Compaq Computer Corporation

TPC Benchmark™ C
Full Disclosure Report
for
Proliant DL580 6/900
using
Microsoft SQL Server 2000 Standard Edition
and
Windows 2000 Server

Second Edition
October 2001

Second Edition – October 2001

Compaq Computer Corporation (Compaq) believes that the information in this document is accurate as of the publication date. The information in this document is subject to change without notice. Compaq assumes no responsibility for any errors that may appear in this document. The pricing information in this document is believed to accurately reflect the current prices as of the publication date. However, Compaq provides no warranty of the pricing information in this document.

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. Compaq 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.

Printed in U.S.A., 2001
Compaq, NonStop, Proliant DL580, and ProLiant are registered trademarks of Compaq Computer Corporation.

Microsoft, Windows 2000 and SQL Server 2000 are registered trademarks of Microsoft Corporation.

Pentium III Xeon is a registered trademark of Intel.

TPC Benchmark is a trademark of the Transaction Processing Performance Council.

Other product names mentioned in this document may be trademarks and/or registered trademarks of their respective companies.

Table of Contents

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 5.0, released March 7, 2001.

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 Compaq Proliant ML530. The operating system used for the benchmark was Windows 2000 Advanced Server. The DBMS used was Microsoft SQL Server 2000 Enterprise Edition.

TPC Benchmark C Metrics

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

39158.09 tpmC
$7.95 per tpmC

The availability date is October 15, 2001.

Standard and Executive Summary Statements

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

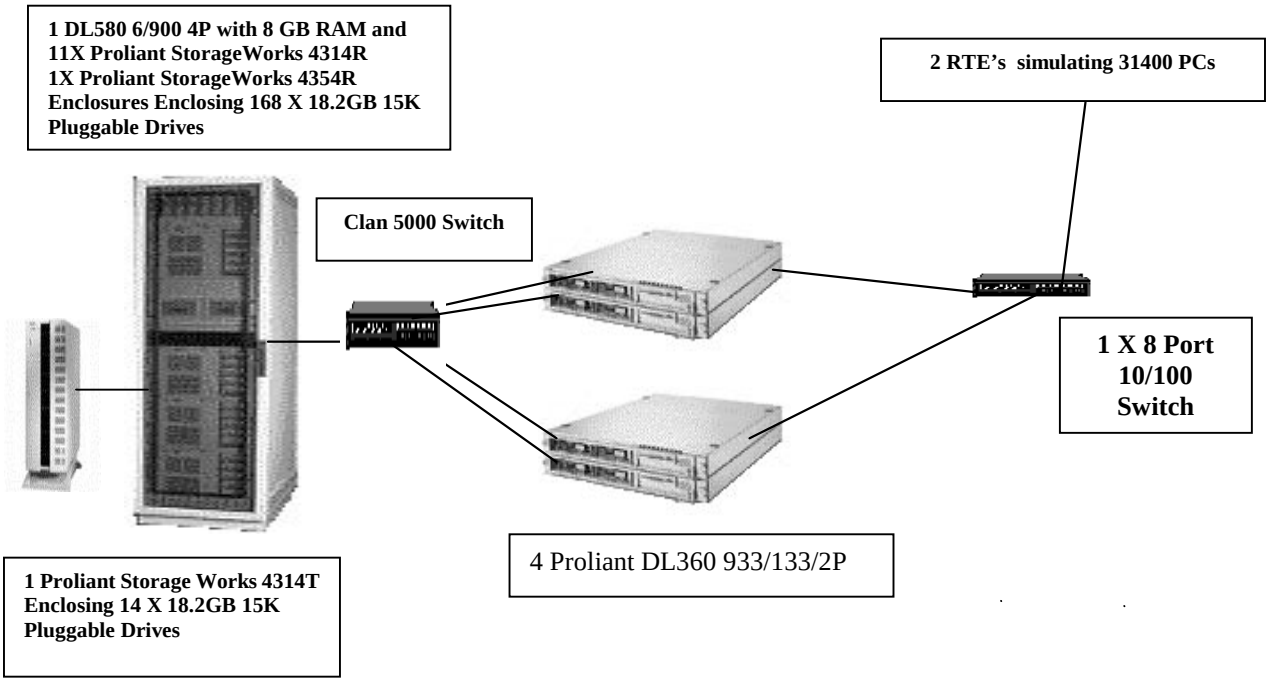
Auditor

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

Compaq Computer Corporation	Proliant DL580 6/900 C/S with 4 ProLiant DL360	TPC-C Rev. 5.0 Report Date: Sept 27, 2001

Total System Cost	TPC-C Throughput	Price/Performance	Availability Date
$310,945	**39158.09**	**$7.95**	**Oct 15, 2001**

Processors	Database Manager	Operating System	Other Software	Number of Users
4 Pentium III Xeon 900 Mhz – Server 8 Pentium III 933MHz – Client	Microsoft SQL Server 2000 Enterprise Edition	Windows 2000 Advanced Server	Microsoft Visual C++ Microsoft COM+	**31400**



	Server		Each Client	
System Components	Quantity	Description	Quantity	Description
Processor	4	900 Mhz Pentium III Xeon w/ 2M Cache	2	933MhzPentium III w/ 256K cache
Memory	16	512MB	4	128MB
Disk Controllers	5	SMART 5304 Array Controller	1	Integrated Ultra SCSI Controller
Disk Drives	182 1	18GB SCSI Drive 9.1 GB SCSI drive	1	9.1GB SCSI Drive
Total Storage		3084.27 GB		9.1GB
Tape Drives	1	12/24 GB DAT		

Compaq Computer Corporation	ProLiant DL580-900 Client/Server				TPC-C Rev. 5.0 Report Date:		27-Sep-01
Description	Part Number	Third Party Brand	Pricing	Unit Price	Qty	Extended Price	3 yr. Maint. Price
Server Hardware							
Compaq Proliant DL580 6/900 2 Pentium III Xeon 900MHz/100-2MB Processor 1GBB registered 100Mhz SDRAM DIMM CD-ROM 24X Integrated RAID,Redundant Power Supply	155618-003		1	16,129	1	16,129	
Pentium III Xeon 900/100-2MB Processor Option Kit	222627-B21		1	6,199	2	12,398	
2GB SDRAM (4x512) memory kit	189082-B21		1	2,849	4	11,396	
StorageWorks Enclosure Model 4314R	190209-001		1	2,955	11	32,505	
StorageWorks Enclosure Model 4314T	190210-001		1	3,182	1	3,182	
StorageWorks Enclosure Model 4354	190211-001		1	3,523	1	3,523	
Compaq SMART Array Controller 5304	158939-B21		1	2,499	5	12,495	
Deskpro Easy Access Keyboard	122660-006		1	44	1	44	
Compaq Scroll Mouse	170299-B21		1	23	1	23	
S510 Color Monitor - Carbon - 15 inch CRT	168636-002		1	189	1	189	
12/24-Gigabyte DAT Drive (Internal)	295513-B22		1	682	1	682	
Compaq Rack Model 9142 (42U - Opal) - Shock Pallet	120663-B21		1	1,352	1	1,352	
Side Panel Kit - 9142 Rack	120670-B21		1	212	1	212	
R3000 UPS	242705-001		1	1,431	1	1,431	
9.1-GB Pluggable Wide Ultra SCSI 3 Universal 10K Drive (1"	142671-B22		1	319	1	319	
18.2 GB Hot-Plug Wide U3 15K 1"	188122-B22		1	679	182	123,578	
18.2 GB Hot-Plug U3 15K 1" (10% spares for all 18GB drives	188122-B22		1	679	19		12,901
CarePaq Service - Departmental Servers 3Yr,7x24,4hr Resp.	FM-MI724-36		1	1,795	1		1,795
CarePaq Service - 42xx/43xx Enclosure 3Yr,7x24,4hr Resp.	FM-4E724-36		1	157	13		2,041
					Subtotal	**219,458**	**16,737**
Server Software							
Microsoft SQL Server 2000 Enterprise Edition (per processor	810-00846	Microsoft	2	16,541	4	66,164	6,285
Microsoft Visual C++ 6.0	048-00317	Microsoft	2	549	1	549	Incl Above
Microsoft Windows 2000 Advanced Server	C10-00475	Microsoft	2	2,399	1	2,399	Incl Above
					Subtotal	**69,112**	**6,285**
Client Hardware							
ProLiant DL360R P933/133 128MB M1 Pentium III 933MHz , 256KB level two ECC cache,Two integrated 10/100 T/X NIC, Integrated Smart Array Controller	210645-001		1	2,249	4	8,996	
PIII 933/133-256 Processor kit	210647-B21		1	649	4	2,596	
128 MB 133 DIMM	128277-B21		1	125	12	1,500	
S510 Color Monitor - Carbon - 15 inch CRT	168636-002		1	189	4	756	
Compaq Scroll Mouse	170299-B21		1	21	4	84	
Deskpro Easy Access Keyboard	122660-006		1	44	4	176	
9.1-GB Pluggable Wide Ultra SCSI 3 Universal 10K Drive (1"	142671-B22		1	319	4	1,276	
CarePaq Service - Entry Workgroup Servers 3Yr,7x24,4hr	FM-EL724-36		1	750	4		3,000
					Subtotal	**15,384**	**3,000**
Client Software							
Microsoft Windows 2000 Server	C11-00821	Microsoft	2	738	4	2,952	Incl. Above
					Subtotal	**2,952**	**0**
Connectivity							
cLAN 5000 switch	CL5000	Emulex	3	6,250	3	**18,750**	**See Note 1**
cLAN 1000 HBA	CLS004	Emulex	3	795	7	**5,565**	**See Note 1**
cLAN 5 meter cable	CLA0511	Emulex	3	95	7	**665**	**See Note 1**
Large Purchase and Cash discount (See Note 2)	16.0%		1			**($37,575)**	**($3,158)**
					Total	**$288,081**	**$22,864**

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: **$310,945**

tpmC Rating: **39158.09**

$ / tpmC: **$7.95**

Pricing: 1=Compaq Direct 2= Microsoft 3=Emulex Note 1 = 3 Year warranty with 10% Spares - Note 2 = Discount based on Compaq Direct guidence and large cash purchase level.

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

Numerical Quantities Summary

MQTH, Computed Maximum Qualified Throughput 39158.09 tpmC

Response Times (in seconds)	Average	90%	Maximum
New-Order	0.39	0.55	16.76
Payment	0.29	0.45	18.06
Order-Status	0.32	0.48	15.20
Delivery (interactive portion)	0.13	0.11	9.44
Delivery (deferred portion)	0.24	0.41	3.77
Stock-Level	1.47	1.96	18.03
Menu	0.13	0.11	9.47

Transaction Mix, in percent of total transaction

New-Order	44.88%
Payment	43.02%
Order-Status	4.03%
Delivery	4.04%
Stock-Level	4.03%

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

Keying/Think Times (in seconds)	Min.	Average	Max.
New-Order	18.00/0.00	18.02/12.11	18.04/121.11
Payment	3.00/0.00	3.02/12.10	3.03/121.11
Order-Status	2.00/0.00	2.02/10.10	2.03/101.00
Delivery (interactive)	2.00/0.00	2.02/5.08	2.03/50.82
Stock-Level	2.00/0.00	2.02/5.09	2.02/50.81

Test Duration

Ramp-up time	15 minutes
Measurement interval	120 minutes
Transactions (all types) completed during measurement interval	10,891,794
Ramp down time	25 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 Compaq Computer Corporation. The benchmark was developed and engineered by Compaq Computer Corporation. Testing took place at Compaq 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 diagrams for both the tested and priced systems are included on the following pages.

Figure 1. Benchmarked Configuration

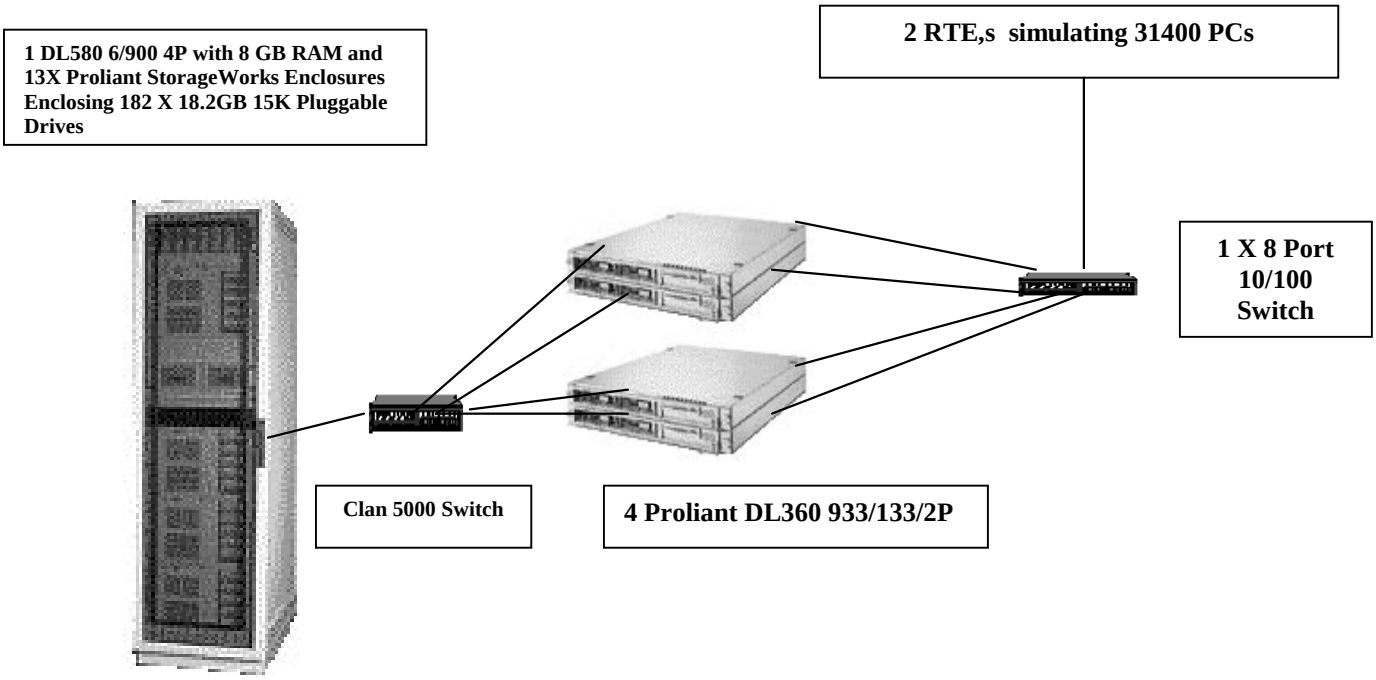
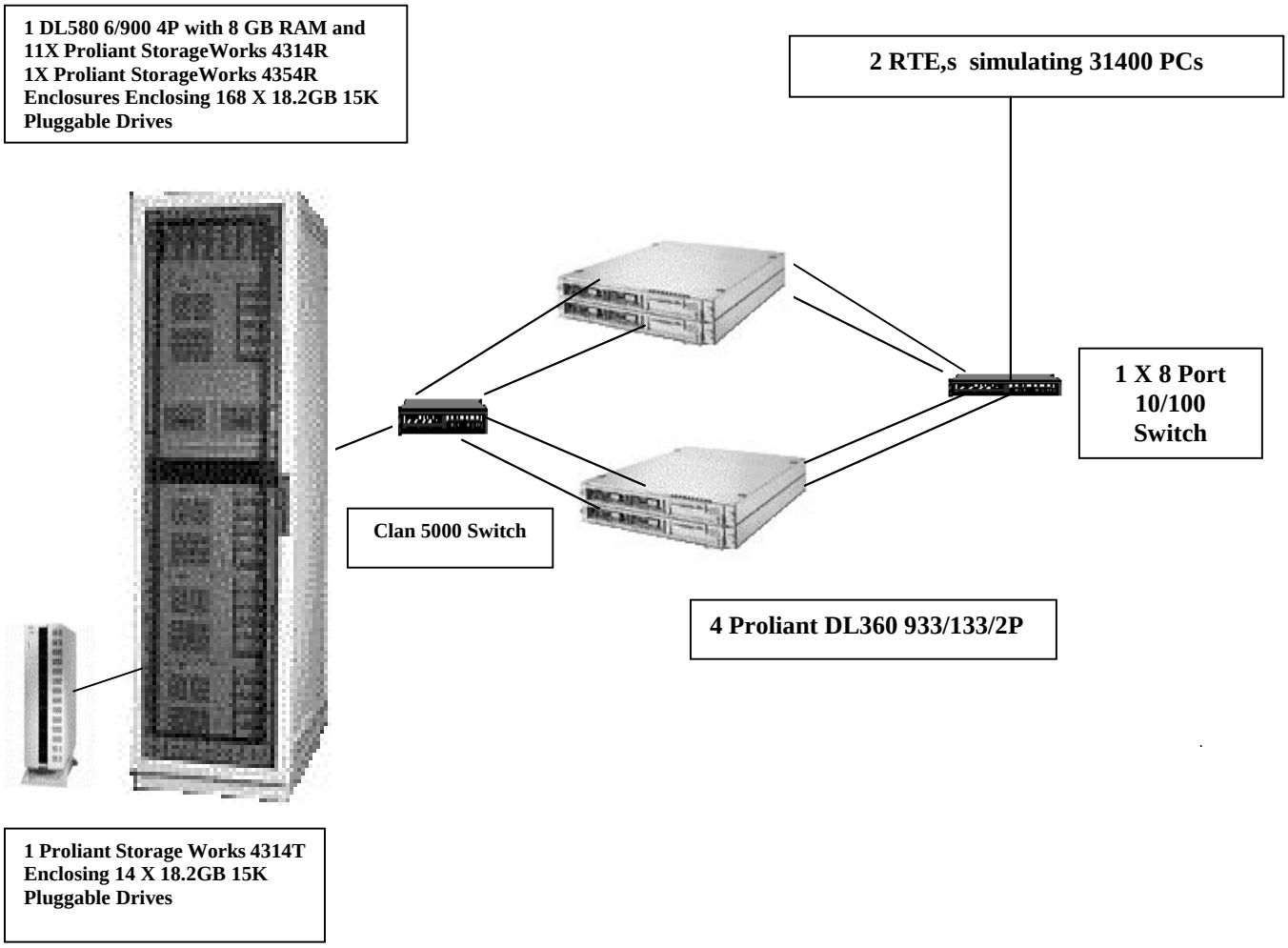


