB (38,912 bytes)       3/25/2005
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7:00 AM   Microsoft Corporation
          c:\windows\system32\davclnt.dll
cpqteam   8.40.0.24 59.50 KB (60,928 bytes)
          7/19/2006 6:13 AM   Hewlett-Packard Company
          c:\windows\system32\cpqteam.exe
helpctr   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.30 MB (1,363,456 bytes)     12/12/2006
8:48 AM   Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\helpct
r.exe
hcappres  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          7.50 KB (7,680 bytes)         12/12/2006
8:48 AM   Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\hcappr
es.dll
itss      5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          208.00 KB (212,992 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\itss.dll
msxml3    8.70.1104.0         2.04 MB (2,141,184
bytes)    3/25/2005 7:00 AM   Microsoft Corporation
          c:\windows\system32\msxml3.dll
pchshell  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          155.00 KB (158,720 bytes)     12/12/2006
8:48 AM   Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\pchshe
ll.dll
mlang     6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          686.00 KB (702,464 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\mlang.dll
mshtml    6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          5.65 MB (5,928,448 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\mshtml.dll
msls31    3.10.349.0          357.00 KB (365,568
bytes)    3/25/2005 7:00 AM   Microsoft Corporation
          c:\windows\system32\msls31.dll
msimtf    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          380.50 KB (389,632 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\msimtf.dll
msctf     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          617.50 KB (632,320 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\msctf.dll
shdoclc   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          589.50 KB (603,648 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\shdoclc.dll
jscript   5.6.0.8827          974.50 KB (997,888
bytes)    3/25/2005 7:00 AM   Microsoft Corporation
          c:\windows\system32\jscript.dll
imm32     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          208.00 KB (212,992 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\imm32.dll
mshtmled  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          905.50 KB (927,232 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\mshtmled.dll
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vbscript  5.6.0.8827          646.50 KB (662,016
bytes)    3/25/2005 7:00 AM   Microsoft Corporation
          c:\windows\system32\vbscript.dll
msinfo    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          636.00 KB (651,264 bytes)     12/12/2006
8:48 AM   Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\msinfo
.dll
mfc42u    6.50.9146.0         1.39 MB (1,462,272
bytes)    3/25/2005 7:00 AM   Microsoft Corporation
          c:\windows\system32\mfc42u.dll
comdlg32  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          446.50 KB (457,216 bytes)     3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\comdlg32.dll
riched32  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          7.00 KB (7,168 bytes)         3/25/2005
7:00 AM   Microsoft Corporation
          c:\windows\system32\riched32.dll
riched20  5.31.23.1224        1.10 MB (1,157,120
bytes)    3/25/2005 7:00 AM   Microsoft Corporation
          c:\windows\system32\riched20.dll
wbemprox  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          38.00 KB (38,912 bytes)       12/12/2006
8:46 AM   Microsoft Corporation
          c:\windows\system32\wbem\wbemprox.dll
helpsvc   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.52 MB (1,591,296 bytes)     12/12/2006
8:48 AM   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\framework64\v2.0.5
0727\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 v2.0.50727_X86
          clr_optimization_v2.0.50727_32
          Stopped   Manual    Own Process
          c:\windows\microsoft.net\framework\v2.0.507
27\mscorsvw.exe     Ignore    LocalSystem         0

.NET Runtime Optimization Service v2.0.50727_x64
          clr_optimization_v2.0.50727_64
          Stopped   Manual    Own Process
          c:\windows\microsoft.net\framework64\v2.0.5
0727\mscorsvw.exe   Ignore    LocalSystem         0

COM+ System Application       COMSysApp Stopped
          Manual    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       Stopped
          Manual    Own Process
          c:\windows\system32\dfssvc.exe
          Normal    LocalSystem         0
DHCP Client         Dhcp      Stopped   Disabled
          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
          Auto      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
IAS Jet Database Access       IASJet    Stopped
          Manual    Share Process
          c:\windows\syswow64\svchost.exe -k iasjet
          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   Stopped
          Disabled  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
SQL Server FullText Search (MSSQLSERVER)
          msftesql  Stopped   Disabled  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\NetworkService      0
Network DDE         NetDDE    Stopped   Disabled
          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   Manual
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Network Location Awareness (NLA)        Nla
          Stopped   Disabled  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
          Stopped   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 (x86)\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         Stopped
          Disabled  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
PSEXESVC  PSEXESVC  Stopped   Manual    Own Process
          c:\windows\system32\psexesvc.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
          Stopped   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   Disabled  Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Remote Registry     RemoteRegistry      Stopped
          Manual    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    NT AUTHORITY\NetworkService   0

Remote Procedure Call (RPC)   RpcSs     Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k rpcss
          Normal    NT AUTHORITY\NetworkService   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  Stopped   Disabled
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
```

```
Secondary Logon     seclogon  Stopped   Manual
          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   Stopped   Disabled  Own
Process   c:\windows\system32\spoolsv.exe
          Normal    LocalSystem         0
SQL Server Browser  SQLBrowser          Stopped
          Disabled  Own Process         "c:\program
files (x86)\microsoft sql
server\90\shared\sqlbrowser.exe"        Normal
          LocalSystem         0
SQL Server Agent (MSSQLSERVER)
          SQLSERVERAGENT      Stopped   Manual    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
          Manual    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
          Auto      Own Process
          c:\windows\system32\smlogsvc.exe
          Normal    NT Authority\NetworkService   0

Telephony TapiSrv   Stopped   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   Disabled  Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Distributed Link Tracking Client        TrkWks
          Stopped   Disabled  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

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  Stopped   Disabled
          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
HP System Tools     All Users:HP System Tools     All
Users
HP System Tools\HP Array Configuration Utility    All
Users:HP System Tools\HP Array Configuration Utility
          All Users
HP System Tools\HP Array Configuration Utility CLI
          All Users:HP System Tools\HP Array
Configuration Utility CLI     All Users
HP System Tools\HP Array Diagnostic Utility       All
Users:HP System Tools\HP Array Diagnostic Utility All
Users
Microsoft SQL Server 2005     All Users:Microsoft SQL
Server 2005         All Users
Microsoft SQL Server 2005\Analysis Services       All
Users:Microsoft SQL Server 2005\Analysis Services All
Users
Microsoft SQL Server 2005\Configuration Tools     All
Users:Microsoft SQL Server 2005\Configuration Tools
          All Users
Microsoft SQL Server 2005\Documentation and Tutorials
          All Users:Microsoft SQL Server
2005\Documentation and Tutorials        All Users
Microsoft SQL Server 2005\Documentation and
Tutorials\Tutorials All Users:Microsoft SQL Server
2005\Documentation and Tutorials\Tutorials        All
Users
Microsoft SQL Server 2005\Performance Tools       All
Users:Microsoft SQL Server 2005\Performance Tools All
Users
```

```
Microsoft Visual Studio 2005  All Users:Microsoft
Visual Studio 2005  All Users
Microsoft Visual Studio 2005\Visual Studio Tools  All
Users:Microsoft Visual Studio 2005\Visual Studio
Tools     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         HOPE\Administrator:Accessories
          HOPE\Administrator
Accessories\Accessibility
          HOPE\Administrator:Accessories\Accessibilit
y         HOPE\Administrator
Accessories\Entertainment
          HOPE\Administrator:Accessories\Entertainmen
t         HOPE\Administrator
Administrative Tools
          HOPE\Administrator:Administrative Tools
          HOPE\Administrator
Administrative Tools (2)
          HOPE\Administrator:Administrative Tools (2)
          HOPE\Administrator
Startup   HOPE\Administrator:Startup
          HOPE\Administrator

[Startup Programs]

Program   Command   User Name Location
desktop   desktop.ini         NT AUTHORITY\SYSTEM
          Startup
desktop   desktop.ini         HOPE\Administrator
          Startup
desktop   desktop.ini         .DEFAULT  Startup
desktop   desktop.ini         All Users Common
Startup
CPQTEAM   cpqteam.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
WordPad Document    "%programfiles%\windows
nt\accessories\wordpad.exe"
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       221 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

advpack.dll         6.0.3790.1830       146 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

asctrls.ocx         6.0.3790.1830       147 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

browselc.dll        6.0.3790.1830       63 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

browseui.dll        6.0.3790.1830       1,564 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

cdfview.dll         6.0.3790.1830       216 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

comctl32.dll        5.82.3790.1830      935 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

dxtrans.dll         6.3.3790.1830       320 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

dxtmsft.dll         6.3.3790.1830       549 KB
          3/25/2005 7:00:00 AM
          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      417 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

iepeers.dll         6.0.3790.1830       361 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

iesetup.dll         6.0.3790.1830       71 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

ieuinit.inf         Not Available       24 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Not Available
iexplore.exe        6.0.3790.1830       94 KB
          3/25/2005 7:00:00 AM          C:\Program
Files\Internet Explorer       Microsoft Corporation

imgutil.dll         6.0.3790.1830       61 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

inetcpl.cpl         6.0.3790.1830       428 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

inetcplc.dll        6.0.3790.1830       110 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

inseng.dll          6.0.3790.1830       147 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

mlang.dll 6.0.3790.1830       686 KB    3/25/2005
7:00:00 AM          C:\WINDOWS\system32 Microsoft
Corporation
msencode.dll        <File Missing>      Not Available
          Not Available       Not Available       Not
Available
mshta.exe 6.0.3790.1830       38 KB     3/25/2005
7:00:00 AM          C:\WINDOWS\system32 Microsoft
Corporation
mshtml.dll          6.0.3790.1830       5,790 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

mshtml.tlb          6.0.3790.1830       1,320 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

mshtmled.dll        6.0.3790.1830       906 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation
```

```
mshtmler.dll        6.0.3790.1830       56 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

msident.dll         6.0.3790.1830       69 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

msidntld.dll        6.0.3790.1830       16 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

msieftp.dll         6.0.3790.1830       369 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

msrating.dll        6.0.3790.1830       240 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

mstime.dll          6.0.3790.1830       878 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

occache.dll         6.0.3790.1830       126 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

proctexe.ocx        <File Missing>      Not Available
          Not Available       Not Available       Not
Available
sendmail.dll        6.0.3790.1830       64 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

shdoclc.dll         6.0.3790.1830       590 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

shdocvw.dll         6.0.3790.1830       2,360 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

shfolder.dll        6.0.3790.1830       34 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

shlwapi.dll         6.0.3790.1830       607 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

tdc.ocx   1.3.0.3130          91 KB     3/25/2005
7:00:00 AM          C:\WINDOWS\system32 Microsoft
Corporation
url.dll   6.0.3790.1830       40 KB     3/25/2005
7:00:00 AM          C:\WINDOWS\system32 Microsoft
Corporation
urlmon.dll          6.0.3790.1830       1,049 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

webcheck.dll        6.0.3790.1830       439 KB
          3/25/2005 7:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

wininet.dll         6.0.3790.1830       1,159 KB
          3/25/2005 7:00:00 AM
          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  High
Restricted sites    Custom
```

Server Bus Performance Driver Registry Parameters

```
Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
hpqcissb
Class Name:        <NO CLASS>
Last Write Time:   3/19/2007 - 9:19 AM
Value 0
  Name:            Type
  Type:            REG_DWORD
  Data:            0x1

Value 1
  Name:            Start
  Type:            REG_DWORD
  Data:            0

Value 2
  Name:            ErrorControl
  Type:            REG_DWORD
  Data:            0x1

Value 3
  Name:            Tag
  Type:            REG_DWORD
  Data:            0x102

Value 4
  Name:            ImagePath
  Type:            REG_EXPAND_SZ
  Data:            system32\DRIVERS\hpqcissb.sys

Value 5
  Name:            DisplayName
  Type:            REG_SZ
  Data:            Smart Array Controllers Non-
Miniport Bus Driver

Value 6
```

```
  Name:            Group
  Type:            REG_SZ
  Data:            port


Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
hpqcissb\Parameters
Class Name:        <NO CLASS>
Last Write Time:   3/20/2007 - 4:24 PM
Value 0
  Name:            CompletionMode
  Type:            REG_DWORD
  Data:            0x2

Value 1
  Name:            CosTimerRate
  Type:            REG_DWORD
  Data:            0x2


Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
hpqcissb\Security
Class Name:        <NO CLASS>
Last Write Time:   12/18/2006 - 11:37 AM
Value 0
  Name:            Security
  Type:            REG_BINARY
  Data:
00000000   01 00 14 80 b8 00 00 00 - c4 00 00 00 14
00 00 00  ....¸...Ä.......
00000010   30 00 00 00 02 00 1c 00 - 01 00 00 00 02
80 14 00  0...............
00000020   ff 01 0f 00 01 01 00 00 - 00 00 00 01 00
00 00 00  ÿ...............
00000030   02 00 88 00 06 00 00 00 - 00 00 14 00 fd
01 02 00  ............ý...
00000040   01 01 00 00 00 00 00 05 - 12 00 00 00 00
00 18 00  ................
00000050   ff 01 0f 00 01 02 00 00 - 00 00 00 05 20
00 00 00  ÿ........... ...
00000060   20 02 00 00 00 00 14 00 - 8d 01 02 00 01
01 00 00   ...............
00000070   00 00 00 05 04 00 00 00 - 00 00 14 00 8d
01 02 00  ................
00000080   01 01 00 00 00 00 00 05 - 06 00 00 00 00
00 14 00  ................
00000090   00 01 00 00 01 01 00 00 - 00 00 00 05 0b
00 00 00  ................
000000a0   00 00 18 00 fd 01 02 00 - 01 02 00 00 00
00 00 05  ....ý...........
000000b0   20 00 00 00 23 02 00 00 - 01 01 00 00 00
00 00 05   ...#...........
000000c0   12 00 00 00 01 01 00 00 - 00 00 00 05 12
00 00 00  ................



Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
hpqcissb\Enum
Class Name:        <NO CLASS>
Last Write Time:   3/19/2007 - 9:19 AM
Value 0
  Name:            0
  Type:            REG_SZ
  Data:
PCI\VEN_103C&DEV_3230&SUBSYS_3223103C&REV_03\6&305972
a8&0&00000010

Value 1
  Name:            Count
  Type:            REG_DWORD
  Data:            0x2

Value 2
  Name:            NextInstance
  Type:            REG_DWORD
  Data:            0x2

Value 3
  Name:            1
  Type:            REG_SZ
  Data:
PCI\VEN_103C&DEV_3230&SUBSYS_3223103C&REV_03\6&abadbb
5&0&00080010
```

Server Disk Device Performance Driver Registry Parameters

```
Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
hpqcissd
Class Name:        <NO CLASS>
Last Write Time:   3/19/2007 - 9:19 AM
Value 0
  Name:            Type
  Type:            REG_DWORD
  Data:            0x1

Value 1
  Name:            Start
  Type:            REG_DWORD
  Data:            0

Value 2
  Name:            ErrorControl
  Type:            REG_DWORD
  Data:            0x1

Value 3
  Name:            Tag
  Type:            REG_DWORD
  Data:            0x102

Value 4
  Name:            ImagePath
  Type:            REG_EXPAND_SZ
  Data:            system32\DRIVERS\hpqcissd.sys

Value 5
  Name:            DisplayName
  Type:            REG_SZ
  Data:            Smart Array Controllers Non-
Miniport Disk Driver

Value 6
  Name:            Group
  Type:            REG_SZ
  Data:            Primary Disk


Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
hpqcissd\Security
Class Name:        <NO CLASS>
Last Write Time:   12/18/2006 - 11:38 AM
Value 0
  Name:            Security
  Type:            REG_BINARY
  Data:
00000000   01 00 14 80 b8 00 00 00 - c4 00 00 00 14
00 00 00  ....¸...Ä.......
00000010   30 00 00 00 02 00 1c 00 - 01 00 00 00 02
80 14 00  0...............
00000020   ff 01 0f 00 01 01 00 00 - 00 00 00 01 00
00 00 00  ÿ...............
00000030   02 00 88 00 06 00 00 00 - 00 00 14 00 fd
01 02 00  ............ý...
00000040   01 01 00 00 00 00 00 05 - 12 00 00 00 00
00 18 00  ................
00000050   ff 01 0f 00 01 02 00 00 - 00 00 00 05 20
00 00 00  ÿ........... ...
00000060   20 02 00 00 00 00 14 00 - 8d 01 02 00 01
01 00 00   ...............
00000070   00 00 00 05 04 00 00 00 - 00 00 14 00 8d
01 02 00  ................
00000080   01 01 00 00 00 00 00 05 - 06 00 00 00 00
00 14 00  ................
00000090   00 01 00 00 01 01 00 00 - 00 00 00 05 0b
00 00 00  ................
000000a0   00 00 18 00 fd 01 02 00 - 01 02 00 00 00
00 00 05  ....ý...........
000000b0   20 00 00 00 23 02 00 00 - 01 01 00 00 00
00 00 05   ...#...........
000000c0   12 00 00 00 01 01 00 00 - 00 00 00 05 12
00 00 00  ................



Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
hpqcissd\Enum
Class Name:        <NO CLASS>
Last Write Time:   3/19/2007 - 9:19 AM
```

```
Value 0
  Name:            0
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&302311db&0&
0000004000000000

Value 1
  Name:            Count
  Type:            REG_DWORD
  Data:            0x14

Value 2
  Name:            NextInstance
  Type:            REG_DWORD
  Data:            0x14

Value 3
  Name:            1
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&302311db&0&
0100004000000000

Value 4
  Name:            2
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&302311db&0&
0200004000000000

Value 5
  Name:            3
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&302311db&0&
0300004000000000

Value 6
  Name:            4
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&302311db&0&
0400004000000000

Value 7
  Name:            5
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&302311db&0&
0500004000000000

Value 8
  Name:            6
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&302311db&0&
0600004000000000

Value 9
  Name:            7
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&302311db&0&
0700004000000000

Value 10
  Name:            8
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&302311db&0&
0800004000000000

Value 11
  Name:            9
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&302311db&0&
0900004000000000

Value 12
  Name:            10
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&27135226&0&
0000004000000000

Value 13
  Name:            11
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&27135226&0&
0100004000000000

Value 14
  Name:            12
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&27135226&0&
0200004000000000

Value 15
  Name:            13
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&27135226&0&
0300004000000000

Value 16
  Name:            14
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&27135226&0&
0400004000000000

Value 17
  Name:            15
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&27135226&0&
0500004000000000

Value 18
  Name:            16
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&27135226&0&
0600004000000000

Value 19
  Name:            17
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&27135226&0&
0700004000000000

Value 20
  Name:            18
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&27135226&0&
0800004000000000

Value 21
  Name:            19
  Type:            REG_SZ
  Data:
HPQCISS\Disk&VEN_HP&PROD_LOGICAL_VOLUME\7&27135226&0&
0900004000000000
```

Web Client Hardware Configuration

```
System Information report written at: 03/20/07
16:36:25
System Name: MLC1
[System Summary]

Item      Value
OS Name   Microsoft(R) Windows(R) Server 2003,
Standard Edition
Version   5.2.3790 Service Pack 1 Build 3790
Other OS Description          Not Available
OS Manufacturer     Microsoft Corporation
System Name         MLC1
System Manufacturer HP
System Model        ProLiant ML110 G4
System Type         X86-based PC
Processor x86 Family 15 Model 6 Stepping 4
GenuineIntel ~2793 Mhz
Processor x86 Family 15 Model 6 Stepping 4
GenuineIntel ~2793 Mhz
BIOS Version/Date   HP O10, 1/27/2007
SMBIOS Version      2.4
Windows Directory   C:\WINDOWS
System Directory    C:\WINDOWS\system32
Boot Device         \Device\HarddiskVolume1
Locale    United States
Hardware Abstraction Layer    Version =
"5.2.3790.1830 (srv03_sp1_rtm.050324-1447)"
```

```
User Name Not Available
Time Zone Central Daylight Time
Total Physical Memory         1,022.05 MB
Available Physical Memory     614.15 MB
Total Virtual Memory          1.66 GB
Available Virtual Memory      1.38 GB
Page File Space     768.00 MB
Page File C:\pagefile.sys

[Hardware Resources]



[Conflicts/Sharing]

Resource  Device
I/O Port 0x00000000-0x00000BFF          PCI bus
I/O Port 0x00000000-0x00000BFF          Direct memory
access controller

I/O Port 0x000003C0-0x000003DF          PCI standard
PCI-to-PCI bridge
I/O Port 0x000003C0-0x000003DF          Standard VGA
Graphics Adapter

Memory Address 0xEF900000-0xEF9FFFFF    PCI standard
PCI-to-PCI bridge
Memory Address 0xEF900000-0xEF9FFFFF    HP NC110T
PCIe Gigabit Server Adapter

IRQ 23    Standard Universal PCI to USB Host
Controller
IRQ 23    Standard Enhanced PCI to USB Host
Controller

Memory Address 0xEF000000-0xEF8FFFFF    PCI standard
PCI-to-PCI bridge
Memory Address 0xEF000000-0xEF8FFFFF    Standard VGA
Graphics Adapter

IRQ 16    HP NC110T PCIe Gigabit Server Adapter
IRQ 16    PCI standard PCI-to-PCI bridge
IRQ 16    Standard Universal PCI to USB Host
Controller

IRQ 17    PCI standard PCI-to-PCI bridge
IRQ 17    PCI standard PCI-to-PCI bridge
IRQ 17    HP NC320i PCIe Gigabit Server Adapter

IRQ 19    Standard Universal PCI to USB Host
Controller
IRQ 19    Standard Dual Channel PCI IDE 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

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          HP NC110T
PCIe Gigabit Server Adapter

Memory Address 0xEFA00000-0xEFAFFFFF    PCI standard
PCI-to-PCI bridge
Memory Address 0xEFA00000-0xEFAFFFFF    HP NC320i
PCIe Gigabit Server Adapter

Memory Address 0xEE000000-0xEEFFFFFF    PCI standard
PCI-to-PCI bridge
Memory Address 0xEE000000-0xEEFFFFFF    Standard VGA
Graphics Adapter


[DMA]

Resource  Device    Status
Channel 4 Direct memory access controller         OK


[Forced Hardware]

Device    PNP Device ID

[I/O]

Resource  Device    Status
0x00000000-0x00000BFF         PCI bus   OK
0x00000000-0x00000BFF         Direct memory access
controller          OK
0x00000D00-0x0000FDFF         PCI bus   OK
0x00004000-0x00004FFF         PCI standard PCI-to-PCI
bridge    OK
0x00004000-0x00004FFF         HP NC110T PCIe Gigabit
Server Adapter      OK
0x000003B0-0x000003BB         PCI standard PCI-to-PCI
bridge    OK
0x000003B0-0x000003BB         Standard VGA Graphics
Adapter   OK
0x000003C0-0x000003DF         PCI standard PCI-to-PCI
bridge    OK
0x000003C0-0x000003DF         Standard VGA Graphics
Adapter   OK
0x00003000-0x0000301F         Standard Universal PCI
to USB Host Controller        OK
0x00003020-0x0000303F         Standard Universal PCI
to USB Host Controller        OK
0x00003040-0x0000305F         Standard Universal PCI
to USB Host Controller        OK
0x00003060-0x0000307F         Standard Universal PCI
to USB Host Controller        OK
0x00000A79-0x00000A79         ISAPNP Read Data Port
          OK
0x00000279-0x00000279         ISAPNP Read Data Port
          OK
0x00000274-0x00000277         ISAPNP Read Data Port
          OK
```

```
0x00000010-0x0000001F         Motherboard resources
          OK
0x00000024-0x00000025         Motherboard resources
          OK
0x00000028-0x00000029         Motherboard resources
          OK
0x0000002C-0x0000002D         Motherboard resources
          OK
0x00000030-0x00000031         Motherboard resources
          OK
0x00000034-0x00000035         Motherboard resources
          OK
0x00000038-0x00000039         Motherboard resources
          OK
0x0000003C-0x0000003D         Motherboard resources
          OK
0x00000060-0x00000060         Motherboard resources
          OK
0x00000062-0x00000062         Motherboard resources
          OK
0x00000064-0x00000064         Motherboard resources
          OK
0x00000066-0x00000066         Motherboard resources
          OK
0x00000072-0x00000077         Motherboard resources
          OK
0x00000080-0x00000080         Motherboard resources
          OK
0x00000090-0x0000009F         Motherboard resources
          OK
0x000000A4-0x000000A5         Motherboard resources
          OK
0x000000A8-0x000000A9         Motherboard resources
          OK
0x000000AC-0x000000AD         Motherboard resources
          OK
0x000000B0-0x000000B5         Motherboard resources
          OK
0x000000B8-0x000000B9         Motherboard resources
          OK
0x000000BC-0x000000BD         Motherboard resources
          OK
0x00000800-0x0000083F         Motherboard resources
          OK
0x00001000-0x0000107F         Motherboard resources
          OK
0x00001180-0x000011BF         Motherboard resources
          OK
0x0000002E-0x0000002F         Motherboard resources
          OK
0x000004D0-0x000004D1         Motherboard resources
          OK
0x00000600-0x0000063F         Motherboard resources
          OK
0x0000FE00-0x0000FE00         Motherboard resources
          OK
0x00000081-0x0000008F         Direct memory access
controller          OK
0x000000C0-0x000000DF         Direct memory access
controller          OK
0x000000F0-0x000000FE         Numeric data processor
          OK
```

```
0x00000020-0x00000021         Programmable interrupt
controller          OK
0x000000A0-0x000000A1         Programmable interrupt
controller          OK
0x00000070-0x00000071         System CMOS/real time
clock     OK
0x00000061-0x00000061         System speaker      OK

0x00000040-0x00000043         System timer        OK

0x00000050-0x00000053         System timer        OK

0x000003F8-0x000003FF         Communications Port
(COM1)    OK
0x000002F8-0x000002FF         Communications Port
(COM2)    OK
0x00003080-0x0000308F         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
0x000030C8-0x000030CF         Standard Dual Channel
PCI IDE Controller  OK
0x000030BC-0x000030BF         Standard Dual Channel
PCI IDE Controller  OK
0x000030C0-0x000030C7         Standard Dual Channel
PCI IDE Controller  OK
0x000030B8-0x000030BB         Standard Dual Channel
PCI IDE Controller  OK
0x00003090-0x0000309F         Standard Dual Channel
PCI IDE Controller  OK
0x00000CA2-0x00000CA3                   OK

[IRQs]

Resource  Device    Status
IRQ 9     Microsoft ACPI-Compliant System         OK

IRQ 17    PCI standard PCI-to-PCI bridge          OK

IRQ 17    PCI standard PCI-to-PCI bridge          OK

IRQ 17    HP NC320i PCIe Gigabit Server Adapter   OK

IRQ 16    HP NC110T PCIe Gigabit Server Adapter   OK

IRQ 16    PCI standard PCI-to-PCI bridge          OK

IRQ 16    Standard Universal PCI to USB Host
Controller          OK
IRQ 23    Standard Universal PCI to USB Host
Controller          OK
IRQ 23    Standard Enhanced PCI to USB Host
Controller          OK
IRQ 19    Standard Universal PCI to USB Host
Controller          OK
IRQ 19    Standard Dual Channel PCI IDE Controller
          OK
IRQ 18    Standard Universal PCI to USB Host
Controller          OK
IRQ 13    Numeric data processor        OK
IRQ 8     System CMOS/real time clock   OK
IRQ 0     System timer        OK
IRQ 4     Communications Port (COM1)    OK
IRQ 3     Communications Port (COM2)    OK
IRQ 14    Primary IDE Channel 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

0xCC000-0xCFFFF     PCI bus   OK
0xD0000-0xD3FFF     PCI bus   OK
0xD4000-0xD7FFF     PCI bus   OK
0xD8000-0xDBFFF     PCI bus   OK
0x40000000-0xEFFFFFFF         PCI bus   OK
0xEF900000-0xEF9FFFFF         PCI standard PCI-to-PCI
bridge    OK
0xEF900000-0xEF9FFFFF         HP NC110T PCIe Gigabit
Server Adapter      OK
0xEF920000-0xEF93FFFF         HP NC110T PCIe Gigabit
Server Adapter      OK
0xEF000000-0xEF8FFFFF         PCI standard PCI-to-PCI
bridge    OK
0xEF000000-0xEF8FFFFF         Standard VGA Graphics
Adapter   OK
0xEE000000-0xEEFFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xEE000000-0xEEFFFFFF         Standard VGA Graphics
Adapter   OK
0xEF800000-0xEF803FFF         Standard VGA Graphics
Adapter   OK
0xEFA00000-0xEFAFFFFF         PCI standard PCI-to-PCI
bridge    OK
0xEFA00000-0xEFAFFFFF         HP NC320i PCIe Gigabit
Server Adapter      OK
0xEFD00000-0xEFD003FF         Standard Enhanced PCI
to USB Host Controller        OK
0xFED14000-0xFED17FFF         Motherboard resources
          OK
0xFED13000-0xFED13FFF         Motherboard resources
          OK
0xF0000000-0xFFFFFFFF         Motherboard resources
          OK
0xFED20000-0xFED8FFFF         Motherboard resources
          OK
0xFEF00000-0xFEFFFFFF         Motherboard resources
          OK
0xFF800000-0xFFFFFFFF         Intel(R) 82802 Firmware
Hub Device          OK
0xEFD00400-0xEFD007FF         Standard Dual Channel
PCI IDE Controller  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 7:00 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
7:00 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 7:00 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 7:00 AM
c:\windows\system32\msg723.acm          Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSG723.ACM
          5.2.3790.1830       120.00 KB (122,880
bytes)    3/5/2007 1:10 PM
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
7:00 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 7:00 AM
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
7:00 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
7:00 AM

[Video Codecs]
```

```
CODEC     Manufacturer        Description
          Status    File      Version   Size
          Creation Date
c:\windows\system32\msh261.drv          Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSH261.DRV
          5.2.3790.1830       184.00 KB (188,416
bytes)    3/5/2007 1:10 PM
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
8:50 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 8:49 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
7:00 AM
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
7:00 AM
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)       3/5/2007 1:10
PM
c:\windows\system32\msh263.drv          Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSH263.DRV
          5.2.3790.1830       288.00 KB (294,912
bytes)    3/5/2007 1:10 PM

[CD-ROM]

Item      Value
Drive     D:
Description         CD-ROM Drive
Media Loaded        No
Media Type          CD-ROM
Name      HL-DT-ST CD-ROM GCR-8486B
Manufacturer        (Standard CD-ROM drives)
Status    OK
Transfer Rate       Not Available
SCSI Target ID      0
PNP Device ID       IDE\CDROMHL-DT-ST_CD-ROM_GCR-
8486B_______________2.00____\5&398DF2D0&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 7:00 AM)

[Sound Device]
```

```
Item      Value

[Display]

Item      Value
Name      Standard VGA Graphics Adapter
PNP Device ID
          PCI\VEN_102B&DEV_0522&SUBSYS_31FA103C&REV_0
2\4&2D8B019B&0&00E4
Adapter Type        Matrox Graphics Inc., (Standard
display types) compatible
Adapter Description Standard VGA Graphics Adapter
Adapter RAM         1.63 MB (1,703,936 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 65536
Resolution          800 x 600 x 1 hertz
Bits/Pixel          16
Memory Address      0xEE000000-0xEEFFFFFF
Memory Address      0xEF800000-0xEF803FFF
Memory Address      0xEF000000-0xEF8FFFFF
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), 3/5/2007 6:01 AM)

[Infrared]

Item      Value

[Input]



[Keyboard]

Item      Value
Description         USB Human Interface Device
Name      Enhanced (101- or 102-key)
Layout    00000409
PNP Device ID
          USB\VID_0000&PID_0000&MI_00\6&232E42B&0&000
0
Number of Function Keys       12
Driver    c:\windows\system32\drivers\hidusb.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 11.50 KB (11,776
bytes), 3/25/2003 7:00 AM)