Figure 2. Priced Configuration



Clause 1 Related Items

Table Definitions

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

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

Physical Organization of Database

The physical organization of tables and indices within the database must be disclosed.
The tested configuration consisted of: 182 drives at 18.2GB. Forty-two drives per controller for four controllers, and fourteen drives for the fifth controller.

Benchmarked Configuration:

Embedded Raid Controller

EISA UTILITIES PARTITION	Total Capacity = 36 MB	
Compaq System Configuration Utilities		
LOGICAL DRIVE C:	Total Capacity = 8.43 GB	
Microsoft Windows 2000 Advanced Server		

SMART-5304 Controller, Slot 1 Array A

LOGICAL DRIVE F:	Total Capacity = 118.70 GB	RAID 0+1
MSSQL70_tpcc_log		

SMART-5304 Controller, Slot 2, Array A

LOGICAL DRIVE G:	Total Capacity = 53.71GB	RAID 0
MSSQL70_cs1		
LOGICAL DRIVE K:	Total Capacity = 26.36GB	RAID 0
MSSQL70_misc1		
LOGICAL DRIVE X:	Total Capacity = 316.07GB	RAID 0+1
Tpccback_1		

SMART-5304 Controller, Slot 3, Array A

LOGICAL DRIVE H:	Total Capacity = 53.71GB	RAID 0
MSSQL70_cs2		
LOGICAL DRIVE L:	Total Capacity = 26.36GB	RAID 0
MSSQL70_misc2		
LOGICAL DRIVE Y:	Total Capacity = 316.07GB	RAID 0+1
Tpccback_2		

SMART-5304 Controller, Slot 4, Array A

LOGICAL DRIVE I:	Total Capacity = 53.71GB	RAID 0
MSSQL70_cs3		
LOGICAL DRIVE M:	Total Capacity = 26.36GB	RAID 0
MSSQL70_misc3		
LOGICAL DRIVE W:	Total Capacity = 316.07GB	RAID 0+1
Tpccback_3		

SMART-5304 Controller, Slot 5 Array A

LOGICAL DRIVE J:	Total Capacity = 53.71GB	RAID 0
MSSQL70_cs4		
LOGICAL DRIVE N:	Total Capacity = 26.36GB	RAID 0
MSSQL70_misc4		
LOGICAL DRIVE Z:	Total Capacity = 316.07GB	RAID 0+1
Tpccback_4		

Priced Configuration vs. Measured Configuration:

The measured and priced configuration differ in that the measured configuration used disk drives for database backup and the priced configuration used a DAT drive for backup. Thirteen Proliant storage cabinets rack version were used for the benchmarked configuration. The priced configuration replaced one cabinet with a tower version.

Insert and Delete Operations

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

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

Partitioning

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

No partitioning was used in this benchmark.

Replication, Duplication or Additions

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

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

Clause 2 Related Items

Random Number Generation

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

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

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

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

Input/Output Screen Layout

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

All screen layouts followed the specifications exactly.

Priced Terminal Feature Verification

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

The terminal attributes were verified by the auditor in a previous benchmark by manually exercising each specification on a representative Compaq ProLiant web server.

Presentation Manager or Intelligent Terminal

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

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

Transaction Statistics

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

Table 2.1 Transaction Statistics

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

Statistic		Value
	Accessed by last name	59.99%
Order Status	Accessed by last name	60.04%
Transaction Mix	New Order	44.88%
	Payment	43.02%
	Order status	4.03%
	Delivery	4.04%
	Stock level	4.03%

Queuing Mechanism

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

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

The source code is listed in Appendix A.

Clause 3 Related Items

Transaction System Properties (ACID)

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

All ACID 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:

- A new database containing 10% of the warehouses of the full database was created and was backed up to extra disks.
- 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 3140 users.
- The test was allowed to run for a minimum of 10 minutes.
- One log disk was removed from the drive cabinet.
- Since the disk was mirrored, processing was not interrupted. This was verified by checking the users status on the RTE.
- One of the data disks was removed from the drive cabinet.
- When Microsoft SQL Server recorded errors about not being able to access the database, the RTE was shut down.
- A dump of the transaction log was taken and the Microsoft SQL Server was shutdown.
- A new log disk was inserted into the log drive cabinet. A new data disk was inserted into the data drive cabinet. After the RAID recovery process finished, the system was rebooted and Microsoft SQL Server was started.
- The database was restored from backup and the transaction log dump was applied.
- Consistency condition #3 was executed and verified.
- Step 2 was repeated and the difference between the first and second counts was noted.
- An RTE report was generated for the entire run time giving the number of NEW-ORDERS successfully returned to the RTE.
- The counts in step 14 and 15 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 3140 warehouses under a full load of 31400 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 31400 users.
- The test was allowed to run for a minimum of 10 minutes.
- A checkpoint was performed.
- System crash and loss of memory were induced by switching the power off. The power cords were then physically removed from the SUT. No battery backup or Uninterruptible Power Supply (UPS) were used to preserve the contents of memory.
- The RTE was shutdown.
- Power was restored and the system restarted.
- Microsoft SQL Server was restarted and performed an automatic recovery.
- Consistency condition #3 was executed and verified.
- Step 1 was repeated and the difference between the first and second counts was noted.

- An RTE report was generated for the entire run time giving the number of NEW-ORDERS successfully returned to the RTE.
- The counts in step 10 and 11 were compared and the results verified that all committed transactions had been successfully recovered.
- Samples were taken from the RTE files and used to query the database to demonstrate successful transactions had corresponding rows in the ORDER table.

Clause 4 Related Items

Initial Cardinality of Tables

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

Table 4.1 Number of Rows for Server

Table	Cardinality as built
Warehouse	3248
District	32480
Customer	97440000
History	97440000
Orders	97440000
New Order	29232000
Order Line	974401966
Stock	324800000
Item	100,000
Deleted Warehouses	108

Database Layout

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

The benchmarked configuration used 5 SMART-53024 Array controllers with 4 SCSI channels. Each controller is capable of accessing up to 56 disk drives per channel, and supports RAID 0 and RAID 0+1 per each logical volume configured. The data tables were stored on 4 RAID arrays. The four data RAID arrays, one on each of 4 SMART-5304 controllers, consisted of (42) 18.2GB 15K drives. Each array was configured as RAID 0 and housed a logical drive for database data. Each of these controllers also housed a RAID 0+1 volume used for backup of the database. The fifth SMART-5304 controller consisted of (14) 18.2GB 15K drives configured as RAID 0+1 to hold the database transaction log. The operating system was housed internally on the integrated Smart array controller as one 9.1GB drive. The Array Accelerators on the data controllers were configured as 100% write cache and were enabled for all logical drives on those controllers. The controller for the transaction log had the 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 filegroups and tables is included in Appendix B.

Type of Database

A statement must be provided that describes:

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

Microsoft SQL Server 2000 Enterprise Edition is a relational DBMS.

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

Database Mapping

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

The database was not replicated.

60 Day Space

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

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

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

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

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

Clause 5 Related Items

Throughput

Measured tpmC must be reported

Measured tpmC	39158.09 tpmC
Price per tpmC	$7.95 per tpmC

Response Times

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

Table 5.2: Response Times

Type	Average	90th %	Maximum
New-Order	0.39	0.55	16.76
Payment	0.29	0.45	18.06
Order-Status	0.32	0.48	15.20
Interactive Delivery	0.13	0.11	9.44
Deferred Delivery	0.24	0.41	3.77
Stock-Level	1.47	1.96	18.03
Menu	0.13	0.11	9.47

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	18.00	18.02	18.04
Payment	3.00	3.02	3.03
Order-Status	2.00	2.02	2.03
Interactive Delivery	2.00	2.02	2.03
Stock-Level	2.00	2.02	2.02

Table 5.4: Think Times

Type	Minimum	Average	Maximum
New-Order	0.00	12.11	121.11
Payment	0.00	12.10	121.11
Order-Status	0.00	10.10	101.00
Interactive Delivery	0.00	5.08	50.82
Stock-Level	0.00	5.09	50.81

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

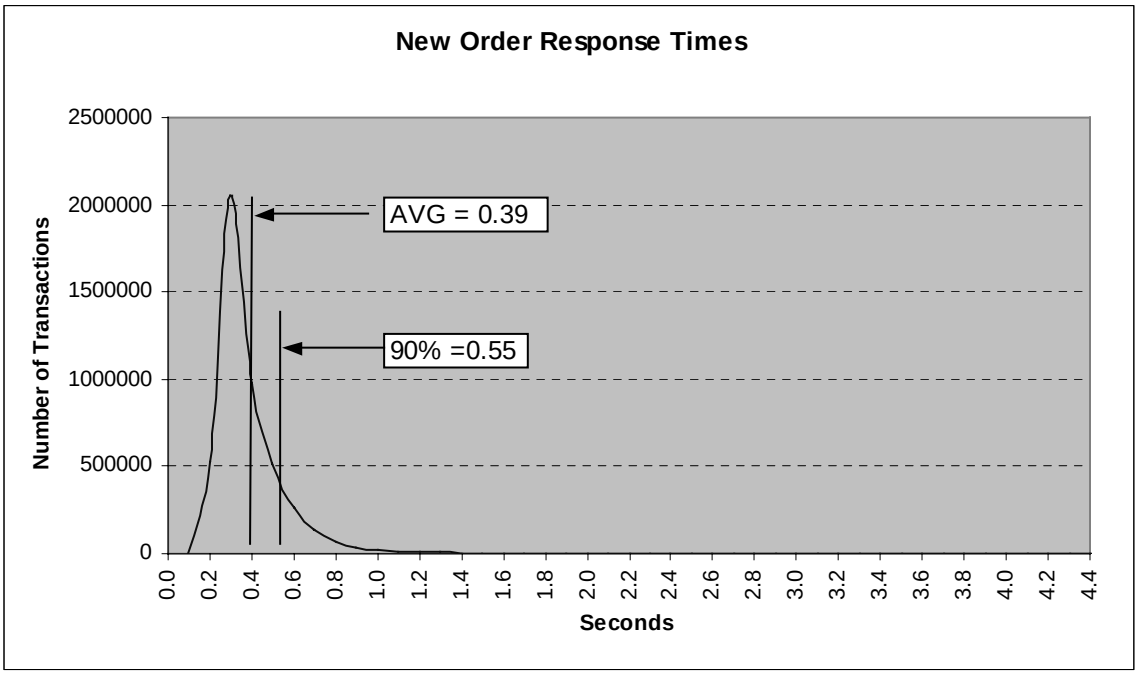


Figure 4. Payment Response Time Distribution

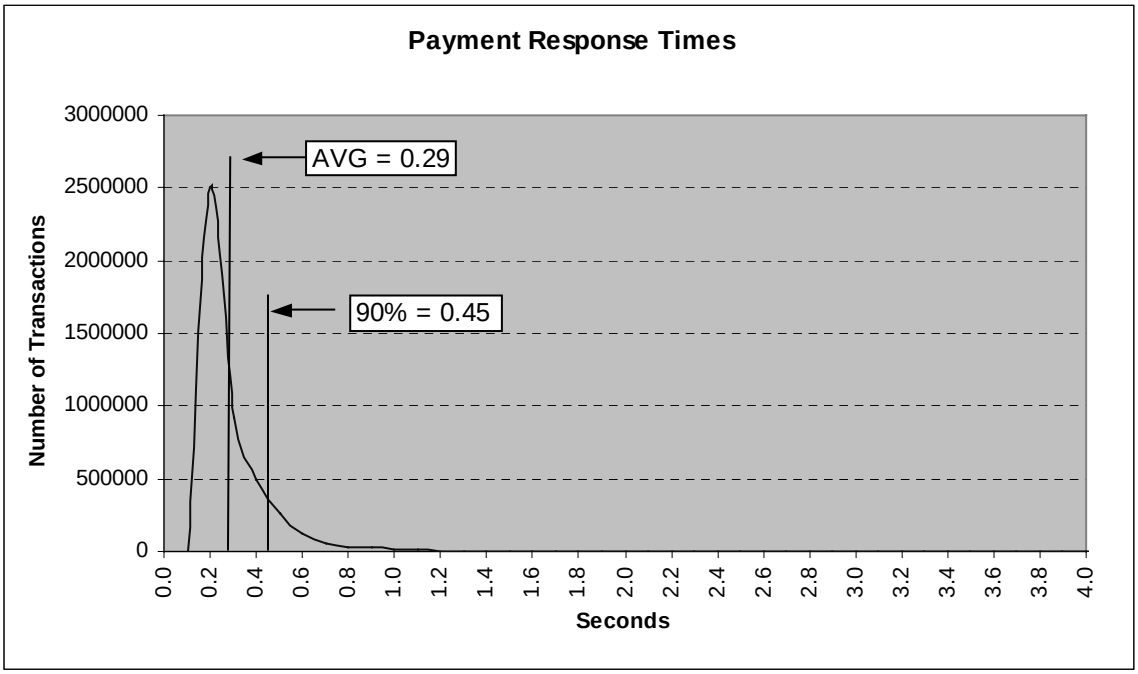


Figure 5. Order Status Response Time Distribution

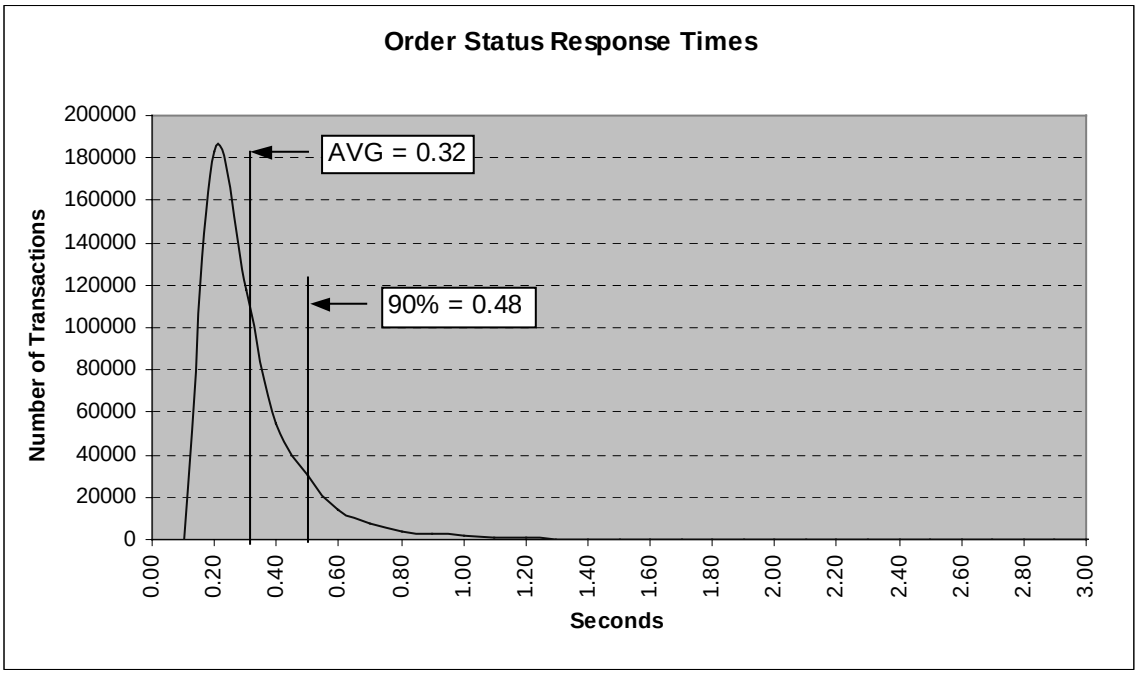


Figure 6. Delivery Response Time Distribution

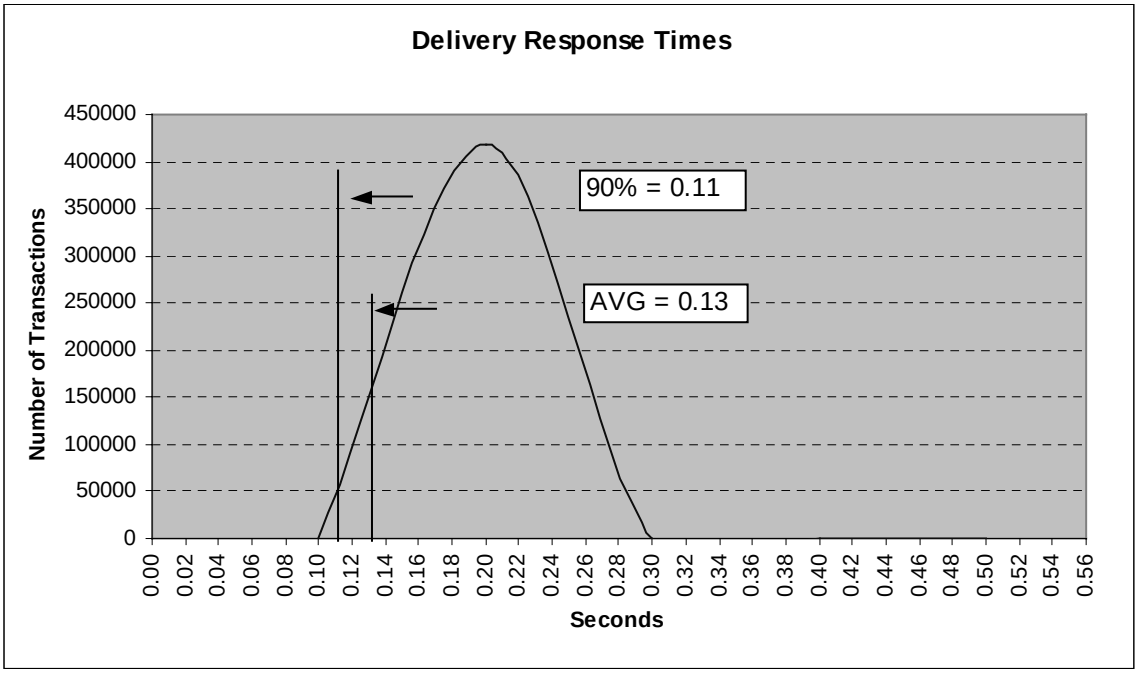


Figure 7. Stock Level Response Time Distribution

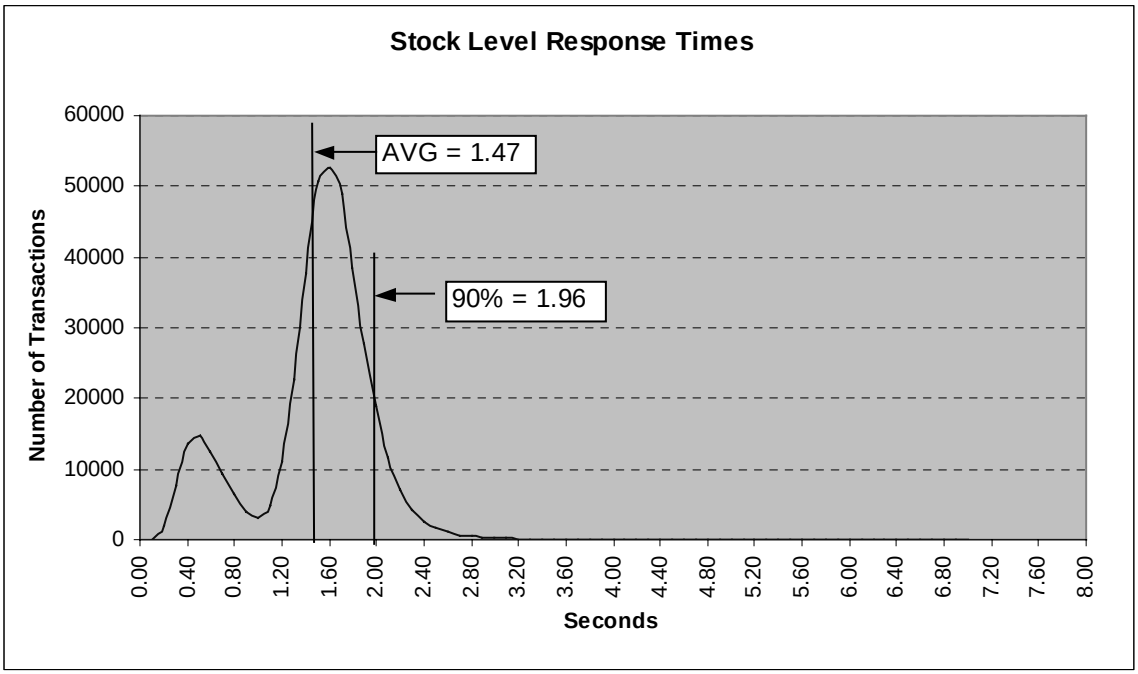


Figure 8. Response Time vs. Throughput

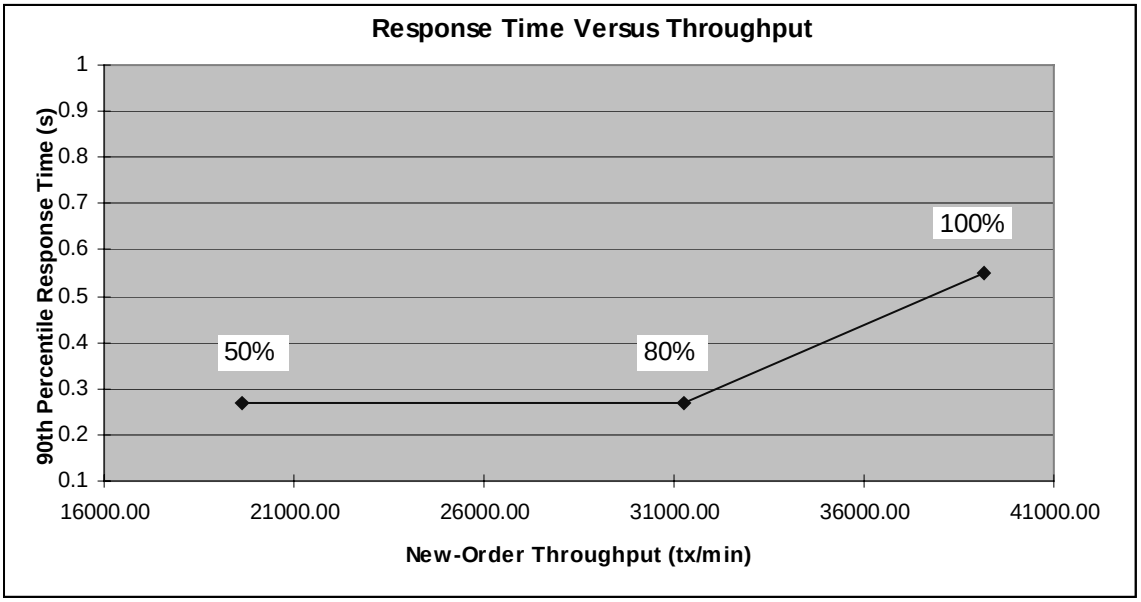


Figure 9. New Order Think Time Distribution

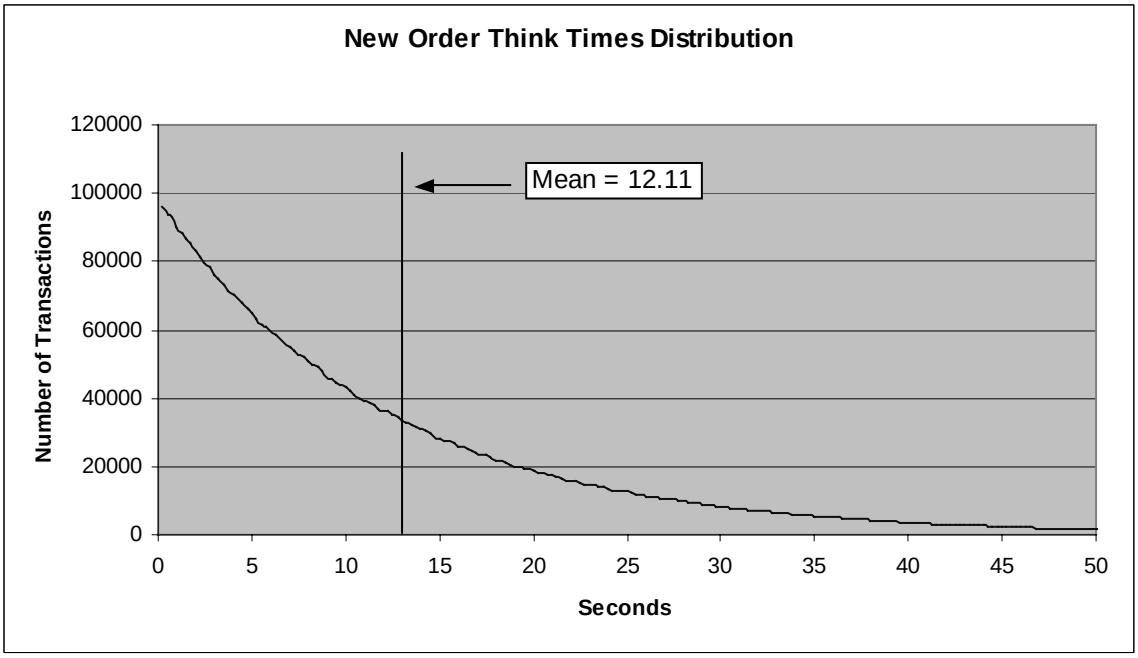
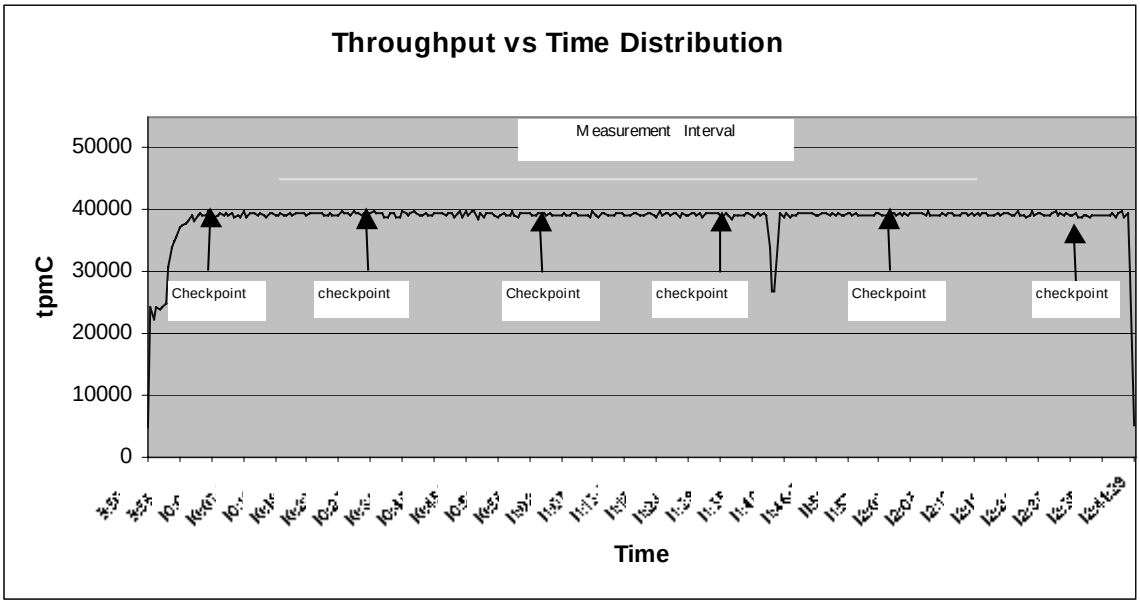


Figure 10. Throughput vs. Time Distribution



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 VIA protocol through the clan switch and HBA's using DBLIB and RPC calls.