[Pointing Device]

Item      Value
Hardware Type       USB Human Interface Device
Number of Buttons   8
Status    OK
PNP Device ID
          USB\VID_0000&PID_0000&MI_01\6&232E42B&0&000
1
```

```
Power Management Supported    No
Double Click Threshold        6
Handedness          Right Handed Operation
Driver    c:\windows\system32\drivers\hidusb.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 11.50 KB (11,776
bytes), 3/25/2003 7:00 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          3/15/2007 2:01 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          3/15/2007 2:01 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 7:00 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          3/15/2007 2:01 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 7:00 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          3/15/2007 2:01 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 7:00 AM)

Name      [00000005] Direct Parallel
Adapter Type        Not Available
Product Type        Direct Parallel
Installed Yes
PNP Device ID       ROOT\MS_PTIMINIPORT\0000
Last Reset          3/15/2007 2:01 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 7:00 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          3/15/2007 2:01 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 7:00 AM)

Name      [00000007] HP NC320i PCIe Gigabit Server
Adapter
Adapter Type        Ethernet 802.3
Product Type        HP NC320i PCIe Gigabit Server
Adapter
Installed Yes
PNP Device ID
          PCI\VEN_14E4&DEV_1659&SUBSYS_7032103C&REV_2
1\4&261E705A&0&00E5
Last Reset          3/15/2007 2:01 PM
Index     7
Service Name        q57w2k
IP Address          130.120.208.101
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         00:19:BB:CD:9F:F1
Memory Address      0xEFA00000-0xEFAFFFFF
IRQ Channel         IRQ 17
Driver    c:\windows\system32\drivers\q57xp32.sys
(9.81.0.0 built by: WinDDK, 154.50 KB (158,208
bytes), 3/5/2007 12:38 PM)

Name      [00000008] HP NC110T PCIe Gigabit Server
Adapter
Adapter Type        Ethernet 802.3
Product Type        HP NC110T PCIe Gigabit Server
Adapter
Installed Yes
PNP Device ID
          PCI\VEN_8086&DEV_10B9&SUBSYS_704A103C&REV_0
6\4&6C79FC5&0&00E0
Last Reset          3/15/2007 2:01 PM
Index     8
Service Name        N1e5132
IP Address          130.172.4.1
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         00:18:71:EA:15:BF
Memory Address      0xEF920000-0xEF93FFFF
Memory Address      0xEF900000-0xEF9FFFFF
I/O Port  0x00004000-0x00004FFF
IRQ Channel         IRQ 16
Driver    c:\windows\system32\drivers\n1e5132.sys
(9.6.31.0 built by: WinDDK, 225.40 KB (230,808
bytes), 3/5/2007 12:41 PM)
```

```
[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_{73ED6AE7-E242-4131-A925-
5B86C520DB92}] 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_{73ED6AE7-E242-4131-A925-
5B86C520DB92}] 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_{454DFD47-D384-4B74-804E-
82F08DC2601A}] 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_{454DFD47-D384-4B74-804E-
82F08DC2601A}] 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_{F9DA554D-C222-4B9C-9BE0-
43D5D7E14228}] 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_{F9DA554D-C222-4B9C-9BE0-
43D5D7E14228}] 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_{133DB964-0A97-485A-A33A-
684B072FFA34}] 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_{133DB964-0A97-485A-A33A-
684B072FFA34}] 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\1
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
I/O Port  0x000003F8-0x000003FF
IRQ Channel         IRQ 4
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 7:00 AM)

Name      Communications Port (COM2)
Status    OK
PNP Device ID       ACPI\PNP0501\2
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
I/O Port  0x000002F8-0x000002FF
IRQ Channel         IRQ 3
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 7:00 AM)

[Parallel]

Item      Value

[Storage]



[Drives]

Item      Value
Drive     C:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size      149.04 GB (160,031,014,912 bytes)
Free Space          142.12 GB (152,597,147,648 bytes)

Volume Name
Volume Serial Number          541601D3

Drive     D:
Description         CD-ROM Disc
```

```

[Disks]

Item      Value
Description         Disk drive
Manufacturer        (Standard disk drives)
Model     ST3160812AS
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  0
SCSI Logical Unit   0
SCSI Port 1
SCSI Target ID      0
Sectors/Track       63
Size      149.05 GB (160,039,272,960 bytes)
Total Cylinders     19,457
Total Sectors       312,576,705
Total Tracks        4,961,535
Tracks/Cylinder     255
Partition Disk #0, Partition #0
Partition Size      149.04 GB (160,031,015,424 bytes)

Partition Starting Offset     32,256 bytes

[SCSI]

Item      Value

[IDE]

Item      Value
Name      Standard Dual Channel PCI IDE Controller

Manufacturer        (Standard IDE ATA/ATAPI
controllers)
Status    OK
PNP Device ID
          PCI\VEN_8086&DEV_27DF&SUBSYS_3206103C&REV_0
1\3&61AAA01&0&F9
I/O Port  0x00003080-0x0000308F
Driver    c:\windows\system32\drivers\pciide.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 5.50 KB (5,632
bytes), 3/25/2003 7:00 AM)

Name      Primary IDE Channel
Manufacturer        (Standard IDE ATA/ATAPI
controllers)
Status    OK
PNP Device ID       PCIIDE\IDECHANNEL\4&78810&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 7:00 AM)

Name      Secondary IDE Channel
Manufacturer        (Standard IDE ATA/ATAPI
controllers)
Status    OK
PNP Device ID       PCIIDE\IDECHANNEL\4&78810&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 7:00 AM)

Name      Standard Dual Channel PCI IDE Controller

Manufacturer        (Standard IDE ATA/ATAPI
controllers)
Status    OK
PNP Device ID
          PCI\VEN_8086&DEV_27C0&SUBSYS_3206103C&REV_0
1\3&61AAA01&0&FA
I/O Port  0x000030C8-0x000030CF
I/O Port  0x000030BC-0x000030BF
I/O Port  0x000030C0-0x000030C7
I/O Port  0x000030B8-0x000030BB
I/O Port  0x00003090-0x0000309F
Memory Address      0xEFD00400-0xEFD007FF
IRQ Channel         IRQ 19
Driver    c:\windows\system32\drivers\pciide.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 5.50 KB (5,632
bytes), 3/25/2003 7:00 AM)

Name      Primary IDE Channel
Manufacturer        (Standard IDE ATA/ATAPI
controllers)
Status    OK
PNP Device ID       PCIIDE\IDECHANNEL\4&193DA539&0&0

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 7:00 AM)

Name      Secondary IDE Channel
Manufacturer        (Standard IDE ATA/ATAPI
controllers)
Status    OK
PNP Device ID       PCIIDE\IDECHANNEL\4&193DA539&0&1

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 7:00 AM)

[Printing]

Name      Driver    Port Name Server Name

[Problem Devices]

Device    PNP Device ID       Error Code
Not Available       ACPI\IPI0001\0      The drivers
for this device are not installed.

[USB]

Device    PNP Device ID
Standard Universal PCI to USB Host Controller
          PCI\VEN_8086&DEV_27C8&SUBSYS_3206103C&REV_0
1\3&61AAA01&0&E8
```

```
Standard Universal PCI to USB Host Controller
          PCI\VEN_8086&DEV_27C9&SUBSYS_3206103C&REV_0
1\3&61AAA01&0&E9
Standard Universal PCI to USB Host Controller
          PCI\VEN_8086&DEV_27CA&SUBSYS_3206103C&REV_0
1\3&61AAA01&0&EA
Standard Universal PCI to USB Host Controller
          PCI\VEN_8086&DEV_27CB&SUBSYS_3206103C&REV_0
1\3&61AAA01&0&EB
Standard Enhanced PCI to USB Host Controller
          PCI\VEN_8086&DEV_27CC&SUBSYS_3206103C&REV_0
1\3&61AAA01&0&EF

[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
```

```
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
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

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  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
cpqfcalm  cpqfcalm  Not Available       Kernel Driver
          No        Disabled  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       Fdc
          c:\windows\system32\drivers\fdc.sys
          Kernel Driver       No        System
          Stopped   OK        Ignore    No        No

fips      Fips
          c:\windows\system32\drivers\fips.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

flpydisk  Flpydisk
          c:\windows\system32\drivers\flpydisk.sys
          Kernel Driver       No        System
```

```
          Stopped   OK        Ignore    No        No

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

hidusb    Microsoft HID Class Driver
          c:\windows\system32\drivers\hidusb.sys
          Kernel Driver       Yes       Manual
          Running   OK        Ignore    No        Yes

hpn       hpn       Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
hpt3xx    hpt3xx    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
http      HTTP
          c:\windows\system32\drivers\http.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

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
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
intelppm  Intel Processor Driver
          c:\windows\system32\drivers\intelppm.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

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

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
irenum    IR Enumerator Service
          c:\windows\system32\drivers\irenum.sys
          Kernel Driver       No        Manual
          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

kbdhid    Keyboard HID Driver
          c:\windows\system32\drivers\kbdhid.sys
          Kernel Driver       Yes       System
          Running   OK        Ignore    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
```

```
mouhid    Mouse HID Driver
          c:\windows\system32\drivers\mouhid.sys
          Kernel Driver       Yes       Manual
          Running   OK        Ignore    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
          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

mup       Mup
          c:\windows\system32\drivers\mup.sys
          File System Driver  Yes       Boot
          Running   OK        Normal    No        Yes

n1e5132   HP PCIe Gigabit NIC Driver
          c:\windows\system32\drivers\n1e5132.sys
          Kernel Driver       Yes       Manual
          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
```

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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 NC320i PCIe 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
          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       Manual
          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

usbccgp   Microsoft USB Generic Parent Driver
          c:\windows\system32\drivers\usbccgp.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

usbehci   Microsoft USB 2.0 Enhanced Host Controller
Miniport Driver
          c:\windows\system32\drivers\usbehci.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

usbhub    USB2 Enabled Hub
          c:\windows\system32\drivers\usbhub.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

usbuhci   Microsoft USB Universal Host Controller
Miniport Driver
          c:\windows\system32\drivers\usbuhci.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

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
          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
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
HTTP      Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_HTTP\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
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
Available ROOT\LEGACY_AFD\0000
Generic volume      Yes       VOLUME    5.2.3790.0
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATUREA607A6
07OFFSET7E00LENGTH2542978200
Volume Manager      Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ROOT\FTDISK\0000
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
          ACPI\FIXEDBUTTON\2&DABA3FF&0
```

```
ACPI Power Button   Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0C0C\3&61AAA01&0
Not Available       Not Available       Not Available
          Not Available       Not Available       Not
Available Not Available       Not Available
          ACPI\IPI0001\0
Secondary IDE Channel         Yes       HDC
          5.2.3790.0          10/1/2002 (Standard IDE
ATA/ATAPI controllers)        mshdc.inf Not Available
          PCIIDE\IDECHANNEL\4&193DA539&0&1
Disk drive          Yes       DISKDRIVE 5.2.3790.0
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          IDE\DISKST3160812AS________________________
_______3.AJL_\5&1348C537&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&193DA539&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_8086&DEV_27C0&SUBSYS_3206103C&REV_0
1\3&61AAA01&0&FA
Secondary IDE Channel         Yes       HDC
          5.2.3790.0          10/1/2002 (Standard IDE
ATA/ATAPI controllers)        mshdc.inf Not Available
          PCIIDE\IDECHANNEL\4&78810&0&1
CD-ROM Drive        Yes       CDROM     5.2.3790.0
          10/1/2002 (Standard CD-ROM drives)
          cdrom.inf Not Available       IDE\CDROMHL-
DT-ST_CD-ROM_GCR-
8486B_______________2.00____\5&398DF2D0&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&78810&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_8086&DEV_27DF&SUBSYS_3206103C&REV_0
1\3&61AAA01&0&F9
Communications Port Yes       PORTS     5.2.3790.0
          10/1/2002 (Standard port types)
          msports.inf         Not Available
          ACPI\PNP0501\2
Communications Port Yes       PORTS     5.2.3790.0
          10/1/2002 (Standard port types)
          msports.inf         Not Available
          ACPI\PNP0501\1
Generic Bus         Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0A05\4&2B9557D4&0
Intel(R) 82802 Firmware Hub Device      Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          Intel     machine.inf         Not Available
          ACPI\INT0800\4&2B9557D4&0
```

```
System timer        Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0100\4&2B9557D4&0
System speaker      Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0800\4&2B9557D4&0
System CMOS/real time clock   Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ACPI\PNP0B00\4&2B9557D4&0
Programmable interrupt controller       Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          ACPI\PNP0000\4&2B9557D4&0
Numeric data processor        Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ACPI\PNP0C04\4&2B9557D4&0
Direct memory access controller         Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          ACPI\PNP0200\4&2B9557D4&0
Motherboard resources         Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ACPI\PNP0C02\1F
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_8086&DEV_27B8&SUBSYS_00000000&REV_0
1\3&61AAA01&0&F8
Intel(R) 82801 PCI Bridge - 244E        Yes
          SYSTEM    5.2.3790.1830       10/1/2002
          Intel     machine.inf         Not Available
          PCI\VEN_8086&DEV_244E&SUBSYS_00000000&REV_E
1\3&61AAA01&0&F0
USB Root Hub        Yes       USB       5.2.3790.0
          10/1/2002 (Standard USB Host Controller)
          usbport.inf         Not Available
          USB\ROOT_HUB20\4&393835B&0
Standard Enhanced PCI to USB Host Controller      Yes
          USB       5.2.3790.0          10/1/2002
          (Standard USB Host Controller)
          usbport.inf         Not Available
          PCI\VEN_8086&DEV_27CC&SUBSYS_3206103C&REV_0
1\3&61AAA01&0&EF
HID-compliant mouse Yes       MOUSE     5.2.3790.0
          10/1/2002 Microsoft msmouse.inf         Not
Available
          HID\VID_0000&PID_0000&MI_01\7&35B7FE4E&0&00
00
USB Human Interface Device    Yes       HIDCLASS
          5.2.3790.0          10/1/2002 (Standard
system devices)     input.inf Not Available
```

```
          USB\VID_0000&PID_0000&MI_01\6&232E42B&0&000
1
HID Keyboard Device Yes       KEYBOARD  5.2.3790.0
          10/1/2002 (Standard keyboards)
          keyboard.inf        Not Available
          HID\VID_0000&PID_0000&MI_00\7&447875F&0&000
0
USB Human Interface Device    Yes       HIDCLASS
          5.2.3790.0          10/1/2002 (Standard
system devices)     input.inf Not Available
          USB\VID_0000&PID_0000&MI_00\6&232E42B&0&000
0
USB Composite Device          Yes       USB
          5.2.3790.0          10/1/2002 (Standard USB
Host Controller)    usb.inf   Not Available
          USB\VID_0000&PID_0000\601545E48CC134
USB Root Hub        Yes       USB       5.2.3790.0
          10/1/2002 (Standard USB Host Controller)
          usbport.inf         Not Available
          USB\ROOT_HUB\4&389CB90A&0
Standard Universal PCI to USB Host Controller     Yes
          USB       5.2.3790.0          10/1/2002
          (Standard USB Host Controller)
          usbport.inf         Not Available
          PCI\VEN_8086&DEV_27CB&SUBSYS_3206103C&REV_0
1\3&61AAA01&0&EB
USB Root Hub        Yes       USB       5.2.3790.0
          10/1/2002 (Standard USB Host Controller)
          usbport.inf         Not Available
          USB\ROOT_HUB\4&621ED3D&0
Standard Universal PCI to USB Host Controller     Yes
          USB       5.2.3790.0          10/1/2002
          (Standard USB Host Controller)
          usbport.inf         Not Available
          PCI\VEN_8086&DEV_27CA&SUBSYS_3206103C&REV_0
1\3&61AAA01&0&EA
USB Root Hub        Yes       USB       5.2.3790.0
          10/1/2002 (Standard USB Host Controller)
          usbport.inf         Not Available
          USB\ROOT_HUB\4&148839B4&0
Standard Universal PCI to USB Host Controller     Yes
          USB       5.2.3790.0          10/1/2002
          (Standard USB Host Controller)
          usbport.inf         Not Available
          PCI\VEN_8086&DEV_27C9&SUBSYS_3206103C&REV_0
1\3&61AAA01&0&E9
USB Root Hub        Yes       USB       5.2.3790.0
          10/1/2002 (Standard USB Host Controller)
          usbport.inf         Not Available
          USB\ROOT_HUB\4&35838BF7&0
Standard Universal PCI to USB Host Controller     Yes
          USB       5.2.3790.0          10/1/2002
          (Standard USB Host Controller)
          usbport.inf         Not Available
          PCI\VEN_8086&DEV_27C8&SUBSYS_3206103C&REV_0
1\3&61AAA01&0&E8
HP NC320i PCIe Gigabit Server Adapter   Yes       NET
          9.81.0.0  8/28/2006 Hewlett-Packard Company
          oem0.inf  Not Available
          PCI\VEN_14E4&DEV_1659&SUBSYS_7032103C&REV_2
1\4&261E705A&0&00E5
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_8086&DEV_27E2&SUBSYS_00000000&REV_0
1\3&61AAA01&0&E5
Plug and Play Monitor         Yes       MONITOR
          5.1.2001.0          6/6/2001  (Standard
monitor types)      monitor.inf         Not Available
          DISPLAY\AVO0402\5&3006B4AB&0&12345678&03&00

Standard VGA Graphics Adapter Yes       DISPLAY
          5.2.3790.0          10/1/2002 (Standard
display types)      display.inf         Not Available
          PCI\VEN_102B&DEV_0522&SUBSYS_31FA103C&REV_0
2\4&2D8B019B&0&00E4
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_8086&DEV_27E0&SUBSYS_00000000&REV_0
1\3&61AAA01&0&E4
HP NC110T PCIe Gigabit Server Adapter   Yes       NET
          9.6.31.0  11/1/2006 Hewlett-Packard Company
          oem1.inf  Not Available
          PCI\VEN_8086&DEV_10B9&SUBSYS_704A103C&REV_0
6\4&6C79FC5&0&00E0
PCI standard PCI-to-PCI bridge          Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          PCI\VEN_8086&DEV_27D0&SUBSYS_00000000&REV_0
1\3&61AAA01&0&E0
PCI standard host CPU bridge  Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          PCI\VEN_8086&DEV_2778&SUBSYS_00000000&REV_C
0\3&61AAA01&0&00
PCI bus   Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0A03\2&DABA3FF&0
Intel Processor     Yes       PROCESSOR 5.2.3790.1830
          10/1/2002 Intel     cpu.inf   Not Available
          ACPI\GENUINEINTEL_-
_X86_FAMILY_15_MODEL_6\_1
Intel Processor     Yes       PROCESSOR 5.2.3790.1830
          10/1/2002 Intel     cpu.inf   Not Available
          ACPI\GENUINEINTEL_-
_X86_FAMILY_15_MODEL_6\_0
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
ComSpec   %SystemRoot%\system32\cmd.exe <SYSTEM>
Path
          %SystemRoot%\system32;%SystemRoot%;%SystemR
oot%\System32\Wbem;C:\Program Files\Microsoft SQL
Server\80\Tools\Binn\;C:\Program Files\Microsoft SQL
Server\90\Tools\binn\;C:\Program Files\Microsoft SQL
Server\90\DTS\Binn\;C:\Program Files\Microsoft SQL
Server\90\Tools\Binn\VSShell\Common7\IDE\;C:\Program
Files\Microsoft Visual Studio
8\Common7\IDE\PrivateAssemblies\        <SYSTEM>
windir    %SystemRoot%        <SYSTEM>
OS        Windows_NT          <SYSTEM>
PROCESSOR_ARCHITECTURE        x86       <SYSTEM>
PROCESSOR_LEVEL     15        <SYSTEM>
PROCESSOR_IDENTIFIER          x86 Family 15 Model 6
Stepping 4, GenuineIntel      <SYSTEM>
PROCESSOR_REVISION  0604      <SYSTEM>
NUMBER_OF_PROCESSORS          2         <SYSTEM>
ClusterLog          C:\WINDOWS\Cluster\cluster.log
          <SYSTEM>
PATHEXT
          .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF
;.WSH     <SYSTEM>
TEMP      %SystemRoot%\TEMP   <SYSTEM>
TMP       %SystemRoot%\TEMP   <SYSTEM>
FP_NO_HOST_CHECK    NO        <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
          MLC1\Administrator
TMP       %USERPROFILE%\Local Settings\Temp
          MLC1\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

[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       360       11
          204800    1413120   3/15/2007 2:01 PM   Not
Available Not Available       Not Available
csrss.exe Not Available       556       13        Not
Available Not Available       3/15/2007 2:01 PM   Not
Available Not Available       Not Available
winlogon.exe        c:\windows\system32\winlogon.exe
          712       13        204800    1413120
          3/15/2007 2:01 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   497.00 KB (508,928
bytes)    3/5/2007 1:10 PM
services.exe        c:\windows\system32\services.exe
          756       9         204800    1413120
          3/15/2007 2:01 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   107.50 KB (110,080
bytes)    3/25/2003 7:00 AM
lsass.exe c:\windows\system32\lsass.exe 768       9
          204800    1413120   3/15/2007 2:01 PM
          5.2.3790.0 (srv03_rtm.030324-2048)
          13.00 KB (13,312 bytes)       3/25/2003
7:00 AM
svchost.exe         c:\windows\system32\svchost.exe
          976       8         204800    1413120
          3/15/2007 2:01 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   14.00 KB (14,336 bytes)
          3/5/2007 1:10 PM
svchost.exe         Not Available       1060      8
          Not Available       Not Available
          3/15/2007 2:01 PM   Not Available       Not
Available Not Available
svchost.exe         Not Available       1116      8
          Not Available       Not Available
          3/15/2007 2:01 PM   Not Available       Not
Available Not Available
svchost.exe         c:\windows\system32\svchost.exe
          1172      8         204800    1413120
          3/15/2007 2:01 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   14.00 KB (14,336 bytes)
          3/5/2007 1:10 PM
msdtc.exe Not Available       1560      8         Not
Available Not Available       3/15/2007 2:02 PM   Not
Available Not Available       Not Available
svchost.exe         c:\windows\system32\svchost.exe
          1756      8         204800    1413120
          3/15/2007 2:02 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   14.00 KB (14,336 bytes)
          3/5/2007 1:10 PM
inetinfo.exe
          c:\windows\system32\inetsrv\inetinfo.exe
          1804      8         204800    1413120
          3/15/2007 2:02 PM   6.0.3790.1830
(srv03_sp1_rtm.050324-1447)   14.00 KB (14,336 bytes)
          3/5/2007 1:11 PM
```

```
svchost.exe         Not Available       1864      8
          Not Available       Not Available
          3/15/2007 2:02 PM   Not Available       Not
Available Not Available
svchost.exe         Not Available       1912      8
          Not Available       Not Available
          3/15/2007 2:02 PM   Not Available       Not
Available Not Available
svchost.exe         c:\windows\system32\svchost.exe
          508       8         204800    1413120
          3/15/2007 2:02 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   14.00 KB (14,336 bytes)
          3/5/2007 1:10 PM
svchost.exe         c:\windows\system32\svchost.exe
          280       8         204800    1413120
          3/15/2007 2:02 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   14.00 KB (14,336 bytes)
          3/5/2007 1:10 PM
wmiprvse.exe        Not Available       240       8
          Not Available       Not Available
          3/15/2007 2:03 PM   Not Available       Not
Available Not Available
logon.scr Not Available       1972      4         Not
Available Not Available       3/15/2007 2:12 PM   Not
Available Not Available       Not Available
w3wp.exe  c:\windows\system32\inetsrv\w3wp.exe
          1456      8         204800    1413120
          3/15/2007 3:22 PM   6.0.3790.1830
(srv03_sp1_rtm.050324-1447)   7.00 KB (7,168 bytes)
          3/5/2007 1:11 PM
dllhost.exe         c:\windows\system32\dllhost.exe
          620       8         204800    1413120
          3/15/2007 3:22 PM   5.2.3790.0
(srv03_rtm.030324-2048)       5.50 KB (5,632 bytes)
          3/25/2003 7:00 AM
csrss.exe Not Available       3760      13        Not
Available Not Available       3/20/2007 4:06 PM   Not
Available Not Available       Not Available
winlogon.exe        c:\windows\system32\winlogon.exe
          2024      13        204800    1413120
          3/20/2007 4:06 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   497.00 KB (508,928
bytes)    3/5/2007 1:10 PM
rdpclip.exe         c:\windows\system32\rdpclip.exe
          3728      8         204800    1413120
          3/20/2007 4:06 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   68.00 KB (69,632 bytes)
          3/5/2007 1:10 PM
explorer.exe        c:\windows\explorer.exe
          1820      8         204800    1413120
          3/20/2007 4:06 PM   6.00.3790.1830
(srv03_sp1_rtm.050324-1447)   1.00 MB (1,050,624
bytes)    3/5/2007 1:11 PM
helpctr.exe
          c:\windows\pchealth\helpctr\binaries\helpct
r.exe     3748      8         204800    1413120
          3/20/2007 4:35 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   778.00 KB (796,672
bytes)    3/5/2007 1:11 PM
helpsvc.exe
          c:\windows\pchealth\helpctr\binaries\helpsv
c.exe     956       8         204800    1413120
          3/20/2007 4:35 PM   5.2.3790.1830
(srv03_sp1_rtm.050324-1447)   745.00 KB (762,880
bytes)    3/5/2007 1:11 PM
wmiprvse.exe        Not Available       2724      8
          Not Available       Not Available
          3/20/2007 4:35 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)     3/5/2007 1:10
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
7:00 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) 3/5/2007 1:10
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
7:00 AM   Microsoft Corporation
          c:\windows\system32\advapi32.dll
rpcrt4    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          627.00 KB (642,048 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\rpcrt4.dll
crypt32   5.131.3790.1830 (srv03_sp1_rtm.050324-1447)
          582.00 KB (595,968 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\crypt32.dll
msasn1    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          56.50 KB (57,856 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\msasn1.dll
msvcrt    7.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          340.50 KB (348,672 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\msvcrt.dll
user32    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          574.50 KB (588,288 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\user32.dll
gdi32     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          273.00 KB (279,552 bytes)     3/5/2007 1:10
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
7:00 AM   Microsoft Corporation
          c:\windows\system32\nddeapi.dll
profmap   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          22.50 KB (23,040 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\profmap.dll
netapi32  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          341.50 KB (349,696 bytes)     3/5/2007 1:10
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
7:00 AM   Microsoft Corporation
          c:\windows\system32\userenv.dll
psapi     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          20.00 KB (20,480 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\psapi.dll
regapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          55.00 KB (56,320 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\regapi.dll
secur32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          64.00 KB (65,536 bytes)       3/5/2007 1:10
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
7:00 AM   Microsoft Corporation
          c:\windows\system32\setupapi.dll
version   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          18.00 KB (18,432 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\version.dll
winsta    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          54.50 KB (55,808 bytes)       3/5/2007 1:10
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)       3/5/2007 1:10
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)       3/5/2007 1:10
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)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\msgina.dll
shsvcs    6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          131.50 KB (134,656 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\shsvcs.dll
shlwapi   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          313.50 KB (321,024 bytes)     3/5/2007 1:10
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
7:00 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)     3/5/2007 1:10
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)     3/5/2007 1:10
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
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7:00 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)     3/5/2007 1:10
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
10:41 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
7:00 AM   Microsoft Corporation
          c:\windows\system32\winscard.dll
wtsapi32  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          19.00 KB (19,456 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\wtsapi32.dll
sxs       5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          743.50 KB (761,344 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\sxs.dll
winmm     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          172.50 KB (176,640 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\winmm.dll
shell32   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          7.99 MB (8,379,392 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\shell32.dll
rsaenh    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          183.98 KB (188,392 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\rsaenh.dll
wldap32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          174.50 KB (178,688 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\wldap32.dll
cscdll    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          100.00 KB (102,400 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\cscdll.dll
dimsntfy  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          19.00 KB (19,456 bytes)       3/5/2007 1:12
PM        Microsoft Corporation
          c:\windows\system32\dimsntfy.dll
wlnotify  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          94.50 KB (96,768 bytes)       3/5/2007 1:10
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
7:00 AM   Microsoft Corporation
          c:\windows\system32\mpr.dll
oleaut32  5.2.3790.1830       543.00 KB (556,032
bytes)    3/25/2003 7:00 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
7:00 AM   Microsoft Corporation
          c:\windows\system32\winspool.drv
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comctl32  5.82 (srv03_sp1_rtm.050324-1447)
          585.00 KB (599,040 bytes)     3/24/2005
10:41 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)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\uxtheme.dll
clbcatq   2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     502.50 KB (514,560 bytes)     3/5/2007 1:10
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
7:00 AM   Microsoft Corporation
          c:\windows\system32\comres.dll
wbemprox  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          20.50 KB (20,992 bytes)       3/5/2007 1:11
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)     3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\wbem\wbemcomn.dll
xpsp2res  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          2.76 MB (2,897,920 bytes)     3/5/2007 1:12
PM        Microsoft Corporation
          c:\windows\system32\xpsp2res.dll
wbemsvc   5.2.3790.0 (srv03_rtm.030324-2048)
          42.50 KB (43,520 bytes)       3/5/2007
12:08 PM  Microsoft Corporation
          c:\windows\system32\wbem\wbemsvc.dll
fastprox  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          471.00 KB (482,304 bytes)     3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\wbem\fastprox.dll
msvcp60   6.05.2144.0         388.00 KB (397,312
bytes)    3/25/2003 7:00 AM   Microsoft Corporation
          c:\windows\system32\msvcp60.dll
ntdsapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          71.00 KB (72,704 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\ntdsapi.dll
dnsapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          153.50 KB (157,184 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\dnsapi.dll
services  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          107.50 KB (110,080 bytes)     3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\services.exe
ncobjapi  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          36.00 KB (36,864 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\ncobjapi.dll
scesrv    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          327.00 KB (334,848 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\scesrv.dll
authz     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          66.50 KB (68,096 bytes)       3/5/2007 1:10
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PM        Microsoft Corporation
          c:\windows\system32\authz.dll
umpnpmgr  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          126.50 KB (129,536 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\umpnpmgr.dll
eventlog  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          67.50 KB (69,120 bytes)       3/5/2007 1:10
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
7:00 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
7:00 AM   Microsoft Corporation
          c:\windows\system32\lsasrv.dll
samlib    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          46.50 KB (47,616 bytes)       3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\samlib.dll
samsrv    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          450.50 KB (461,312 bytes)     3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\samsrv.dll
cryptdll  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          32.00 KB (32,768 bytes)       3/5/2007 1:10
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
7:00 AM   Microsoft Corporation
          c:\windows\system32\msprivs.dll
kerberos  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          340.50 KB (348,672 bytes)     3/5/2007 1:10
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)     3/5/2007 1:10
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)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\iphlpapi.dll
netlogon  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          409.50 KB (419,328 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\netlogon.dll
w32time   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          222.00 KB (227,328 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\w32time.dll
schannel  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          141.00 KB (144,384 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\schannel.dll
wdigest   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          74.00 KB (75,776 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\wdigest.dll
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rassfm    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          23.00 KB (23,552 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\rassfm.dll
kdcsvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          213.50 KB (218,624 bytes)     3/5/2007 1:10
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)     3/5/2007 1:10
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) 3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\esent.dll
ntdsatq   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          29.50 KB (30,208 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\ntdsatq.dll
mswsock   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          250.50 KB (256,512 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\mswsock.dll
scecli    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          186.50 KB (190,976 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\scecli.dll
ws03res   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          793.50 KB (812,544 bytes)     3/5/2007 1:12
PM        Microsoft Corporation
          c:\windows\system32\ws03res.dll
pstorsvc  5.2.3790.0 (srv03_rtm.030324-2048)
          24.00 KB (24,576 bytes)       3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\pstorsvc.dll
psbase    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          84.00 KB (86,016 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\psbase.dll
hnetcfg   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          343.50 KB (351,744 bytes)     3/5/2007 1:10
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
7:00 AM   Microsoft Corporation
          c:\windows\system32\wshtcpip.dll
w3ssl     6.0.3790.0 (srv03_rtm.030324-2048)
          15.00 KB (15,360 bytes)       3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\w3ssl.dll
strmfilt  6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          84.00 KB (86,016 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\strmfilt.dll
httpapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          24.00 KB (24,576 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\httpapi.dll
dssenh    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          139.98 KB (143,336 bytes)     3/5/2007 1:10
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PM        Microsoft Corporation
          c:\windows\system32\dssenh.dll
svchost   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          14.00 KB (14,336 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\svchost.exe
rpcss     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          406.00 KB (415,744 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\rpcss.dll
ntmarta   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          120.50 KB (123,392 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\ntmarta.dll
audiosrv  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          40.50 KB (41,472 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\audiosrv.dll
wkssvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          130.00 KB (133,120 bytes)     3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\wkssvc.dll
wiarpc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          32.50 KB (33,280 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\wiarpc.dll
aelupsvc  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          26.00 KB (26,624 bytes)       3/5/2007 1:12
PM        Microsoft Corporation
          c:\windows\system32\aelupsvc.dll
apphelp   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          146.50 KB (150,016 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\apphelp.dll
cryptsvc  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          55.50 KB (56,832 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\cryptsvc.dll
certcli   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          227.00 KB (232,448 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\certcli.dll
atl       3.05.2283 83.00 KB (84,992 bytes)
          3/25/2003 7:00 AM   Microsoft Corporation
          c:\windows\system32\atl.dll
vssapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          548.00 KB (561,152 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\vssapi.dll
es        2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     233.00 KB (238,592 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\es.dll
pchsvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          39.00 KB (39,936 bytes)       3/5/2007 1:11
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
7:00 AM   Microsoft Corporation
          c:\windows\system32\srvsvc.dll
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comsvcs   2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     1.19 MB (1,248,256 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\comsvcs.dll
sens      5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          36.50 KB (37,376 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\sens.dll
wmisvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          140.00 KB (143,360 bytes)     3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\wbem\wmisvc.dll
browser   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          76.50 KB (78,336 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\browser.dll
xactsrv   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          90.00 KB (92,160 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\xactsrv.dll
netrap    5.2.3790.0 (srv03_rtm.030324-2048)
          11.50 KB (11,776 bytes)       3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\netrap.dll
wbemcore  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          497.50 KB (509,440 bytes)     3/5/2007 1:11
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)     3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\wbem\esscli.dll
wmiutils  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          93.50 KB (95,744 bytes)       3/5/2007 1:11
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)     3/5/2007 1:11
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)     3/5/2007 1:11
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)     3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\wbem\wbemess.dll
ncprov    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          46.50 KB (47,616 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\wbem\ncprov.dll
mprapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          89.00 KB (91,136 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\mprapi.dll
activeds  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          194.00 KB (198,656 bytes)     3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\activeds.dll
adsldpc   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          146.00 KB (149,504 bytes)     3/5/2007 1:11
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PM        Microsoft Corporation
          c:\windows\system32\adsldpc.dll
credui    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          162.00 KB (165,888 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\credui.dll
rtutils   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          34.50 KB (35,328 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\rtutils.dll
ntlsapi   5.2.3790.0 (srv03_rtm.030324-2048)
          8.00 KB (8,192 bytes)         3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\ntlsapi.dll
netman    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          258.50 KB (264,704 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\netman.dll
netshell  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.73 MB (1,812,992 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\netshell.dll
clusapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          60.00 KB (61,440 bytes)       3/5/2007 1:10
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
7:00 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
7:00 AM   Microsoft Corporation
          c:\windows\system32\rasman.dll
tapi32    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          179.50 KB (183,808 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\tapi32.dll
wininet   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          646.00 KB (661,504 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\wininet.dll
wzcsapi   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          41.00 KB (41,984 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\wzcsapi.dll
wzcsvc    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          364.50 KB (373,248 bytes)     3/5/2007 1:10
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
7:00 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
7:00 AM   Microsoft Corporation
          c:\windows\system32\dhcpcsvc.dll
netcfgx   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          763.00 KB (781,312 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\netcfgx.dll
```