To perform checkpoints at specific intervals, the SQL Server *recovery interval* was set to 67 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 so that the checkpoint interval was an integral multiple of the measurement interval, which was 120 minutes. The checkpoint script was started manually after the RTE had all users logged in and the database had achieved steady state.

At each checkpoint, Microsoft SQL Server wrote to disk all memory pages that had been updated but not yet physically written to disk. The positioning of the measurement interval is depicted on the graph in Figure 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	99.00%
	Remote warehouse order lines	1.00%
	Rolled back transactions	1.00%
	Average items per order	10.00
Payment	Home warehouse payments	85.00%
	Remote warehouse payments	15.00%
	Accessed by last name	59.99%
Delivery	Skipped transactions (interactive)	0
	Skipped transactions (deferred)	0
Order Status	Accessed by last name	60.04%
Transaction Mix	New Order	44.88%
	Payment	43.02%
	Order status	4.03%
	Delivery	4.04%
	Stock level	4.03%

Checkpoint Count and Location

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

The initial checkpoint was started 15 minutes after the start of the ramp-up. Subsequent checkpoints occurred every 30 minutes. Each checkpoint in the measurement interval lasted approximately 11 minutes. The measurement interval contains four checkpoints.

Checkpoint Duration

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

Checkpoint Start Time	Duration
10:31:13 a.m.	10 minutes, 42 seconds
11:01:10 a.m.	11 minutes, 39 seconds
11:31:07 a.m.	10 minutes, 44 seconds
12:01:04 p.m.	11 minutes, 30 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 are 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 2 Compaq ProLiant servers. This driver machine 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 which 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) machine were connected to a 10/100Mbs switch. This 10/100 switch connected to the client machine at 100Mbs, thus providing the path from the RTEs to the clients. The server (SUT) was connected to the client via a cLAN5000 switch, HBA,s, and cables using VIA technology. The clients were connected to the server via the same cLAN switch.

The priced configuration was connected the same 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** **39158.09 tpmC**
- **Price per tpmC** **$7.95 per tpmC**
- **Availability** **October 15, 2001**

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:

- 4 Microsoft Windows 2000 Server
- 1 Microsoft Windows 2000 Advanced Server
- 1 Microsoft SQL Server 2000 Enterprise Edition (per processor)
- 1 Microsoft Visual C++
- Compaq 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.
137 Yankton St., Suite 101
Folsom, CA 95630
(phone) (916) 985-1131
(fax) (916) 985-1185
e-mail: lorna@perfmetrics.com

Availability of the Full Disclosure Report

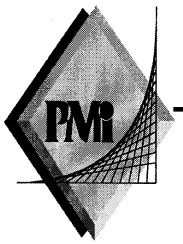
The Full Disclosure Report must be readily available to the public at a reasonable charge, similar to the charges for similar documents by the test sponsor. The report must be made available when results are made public. In order to use the phrase "TPC Benchmark™ C", the Full Disclosure Report must have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

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

Transaction Processing Performance Council
c/o Shanley Public Relations
777 North First Street, Suite 600
San Jose, CA 95112-6311

or

Compaq Computer Corporation
Database Performance Engineering
P.O. Box 692000
Houston, TX 77269-2000



PERFORMANCE METRICS INC.
TPC Certified Auditors

September 26, 2001

Mr. David Adams
Systems Software Engineer
Compaq Computer Corporation
20555 SH 249
Houston, TX 77070

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

Platform: ProLiant DL580 6/900
Database Manager: Microsoft SQL Server 2000 Enterprise Edition
Operating System: Microsoft Windows 2000 Advanced Server
Transaction Monitor: Microsoft COM+

Servers: ProLiant DL580 with:				
CPU's	Memory	Disks (total)	90% Response	TpmC
4 Pentium III Xeon@900Mhz	Main: 8192 MB Cache: 2 MB	182 @ 18GB 1 @ 9.1 GB	0.55 sec	39,158.09
4 Clients: ML360 each with:				
Pentium III Xeon @ 933 Mhz	Main: 512 MB Cache: 256K	1 @ 9.1GB	na	Na

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

- The transactions were correctly implemented.
- The database files were properly sized and populated.
- The database was properly scaled with 3,248 warehouses of which only 3,140 were active during the measured interval.
- The ACID properties were successfully demonstrated.

2229 Benita Dr. Suite 101, Rancho Cordova, CA 95670
(916) 635-2822 fax: (916) 858-0109 email: Lorna@PerfMetrics.com

- The ACID properties for data and log loss were demonstrated on a subset of the SUT configured with a database properly populated for 314 warehouses and using 3,140 users to drive the load.
- 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 day space calculation was verified.
- The controller cache was disabled on the log disk controllers.
- The steady state portion of the test was 120 minutes.
- One checkpoint was taken before the measured interval.
- Four checkpoints were taken during the measured interval.
- The system pricing was checked for major components and maintenance.
- Third party quotes were verified for compliance.

Auditor Notes: None.

Sincerely,

Lorna Livingtree

Lorna Livingtree
Auditor

2229 Benita Dr. Suite 101, Rancho Cordova, CA 95670
(916) 635-2822 fax: (916) 858-0109 email: Lorna@PerfMetrics.com

Appendix A: Source Code

The client source code is listed below.

Methods.h

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


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

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

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

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

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

                    int ErrorType() {return ERR_TYPE_COMPONENT;};
                    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)
        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_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_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_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_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 Tuxedo class.
 *      Contact:  Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *                4.20.000 - first version
 */


/* FUNCTION: ReadTPCCRegistrySettings
 *
 * PURPOSE:         This function reads the NT registry for startup parameters.
There parameters are
 *                          under the TPCC key.
 *
 * RETURNS          FALSE = no errors
 *                          TRUE  = error reading registry
 */
BOOL ReadTPCCRegistrySettings( TPCCREGISTRYDATA *pReg )
{
        HKEY      hKey;
        DWORD     size;
        DWORD     type;
        DWORD     dwTmp;
        char      szTmp[256];

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

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

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

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

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

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

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

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

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

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

        size = sizeof( pReg->szDbUser );
```

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

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

          RegCloseKey(hKey);

          return FALSE;
}
```

ReadRegistry.h

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

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

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

//This structure defines the data necessary to keep distinct for each terminal or
client connection.
typedef struct _TPCCREGISTRYDATA
{
          enum DBPROTOCOL eDB_Protocol;
          enum TXNMON eTxnMon;
          BOOL bCOM_SinglePool;
          DWORD dwMaxConnections;
          DWORD dwMaxPendingDeliveries;
          DWORD dwNumberOfDeliveryThreads;
          char szPath[128];
          char szDbServer[32];
          char szDbName[32];
          char szDbUser[32];
          char szDbPassword[32];
} TPCCREGISTRYDATA, *PTPCCREGISTRYDATA;

BOOL ReadTPCCRegistrySettings( TPCCREGISTRYDATA *pReg );
```

WEBCLNT.DSP

```
# Microsoft Developer Studio Project File - Name="webclnt" - Package Owner=<4>
# Microsoft Developer Studio Generated Build File, Format Version 5.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Application" 0x0101

CFG=webclnt - Win32 Release
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "Webclnt.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "Webclnt.mak" CFG="webclnt - Win32 Release"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "webclnt - Win32 Release" (based on "Win32 (x86) Application")
!MESSAGE "webclnt - Win32 Debug" (based on "Win32 (x86) Application")
!MESSAGE

# Begin Project
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "webclnt - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir ".\Release"
# PROP BASE Intermediate_Dir ".\Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\Release"
# PROP Intermediate_Dir ".\Release"
# PROP Target_Dir ""
# ADD BASE CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /YX /c
# ADD CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "NDEBUG" /win32
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /machine:I386
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /machine:I386

!ELSEIF  "$(CFG)" == "webclnt - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir ".\Debug"
# PROP BASE Intermediate_Dir ".\Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
```

```
# PROP Output_Dir ".\Debug"
# PROP Intermediate_Dir ".\Debug"
# PROP Target_Dir ""
# ADD BASE CPP /nologo /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D "_WINDOWS" /YX
/c
# ADD CPP /nologo /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D "_WINDOWS" /YX /FD
/c
# ADD BASE MTL /nologo /D "_DEBUG" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /debug /machine:I386
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /debug /machine:I386

!ENDIF

# Begin Target

# Name "webclnt - Win32 Release"
# Name "webclnt - Win32 Debug"
# End Target
# End Project
```

Webclnt.dsw

```
Microsoft Developer Studio Workspace File, Format Version 6.00
# WARNING: DO NOT EDIT OR DELETE THIS WORKSPACE FILE!

###############################################################################

Project: "db_dblib_dll"=.\db_dblib_dll\db_dblib_dll.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "db_odbc_dll"=.\db_odbc_dll\db_odbc_dll.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "install"=.\install\install.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
    Begin Project Dependency
    Project_Dep_Name isapi_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tuxapp
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name db_dblib_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name db_odbc_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tm_com_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tm_tuxedo_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tpcc_com_all
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tpcc_com_ps
    End Project Dependency
}}}

###############################################################################

Project: "isapi_dll"=.\isapi_dll\isapi_dll.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
    Begin Project Dependency
    Project_Dep_Name db_dblib_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name db_odbc_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tm_tuxedo_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tm_com_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tm_encina_dll
    End Project Dependency
}}}

###############################################################################
```

```
Project: "tm_com_dll"=.\tm_com_dll\tm_com_dll.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
    Begin Project Dependency
    Project_Dep_Name tpcc_com_ps
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tpcc_com_all
    End Project Dependency
}}}

###############################################################################

Project: "tm_encina_dll"=.\tm_encina_dll\tm_encina_dll.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "tm_tuxedo_dll"=.\tm_tuxedo_dll\tm_tuxedo_dll.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "tpcc_com_all"=.\tpcc_com_all\tpcc_com_all.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
    Begin Project Dependency
    Project_Dep_Name tpcc_com_ps
    End Project Dependency
}}}

###############################################################################

Project: "tpcc_com_ps"=.\tpcc_com_ps\tpcc_com_ps.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "tuxapp"=.\tuxapp\tuxapp.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
    Begin Project Dependency
    Project_Dep_Name db_dblib_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name db_odbc_dll
    End Project Dependency
}}}

###############################################################################

Global:

Package=<5>
{{{
}}}

Package=<3>
{{{
}}}

###############################################################################
```

db_dblib_dll.dsp

```
# Microsoft Developer Studio Project File - Name="db_dblib_dll" - Package Owner=<4>
# Microsoft Developer Studio Generated Build File, Format Version 6.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Dynamic-Link Library" 0x0102

CFG=db_dblib_dll - Win32 IceCAP
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "db_dblib_dll.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "db_dblib_dll.mak" CFG="db_dblib_dll - Win32 IceCAP"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "db_dblib_dll - Win32 Release" (based on "Win32 (x86) Dynamic-Link
Library")
!MESSAGE "db_dblib_dll - Win32 Debug" (based on "Win32 (x86) Dynamic-Link Library")
!MESSAGE "db_dblib_dll - Win32 IceCAP" (based on "Win32 (x86) Dynamic-Link Library")
```

```
!MESSAGE

# Begin Project
# PROP AllowPerConfigDependencies 0
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "db_dblib_dll - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir "Release"
# PROP BASE Intermediate_Dir "Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MT /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /YX /FD
/c
# ADD CPP /nologo /MD /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /machine:I386
# ADD LINK32 ntwdblib.lib kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib /nologo
/subsystem:windows /dll /machine:I386 /out:".\bin/tpcc_dblib.dll"

!ELSEIF  "$(CFG)" == "db_dblib_dll - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "Debug"
# PROP BASE Intermediate_Dir "Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MTd /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D "_WINDOWS"
/YX /FD /c
# ADD CPP /nologo /MDd /W3 /Gm /GX /ZI /Od /D "WIN32" /D "_DEBUG" /D "_WINDOWS" /YX
/FD /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /pdbtype:sept
# ADD LINK32 ntwdblib.lib kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib /nologo
/subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc_dblib.dll"
/pdbtype:sept

!ELSEIF  "$(CFG)" == "db_dblib_dll - Win32 IceCAP"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "db_dblib"
# PROP BASE Intermediate_Dir "db_dblib"
# PROP BASE Ignore_Export_Lib 0
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MDd /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D "_WINDOWS"
/YX /FD /Gh /c
# ADD CPP /nologo /MD /W3 /Gm /GX /Zi /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /D
"ICECAP" /YX /FD /Gh /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 ntwdblib.lib kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib /nologo
/subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc_dblib.dll"
/pdbtype:sept
# ADD LINK32 icap.lib ntwdblib.lib kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib /nologo
/subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc_dblib.dll"
/pdbtype:sept

!ENDIF

# Begin Target

# Name "db_dblib_dll - Win32 Release"
# Name "db_dblib_dll - Win32 Debug"
# Name "db_dblib_dll - Win32 IceCAP"
# Begin Group "Source"

# PROP Default_Filter "*.cpp"
# Begin Source File

SOURCE=.\src\tpcc_dblib.cpp
# End Source File
# End Group
# Begin Group "Header"
```

```
# PROP Default_Filter "*.h"
# Begin Source File

SOURCE=..\common\src\error.h
# End Source File
# Begin Source File

SOURCE=.\src\tpcc_dblib.h
# End Source File
# Begin Source File

SOURCE=..\common\src\trans.h
# End Source File
# Begin Source File

SOURCE=..\common\src\txn_base.h
# End Source File
# End Group
# End Target
# End Project
```

db_odbc_dll.dsp

```
# Microsoft Developer Studio Project File - Name="db_odbc_dll" - Package Owner=<4>
# Microsoft Developer Studio Generated Build File, Format Version 6.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Dynamic-Link Library" 0x0102

CFG=db_odbc_dll - Win32 IceCAP
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "db_odbc_dll.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "db_odbc_dll.mak" CFG="db_odbc_dll - Win32 IceCAP"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "db_odbc_dll - Win32 Release" (based on "Win32 (x86) Dynamic-Link Library")
!MESSAGE "db_odbc_dll - Win32 Debug" (based on "Win32 (x86) Dynamic-Link Library")
!MESSAGE "db_odbc_dll - Win32 IceCAP" (based on "Win32 (x86) Dynamic-Link Library")
!MESSAGE

# Begin Project
# PROP AllowPerConfigDependencies 0
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "db_odbc_dll - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir "Release"
# PROP BASE Intermediate_Dir "Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MT /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /YX /FD
/c
# ADD CPP /nologo /MD /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "NDEBUG" /mktyplib203 /o /win32 "NUL"
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /o /win32 "NUL"
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /machine:I386
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /machine:I386 /out:".\bin/tpcc_odbc.dll"

!ELSEIF  "$(CFG)" == "db_odbc_dll - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "Debug"
# PROP BASE Intermediate_Dir "Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MTd /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D "_WINDOWS"
/YX /FD /c
# ADD CPP /nologo /MDd /W3 /GX /ZI /Od /D "WIN32" /D "_DEBUG" /D "_WINDOWS" /YX /FD
/c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o /win32 "NUL"
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o /win32 "NUL"
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /pdbtype:sept
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc_odbc.dll"
/pdbtype:sept

!ELSEIF  "$(CFG)" == "db_odbc_dll - Win32 IceCAP"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "db_odbc_"
# PROP BASE Intermediate_Dir "db_odbc_"
```