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winipsec  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          35.50 KB (36,352 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\winipsec.dll
rasmans   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          176.00 KB (180,224 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\rasmans.dll
rasdlg    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          663.00 KB (678,912 bytes)     3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\rasdlg.dll
rasadhlp  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          7.50 KB (7,680 bytes)         3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\rasadhlp.dll
ersvc     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          24.00 KB (24,576 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\ersvc.dll
inetinfo  6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          14.00 KB (14,336 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\inetinfo.exe

iisutil   6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          164.00 KB (167,936 bytes)     3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\iisutil.dll
rpcref    6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          4.00 KB (4,096 bytes)         3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\rpcref.dll
iisrtl    6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          138.50 KB (141,824 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\iisrtl.dll
iisadmin  6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          21.00 KB (21,504 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\iisadmin.dll

coadmin   6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          62.50 KB (64,000 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\coadmin.dll
admwprox  6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          47.00 KB (48,128 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\admwprox.dll
iiscfg    6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.08 MB (1,133,056 bytes)     3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\iiscfg.dll
metadata  6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          229.00 KB (234,496 bytes)     3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\metadata.dll

msxml3    8.70.1104.0         1.06 MB (1,107,456
bytes)    3/5/2007 1:10 PM    Microsoft Corporation
          c:\windows\system32\msxml3.dll
```

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svcext    6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          43.50 KB (44,544 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\svcext.dll
security  5.2.3790.0 (srv03_rtm.030324-2048)
          5.50 KB (5,632 bytes)         3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\security.dll
iismap    6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          58.50 KB (59,904 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\iismap.dll
wamreg    6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          54.50 KB (55,808 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\wamreg.dll
iisw3adm  6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          211.00 KB (216,064 bytes)     3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\iisw3adm.dll

w3cache   6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          19.00 KB (19,456 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\w3cache.dll
w3tp      6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          13.00 KB (13,312 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\w3tp.dll
lonsint   6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          13.00 KB (13,312 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\lonsint.dll
termsrv   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          239.00 KB (244,736 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\termsrv.dll
icaapi    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          12.50 KB (12,800 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\icaapi.dll
mstlsapi  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          116.00 KB (118,784 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\mstlsapi.dll
rdpwsx    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          101.63 KB (104,072 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\rdpwsx.dll
w3wp      6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          7.00 KB (7,168 bytes)         3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\w3wp.exe
w3core    6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          340.50 KB (348,672 bytes)     3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\w3core.dll
w3comlog  6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          10.50 KB (10,752 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\w3comlog.dll
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w3dt      6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          38.50 KB (39,424 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\w3dt.dll
wsock32   5.2.3790.0 (srv03_rtm.030324-2048)
          22.00 KB (22,528 bytes)       3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\wsock32.dll
iisres    6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          120.00 KB (122,880 bytes)     3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\iisres.dll
aspnet_filter       2.0.50727.42 (RTM.050727-4200)
          10.50 KB (10,752 bytes)       9/23/2005
8:28 AM   Microsoft Corporation
          c:\windows\microsoft.net\framework\v2.0.507
27\aspnet_filter.dll
msvcr80   8.00.50727.42       612.00 KB (626,688
bytes)    9/23/2005 8:29 AM   Microsoft Corporation
          c:\windows\winsxs\x86_microsoft.vc80.crt_1f
c8b3b9a1e18e3b_8.0.50727.42_x-ww_0de06acd\msvcr80.dll

w3isapi   6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          61.00 KB (62,464 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\w3isapi.dll
winrnr    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          17.00 KB (17,408 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\winrnr.dll
gzip      6.0.3790.1830 (srv03_sp1_rtm.050324-1447)
          25.00 KB (25,600 bytes)       3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\system32\inetsrv\gzip.dll
"\\?\c:\inetpub\wwwroot\tpcc.dll"

          "\\?\c:\inetpub\wwwroot\tpcc.dll"
msvcr71   7.10.3052.4         340.00 KB (348,160
bytes)    3/6/2007 8:42 AM    Microsoft Corporation
          c:\windows\system32\msvcr71.dll
tpcc_com  Not Available       11.50 KB (11,776 bytes)
          3/6/2007 8:42 AM    Not Available
          c:\inetpub\wwwroot\tpcc_com.dll
tpcc_odbc Not Available       21.00 KB (21,504 bytes)
          3/6/2007 8:42 AM    Not Available
          c:\inetpub\wwwroot\tpcc_odbc.dll
odbc32    3.526.1830.0 (srv03_sp1_rtm.050324-1447)
          240.00 KB (245,760 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\odbc32.dll
comdlg32  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          274.50 KB (281,088 bytes)     3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\comdlg32.dll
odbcint   3.526.1830.0 (srv03_sp1_rtm.050324-1447)
          92.00 KB (94,208 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\odbcint.dll
sqlsrv32  2000.086.1830.00 (srv03_sp1_rtm.050324-
1447)     436.00 KB (446,464 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\sqlsrv32.dll
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sqlunirl  2000.080.0728.00    176.56 KB (180,800
bytes)    3/5/2007 1:10 PM    Microsoft Corporation
          c:\windows\system32\sqlunirl.dll
sqlsrv32  2000.086.1830.00 (srv03_sp1_rtm.050324-
1447)     88.00 KB (90,112 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\sqlsrv32.rll
odbccp32  3.526.1830.0 (srv03_sp1_rtm.050324-1447)
          100.00 KB (102,400 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\odbccp32.dll
dbnetlib  2000.086.1830 (srv03_sp1_rtm.050324-1447)
          112.00 KB (114,688 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\dbnetlib.dll
tpcc_com_all        1, 0, 0, 1          104.00 KB
(106,496 bytes)     3/6/2007 8:42 AM
          c:\inetpub\wwwroot\tpcc_com_all.dll
dllhost   5.2.3790.0 (srv03_rtm.030324-2048)
          5.50 KB (5,632 bytes)         3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\dllhost.exe
txflog    2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     96.50 KB (98,816 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\txflog.dll
xolehlp   2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     10.50 KB (10,752 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\xolehlp.dll
msdtcprx  2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     455.50 KB (466,432 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\msdtcprx.dll
mtxclu    2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     77.00 KB (78,848 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\mtxclu.dll
resutils  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          63.50 KB (65,024 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\resutils.dll
catsrv    2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     273.00 KB (279,552 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\catsrv.dll
clbcatex  2001.12.4720.1830 (srv03_sp1_rtm.050324-
1447)     102.50 KB (104,960 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\clbcatex.dll
rdpsnd    5.2.3790.0 (srv03_rtm.030324-2048)
          18.00 KB (18,432 bytes)       3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\rdpsnd.dll
scredir   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          28.00 KB (28,672 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\scredir.dll
cscui     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          319.50 KB (327,168 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\cscui.dll
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msacm32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          22.00 KB (22,528 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\msacm32.drv
msacm32   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          69.50 KB (71,168 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\msacm32.dll
imaadp32  5.2.3790.0 (srv03_rtm.030324-2048)
          15.50 KB (15,872 bytes)       3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\imaadp32.acm
msadp32   5.2.3790.0 (srv03_rtm.030324-2048)
          14.50 KB (14,848 bytes)       3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\msadp32.acm
msg711    5.2.3790.0 (srv03_rtm.030324-2048)
          10.00 KB (10,240 bytes)       3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\msg711.acm
msgsm32   5.2.3790.0 (srv03_rtm.030324-2048)
          20.50 KB (20,992 bytes)       3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\msgsm32.acm
tssoft32  1.01      9.50 KB (9,728 bytes)
          3/25/2003 7:00 AM   DSP GROUP, INC.
          c:\windows\system32\tssoft32.acm
tsd32     1.03      16.50 KB (16,896 bytes)
          3/25/2003 7:00 AM   DSP GROUP, INC.
          c:\windows\system32\tsd32.dll
msg723    5.2.3790.1830       120.00 KB (122,880
bytes)    3/5/2007 1:10 PM    Microsoft Corporation
          c:\windows\system32\msg723.acm
msaud32   8.00.00.4487        288.00 KB (294,912
bytes)    3/25/2003 7:00 AM   Microsoft Corporation
          c:\windows\system32\msaud32.acm
sl_anet   3.02      84.00 KB (86,016 bytes)
          3/25/2003 7:00 AM   Sipro Lab Telecom Inc.
          c:\windows\system32\sl_anet.acm
l3codeca  1, 9, 0, 0305       284.00 KB (290,816
bytes)    3/25/2003 7:00 AM   Fraunhofer Institut
Integrierte Schaltungen IIS
          c:\windows\system32\l3codeca.acm
rdpclip   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          68.00 KB (69,632 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\rdpclip.exe
urlmon    6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          673.00 KB (689,152 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\urlmon.dll
explorer  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          1.00 MB (1,050,624 bytes)     3/5/2007 1:11
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) 3/5/2007 1:10
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)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\shdocvw.dll
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cryptui   5.131.3790.1830 (srv03_sp1_rtm.050324-1447)
          496.50 KB (508,416 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\cryptui.dll
themeui   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          377.50 KB (386,560 bytes)     3/5/2007 1:10
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
7:00 AM   Microsoft Corporation
          c:\windows\system32\msimg32.dll
linkinfo  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          19.00 KB (19,456 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\linkinfo.dll
ntshrui   6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          140.00 KB (143,360 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\ntshrui.dll
webcheck  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          272.50 KB (279,040 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\webcheck.dll
stobject  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          120.50 KB (123,392 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\stobject.dll
batmeter  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          31.50 KB (32,256 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\batmeter.dll
powrprof  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          16.50 KB (16,896 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\powrprof.dll
shdoclc   6.00.3790.0 (srv03_rtm.030324-2048)
          588.50 KB (602,624 bytes)     3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\shdoclc.dll
drprov    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          14.00 KB (14,336 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\drprov.dll
ntlanman  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          43.50 KB (44,544 bytes)       3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\ntlanman.dll
netui0    5.2.3790.0 (srv03_rtm.030324-2048)
          75.50 KB (77,312 bytes)       3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\netui0.dll
netui1    5.2.3790.0 (srv03_rtm.030324-2048)
          184.00 KB (188,416 bytes)     3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\netui1.dll
davclnt   5.2.3790.0 (srv03_rtm.030324-2048)
          23.50 KB (24,064 bytes)       3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\davclnt.dll
browselc  6.00.3790.0 (srv03_rtm.030324-2048)
          62.00 KB (63,488 bytes)       3/25/2003
```

```
7:00 AM   Microsoft Corporation
          c:\windows\system32\browselc.dll
mlang     6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          577.50 KB (591,360 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\mlang.dll
mprui     5.2.3790.0 (srv03_rtm.030324-2048)
          49.00 KB (50,176 bytes)       3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\mprui.dll
netui2    5.2.3790.0 (srv03_rtm.030324-2048)
          309.50 KB (316,928 bytes)     3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\netui2.dll
netmsg    5.2.3790.0 (srv03_rtm.030324-2048)
          178.00 KB (182,272 bytes)     3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\netmsg.dll
netplwiz  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          855.00 KB (875,520 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\netplwiz.dll
helpctr   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          778.00 KB (796,672 bytes)     3/5/2007 1:11
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)         3/5/2007
12:10 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)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\itss.dll
pchshell  5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          104.50 KB (107,008 bytes)     3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\pchshe
ll.dll
mshtml    6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          2.96 MB (3,108,864 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\mshtml.dll
msls31    3.10.349.0          142.00 KB (145,408
bytes)    3/5/2007 1:10 PM    Microsoft Corporation
          c:\windows\system32\msls31.dll
msimtf    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          156.00 KB (159,744 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\msimtf.dll
msctf     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          311.00 KB (318,464 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\msctf.dll
jscript   5.6.0.8827          448.00 KB (458,752
bytes)    3/5/2007 1:10 PM    Microsoft Corporation
          c:\windows\system32\jscript.dll
imm32     5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          108.00 KB (110,592 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\imm32.dll
```

```
mshtmled  6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
          454.50 KB (465,408 bytes)     3/5/2007 1:10
PM        Microsoft Corporation
          c:\windows\system32\mshtmled.dll
vbscript  5.6.0.8827          392.00 KB (401,408
bytes)    3/5/2007 1:10 PM    Microsoft Corporation
          c:\windows\system32\vbscript.dll
msinfo    5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          376.00 KB (385,024 bytes)     3/5/2007 1:11
PM        Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\msinfo
.dll
mfc42u    6.06.8063.0         1.11 MB (1,163,776
bytes)    3/5/2007 1:10 PM    Microsoft Corporation
          c:\windows\system32\mfc42u.dll
riched32  5.2.3790.0 (srv03_rtm.030324-2048)
          3.50 KB (3,584 bytes)         3/25/2003
7:00 AM   Microsoft Corporation
          c:\windows\system32\riched32.dll
riched20  5.31.23.1224        439.00 KB (449,536
bytes)    3/5/2007 1:10 PM    Microsoft Corporation
          c:\windows\system32\riched20.dll
helpsvc   5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
          745.00 KB (762,880 bytes)     3/5/2007 1:11
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  Running   Auto
          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 v2.0.50727_X86
          clr_optimization_v2.0.50727_32
          Stopped   Manual    Own Process
          c:\windows\microsoft.net\framework\v2.0.507
27\mscorsvw.exe     Ignore    LocalSystem         0

COM+ System Application       COMSysApp Running
          Manual    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       Stopped
          Manual    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  Stopped
          Manual    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
          Auto      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          Running   Manual
          Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
IIS Admin Service   IISADMIN  Running   Auto
          Share Process
          c:\windows\system32\inetsrv\inetinfo.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   Stopped
          Disabled  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
Windows Installer   MSIServer Stopped   Manual
          Share Process
          c:\windows\system32\msiexec.exe /v
          Normal    LocalSystem         0
Visual Studio 2005 Remote Debugger      msvsmon80
          Stopped   Disabled  Own Process
          "c:\program files\microsoft visual studio
8\common7\ide\remote debugger\x86\msvsmon.exe"
/service msvsmon80  Ignore    LocalSystem         0

Network DDE         NetDDE    Stopped   Disabled
          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   Manual
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Network Location Awareness (NLA)        Nla
          Running   Manual    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
          Stopped   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         Stopped
          Disabled  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
          Stopped   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   Disabled  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    NT AUTHORITY\NetworkService   0

Remote Procedure Call (RPC)   RpcSs     Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k rpcss
          Normal    NT Authority\NetworkService   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  Stopped   Disabled
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Secondary Logon     seclogon  Stopped   Disabled
          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   Stopped   Disabled  Own
Process   c:\windows\system32\spoolsv.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   Stopped   Disabled  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   Disabled  Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Distributed Link Tracking Client        TrkWks
          Stopped   Disabled  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    NT
AUTHORITY\LocalService        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
World Wide Web Publishing Service       W3SVC
          Running   Auto      Share Process
          c:\windows\system32\svchost.exe -k iissvcs
          Normal    LocalSystem         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  Stopped   Disabled
          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
HP System Tools     All Users:HP System Tools     All
Users
HP System Tools\HP Array Configuration Utility    All
Users:HP System Tools\HP Array Configuration Utility
          All Users
HP System Tools\HP Array Configuration Utility CLI
          All Users:HP System Tools\HP Array
Configuration Utility CLI     All Users
HP System Tools\HP Array Diagnostic Utility       All
Users:HP System Tools\HP Array Diagnostic Utility All
Users
Microsoft SQL Server 2005     All Users:Microsoft SQL
Server 2005         All Users
Microsoft SQL Server 2005\Analysis Services       All
Users:Microsoft SQL Server 2005\Analysis Services All
Users
Microsoft SQL Server 2005\Configuration Tools     All
Users:Microsoft SQL Server 2005\Configuration Tools
          All Users
Microsoft SQL Server 2005\Documentation and Tutorials
          All Users:Microsoft SQL Server
2005\Documentation and Tutorials        All Users
Microsoft SQL Server 2005\Documentation and
Tutorials\Tutorials All Users:Microsoft SQL Server
2005\Documentation and Tutorials\Tutorials        All
Users
Microsoft SQL Server 2005\Performance Tools       All
Users:Microsoft SQL Server 2005\Performance Tools All
Users
Microsoft Visual Studio 2005  All Users:Microsoft
Visual Studio 2005  All Users
Microsoft Visual Studio 2005\Visual Studio Tools  All
Users:Microsoft Visual Studio 2005\Visual Studio
Tools     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         MLC1\Administrator:Accessories
          MLC1\Administrator
Accessories\Accessibility
          MLC1\Administrator:Accessories\Accessibilit
y         MLC1\Administrator
Accessories\Entertainment
          MLC1\Administrator:Accessories\Entertainmen
t         MLC1\Administrator
```

```
Administrative Tools
          MLC1\Administrator:Administrative Tools
          MLC1\Administrator
Startup   MLC1\Administrator:Startup
          MLC1\Administrator

[Startup Programs]

Program   Command   User Name Location
desktop   desktop.ini         NT AUTHORITY\SYSTEM
          Startup
desktop   desktop.ini         MLC1\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 6:55:26 PM
          C:\WINDOWS\system32 Microsoft Corporation

advpack.dll         6.0.3790.1830       98 KB
          3/24/2005 6:55:28 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 6:56:10 PM
          C:\WINDOWS\system32 Microsoft Corporation

cdfview.dll         6.0.3790.1830       149 KB
          3/24/2005 6:56:32 PM
          C:\WINDOWS\system32 Microsoft Corporation

comctl32.dll        5.82.3790.1830      585 KB
          3/24/2005 6:57:56 PM
          C:\WINDOWS\system32 Microsoft Corporation

dxtrans.dll         6.3.3790.1830       205 KB
          3/24/2005 7:00:58 PM
          C:\WINDOWS\system32 Microsoft Corporation

dxtmsft.dll         6.3.3790.1830       355 KB
          3/24/2005 7:00:58 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 7:04:58 PM
          C:\WINDOWS\system32 Microsoft Corporation

iepeers.dll         6.0.3790.1830       248 KB
          3/24/2005 7:04:58 PM
          C:\WINDOWS\system32 Microsoft Corporation

iesetup.dll         6.0.3790.1830       61 KB
          3/24/2005 7:04:58 PM
          C:\WINDOWS\system32 Microsoft Corporation

ieuinit.inf         Not Available       24 KB
          3/24/2005 7:04:58 PM
          C:\WINDOWS\system32 Not Available
iexplore.exe        6.0.3790.1830       92 KB
          3/24/2005 7:04:58 PM          C:\Program
Files\Internet Explorer       Microsoft Corporation

imgutil.dll         6.0.3790.1830       38 KB
          3/24/2005 7:05:04 PM
          C:\WINDOWS\system32 Microsoft Corporation

inetcpl.cpl         6.0.3790.1830       358 KB
          3/24/2005 7:05:06 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 7:05:06 PM
          C:\WINDOWS\system32 Microsoft Corporation

mlang.dll 6.0.3790.1830       578 KB    3/24/2005
7:07:20 PM          C:\WINDOWS\system32 Microsoft
Corporation
msencode.dll        2002.10.4.0         112 KB
          3/25/2003 7:00:00 AM
          C:\WINDOWS\system32 ???o?w??
mshta.exe 6.0.3790.1830       30 KB     3/24/2005
7:07:26 PM          C:\WINDOWS\system32 Microsoft
Corporation
mshtml.dll          6.0.3790.1830       3,036 KB
          3/24/2005 7:07:26 PM
          C:\WINDOWS\system32 Microsoft Corporation

mshtml.tlb          6.0.3790.1830       1,320 KB
          3/24/2005 7:07:26 PM
          C:\WINDOWS\system32 Microsoft Corporation

mshtmled.dll        6.0.3790.1830       455 KB
          3/24/2005 7:07:26 PM
          C:\WINDOWS\system32 Microsoft Corporation

mshtmler.dll        6.0.3790.1830       56 KB
          3/24/2005 7:07:26 PM
          C:\WINDOWS\system32 Microsoft Corporation

msident.dll         6.0.3790.1830       48 KB
          3/24/2005 7:07:28 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 7:07:28 PM
          C:\WINDOWS\system32 Microsoft Corporation

msrating.dll        6.0.3790.1830       144 KB
          3/24/2005 7:07:36 PM
          C:\WINDOWS\system32 Microsoft Corporation

mstime.dll          6.0.3790.1830       523 KB
          3/24/2005 7:07:38 PM
          C:\WINDOWS\system32 Microsoft Corporation

occache.dll         6.0.3790.1830       94 KB
          3/24/2005 7:08:34 PM
          C:\WINDOWS\system32 Microsoft Corporation
```

```
proctexe.ocx        6.3.3790.1830       83 KB
          3/24/2005 7:12:26 PM
          C:\WINDOWS\system32 Intel Corporation
sendmail.dll        6.0.3790.1830       56 KB
          3/24/2005 7:13:36 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 7:13:36 PM
          C:\WINDOWS\system32 Microsoft Corporation

shfolder.dll        6.0.3790.1830       25 KB
          3/24/2005 7:13:36 PM
          C:\WINDOWS\system32 Microsoft Corporation

shlwapi.dll         6.0.3790.1830       314 KB
          3/24/2005 7:13:40 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
7:26:12 PM          C:\WINDOWS\system32 Microsoft
Corporation
urlmon.dll          6.0.3790.1830       673 KB
          3/24/2005 7:26:12 PM
          C:\WINDOWS\system32 Microsoft Corporation

webcheck.dll        6.0.3790.1830       273 KB
          3/24/2005 7:26:16 PM
          C:\WINDOWS\system32 Microsoft Corporation

wininet.dll         6.0.3790.1830       646 KB
          3/24/2005 7:26:18 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
```

Microsoft COM Component Configuration Parameters

The component services tool in Windows 2003 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 164 queues. Delivery threads were set under the TPCC key in the registry.

Internet Information Server Registry Parameters

```
Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
InetInfo
Class Name:        <NO CLASS>
Last Write Time:   3/5/2007 - 1:51 PM

Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
InetInfo\Parameters
Class Name:        <NO CLASS>
Last Write Time:   3/6/2007 - 9:42 AM
Value 0
  Name:            ListenBackLog
  Type:            REG_DWORD
  Data:            0x19

Value 1
  Name:            PoolThreadLimit
  Type:            REG_DWORD
  Data:            0x7f8

Value 2
  Name:            MaxPoolThreads
  Type:            REG_DWORD
  Data:            0x3fc

Value 3
  Name:            ThreadTimeout
  Type:            REG_DWORD
  Data:            0x15180


Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
InetInfo\Performance
Class Name:        <NO CLASS>
Last Write Time:   3/5/2007 - 1:51 PM
Value 0
  Name:            Library
  Type:            REG_SZ
  Data:            infoctrs.dll

Value 1
  Name:            Open
  Type:            REG_SZ
  Data:            OpenINFOPerformanceData

Value 2
  Name:            Close
  Type:            REG_SZ
  Data:            CloseINFOPerformanceData

Value 3
  Name:            Collect
  Type:            REG_SZ
  Data:            CollectINFOPerformanceData

Value 4
  Name:            PerfIniFile
  Type:            REG_SZ
  Data:            infoctrs.ini

Value 5
  Name:            Last Counter
  Type:            REG_DWORD
  Data:            0x9a6

Value 6
  Name:            Last Help
  Type:            REG_DWORD
  Data:            0x9a7

Value 7
  Name:            First Counter
  Type:            REG_DWORD
  Data:            0x966

Value 8
  Name:            First Help
  Type:            REG_DWORD
  Data:            0x967

Value 9
  Name:            Object List
  Type:            REG_SZ
  Data:            2406

Value 10
  Name:            Library Validation Code
  Type:            REG_BINARY
  Data:
00000000   00 74 45 30 57 5f c7 01 - 00 20 00 00 00
00 00 00  .tE0W_Ç.. ......
```

World Wide Web Service Registry Parameters

```
Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
W3SVC
Class Name:        <NO CLASS>
Last Write Time:   3/15/2007 - 2:01 PM
Value 0
  Name:            Type
  Type:            REG_DWORD
  Data:            0x20

Value 1
  Name:            Start
  Type:            REG_DWORD
  Data:            0x2

Value 2
  Name:            ErrorControl
  Type:            REG_DWORD
  Data:            0x1

Value 3
  Name:            ImagePath
  Type:            REG_EXPAND_SZ
  Data:            %SystemRoot%\System32\svchost.exe
-k iissvcs

Value 4
  Name:            DisplayName
  Type:            REG_SZ
  Data:            World Wide Web Publishing Service

Value 5
  Name:            DependOnService
  Type:            REG_MULTI_SZ
  Data:            RPCSS
                   HTTPFilter
                   IISADMIN


Value 6
  Name:            DependOnGroup
  Type:            REG_MULTI_SZ
  Data:

Value 7
  Name:            ObjectName
  Type:            REG_SZ
  Data:            LocalSystem

Value 8
  Name:            Description
  Type:            REG_SZ
  Data:            Provides Web connectivity and
administration through the Internet Information
Services Manager

Value 9
  Name:            FailureActions
  Type:            REG_BINARY
  Data:
00000000   80 51 01 00 01 00 00 00 - 00 00 00 00 03
00 00 00  .Q..............
00000010   53 00 65 00 01 00 00 00 - 01 00 00 00 01
00 00 00  S.e.............
01 00 00 00 01 00 00 00 - 01 00 00 00
............


Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
W3SVC\Parameters
Class Name:        <NO CLASS>
Last Write Time:   3/6/2007 - 9:42 AM
Value 0
  Name:            MajorVersion
  Type:            REG_DWORD
  Data:            0x6

Value 1
  Name:            MinorVersion
  Type:            REG_DWORD
  Data:            0

Value 2
  Name:            InstallPath
  Type:            REG_SZ
  Data:            C:\WINDOWS\system32\inetsrv

Value 3
  Name:            AccessDeniedMessage
  Type:            REG_SZ
  Data:            Error: Access is Denied.

Value 4
  Name:            ServiceDll
  Type:            REG_EXPAND_SZ
  Data:
C:\WINDOWS\system32\inetsrv\iisw3adm.dll

Value 5
  Name:            AcceptExOutstanding
  Type:            REG_DWORD
  Data:            0x28


Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
W3SVC\Parameters\ADCLaunch
Class Name:        <NO CLASS>
Last Write Time:   3/5/2007 - 1:51 PM

Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
W3SVC\Parameters\ADCLaunch\AdvancedDataFactory
Class Name:        <NO CLASS>
Last Write Time:   3/5/2007 - 1:51 PM

Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
W3SVC\Parameters\ADCLaunch\RDSServer.DataFactory
Class Name:        <NO CLASS>
```

```
Last Write Time:   3/5/2007 - 1:51 PM

Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
W3SVC\Performance
Class Name:        <NO CLASS>
Last Write Time:   3/5/2007 - 1:51 PM
Value 0
  Name:            Library
  Type:            REG_SZ
  Data:
C:\WINDOWS\system32\inetsrv\w3ctrs.dll

Value 1
  Name:            Open
  Type:            REG_SZ
  Data:            OpenW3PerformanceData

Value 2
  Name:            Close
  Type:            REG_SZ
  Data:            CloseW3PerformanceData

Value 3
  Name:            Collect
  Type:            REG_SZ
  Data:            CollectW3PerformanceData

Value 4
  Name:            PerfIniFile
  Type:            REG_SZ
  Data:            w3ctrs.ini

Value 5
  Name:            Last Counter
  Type:            REG_DWORD
  Data:            0xa9e

Value 6
  Name:            Last Help
  Type:            REG_DWORD
  Data:            0xa9f

Value 7
  Name:            First Counter
  Type:            REG_DWORD
  Data:            0x9a8

Value 8
  Name:            First Help
  Type:            REG_DWORD
  Data:            0x9a9

Value 9
  Name:            Object List
  Type:            REG_SZ
  Data:            2472 2646

Value 10
  Name:            Library Validation Code
  Type:            REG_BINARY
  Data:
```

```
00000000   00 28 0a 35 57 5f c7 01 - 00 5e 00 00 00
00 00 00  .(.5W_Ç..^......



Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
W3SVC\Security
Class Name:        <NO CLASS>
Last Write Time:   3/5/2007 - 1:51 PM
Value 0
  Name:            Security
  Type:            REG_BINARY
  Data:
00000000   01 00 14 80 90 00 00 00 - 9c 00 00 00 14
00 00 00  ................
00000010   30 00 00 00 02 00 1c 00 - 01 00 00 00 02
80 14 00  0...............
00000020   ff 01 0f 00 01 01 00 00 - 00 00 00 01 00
00 00 00  ÿ...............
00000030   02 00 60 00 04 00 00 00 - 00 00 14 00 fd
01 02 00  ..`.........ý...
00000040   01 01 00 00 00 00 00 05 - 12 00 00 00 00
00 18 00  ................
00000050   ff 01 0f 00 01 02 00 00 - 00 00 00 05 20
00 00 00  ÿ.......... ...
00000060   20 02 00 00 00 00 14 00 - 8d 01 02 00 01
01 00 00   ...............
00000070   00 00 00 05 0b 00 00 00 - 00 00 18 00 fd
01 02 00  ............ý...
00000080   01 02 00 00 00 00 00 05 - 20 00 00 00 23
02 00 00  ........ ...#...
00000090   01 01 00 00 00 00 00 05 - 12 00 00 00 01
01 00 00  ................
00 00 00 05 12 00 00 00 -
........


Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
W3SVC\Enum
Class Name:        <NO CLASS>
Last Write Time:   3/15/2007 - 2:01 PM
Value 0
  Name:            0
  Type:            REG_SZ
  Data:            Root\LEGACY_W3SVC\0000

Value 1
  Name:            Count
  Type:            REG_DWORD
  Data:            0x1

Value 2
  Name:            NextInstance
  Type:            REG_DWORD
  Data:            0x1
```