```
# PROP BASE Ignore_Export_Lib 0
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MDd /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D "_WINDOWS"
/YX /FD /Gh /c
# ADD CPP /nologo /MD /W3 /Gm /GX /Zi /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /D
"ICECAP" /YX /FD /Gh /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o /win32 "NUL"
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o /win32 "NUL"
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc_odbc.dll"
/pdbtype:sept
# ADD LINK32 icap.lib kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc_odbc.dll"
/pdbtype:sept

!ENDIF

# Begin Target

# Name "db_odbc_dll - Win32 Release"
# Name "db_odbc_dll - Win32 Debug"
# Name "db_odbc_dll - Win32 IceCAP"
# Begin Group "Source"

# PROP Default_Filter "*.cpp"
# Begin Source File

SOURCE=.\src\tpcc_odbc.cpp
# End Source File
# End Group
# Begin Group "Header"

# PROP Default_Filter "*.h"
# Begin Source File

SOURCE=..\common\src\error.h
# End Source File
# Begin Source File

SOURCE=.\src\tpcc_odbc.h
# End Source File
# Begin Source File

SOURCE=..\common\src\trans.h
# End Source File
# Begin Source File

SOURCE=..\common\src\txn_base.h
# End Source File
# End Group
# End Target
# End Project
```

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_INS_MEMORY                          "Insufficient Memory to continue."
#define ERR_UNKNOWN                             "Unknown error."
#define ERR_MSG_BUF_SIZE                512
#define INV_ERROR_CODE                          -1

class CBaseErr
{
public:
          CBaseErr(LPCTSTR szLoc = NULL)
          {
                    m_idMsg             = INV_ERROR_CODE;

                    if (szLoc)
                    {
                              m_szLoc = new char[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[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 *ErrorText() = 0; // a string (i.e., human readable)
representation of the error

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

class CSocketErr : public CBaseErr
{
public:
        enum Action
        {
                eNone,
                eSend,
                eSocket,
                eBind,
                eConnect,
                eListen,
                eHost,
                eRecv,
        };

        CSocketErr(Action eAction, LPCTSTR szLocation = NULL);
        Action    m_eAction;

        int ErrorType() { return ERR_TYPE_SOCKET;};
        char *ErrorText(void);
};

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,
        };

                        CSystemErr(Action eAction, LPCTSTR szLocation);
        int             ErrorType() { return ERR_TYPE_OS;};
        char      *ErrorText(void);
        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 *ErrorText() {return ERR_INS_MEMORY;}
};
```

install.c

```
/*      FILE:               INSTALL.C
 *                                      Microsoft TPC-C Kit Ver. 4.20.000
 *                                      Copyright Microsoft, 1999
 *            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
 */
```

```
#include <windows.h>
#include <direct.h>
#include <io.h>
#include <stdlib.h>
#include <stdio.h>
#include <commctrl.h>
#include "..\..\common\src\ReadRegistry.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                   iThreadTimeout;
static    int                   iListenBackLog;
static    int                   iAcceptExOutstanding;

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);
static    void                  ReadRegistrySettings(void);
static    void                  WriteRegistrySettings(char *szDllPath);
static    BOOL                  RegisterDLL(char *szFileName);
static    int                             CopyFiles(HWND hDlg, char *szDllPath);
static    BOOL                  GetInstallPath(char *szDllPath);
static    void                  GetVersionInfo(char *szDLLPath, char *szExePath);
static    BOOL                  CheckWWWebService(void);
static    BOOL                  StartWWWebService(void);
static    BOOL                  StopWWWebService(void);
static    void                  UpdateDialog(HWND hDlg);

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                     szExePath[256];

                switch(uMsg)
                {
                        case WM_INITDIALOG:
                                GlobalMemoryStatus(&memoryStatus);
                                iMaxPhysicalMemory  = (memoryStatus.dwTotalPhys/
1048576);

                                if ( GetInstallPath(szDllPath) )
                                {
                                        MessageBox(hwnd, "Error internet service
inetsrv is not installed.", NULL, MB_ICONSTOP | MB_OK);
                                        EndDialog(hwnd, FALSE);
                                        return TRUE;
                                }

                                // set default values
                                ZeroMemory( &Reg, sizeof(Reg) );
                                Reg.dwNumberOfDeliveryThreads = 4;
                                Reg.dwMaxConnections = 100;
                                Reg.dwMaxPendingDeliveries    = 100;
                                Reg.eDB_Protocol = DBLIB;
                                Reg.eTxnMon = None;
                                strcpy(Reg.szDbServer,                  "");
                                strcpy(Reg.szDbName,                    "tpcc");
                                strcpy(Reg.szDbUser,                    "sa");
                                strcpy(Reg.szDbPassword,        "");

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

                                ReadTPCCRegistrySettings( &Reg );
                                ReadRegistrySettings();

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

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

                                SetDlgItemText(hwnd, IDC_PATH, szDllPath);

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

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

                                CheckDlgButton(hwnd, IDC_DBLIB, 0);
                                CheckDlgButton(hwnd, IDC_ODBC,  0);
                                if ( Reg.eDB_Protocol == DBLIB )
                                        CheckDlgButton(hwnd, IDC_DBLIB, 1);
                                else
                                        CheckDlgButton(hwnd, IDC_ODBC,  1);

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

```
                                        Reg.eTxnMon = None;
                        }

                        CheckDlgButton(hwnd, IDC_TM_NONE,   0);
                        CheckDlgButton(hwnd, IDC_TM_TUXEDO, 0);
                        CheckDlgButton(hwnd, IDC_TM_MTS,    0);
                        CheckDlgButton(hwnd, IDC_TM_ENCINA,     0);
                        switch (Reg.eTxnMon)
                        {
                        case None:
                                CheckDlgButton(hwnd, IDC_TM_NONE,   1);
                                break;
                        case TUXEDO:
                                CheckDlgButton(hwnd, IDC_TM_TUXEDO, 1);
                                break;
                        case ENCINA:
                                CheckDlgButton(hwnd, IDC_TM_ENCINA, 1);
                                break;
                        case COM:
                                CheckDlgButton(hwnd, IDC_TM_MTS,        1);
                                break;
                        }

                        return TRUE;
                case WM_PAINT:
                        if ( IsIconic(hwnd) )
                        {
                                BeginPaint(hwnd, &ps);
                                DrawIcon(ps.hdc, 0, 0, hIcon);
                                EndPaint(hwnd, &ps);
                                return TRUE;
                        }
                        break;
                case WM_COMMAND:
                        if ( HIWORD(wParam) == BN_CLICKED )
                        {
                                switch( LOWORD(wParam) )
                                {
                                        case IDC_DBLIB:
                                                return TRUE;
                                        case IDC_ODBC:
                                                return TRUE;
                                        case IDOK:
                                                ProcessOK(hwnd,
szDllPath);
                                                return TRUE;
                                        case IDCANCEL:
                                                EndDialog(hwnd, FALSE);
                                                return TRUE;
                                        default:
                                                return FALSE;
                                }
                        }
                        break;
                default:
                        break;
        }
        return FALSE;
}

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

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

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

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

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

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

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


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


        // write binaries to inetpub\wwwroot
        rc = CopyFiles(hDlg, szDllPath);
        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;
        }

        // 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,
"SYSTEM\\CurrentControlSet\\Services\\Inetinfo\\Parameters", 0, KEY_READ, &hKey) ==
ERROR_SUCCESS )
        {
                size = sizeof(iPoolThreadLimit);
                if ( RegQueryValueEx(hKey, "PoolThreadLimit", 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\\Parameters", 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);
        }
}

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\\Parameters", 0, NULL,
REG_OPTION_NON_VOLATILE, KEY_ALL_ACCESS, NULL, &hKey, &dwDisposition)) ==
ERROR_SUCCESS )
          {
                    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\\Parameters", 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, 15));
                    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)
{
          BOOL                bSvcRunning;

          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);
          }

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

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

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

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

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

          // install tpcc_com_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);

          //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();
          }

          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;
          char      *ptr;
          int                 iRc;

          szDllPath[0] =  0;
          bRc = TRUE;
          if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\W3SVC\\Parameters\\Virtual Roots", 0,
KEY_ALL_ACCESS, &hKey) == ERROR_SUCCESS )
          {
                    sv = sizeof(szData);
                    iRc = RegQueryValueEx( hKey, "/,", NULL, NULL, szData, &sv );
// used by IIS 3.0
                    if (iRc == ERROR_FILE_NOT_FOUND)
                              iRc = RegQueryValueEx( hKey, "/", NULL, NULL, szData,
&sv );   // used by IIS 4.0
                    if (iRc == ERROR_SUCCESS)
                    {
                              bRc = FALSE;
                              strcpy(szDllPath, szData);
                              if ( (ptr = strchr(szDllPath, ',')) )
                                        *ptr = 0;

                              len = strlen(szDllPath);
                              if ( szDllPath[len-1] != '\\' )
                              {
                                        szDllPath[len] = '\\';
                                        szDllPath[len+1] = 0;
```

```
                        }
                }

                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);
        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;
}
```

install.h

```
//{{NO_DEPENDENCIES}}
// Microsoft Developer Studio generated include file.
// Used by install.rc
//
#define IDD_DIALOG1                     101
#define IDI_ICON1                       102
#define IDR_TPCCDLL                     103
#define IDD_DIALOG2                     105
#define IDI_ICON2                       106
#define IDR_DELIVERY                    107
#define IDD_DIALOG3                     108

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

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

install.rc

```
//Microsoft 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

////////////////////////////////////////////////////////////////////////////
//
// Dialog
//
```

```
IDD_DIALOG1 DIALOGEX 0, 0, 219, 351
STYLE DS_MODALFRAME | DS_CENTER | WS_MINIMIZEBOX | WS_POPUP | WS_CAPTION |
    WS_SYSMENU
CAPTION "TPC-C Web Client Installation Utility"
FONT 8, "MS Sans Serif"
BEGIN
    EDITTEXT        ED_THREADS,164,45,34,12,ES_RIGHT | ES_NUMBER,
                    WS_EX_RTLREADING
    EDITTEXT        ED_MAXDELIVERIES,164,59,34,12,ES_RIGHT | ES_NUMBER,
                    WS_EX_RTLREADING
    EDITTEXT        ED_MAXCONNECTION,164,73,34,12,ES_RIGHT | ES_NUMBER,
                    WS_EX_RTLREADING
    CONTROL         "None",IDC_TM_NONE,"Button",BS_AUTORADIOBUTTON |
                    WS_GROUP | WS_TABSTOP,43,100,33,10
    CONTROL         "COM",IDC_TM_MTS,"Button",BS_AUTORADIOBUTTON |
                    WS_TABSTOP,43,113,32,10
    CONTROL         "TUXEDO",IDC_TM_TUXEDO,"Button",BS_AUTORADIOBUTTON |
                    WS_TABSTOP,106,100,46,10
    CONTROL         "ENCINA",IDC_TM_ENCINA,"Button",BS_AUTORADIOBUTTON |
                    WS_DISABLED | WS_TABSTOP,106,113,43,10
    EDITTEXT        ED_DB_SERVER,131,152,67,12,ES_AUTOHSCROLL
    EDITTEXT        ED_DB_USER_ID,131,165,67,12,ES_AUTOHSCROLL
    EDITTEXT        ED_DB_PASSWORD,131,178,67,12,ES_AUTOHSCROLL
    EDITTEXT        ED_DB_NAME,131,191,67,12,ES_AUTOHSCROLL
    CONTROL         "DBLIB",IDC_DBLIB,"Button",BS_AUTORADIOBUTTON | WS_GROUP |
                    WS_TABSTOP,45,219,39,12
    CONTROL         "ODBC",IDC_ODBC,"Button",BS_AUTORADIOBUTTON | WS_TABSTOP,
                    91,219,39,12
    EDITTEXT        ED_IIS_MAX_THEAD_POOL_LIMIT,164,263,34,12,ES_RIGHT |
                    ES_NUMBER,WS_EX_RTLREADING
    EDITTEXT        ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE,164,277,34,12,ES_RIGHT |
                    ES_NUMBER,WS_EX_RTLREADING
    EDITTEXT        ED_IIS_THREAD_TIMEOUT,164,291,34,12,ES_RIGHT | ES_NUMBER,
                    WS_EX_RTLREADING
    EDITTEXT        ED_IIS_LISTEN_BACKLOG,164,305,34,12,ES_RIGHT | ES_NUMBER,
                    WS_EX_RTLREADING
    DEFPUSHBUTTON   "OK",IDOK,53,331,50,14
    PUSHBUTTON      "Cancel",IDCANCEL,119,331,50,14
    EDITTEXT        IDC_PATH,106,26,91,13,ES_AUTOHSCROLL | ES_READONLY
    LTEXT           "Number of Delivery Threads:",IDC_STATIC,35,45,115,12
    LTEXT           "Max Number of Connections:",IDC_STATIC,35,73,115,12
    RTEXT           "Version 4.11",IDC_VERSION,120,4,89,9
    LTEXT           "IIS Max Thread Pool Limit:",IDC_STATIC,36,263,115,12
    LTEXT           "Web Service Backlog Queue Size:",IDC_STATIC,36,277,115,
                    12
    LTEXT           "IIS Thread Timeout (seconds):",IDC_STATIC,36,291,115,12
    LTEXT           "IIS Listen Backlog:",IDC_STATIC,36,307,115,10
    GROUPBOX        "Database Interface",IDC_STATIC,35,208,163,27,WS_GROUP
    LTEXT           "Installation directory:",IDC_STATIC,35,29,71,10
    GROUPBOX        "Transaction Monitor",IDC_STATIC,33,90,165,37
    LTEXT           "Server Name:",IDC_STATIC,35,155,56,8
    LTEXT           "User ID:",IDC_STATIC,35,168,60,8
    LTEXT           "User Password:",IDC_STATIC,35,181,83,8
    LTEXT           "Database Name:",IDC_STATIC,35,194,54,8
    GROUPBOX        "SQL Server Connection Properties",IDC_STATIC,22,139,187,
                    102
    GROUPBOX        "Web Client Properties",IDC_STATIC,22,15,187,118
    GROUPBOX        "IIS Settings",IDC_STATIC,22,247,187,79
    LTEXT           "Max Pending Deliveries:",IDC_STATIC,35,59,115,12
END

IDD_DIALOG2 DIALOGEX 0, 0, 117, 62
STYLE DS_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 DISCARDABLE  0, 0, 91, 40
STYLE DS_SYSMODAL | 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_BORDER,
                    7,20,77,13
    CTEXT           "Static",IDC_STATUS,7,7,77,12,SS_SUNKEN
END

IDD_DIALOG4 DIALOG DISCARDABLE  0, 0, 291, 202
STYLE 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 DISCARDABLE
BEGIN
    IDD_DIALOG1, DIALOG
    BEGIN
        LEFTMARGIN, 22
        RIGHTMARGIN, 209
        VERTGUIDE, 35
        VERTGUIDE, 198
        TOPMARGIN, 4
        BOTTOMMARGIN, 345
    END

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

    IDD_DIALOG3, DIALOG
    BEGIN
        LEFTMARGIN, 7
        RIGHTMARGIN, 84
        TOPMARGIN, 7
```

```
        BOTTOMMARGIN, 33
    END

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


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

1 TEXTINCLUDE 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


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

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

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

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

#ifndef _MAC
////////////////////////////////////////////////////////////////////////////
//
// Version
//

VS_VERSION_INFO VERSIONINFO
 FILEVERSION 0,4,20,0
 PRODUCTVERSION 0,4,20,0
 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\0"
            VALUE "CompanyName", "Microsoft\0"
            VALUE "FileDescription", "install\0"
            VALUE "FileVersion", "0, 4, 20, 0\0"
            VALUE "InternalName", "install\0"
            VALUE "LegalCopyright", "Copyright © 1999\0"
            VALUE "OriginalFilename", "install.exe\0"
            VALUE "ProductName", "Microsoft install\0"
            VALUE "ProductVersion", "0, 4, 20, 0\0"
        END
    END
    BLOCK "VarFileInfo"
    BEGIN
        VALUE "Translation", 0x409, 1200
    END
END

#endif    // !_MAC


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

IDR_LICENSE1            LICENSE DISCARDABLE     "license.txt"

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

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

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

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

////////////////////////////////////////////////////////////////////////////
//
// TUXEDO_APP
```

```
//

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

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

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

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

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

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

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

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

IDR_COMALL_DLL          COM_ALL_DLL DISCARDABLE
"..\\..\\tpcc_com_all\\bin\\tpcc_com_all.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. 4.20.000
 *                                  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 =         "";
	// 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;
}
```

isapi_dll.dsp

```
# Microsoft Developer Studio Project File - Name="isapi_dll" - Package Owner=<4>
# Microsoft Developer Studio Generated Build File, Format Version 6.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Dynamic-Link Library" 0x0102

CFG=isapi_dll - Win32 IceCAP
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "isapi_dll.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "isapi_dll.mak" CFG="isapi_dll - Win32 IceCAP"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "isapi_dll - Win32 Release" (based on "Win32 (x86) Dynamic-Link Library")
!MESSAGE "isapi_dll - Win32 Debug" (based on "Win32 (x86) Dynamic-Link Library")
!MESSAGE "isapi_dll - Win32 IceCAP" (based on "Win32 (x86) Dynamic-Link Library")
!MESSAGE

# Begin Project
# PROP AllowPerConfigDependencies 0
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "isapi_dll - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir "Release"
# PROP BASE Intermediate_Dir "Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MT /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /YX /FD
/c
# ADD CPP /nologo /MD /W3 /GX /O2 /D "NDEBUG" /D "WIN32" /D "_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /machine:I386
# ADD LINK32 ..\common\txnlog\lib\release\rtetime.lib
..\common\txnlog\lib\release\spinlock.lib ..\common\txnlog\lib\release\error.lib
..\common\txnlog\lib\release\txnlog.lib wsock32.lib kernel32.lib user32.lib
gdi32.lib winspool.lib comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib
uuid.lib odbc32.lib odbccp32.lib /nologo /subsystem:windows /dll /machine:I386
/nodefaultlib:"LIBCMT" /out:".\bin/tpcc.dll"
# SUBTRACT LINK32 /nodefaultlib

!ELSEIF  "$(CFG)" == "isapi_dll - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "Debug"
# PROP BASE Intermediate_Dir "Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MTd /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D "_WINDOWS"
/YX /FD /c
# ADD CPP /nologo /MDd /W3 /GX /ZI /Od /D "_DEBUG" /D "WIN32" /D "_WINDOWS" /FR /YX
/FD /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /pdbtype:sept
# ADD LINK32 ..\common\txnlog\lib\debug\rtetime.lib
..\common\txnlog\lib\debug\spinlock.lib ..\common\txnlog\lib\debug\error.lib
..\common\txnlog\lib\debug\txnlog.lib wsock32.lib kernel32.lib user32.lib gdi32.lib
winspool.lib comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib
odbc32.lib odbccp32.lib /nologo /subsystem:windows /dll /debug /machine:I386
/nodefaultlib:"LIBCMTD" /out:".\bin/tpcc.dll" /pdbtype:sept
# SUBTRACT LINK32 /profile /pdb:none /nodefaultlib

!ELSEIF  "$(CFG)" == "isapi_dll - Win32 IceCAP"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "isapi_dl"
# PROP BASE Intermediate_Dir "isapi_dl"
# PROP BASE Ignore_Export_Lib 0
# PROP BASE Target_Dir ""
```

```
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MDd /W3 /GX /Zi /Od /D "_DEBUG" /D "WIN32" /D "_WINDOWS" /FR
/YX /FD /Gh /c
# ADD CPP /nologo /MD /W3 /GX /Zi /O2 /D "NDEBUG" /D "ICECAP" /D "WIN32" /D
"_WINDOWS" /FR /YX /FD /Gh /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc.dll"
/pdbtype:sept
# SUBTRACT BASE LINK32 /profile /pdb:none
# ADD LINK32 icap.lib ..\common\txnlog\lib\release\rtetime.lib
..\common\txnlog\lib\release\spinlock.lib ..\common\txnlog\lib\release\error.lib
..\common\txnlog\lib\release\txnlog.lib wsock32.lib kernel32.lib user32.lib
gdi32.lib winspool.lib comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib
uuid.lib odbc32.lib odbccp32.lib /nologo /subsystem:windows /dll /debug
/machine:I386 /out:".\bin/tpcc.dll" /pdbtype:sept
# SUBTRACT LINK32 /profile /pdb:none /map

!ENDIF

# Begin Target

# Name "isapi_dll - Win32 Release"
# Name "isapi_dll - Win32 Debug"
# Name "isapi_dll - Win32 IceCAP"
# Begin Group "Source"

# PROP Default_Filter "*.cpp, *.def, *.rc"
# Begin Source File

SOURCE=.\src\tpcc.cpp
# End Source File
# Begin Source File

SOURCE=.\src\tpcc.def
# End Source File
# Begin Source File

SOURCE=.\src\tpcc.rc
# End Source File
# End Group
# Begin Group "Header Files"

# PROP Default_Filter "*.h, *.hpp"
# Begin Source File

SOURCE=..\common\src\error.h
# End Source File
# Begin Source File

SOURCE=..\common\src\ReadRegistry.h
# End Source File
# Begin Source File

SOURCE=.\src\tpcc.h
# End Source File
# Begin Source File

SOURCE=..\db_dblib_dll\src\tpcc_dblib.h
# End Source File
# Begin Source File

SOURCE=..\db_odbc_dll\src\tpcc_odbc.h
# End Source File
# Begin Source File

SOURCE=..\tm_tuxedo_dll\src\tpcc_tux.h
# End Source File
# Begin Source File

SOURCE=..\common\src\trans.h
# End Source File
# Begin Source File

SOURCE=..\common\src\txn_base.h
# End Source File
# End Group
# End Target
# End Project
```

rtetime.h

```
/* FILE: rtetime.h : header file
 * Copyright 1997 Microsoft Corp., All rights reserved.
 *
 * Source code licensed to Tandem Computers  for Internal
 * use only.  Redistribution of source or object files or
 * any derivative works is prohibited. By agreement, this
 * notice may not be removed.
 *
 * Authors: Charles Levine, Philip Durr
 *                              Microsoft Corp.
 *
 */

//FILE: RTETIME.H

#define   MAX_JULIAN_TIME               0x7FFFFFFFFFFFFFFF
#define JULIAN_TIME __int64
#define   TC_TIME             DWORD
extern "C"
{
BOOL                InitJulianTime(LPSYSTEMTIME lpInitTime);
JULIAN_TIME         GetJulianTime(void);
DWORD               MyTickCount(void);
void                GetJulianAndTC(JULIAN_TIME *pJulian, DWORD *pTC);
JULIAN_TIME         ConvertTo64BitTime(int iYear, int iMonth, int iDay, int iHour,
int iMinute, int iSecond);
JULIAN_TIME         Get64BitTime(LPSYSTEMTIME lpInitTime);
int                         JulianDay( int yr, int mm, int dd );
void                JulianToTime(JULIAN_TIME julianTS, int* yr, int* mm, int* dd,
int *hh, int *mi, int *ss );
```

```
void                JulianToCalendar( int day, int* yr, int* mm, int* dd );
}
```

spinlock.h

```
/*        FILE: SPINLOCK.H
 *
 * Copyright 1997 Microsoft Corp., All rights reserved.
 *
 * Source code licensed to Tandem Computers  for Internal
 * use only.  Redistribution of source or object files or
 * any derivative works is prohibited. By agreement, this
 * notice may not be removed.
 *
 * Authors: Mike Parkes, Charles Levine, Philip Durr
 *                          Microsoft Corp.
 */

#ifndef _INC_Spinlock

          const LONG LockClosed         = 1;
          const LONG LockOpen           = 0;

          /*************************************************************
           *
           *   Spinlock and Semaphore locking.
           *
           *   This class provides a very conservative locking scheme.
           *   The assumption behind the code is that locks will be
           *   held for a very short time.  When a lock is taken a memory
           *   location is exchanged.  All other threads that want this
           *   lock wait by spinning and sometimes sleeping on a semaphore
           *   until it becomes free again.  The only other choice is not
           *   to wait at all and move on to do something else.  This
           *   module should normally be used in conjunction with cache
           *   aligned memory in minimize cache line misses.
           *
           *************************************************************/

          class Spinlock
          {
                    // Private data.
                    HANDLE                      Semaphore;
                    volatile LONG               m_Spinlock;
                    volatile LONG               Waiting;

                    #ifdef _DEBUG
                              // Counters for debugging builds.
                              volatile LONG       TotalLocks;
                              volatile LONG       TotalSleeps;
                              volatile LONG       TotalSpins;
                              volatile LONG       TotalWaits;
                    #endif

                    public:
                              // Public functions.

                              Spinlock( void );

                              inline BOOL ClaimLock( BOOL Wait = TRUE );
                              inline void ReleaseLock( void );
                              ~Spinlock( void );
                              // Disabled operations.
                              Spinlock( const Spinlock & Copy );
                              void operator=( const Spinlock & Copy );

                    private:
                              // Private functions.
                              inline BOOL ClaimSpinlock( volatile LONG *sl );
                              void WaitForLock( void );
                              void WakeAllSleepers( void );
          };

          /*************************************************************
           *
           *   A guaranteed atomic exchange.
           *
           *   An attempt is made to claim the Spinlock.  This action is
           *   guaranteed to be atomic.
           *
           *************************************************************/

          inline BOOL Spinlock::ClaimSpinlock( volatile LONG *Spinlock )
          {
                    #ifdef _DEBUG
                              InterlockedIncrement( (LPLONG) & TotalLocks );
                    #endif
                    return ( ((*Spinlock) == LockOpen) && (InterlockedExchange(
(LPLONG)Spinlock, LockClosed ) == LockOpen) );
          }

          /*************************************************
           *
           *   Claim the Spinlock.
           *
           *   Claim the lock if available else wait or exit.
           *
           *************************************************/

          inline BOOL Spinlock::ClaimLock( BOOL Wait )
          {
                    if ( ! ClaimSpinlock( (volatile LONG*) & m_Spinlock ) )
                    {
                              if ( Wait )
                                        WaitForLock();
                              return Wait;
                    }
                    return TRUE;
          }

          /*********************************************************
           *
           *   Release the Spinlock.
           *
           *   Release the lock and if needed wakeup any sleepers.
           *
           *********************************************************/

          inline void Spinlock::ReleaseLock( void )
          {
                    m_Spinlock = LockOpen;
                    if ( Waiting > 0 )
                              WakeAllSleepers();
          }
```

```
        #define _INC_Spinlock

#endif
```

tm_com_dll.dsp

```
# Microsoft Developer Studio Project File - Name="tm_com_dll" - Package Owner=<4>
# Microsoft Developer Studio Generated Build File, Format Version 6.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Dynamic-Link Library" 0x0102

CFG=tm_com_dll - Win32 Debug
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "tm_com_dll.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "tm_com_dll.mak" CFG="tm_com_dll - Win32 Debug"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "tm_com_dll - Win32 Release" (based on "Win32 (x86) Dynamic-Link Library")
!MESSAGE "tm_com_dll - Win32 Debug" (based on "Win32 (x86) Dynamic-Link Library")
!MESSAGE

# Begin Project
# PROP AllowPerConfigDependencies 0
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "tm_com_dll - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir "Release"
# PROP BASE Intermediate_Dir "Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MT /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /YX /FD
/c
# ADD CPP /nologo /MD /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /machine:I386
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /machine:I386 /out:".\bin/tpcc_com.dll"

!ELSEIF  "$(CFG)" == "tm_com_dll - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "Debug"
# PROP BASE Intermediate_Dir "Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MTd /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D "_WINDOWS"
/YX /FD /c
# ADD CPP /nologo /MDd /W3 /Gm /GX /ZI /Od /D "WIN32" /D "_DEBUG" /D "_WINDOWS" /YX
/FD /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /pdbtype:sept
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /out:".\bin/tpcc_com.dll"
/pdbtype:sept

!ENDIF

# Begin Target

# Name "tm_com_dll - Win32 Release"
# Name "tm_com_dll - Win32 Debug"
# Begin Source File

SOURCE=.\src\tpcc_com.cpp
# End Source File
# Begin Source File

SOURCE=.\src\tpcc_com.h
# End Source File
# End Target
# End Project
```

tpcc.cpp

```
/*        FILE:                TPCC.C
 *                                        Microsoft TPC-C Kit Ver. 4.20.000
 *                                        Copyright Microsoft, 1999
```

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

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

#include <sqltypes.h>

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

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

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

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

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

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


#define   LEN_ERR_STRING      256

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

char               szMyComputerName[MAX_COMPUTERNAME_LENGTH+1];

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

// The WEBCLIENT_VERSION string specifies the version level of this web client
interface.
// The RTE must be synchronized with the interface level on login, otherwise the
login
// will fail.  This is a sanity check to catch problems resulting from mismatched
versions
// of the RTE and web client.
#define WEBCLIENT_VERSION "410"

static    CRITICAL_SECTION              TermCriticalSection;

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

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

// For deferred Delivery txns:

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

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

// configuration settings from registry
TPCCREGISTRYDATA            Reg;


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

#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];

          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(&TermCriticalSection);

                                       if ( ReadTPCCRegistrySettings( &Reg ) )
                                                throw new CWEBCLNT_ERR(
ERR_MISSING_REGISTRY_ENTRIES );

                                       dwDelBuffSize = min(
Reg.dwMaxPendingDeliveries, 10000 );  // min with 10000 as a sanity constraint
                                        dwNumDeliveryThreads = min(
Reg.dwNumberOfDeliveryThreads, 100 );  // min with 100 as a sanity constraint

                                       TermInit();

                                       // load DLL for txn monitor
                                       if (Reg.eTxnMon == TUXEDO)
                                       {
                                                strcpy( szDllName, Reg.szPath );
                                                strcat( szDllName,
"tpcc_tuxedo.dll");
                                                hLibInstanceTm = LoadLibrary(
szDllName );
                                                if (hLibInstanceTm == NULL)
                                                         throw new CWEBCLNT_ERR(
ERR_LOADDLL_FAILED, szDllName, GetLastError() );