TPCC Application Registry Parameters

```
Key Name:
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\TPCC
Class Name:        <NO CLASS>
Last Write Time:   3/6/2007 - 9:41 AM
Value 0
  Name:            Path
  Type:            REG_SZ
  Data:            C:\Inetpub\wwwroot\

Value 1
  Name:            NumberOfDeliveryThreads
  Type:            REG_DWORD
  Data:            0x3c

Value 2
  Name:            MaxConnections
  Type:            REG_DWORD
  Data:            0xc350

Value 3
  Name:            MaxPendingDeliveries
  Type:            REG_DWORD
  Data:            0x7d0

Value 4
  Name:            DB_Protocol
  Type:            REG_SZ
  Data:            ODBC

Value 5
  Name:            TxnMonitor
  Type:            REG_SZ
  Data:            COM

Value 6
  Name:            DbServer
  Type:            REG_SZ
  Data:            hope

Value 7
  Name:            DbName
  Type:            REG_SZ
  Data:            tpcc

Value 8
  Name:            DbUser
  Type:            REG_SZ
  Data:            sa

Value 9
  Name:            DbPassword
  Type:            REG_SZ
  Data:

Value 10
  Name:            COM_SinglePool
  Type:            REG_SZ
  Data:            YES

Value 11
  Name:            CallNoDuplicatesNewOrder
  Type:            REG_DWORD
  Data:            0x1

Value 12
  Name:            ConnectDelay
  Type:            REG_DWORD
  Data:            0x1
```