                                                // get function pointer to wrapper
for class constructor
                                                pCTPCC_TUXEDO_new =
(TYPE_CTPCC_TUXEDO*) GetProcAddress(hLibInstanceTm,"CTPCC_TUXEDO_new");
                                                if (pCTPCC_TUXEDO_new == NULL)
                                                         throw new CWEBCLNT_ERR(
ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                                       }
                                       else if (Reg.eTxnMon == ENCINA)
                                       {
                                                strcpy( szDllName, Reg.szPath );
                                                strcat( szDllName,
"tpcc_encina.dll");
                                                hLibInstanceTm = LoadLibrary(
szDllName );
                                                if (hLibInstanceTm == NULL)
                                                         throw new CWEBCLNT_ERR(
ERR_LOADDLL_FAILED, szDllName, GetLastError() );
                                                // get function pointer to wrapper
for class constructor
                                                pCTPCC_ENCINA_new =
(TYPE_CTPCC_ENCINA*) GetProcAddress(hLibInstanceTm,"CTPCC_ENCINA_new");
                                                pCTPCC_ENCINA_post_init =
(TYPE_CTPCC_ENCINA*) GetProcAddress(hLibInstanceTm,"CTPCC_ENCINA_post_init");
                                                if (pCTPCC_ENCINA_new == NULL)
                                                         throw new CWEBCLNT_ERR(
ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                                       }
                                       else if (Reg.eTxnMon == COM)
                                       {
                                                strcpy( szDllName, Reg.szPath );
                                                strcat( szDllName,
"tpcc_com.dll");
                                                hLibInstanceTm = LoadLibrary(
szDllName );
                                                if (hLibInstanceTm == NULL)
                                                         throw new CWEBCLNT_ERR(
ERR_LOADDLL_FAILED, szDllName, GetLastError() );

                                                // get function pointer to wrapper
for class constructor
                                                pCTPCC_COM_new = (TYPE_CTPCC_COM*)
GetProcAddress(hLibInstanceTm,"CTPCC_COM_new");
                                                if (pCTPCC_COM_new == NULL)
                                                         throw new CWEBCLNT_ERR(
ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                                       }

                                       // load DLL for database connection
                                       if ((Reg.eTxnMon == None) ||
(dwNumDeliveryThreads > 0))
                                       {
                                                if (Reg.eDB_Protocol == DBLIB)
                                                {
                                                         strcpy( szDllName,
Reg.szPath );
                                                         strcat( szDllName,
"tpcc_dblib.dll");
                                                         hLibInstanceDb =
LoadLibrary( szDllName );
```

```
                                                  if (hLibInstanceDb ==
NULL)
                                                            throw new
CWEBCLNT_ERR( ERR_LOADDLL_FAILED, szDllName, GetLastError() );

                                                  // get function pointer
to wrapper for class constructor
                                                  pCTPCC_DBLIB_new =
(TYPE_CTPCC_DBLIB*) GetProcAddress(hLibInstanceDb,"CTPCC_DBLIB_new");
                                                  if (pCTPCC_DBLIB_new ==
NULL)
                                                            throw new
CWEBCLNT_ERR( ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                                                  }
                                                  else if (Reg.eDB_Protocol == ODBC)
                                                  {
                                                            strcpy( szDllName,
Reg.szPath );
                                                  strcat( szDllName,
"tpcc_odbc.dll");
                                                  hLibInstanceDb =
LoadLibrary( szDllName );
                                                  if (hLibInstanceDb ==
NULL)
                                                            throw new
CWEBCLNT_ERR( ERR_LOADDLL_FAILED, szDllName, GetLastError() );

                                                  // get function pointer
to wrapper for class constructor
                                                  pCTPCC_ODBC_new =
(TYPE_CTPCC_ODBC*) GetProcAddress(hLibInstanceDb,"CTPCC_ODBC_new");
                                                  if (pCTPCC_ODBC_new ==
NULL)
                                                            throw new
CWEBCLNT_ERR( ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                                                  }
                                        }

                                        if (dwNumDeliveryThreads)
                                        {
                                                  // for deferred delivery txns:
                                                  hDoneEvent = CreateEvent( NULL,
TRUE /* manual reset */, FALSE /* initially not signalled */, NULL );

          InitializeCriticalSection(&DelBuffCriticalSection);
                                                  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.log",
                                                                      Reg.szPath,
Time.wYear % 100, Time.wMonth, Time.wDay, Time.wHour, Time.wMinute );
                                                  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(&DelBuffCriticalSection);
                                        }

                                        DeleteCriticalSection(&TermCriticalSection);

                                        if (hLibInstanceTm != NULL)
                                                  FreeLibrary( hLibInstanceTm );
                                        hLibInstanceTm = NULL;

                                        if (hLibInstanceDb != NULL)
                                                  FreeLibrary( hLibInstanceDb );
                                        hLibInstanceDb = NULL;
```

```
                                        Sleep(500);
                                        break;

                                default:
                                        /* nothing */;
                        }
                }
                catch (CBaseErr *e)
                {
                        WriteMessageToEventLog( e->ErrorText() );
                        delete e;
                        TerminateExtension(0);
                        return FALSE;
                }
                catch (...)
                {
                        WriteMessageToEventLog(TEXT("Unhandled exception.  DLL could not
load."));
                        TerminateExtension(0);
                        return FALSE;
                }

                return TRUE;
}


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

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

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

        return TRUE;
}

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

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

        TermDeleteAll();
        return TRUE;
}


/* FUNCTION: HttpExtensionProc
 *
 * PURPOSE:         This function is the main entry point for the TPCC DLL. The
internet service
 *                          calls this function passing in the http string.
 *
 * ARGUMENTS:       EXTENSION_CONTROL_BLOCK       *pECB     structure pointer to
passed in internet
 *
                                        service information.
 *
 * RETURNS:                 DWORD     HSE_STATUS_SUCCESS
                connection can be dropped if error
 *
        HSE_STATUS_SUCCESS_AND_KEEP_CONN        keep connect valid comment sent
 *
 * COMMENTS:        None
 *
 */