Benchcraft Profile

```
Profile:  hope_6664
File Path:          C:\Program
Files\BenchCraft\hope_6664.xml
Version:  5

          Number of Engines: 8

                    Name: RTE2
                    Description:
                    Directory: c:\blog\rte2.log
                    Machine: n10
                    Parameter Set: ExtraKick
                    Index: 800000000
                    Seed: 4678
                    Configured Users: 8330
                    Pipe Name: DRIVER53164609
                    Connect Rate: 100000
                    Start Rate: 100000
                    Max. Concurrency: 8330
                    Concurrency Rate: 0
                    CLIENT_NURAND: 25
                    CPU: 1
                    Additional Options:

                    Name: RTE1
                    Description:
                    Directory: c:\blog\rte1.log
                    Machine: n10
                    Parameter Set: ExtraKick
                    Index: 900000000
                    Seed: 4678
                    Configured Users: 8330
                    Pipe Name: DRIVER44265281
                    Connect Rate: 100000
                    Start Rate: 100000
                    Max. Concurrency: 8330
                    Concurrency Rate: 0
                    CLIENT_NURAND: 25
                    CPU: 0
                    Additional Options:

                    Name: RTE3
                    Description:
                    Directory: c:\blog\rte3.log
                    Machine: n10
                    Parameter Set: ExtraKick
                    Index: 200000000
                    Seed: 4678
                    Configured Users: 8330
                    Pipe Name: DRIVER3439676359
                    Connect Rate: 100000
                    Start Rate: 100000
                    Max. Concurrency: 8330
                    Concurrency Rate: 0
                    CLIENT_NURAND: 25
                    CPU: 0
                    Additional Options:

                    Name: RTE4
                    Description:
                    Directory: c:\blog\rte4.log
                    Machine: n10
                    Parameter Set: ExtraKick
                    Index: 300000000
                    Seed: 4678
                    Configured Users: 8330
                    Pipe Name: DRIVER4439706187
                    Connect Rate: 100000
                    Start Rate: 100000
                    Max. Concurrency: 8330
                    Concurrency Rate: 0
                    CLIENT_NURAND: 25
                    CPU: 1
                    Additional Options:

                    Name: RTE5
                    Description:
                    Directory: c:\blog\rte5.log
                    Machine: n11
                    Parameter Set: ExtraKick
                    Index: 400000000
                    Seed: 4678
                    Configured Users: 8330
                    Pipe Name: DRIVER5215703
                    Connect Rate: 100000
                    Start Rate: 100000
                    Max. Concurrency: 8330
                    Concurrency Rate: 0
                    CLIENT_NURAND: 25
                    CPU: 0
                    Additional Options:

                    Name: RTE6
                    Description:
                    Directory: c:\blog\rte6.log
                    Machine: n11
                    Parameter Set: ExtraKick
                    Index: 500000000
                    Seed: 4678
                    Configured Users: 8330
                    Pipe Name: DRIVER6282968
          Connect Rate: 100000
          Start Rate: 100000
          Max. Concurrency: 8330
          Concurrency Rate: 0
          CLIENT_NURAND: 25
          CPU: 0
          Additional Options:

          Name: RTE7
          Description:
          Directory: c:\blog\rte7.log
          Machine: n11
          Parameter Set: ExtraKick
          Index: 600000000
          Seed: 4678
          Configured Users: 8330
          Pipe Name: DRIVER7305953
          Connect Rate: 100000
          Start Rate: 100000
          Max. Concurrency: 8330
          Concurrency Rate: 0
          CLIENT_NURAND: 25
          CPU: 1
          Additional Options:

          Name: RTE8
          Description:
          Directory: c:\blog\rte8.log
          Machine: n11
          Parameter Set: ExtraKick
          Index: 700000000
          Seed: 4678
          Configured Users: 8330
          Pipe Name: DRIVER8341171
          Connect Rate: 100000
          Start Rate: 100000
          Max. Concurrency: 8330
          Concurrency Rate: 0
          CLIENT_NURAND: 25
          CPU: 1
          Additional Options:

Number of User groups: 8

          Driver Engine: RTE1
          IIS Server: mlc1
          SQL Server: hope
          Database: tpcc
          User: sa
          Protocol: HTML
          w_id Range: 1 - 833
          w_id Min Warehouse: 1
          w_id Max Warehouse: 6664
          Scale: Normal
          User Count: 8330
          District id: 1
          Scale Down: No

          Driver Engine: RTE2
          IIS Server: mlc1
          SQL Server: hope
          Database: tpcc
          User: sa
```

```
Protocol: HTML
w_id Range: 834 - 1666
w_id Min Warehouse: 1
w_id Max Warehouse: 6664
Scale: Normal
User Count: 8330
District id: 1
Scale Down: No

Driver Engine: RTE3
IIS Server: mlc1
SQL Server: hope
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1667 - 2499
w_id Min Warehouse: 1
w_id Max Warehouse: 6664
Scale: Normal
User Count: 8330
District id: 1
Scale Down: No

Driver Engine: RTE4
IIS Server: mlc1
SQL Server: hope
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 2500 - 3332
w_id Min Warehouse: 1
w_id Max Warehouse: 6664
Scale: Normal
User Count: 8330
District id: 1
Scale Down: No

Driver Engine: RTE5
IIS Server: mlc2
SQL Server: hope
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 3333 - 4165
w_id Min Warehouse: 1
w_id Max Warehouse: 6664
Scale: Normal
User Count: 8330
District id: 1
Scale Down: No

Driver Engine: RTE6
IIS Server: mlc2
SQL Server: hope
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 4166 - 4998
w_id Min Warehouse: 1
w_id Max Warehouse: 6664
Scale: Normal
User Count: 8330
District id: 1
```

```
                    Scale Down: No

                    Driver Engine: RTE7
                    IIS Server: mlc2
                    SQL Server: hope
                    Database: tpcc
                    User: sa
                    Protocol: HTML
                    w_id Range: 4999 - 5831
                    w_id Min Warehouse: 1
                    w_id Max Warehouse: 6664
                    Scale: Normal
                    User Count: 8330
                    District id: 1
                    Scale Down: No

                    Driver Engine: RTE8
                    IIS Server: mlc2
                    SQL Server: hope
                    Database: tpcc
                    User: sa
                    Protocol: HTML
                    w_id Range: 5832 - 6664
                    w_id Min Warehouse: 1
                    w_id Max Warehouse: 6664
                    Scale: Normal
                    User Count: 8330
                    District id: 1
                    Scale Down: No

          Number of Parameter Sets: 67


                    ~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
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    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
                                    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

                    1.6
                    1.6 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    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
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    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
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    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
                                    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

                    1.9
                    1.9 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    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
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    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
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
```

```
                    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
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    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
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    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
                    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         44.88
12.11       18.01      0.10      5.00      0.10
                    Payment           43.02
12.11        3.01      0.10      5.00      0.10
                    Delivery           4.03
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       4.03
10.10        2.01      0.10      5.00      0.10

                    1.001_best
                    1.001 tt best
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.91
12.06       18.01      0.10      5.00      0.10
                    Payment           43.04
12.06        3.01      0.10      5.00      0.10
                    Delivery           4.01
5.06         2.01      0.10      5.00      0.10
                    Stock Level        4.02
5.06         2.01      0.10     20.00      0.10
                    Order Status       4.02
10.06        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

                    1.005 better
                    1.005 tt more aggressive
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.90
12.11       18.01      0.10      5.00      0.10
                    Payment           43.05
12.11        3.01      0.10      5.00      0.10
                    Delivery           4.01
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       4.01
10.10        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      0.00      5.00      0.00
                    Payment           43.00
12.29        3.01      0.00      5.00      0.00
                    Delivery           4.00
5.15         2.01      0.00      5.00      0.00
                    Stock Level        4.03
5.15         2.01      0.00     20.00      0.00
                    Order Status       4.01
10.25        2.01      0.00      5.00      0.00

                    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
                    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         44.91
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       4.03
10.05        2.01      0.10      5.00      0.10

                    1.003 best
                    1.003 best
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.90
12.09       18.01      0.10      5.00      0.10
                    Payment           43.05
12.09        3.01      0.10      5.00      0.10
                    Delivery           4.01
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       4.01
10.08        2.01      0.10      5.00      0.10

                    ExtraKick
                    FullSpeedKick
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.92
12.03       18.01      0.10      5.00      0.10
                    Payment           43.01
12.03        3.01      0.10      5.00      0.10
                    Delivery           4.02
5.03         2.01      0.10      5.00      0.10
                    Stock Level        4.02
5.03         2.01      0.10     20.00      0.10
                    Order Status       4.03
10.03        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 HP Smart Array P800/512MB SAS Controller Controller default device driver (hpcisss.SYS) was replaced with the HP Smart Array P800/512MB SAS 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	**6,664**				TpmC	**82,774**
Table	Rows	Data KB	Index KB	Extra 5% KB	8hr Space	Total Space KB
Warehouse	6,664	**712**	**40**	38		790
District	66,640	**7,408**	**56**	373		7,837
Customer	199,920,000	**145,396,368**	**9,071,416**	7,723,389		162,191,173
History	199,920,000	**11,674,168**	**43,608**		2,552,621	11,717,776
New_order	59,976,000	**1,068,616**	**2,456**	53,554		1,124,626
Orders	199,920,000	**6,528,000**	**14,656**		3,450,591	6,542,656
Order_line	1,999,189,809	**131,094,416**	**308,760**		48,248,976	131,403,176
Item	100,000	**9,416**	**56**	474		9,946
Stock	666,400,000	**213,248,000**	**449,400**	10,684,870		224,382,270
Total		509,027,104	9,890,448	18,462,697	54,252,187	537,380,249
	MB					
Dynamic Space	145,797	Sum of Data for Order, Orderline and History				
Static Space	378,988	Sum of Data+Index+5%-Dynamic Space				
Free Space	na	Total Allocated Spac - (Dynamic + Static Space)				
Daily Growth	28,975	(Dynamic Space/(W*62.5))*tpmc				
Daily Spread	-	(Free Space -1.5*Daily Growth) Zero Assumed				
60 Day Space MB	2,117,510					
60 Day Space GB	2,067.88	GB				
Log Size	320,000.00	MB				
KB Per New Order	6.43	KB				
8 hr log MB	249,582	MB				
8 hr log GB	243.73	GB				
Space Usage	GB Needed	Disks Measured	GB Priced	Disk Size	Formatted Size	
60 Day Space DB	2,068	100	3,380.00	36GB	33.80	
			0.00			
			0.00			
Total DB			3,380.00			
8-hr log + mirror	487	6	820.20	146GB	136.70	
OS, Swap	3	2	67.60			
Total Storage	2,558.35	GB	4,267.80	GB		

	MSSQL_stk_fg	MSSQL_cust_fg	MSSQL_ol_fg	MSSQL_misc_fg
				790
				7,837
		162,191,173		
				14,270,397
				1,124,626
				9,993,247
			179,652,152	
				9,946
	224,382,270			
	224,382,270	162,191,173	179,652,152	25,406,842
files=	**4**	**4**	**4**	**4**
size=	**9,088,000**	**6,528,000**	**6,272,000**	**1,408,000**
Total=	36,352,000	26,112,000	25,088,000	5,632,000
8K blocks	290,816,000	208,896,000	200,704,000	45,056,000
	OK	OK	OK	OK

tpmC	82,774									
	Data	Index	Data	Index	Data	Index	Total	KB/New-	8-Hr	8-Hr
	Before KB	Before KB	After KB	After KB	Grow KB	Grow KB	Grow KB	Order	Growth KB	Growth MB
History	11,674,168	43,608	12,815,904	87,352	1,141,736	43,744	1,185,480	0.0642	2,552,621.16	2,492.79
Order	6,528,000	14,656	8,115,912	29,256	1,587,912	14,600	1,602,512	0.0868	3,450,590.52	3,369.72
Order-Line	131,094,416	308,760	153,192,848	617,960	22,098,432	309,200	22,407,632	1.2144	48,248,975.68	47,118.14
										52,980.65
	sum(*)		sum(*)		Num					
	Before		After		New-Order					
d_next_o_id	199,986,640		218,438,623		18,451,983					
								KB/New-	8-Hr Growth	8-Hr Growth
	Before MB		After MB		Grow MB			Order	MB	GB
Log	14,600.75		130,511.03		115,910.28			6.4325	249,582.48	243.73
								6,586.8661	bytes	
320,000	4.5627346		40.784698							
Database tpcc log used (%)										

Appendix E:
Third Party Quotes

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

Tel 425 882 8080
Fax 425 936 7329
http://www.microsoft.com/

Microsoft

March 2, 2007

Hewlett-Packard
Company
David Adams
20555 SH 249
Houston, TX 77070

David Adams:

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
228-04026	**SQL Server 2005 Standard Edition (x64)** *Per Processor License* *Discount Schedule: No Discount Applied*	$5,999	1	$5,999
P73-00295	**Windows Server 2003 Standard (x64) Edition** *Server License Only - No CALs* *Discount Schedule: Open Program – No Level* *Unit Price reflects a 28% discount from the retail unit price of $999.*	$719	1	$719
P73-00295	**Windows Server 2003, Standard Edition** *Server License Only - No CALs* *Discount Schedule: Open Program – No Level* *Unit Price reflects a 28% discount from the retail unit price of $999.*	$719	2	$1,438
254-00170	**Visual C++ Standard Edition** *No Discounts Applied*	$109	1	$109
N/A	**Microsoft Problem Resolution Services** *Professional Support* *(1 Incident)*	$245	1	$245

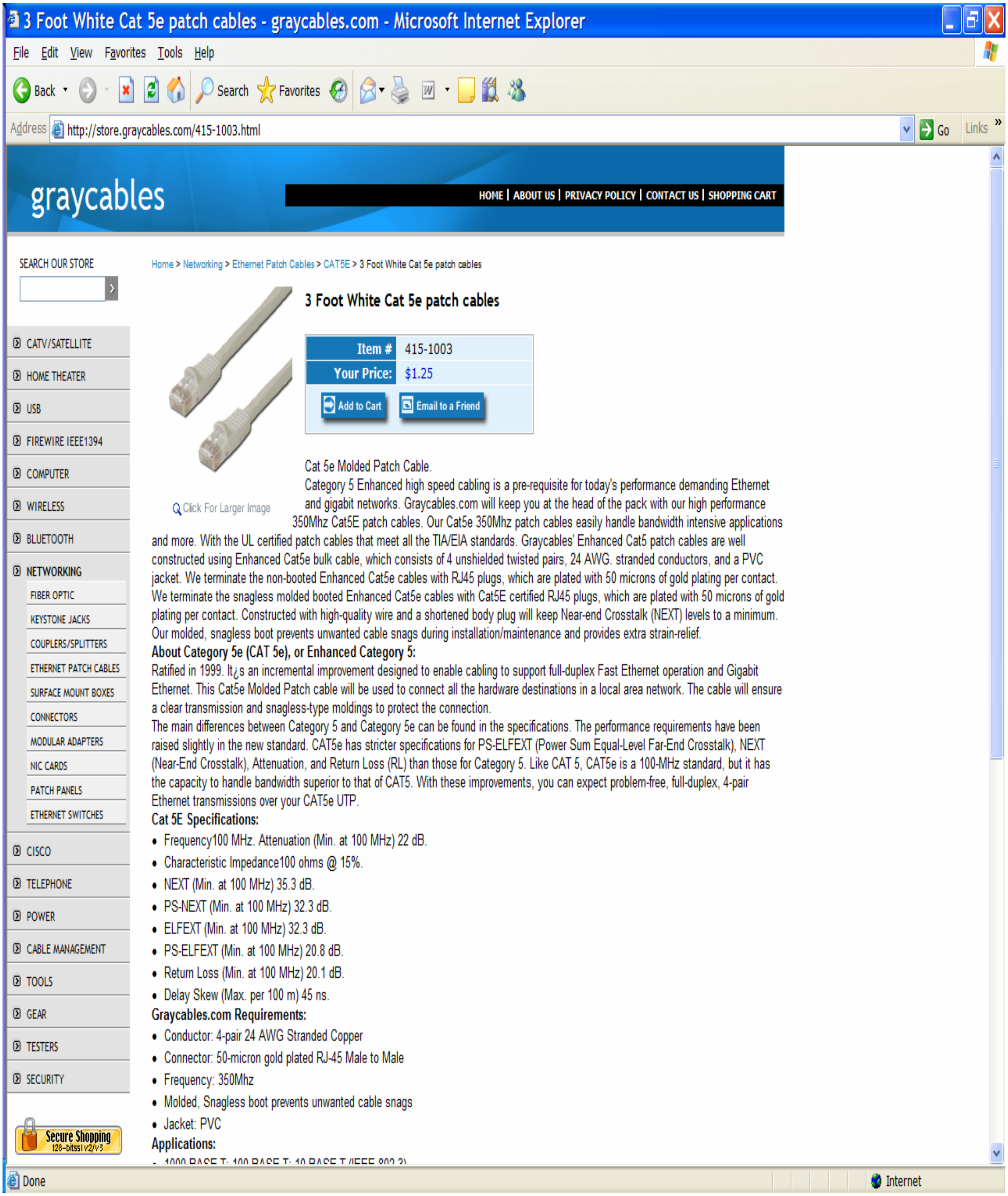
All products are currently orderable through Microsoft's normal distribution channels. A list of these distribution channels can be found at http://www.microsoft.com/products/info/render.aspx?type=mnp&content=22%2flicensing&View=22.

Defect support is included in the purchase price. Additional support is available from Microsoft PSS on an incident by incident basis at $245 per call.

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.

Reference ID: PCdaad0703028372.
Please include this Reference ID in any correspondence regarding this price quote.



3 Foot White Cat 5e patch cables

Item #	415-1003
Your Price:	$1.25

Cat 5e Molded Patch Cable.

Category 5 Enhanced high speed cabling is a pre-requisite for today's performance demanding Ethernet and gigabit networks. Graycables.com will keep you at the head of the pack with our high performance 350Mhz Cat5E patch cables. Our Cat5e 350Mhz patch cables easily handle bandwidth intensive applications and more. With the UL certified patch cables that meet all the TIA/EIA standards. Graycables' Enhanced Cat5 patch cables are well constructed using Enhanced Cat5e bulk cable, which consists of 4 unshielded twisted pairs, 24 AWG. stranded conductors, and a PVC jacket. We terminate the non-booted Enhanced Cat5e cables with RJ45 plugs, which are plated with 50 microns of gold plating per contact. We terminate the snagless molded booted Enhanced Cat5e cables with Cat5E certified RJ45 plugs, which are plated with 50 microns of gold plating per contact. Constructed with high-quality wire and a shortened body plug will keep Near-end Crosstalk (NEXT) levels to a minimum. Our molded, snagless boot prevents unwanted cable snags during installation/maintenance and provides extra strain-relief.

About Category 5e (CAT 5e), or Enhanced Category 5:

Ratified in 1999. It¿s an incremental improvement designed to enable cabling to support full-duplex Fast Ethernet operation and Gigabit Ethernet. This Cat5e Molded Patch cable will be used to connect all the hardware destinations in a local area network. The cable will ensure a clear transmission and snagless-type moldings to protect the connection.

The main differences between Category 5 and Category 5e can be found in the specifications. The performance requirements have been raised slightly in the new standard. CAT5e has stricter specifications for PS-ELFEXT (Power Sum Equal-Level Far-End Crosstalk), NEXT (Near-End Crosstalk), Attenuation, and Return Loss (RL) than those for Category 5. Like CAT 5, CAT5e is a 100-MHz standard, but it has the capacity to handle bandwidth superior to that of CAT5. With these improvements, you can expect problem-free, full-duplex, 4-pair Ethernet transmissions over your CAT5e UTP.

Cat 5E Specifications:

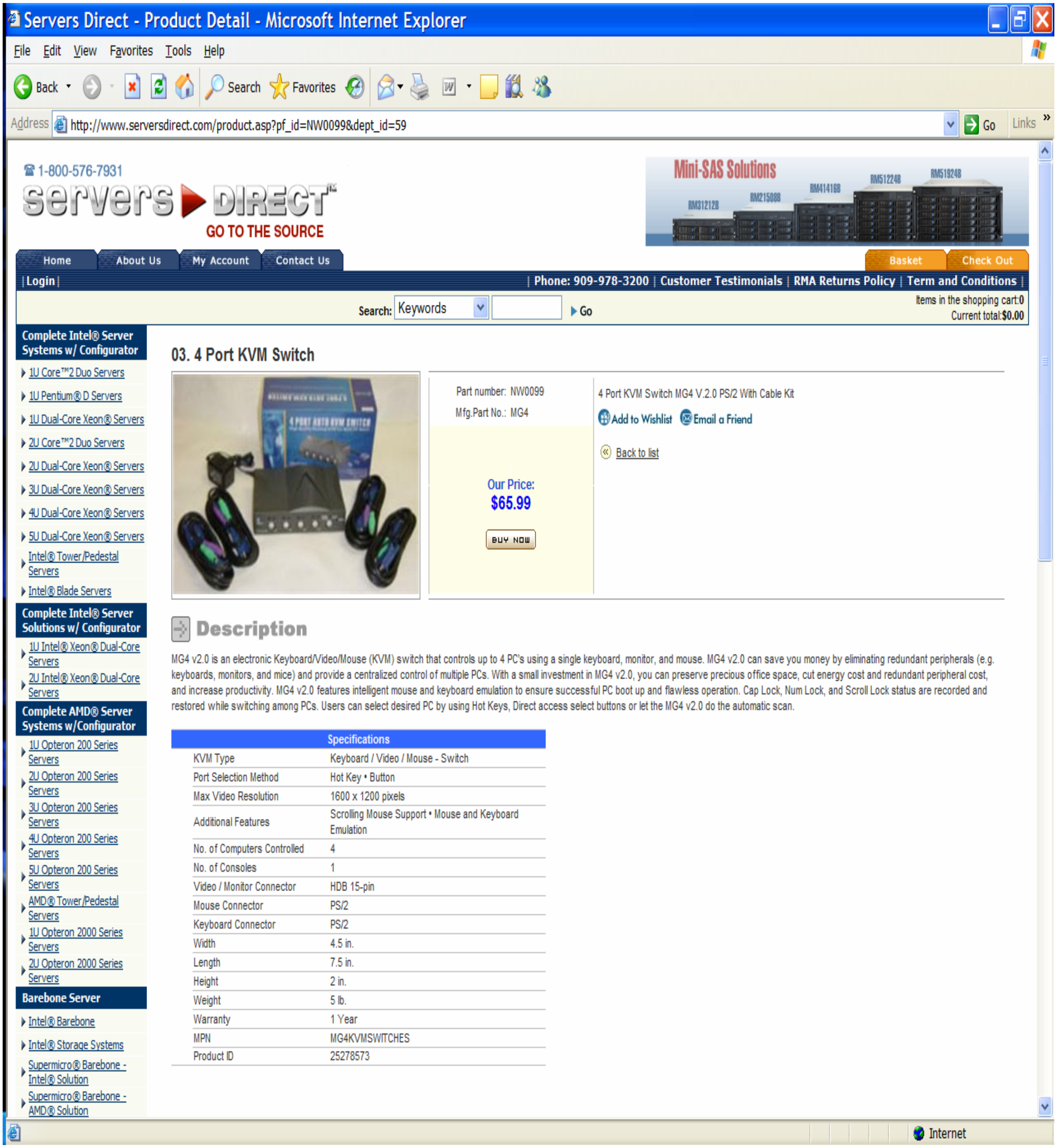
- Frequency100 MHz. Attenuation (Min. at 100 MHz) 22 dB.
- Characteristic Impedance100 ohms @ 15%.
- NEXT (Min. at 100 MHz) 35.3 dB.
- PS-NEXT (Min. at 100 MHz) 32.3 dB.
- ELFEXT (Min. at 100 MHz) 32.3 dB.
- PS-ELFEXT (Min. at 100 MHz) 20.8 dB.
- Return Loss (Min. at 100 MHz) 20.1 dB.
- Delay Skew (Max. per 100 m) 45 ns.

Graycables.com Requirements:

- Conductor: 4-pair 24 AWG Stranded Copper
- Connector: 50-micron gold plated RJ-45 Male to Male
- Frequency: 350Mhz
- Molded, Snagless boot prevents unwanted cable snags
- Jacket: PVC

Applications:

- 1000 BASE T; 100 BASE T; 10 BASE T (IEEE 802.3)


Servers Direct - Product Detail - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://www.serversdirect.com/product.asp?pf_id=NW0099&dept_id=59
Go Links
☎ 1-800-576-7931
servers DIRECT
GO TO THE SOURCE
Mini-SAS Solutions
RM31212B RM21508B RM41416B RM51224B RM51924B
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Search: Keywords Go
Items in the shopping cart:0
Current total:$0.00
Complete Intel® Server Systems w/ Configurator
1U Core™2 Duo Servers
1U Pentium® D Servers
1U Dual-Core Xeon® Servers
2U Core™2 Duo Servers
2U Dual-Core Xeon® Servers
3U Dual-Core Xeon® Servers
4U Dual-Core Xeon® Servers
5U Dual-Core Xeon® Servers
Intel® Tower/Pedestal Servers
Intel® Blade Servers
Complete Intel® Server Solutions w/ Configurator
1U Intel® Xeon® Dual-Core Servers
2U Intel® Xeon® Dual-Core Servers
Complete AMD® Server Systems w/Configurator
1U Opteron 200 Series Servers
2U Opteron 200 Series Servers
3U Opteron 200 Series Servers
4U Opteron 200 Series Servers
5U Opteron 200 Series Servers
AMD® Tower/Pedestal Servers
1U Opteron 2000 Series Servers
2U Opteron 2000 Series Servers
Barebone Server
Intel® Barebone
Intel® Storage Systems
Supermicro® Barebone - Intel® Solution
Supermicro® Barebone - AMD® Solution
4 PORT AUTO KVM SWITCH
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Internet

03. 4 Port KVM Switch

Part number: NW0099

Mfg.Part No.: MG4

4 Port KVM Switch MG4 V.2.0 PS/2 With Cable Kit

Our Price:
$65.99

Description

MG4 v2.0 is an electronic Keyboard/Video/Mouse (KVM) switch that controls up to 4 PC's using a single keyboard, monitor, and mouse. MG4 v2.0 can save you money by eliminating redundant peripherals (e.g. keyboards, monitors, and mice) and provide a centralized control of multiple PCs. With a small investment in MG4 v2.0, you can preserve precious office space, cut energy cost and redundant peripheral cost, and increase productivity. MG4 v2.0 features intelligent mouse and keyboard emulation to ensure successful PC boot up and flawless operation. Cap Lock, Num Lock, and Scroll Lock status are recorded and restored while switching among PCs. Users can select desired PC by using Hot Keys, Direct access select buttons or let the MG4 v2.0 do the automatic scan.

Specifications	
KVM Type	Keyboard / Video / Mouse - Switch
Port Selection Method	Hot Key • Button
Max Video Resolution	1600 x 1200 pixels
Additional Features	Scrolling Mouse Support • Mouse and Keyboard Emulation
No. of Computers Controlled	4
No. of Consoles	1
Video / Monitor Connector	HDB 15-pin
Mouse Connector	PS/2
Keyboard Connector	PS/2
Width	4.5 in.
Length	7.5 in.
Height	2 in.
Weight	5 lb.
Warranty	1 Year
MPN	MG4KVMSWITCHES
Product ID	25278573

Appendix F:
Price Verification

All components available at time of publication.
HP Direct: 800-203-6748
For price verification before order date: e-mail hp.pricing.desk@hp.com