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

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


#ifdef ICECAP
        StartCAP();
#endif

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

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

```
                                        throw new CWEBCLNT_ERR( ERR_INVALID_TERMID
);
                        }

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

                        //set use time
                        Term.pClientData[TermId].iTickCount = GetTickCount();
                }


                switch(iCmd)
                {
                case 0:
                        WelcomeForm(pECB, szBuffer);
                        break;
                case 1:
                        switch( FormId )
                        {
                                case WELCOME_FORM:
                                case MAIN_MENU_FORM:
                                        break;
                                case NEW_ORDER_FORM:
                                        ProcessNewOrderForm(pECB, TermId,
szBuffer);
                                        break;
                                case PAYMENT_FORM:
                                        ProcessPaymentForm(pECB, TermId,
szBuffer);
                                        break;
                                case DELIVERY_FORM:
                                        ProcessDeliveryForm(pECB, TermId,
szBuffer);
                                        break;
                                case ORDER_STATUS_FORM:
                                        ProcessOrderStatusForm(pECB,
TermId, szBuffer);
                                        break;
                                case STOCK_LEVEL_FORM:
                                        ProcessStockLevelForm(pECB,
TermId, szBuffer);
                                        break;
                        }
                        break;
                case 2:
                        // new-order selected from menu; display new-order
input form
                        MakeNewOrderForm(TermId, NULL, INPUT_FORM, szBuffer);
                        break;
                case 3:
                        // payment selected from menu; display payment input
form
                        MakePaymentForm(TermId, NULL, INPUT_FORM, szBuffer);
                        break;
                case 4:
                        // delivery selected from menu; display delivery input
form
                        MakeDeliveryForm(TermId, NULL, INPUT_FORM, szBuffer);
                        break;
                case 5:
                        // order-status selected from menu; display order-
status input form
                        MakeOrderStatusForm(TermId, NULL, INPUT_FORM,
szBuffer);
                        break;
                case 6:
                        // stock-level selected from menu; display stock-level
input form
                        MakeStockLevelForm(TermId, NULL, INPUT_FORM,
szBuffer);
                        break;
                case 7:
                        // ExitCmd
                        TermDelete(TermId);
                        WelcomeForm(pECB, szBuffer);
                        break;
                case 8:
                        SubmitCmd(pECB, szBuffer);
                        break;
                case 9:
                        // menu
                        MakeMainMenuForm(TermId,
Term.pClientData[TermId].iSyncId, szBuffer);
                        break;
                case 10:
                        // CMD=Clear
                        // resets all connections; should only be used when no
other connections are active
                        TermDeleteAll();
                        TermInit();
                        WelcomeForm(pECB, szBuffer);
                        break;
                case 11:  // CMD=Stats
                        StatsCmd(pECB, szBuffer);
                        break;
                }
        }
        catch (CBaseErr *e)
        {
                ErrorForm( pECB, e->ErrorType(), e->ErrorNum(), TermId, iSyncId,
e->ErrorText(), szBuffer );
                delete e;
        }
        catch (...)
        {
                ErrorForm( pECB, ERR_TYPE_WEBDLL, 0, TermId, iSyncId, "Error:
Unhandled exception in Web Client.", szBuffer );
        }

#ifdef ICECAP
        StopCAP();
#endif


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

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

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


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

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

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

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

        (VOID) DeregisterEventSource(hEventSource);
    }
}


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

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

          DELIVERY_TRANSACTION                    delivery;
          PDELIVERY_DATA                                  pDeliveryData;
          TXN_RECORD_TPCC_DELIV_DEF     txnDeliRec;
          DWORD                         index;
          HANDLE                        handles[2];

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

          int                                     iRetryCnt = 0;
          static int                    iMaxRetries = 10;

          assert(txnDelilog != NULL);

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

                    // will retry connection up to ten times
                    if (iRetryCnt++ < iMaxRetries)
                    {
                              Sleep(5000);        // delay for 5 seconds
                              goto Reconnect;
                    }

                    wsprintf( szTmp, "Delivery Txn thread terminating after %d
retries.", iMaxRetries );
                    WriteMessageToEventLog( szTmp );
                    goto ErrorExit;
          }
          catch (...)
          {
                    WriteMessageToEventLog(TEXT("Unhandled exception caught in
DeliveryWorkerThread.  Delivery Txn thread terminating."));
                    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(&DelBuffCriticalSection);
                                        delivery = *(pDelBuff+dwDelBuffBusyIndex);
                                        dwDelBuffFreeCount++;
                                        dwDelBuffBusyIndex++;
                                        if (dwDelBuffBusyIndex == dwDelBuffSize)
        // wrap-around if at end of buffer
                                                dwDelBuffBusyIndex = 0;


        LeaveCriticalSection(&DelBuffCriticalSection);

                                        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, "Error in Delivery Txn thread.  %s",
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:
                delete pTxn;
                _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(short w_id, short o_carrier_id)
{
        BOOL bError;

        EnterCriticalSection(&DelBuffCriticalSection);
        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(&DelBuffCriticalSection);

        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=4><BR>"
                                                        "District ID  = <INPUT
NAME=\"d_id\" SIZE=2><BR>"
                                                        "</PRE></font><HR>"
                                                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Submit\">"

        "</FORM></BODY></HTML>");
}

/* FUNCTION: SubmitCmd
 *
 * PURPOSE:         This function allocated a new terminal id in the Term structure
array.
 *
 */

void SubmitCmd(EXTENSION_CONTROL_BLOCK *pECB, char *szBuffer)
{
        int             iNewTerm;
        char    *ptr = pECB->lpszQueryString;

        char    szVersion[32]       = { 0 };
        char    szServer[32]        = { 0 };
        char    szUser[32]                  = "sa";
        char    szPassword[32]      = { 0 };
        char    szDatabase[32]      = "tpcc";

        // validate version field; the version field ensures that the RTE is
synchronized with the web client
        GetKeyValue(&ptr, "VERSION", szVersion, sizeof(szVersion),
ERR_VERSION_MISMATCH);
        if ( strcmp( szVersion, WEBCLIENT_VERSION ) )
                throw new CWEBCLNT_ERR( ERR_VERSION_MISMATCH );

        if (Reg.eTxnMon == None)
        {
                // parse Server name
                GetKeyValue(&ptr, "db_server", szServer, sizeof(szServer),
ERR_NO_SERVER_SPECIFIED);
                // parse User name
                GetKeyValue(&ptr, "db_user", szUser, sizeof(szUser), NO_ERR);
                // parse Password
                GetKeyValue(&ptr, "db_passwd", szPassword, sizeof(szPassword),
NO_ERR);
                // parse Database name
                GetKeyValue(&ptr, "db_name", szDatabase, sizeof(szDatabase),
NO_ERR);
        }

        // parse warehouse ID
        int w_id = GetIntKeyValue(&ptr, "w_id", ERR_HTML_ILL_FORMED,
ERR_W_ID_INVALID);
        if ( w_id < 1 )
                throw new CWEBCLNT_ERR( ERR_W_ID_INVALID );

        // parse district ID
        int d_id = GetIntKeyValue(&ptr, "d_id", ERR_HTML_ILL_FORMED,
ERR_D_ID_INVALID);
        if ( d_id < 1 || d_id > 10 )
                throw new CWEBCLNT_ERR( ERR_D_ID_INVALID );


        iNewTerm = TermAdd();

        Term.pClientData[iNewTerm].w_id = w_id;
        Term.pClientData[iNewTerm].d_id = d_id;

        try
        {
                if (Reg.eTxnMon == TUXEDO)
                        Term.pClientData[iNewTerm].pTxn = pCTPCC_TUXEDO_new();
                else if (Reg.eTxnMon == ENCINA)
                        Term.pClientData[iNewTerm].pTxn = pCTPCC_ENCINA_new();
                else if (Reg.eTxnMon == COM)
                        Term.pClientData[iNewTerm].pTxn = pCTPCC_COM_new(
Reg.bCOM_SinglePool );
                else if (Reg.eDB_Protocol == ODBC)
                        Term.pClientData[iNewTerm].pTxn = pCTPCC_ODBC_new(
szServer, szUser, szPassword, szMyComputerName, szDatabase );
                else if (Reg.eDB_Protocol == DBLIB)
```

```
                              Term.pClientData[iNewTerm].pTxn = pCTPCC_DBLIB_new(
szServer, szUser, szPassword, szMyComputerName, szDatabase );
          }
          catch (...)
          {
                    TermDelete(iNewTerm);
                    throw;              // pass exception upward
          }

          MakeMainMenuForm(iNewTerm, Term.pClientData[iNewTerm].iSyncId, szBuffer);
}

/* FUNCTION: StatsCmd
 *
 * PURPOSE:          This function returns to the browser the total number of active
terminal ids.
 *                              This routine is for development/debugging purposes.
 *
 */

void StatsCmd(EXTENSION_CONTROL_BLOCK *pECB, char *szBuffer)
{
          int i;
          int       iTotal;

          EnterCriticalSection(&TermCriticalSection);

          iTotal = 0;
          for(i=0; i<Term.iNumEntries; i++)
          {
                    if (Term.pClientData[i].iNextFree == -1)
                              iTotal++;
          }

          LeaveCriticalSection(&TermCriticalSection);

          wsprintf( szBuffer,
                              "<HTML><HEAD><TITLE>TPC-C Web Client
Stats</TITLE></HEAD>"
                              "<BODY><B><BIG> Total Active Connections: %d
</BIG></B><BR></BODY></HTML>"
                              , iTotal );
}

char *CWEBCLNT_ERR::ErrorText()
{
          static SERRORMSG errorMsgs[] =
          {
                    {         ERR_COMMAND_UNDEFINED,
                    "Command undefined."
                                                                                        },

                    {         ERR_D_ID_INVALID,
                    "Invalid District ID Must be 1 to 10."
                                                  },
                    {         ERR_DELIVERY_CARRIER_ID_RANGE,
          "Delivery Carrier ID out of range must be 1 - 10."
                              },
                    {         ERR_DELIVERY_CARRIER_INVALID,
          "Delivery Carrier ID invalid must be numeric 1 - 10."
                    },
                    {         ERR_DELIVERY_MISSING_OCD_KEY,
          "Delivery missing Carrier ID key \"OCD*\"."
                                        },
                    {         ERR_DELIVERY_THREAD_FAILED,
          "Could not start delivery worker thread."
                                        },
                    {         ERR_GETPROCADDR_FAILED,
                    "Could not map proc in DLL.  GetProcAddr error.  DLL="
                              },
                    {         ERR_HTML_ILL_FORMED,
                    "Required key field is missing from HTML string."
                              },
                    {         ERR_INVALID_SYNC_CONNECTION,
          "Invalid Terminal Sync ID."
                                                            },
                    {         ERR_INVALID_TERMID,
                    "Invalid Terminal ID."
                                                                                        },
                    {         ERR_LOADDLL_FAILED,
                    "Load of DLL failed.  DLL="
                                                                  },
                    {         ERR_MAX_CONNECTIONS_EXCEEDED,                   "No
connections available.  Max Connections is probably too low."   },
                    {         ERR_MISSING_REGISTRY_ENTRIES,
          "Required registry entries are missing.  Rerun INSTALL to correct."   },
                    {         ERR_NEWORDER_CUSTOMER_INVALID,
          "New Order customer id invalid data type, range = 1 to 3000."
          },
                    {         ERR_NEWORDER_CUSTOMER_KEY,
          "New Order missing Customer key \"CID*\"."
                                        },
                    {         ERR_NEWORDER_DISTRICT_INVALID,
          "New Order District ID Invalid range 1 - 10."
                              },
                    {         ERR_NEWORDER_FORM_MISSING_DID,
          "New Order missing District key \"DID*\"."
                                        },
                    {         ERR_NEWORDER_ITEMID_INVALID,                    "New
Order Item Id is wrong data type, must be numeric."                             },
                    {         ERR_NEWORDER_ITEMID_RANGE,
          "New Order Item Id is out of range. Range = 1 to 999999."
          },
                    {         ERR_NEWORDER_ITEMID_WITHOUT_SUPPW,              "New
Order Item_Id field entered without a corresponding Supp_W."          },
                    {         ERR_NEWORDER_MISSING_IID_KEY,                   "New
Order missing Item Id key \"IID*\"."
                    },
                    {         ERR_NEWORDER_MISSING_QTY_KEY,                   "New
Order Missing Qty key \"Qty##*\"."
                              },
                    {         ERR_NEWORDER_MISSING_SUPPW_KEY,
          "New Order missing Supp_W key \"SP##*\"."
                                        },
                    {         ERR_NEWORDER_NOITEMS_ENTERED,                   "New
Order No order lines entered."
                                        },
                    {         ERR_NEWORDER_QTY_INVALID,
          "New Order Qty invalid must be numeric range 1 - 99."
                    },
                    {         ERR_NEWORDER_QTY_RANGE,
                    "New Order Qty is out of range. Range = 1 to 99."
                              },
                    {         ERR_NEWORDER_QTY_WITHOUT_SUPPW,
          "New Order Qty field entered without a corresponding Supp_W."
          },
```

```
        {       ERR_NEWORDER_SUPPW_INVALID,
"New Order Supp_W invalid data type must be numeric."
        },
        {       ERR_NO_SERVER_SPECIFIED,
"No Server name specified."
                                                },
        {       ERR_ORDERSTATUS_CID_AND_CLT,
"Order Status Only Customer ID or Last Name may be entered, not both."
},
        {       ERR_ORDERSTATUS_CID_INVALID,
"Order Status Customer ID invalid, range must be numeric 1 - 3000."   },
        {       ERR_ORDERSTATUS_CLT_RANGE,
"Order Status Customer last name longer than 16 characters."
},
        {       ERR_ORDERSTATUS_DID_INVALID,
"Order Status District invalid, value must be numeric 1 - 10."
},
        {       ERR_ORDERSTATUS_MISSING_CID_CLT,
"Order Status Either Customer ID or Last Name must be entered."
},
        {       ERR_ORDERSTATUS_MISSING_CID_KEY,
"Order Status missing Customer key \"CID*\"."
                },
        {       ERR_ORDERSTATUS_MISSING_CLT_KEY,
"Order Status missing Customer Last Name key \"CLT*\"."
        },
        {       ERR_ORDERSTATUS_MISSING_DID_KEY,
"Order Status missing District key \"DID*\"."
                },
        {       ERR_PAYMENT_CDI_INVALID,
"Payment Customer district invalid must be numeric."
        },
        {       ERR_PAYMENT_CID_AND_CLT,
"Payment Only Customer ID or Last Name may be entered, not both."     },
        {       ERR_PAYMENT_CUSTOMER_INVALID,
"Payment Customer data type invalid, must be numeric."
        },
        {       ERR_PAYMENT_CWI_INVALID,
"Payment Customer Warehouse invalid, must be numeric."
        },
        {       ERR_PAYMENT_DISTRICT_INVALID,
"Payment District ID is invalid, must be 1 - 10."
        },
        {       ERR_PAYMENT_HAM_INVALID,
"Payment Amount invalid data type must be numeric."
                },
        {       ERR_PAYMENT_HAM_RANGE,
         "Payment Amount out of range, 0 - 9999.99."
                                        },
        {       ERR_PAYMENT_LAST_NAME_TO_LONG,
"Payment Customer last name longer than 16 characters."
        },
        {       ERR_PAYMENT_MISSING_CDI_KEY,
"Payment missing Customer district key \"CDI*\"."
        },
        {       ERR_PAYMENT_MISSING_CID_CLT,
"Payment Either Customer ID or Last Name must be entered."
},
        {       ERR_PAYMENT_MISSING_CID_KEY,
"Payment missing Customer Key \"CID*\"."
                                },
```

```
                {       ERR_PAYMENT_MISSING_CLT_KEY,
        "Payment missing Customer Last Name key \"CLT*\"."
                        },
                {       ERR_PAYMENT_MISSING_CWI_KEY,
        "Payment missing Customer Warehouse key \"CWI*\"."
                        },
                {       ERR_PAYMENT_MISSING_DID_KEY,
        "Payment missing District Key \"DID*\"."
                                },
                {       ERR_PAYMENT_MISSING_HAM_KEY,
        "Payment missing Amount key \"HAM*\"."
                                },
                {       ERR_STOCKLEVEL_MISSING_THRESHOLD_KEY,   "Stock Level;
missing Threshold key \"TT*\"."
        },
                {       ERR_STOCKLEVEL_THRESHOLD_INVALID,
        "Stock Level; Threshold value must be in the range = 1 - 99."
        },
                {       ERR_STOCKLEVEL_THRESHOLD_RANGE,
        "Stock Level Threshold out of range, range must be 1 - 99."
        },
                {       ERR_VERSION_MISMATCH,
                "Invalid version field.  RTE and Web Client are probably out of
sync." },
                {       ERR_W_ID_INVALID,
                "Invalid Warehouse ID."
                                                                                },
                {       0,
                                        ""

                                                        }
        };

        char szTmp[256];
        int i = 0;
        while (TRUE)
        {
                if (errorMsgs[i].szMsg[0] == 0)
                {
                        strcpy( szTmp, "Unknown error number." );
                        break;
                }
                if (m_Error == errorMsgs[i].iError)
                {
                        strcpy( szTmp, errorMsgs[i].szMsg );
                        break;
                }
                i++;
        }

        if (m_szTextDetail)
                strcat( szTmp, m_szTextDetail );
        if (m_SystemErr)
                wsprintf( szTmp+strlen(szTmp), "  Error=%d", m_SystemErr );

        m_szErrorText = new char[strlen(szTmp)+1];
        strcpy( m_szErrorText, szTmp );
        return m_szErrorText;

}

/* FUNCTION: GetKeyValue
 *
```

```
 * PURPOSE:         This function parses a http formatted string for specific key
values.
 *
 * ARGUMENTS:       char                        *pQueryString       http string
from client browser
 *                                  char                        *pKey
                    key value to look for
 *                                  char                        *pValue
                    character array into which to place key's value
 *                                  int                                     iMax
                             maximum length of key value array.
 *                                  WEBERROR            err
                    error value to throw
 *
 * RETURNS:                   nothing.
 *
 * ERROR:           if (the pKey value is not found) then
 *                                          if (err == 0)
 *                                                  return (empty string)
 *                                          else
 *                                                  throw CWEBCLNT_ERR(err)
 *
 * COMMENTS:        http keys are formatted either KEY=value& or KEY=value\0. This
DLL formats
 *                                  TPC-C input fields in such a manner that the
keys can be extracted in the
 *                                  above manner.
 */

void GetKeyValue(char **pQueryString, char *pKey, char *pValue, int iMax, WEBERROR
err)
{
          char *ptr;

          if ( !(ptr=strstr(*pQueryString, pKey)) )
                    goto ErrorExit;
          ptr += strlen(pKey);
          if ( *ptr != '=' )
                    goto ErrorExit;
          ptr++;

          iMax--;  // one position is for terminating null
          while( *ptr && *ptr != '&' && iMax)
          {
                    *pValue++ = *ptr++;
                    iMax--;
          }
          *pValue = 0;  // terminating null

          *pQueryString = ptr;
          return;

ErrorExit:
          if (err != NO_ERR)
                    throw new CWEBCLNT_ERR( err );
          *pValue = 0;  // return empty result string
}

/* FUNCTION: GetIntKeyValue
 *
 * PURPOSE:         This function parses a http formatted string for a specific key
value.
 *
```

```
 * ARGUMENTS:       char                        *pQueryString       http string
from client browser
 *                                  char                        *pKey
                    key value to look for
 *                                  WEBERROR            NoKeyErr
          error value to throw if key not found
 *                                  WEBERROR            NotIntErr
          error value to throw if value not numeric
 *
 * RETURNS:                   integer
 *
 * ERROR:           if (the pKey value is not found) then
 *                                          if (NoKeyErr != NO_ERR)
 *                                                  throw CWEBCLNT_ERR(err)
 *                                          else
 *                                                  return 0
 *                                  else if (non-numeric char found) then
 *                                          if (NotIntErr != NO_ERR) then
 *                                                  throw CWEBCLNT_ERR(err)
 *                                          else
 *                                                  return 0
 *
 * COMMENTS:        http keys are formatted either KEY=value& or KEY=value\0. This
DLL formats
 *                                  TPC-C input fields in such a manner that the
keys can be extracted in the
 *                                  above manner.
 */

int GetIntKeyValue(char **pQueryString, char *pKey, WEBERROR NoKeyErr, WEBERROR
NotIntErr)
{
          char *ptr0;
          char *ptr;

          if ( !(ptr=strstr(*pQueryString, pKey)) )
                    goto ErrorNoKey;
          ptr += strlen(pKey);
          if ( *ptr != '=' )
                    goto ErrorNoKey;
          ptr++;

          ptr0 = ptr;                   // remember starting point
          // scan string until a terminator (null or &) or a non-digit
          while( *ptr && *ptr != '&' && isdigit(*ptr) )
                    ptr++;

          // make sure we stopped scanning for the right reason
          if ((ptr0 == ptr) || (*ptr && *ptr != '&'))
          {
                    if (NotIntErr != NO_ERR)
                              throw new CWEBCLNT_ERR( NoKeyErr );
                    return 0;
          }

          *pQueryString = ptr;
          return atoi(ptr0);

ErrorNoKey:
          if (NoKeyErr != NO_ERR)
                    throw new CWEBCLNT_ERR( NoKeyErr );
          return 0;
}
```

```
/* FUNCTION: TermInit
 *
 * PURPOSE:         This function initializes the client terminal structure; it is
called when the TPCC.DLL
 *                          is first loaded by the inet service.
 *
 */

void TermInit(void)
{
          EnterCriticalSection(&TermCriticalSection);

          Term.iMasterSyncId  = 1;
          Term.iNumEntries    = Reg.dwMaxConnections+1;

          Term.pClientData    = NULL;
          Term.pClientData    = (PCLIENTDATA)malloc(Term.iNumEntries *
sizeof(CLIENTDATA));
          if (Term.pClientData == NULL)
          {
                    LeaveCriticalSection(&TermCriticalSection);
                    throw new CWEBCLNT_ERR( ERR_MEM_ALLOC_FAILED );
          }

          ZeroMemory( Term.pClientData, Term.iNumEntries * sizeof(CLIENTDATA) );

          Term.iFreeList                = Term.iNumEntries-1;
          // build free list
          // note: Term.pClientData[0].iNextFree gets set to -1, which marks it as
"in use".
          //       This is intentional, as the zero entry is used as an anchor and
never
          //                    allocated as an actual terminal.
          for(int i=0; i<Term.iNumEntries; i++)
                    Term.pClientData[i].iNextFree = i-1;

          LeaveCriticalSection(&TermCriticalSection);
}

/* FUNCTION: TermDeleteAll
 *
 * PURPOSE:         This function frees allocated resources associated with the
terminal structure.
 *
 * ARGUMENTS:       none
 *
 * RETURNS:                  None
 *
 * COMMENTS:        This function is called only when the inet service unloads the
TPCC.DLL
 *
 */

void TermDeleteAll(void)
{
          EnterCriticalSection(&TermCriticalSection);

          for(int i=1; i<Term.iNumEntries; i++)
          {
                    if (Term.pClientData[i].iNextFree == -1)
                              delete Term.pClientData[i].pTxn;
          }
          Term.iFreeList                = 0;
          Term.iNumEntries    = 0;
          if ( Term.pClientData )
                    free(Term.pClientData);
          Term.pClientData    = NULL;

          LeaveCriticalSection(&TermCriticalSection);
}

/* FUNCTION: TermAdd
 *
 * PURPOSE:         This function assigns a terminal id which is used to identify a
client browser.
 *
 * RETURNS:                  int                 assigned terminal id
 *
 */

int TermAdd(void)
{
          DWORD     i;
          int                 iNewTerm, iTickCount;

          if (Term.iNumEntries == 0)
                    return -1;

          EnterCriticalSection(&TermCriticalSection);
          if (Term.iFreeList != 0)
          {         // position is available
                    iNewTerm = Term.iFreeList;
                    Term.iFreeList = Term.pClientData[iNewTerm].iNextFree;
                    Term.pClientData[iNewTerm].iNextFree = -1;  // indicates this
position is in use
          }
          else
          {         // no open slots, so find the slot that hasn't been used in the
longest time and reuse it
                    for(iNewTerm=1, i=1, iTickCount=0x7FFFFFFF;
i<Reg.dwMaxConnections; i++)
                    {
                              if (iTickCount > Term.pClientData[i].iTickCount)
                              {
                                        iTickCount = Term.pClientData[i].iTickCount;
                                        iNewTerm = i;
                              }
                    }
                    // if oldest term is less than one minute old, it probably means
that more connections
                    // are being attempted than were specified as "Max Connections"
at install.  In this case,
                    // do not bump existing connection; instead, return error to
requestor.
                    if ((GetTickCount() - iTickCount) < 60000)
                    {
                              LeaveCriticalSection(&TermCriticalSection);
                              throw new CWEBCLNT_ERR( ERR_MAX_CONNECTIONS_EXCEEDED
);
                    }
          }

          Term.pClientData[iNewTerm].iTickCount = GetTickCount();
          Term.pClientData[iNewTerm].iSyncId = Term.iMasterSyncId++;
```

```
        Term.pClientData[iNewTerm].pTxn = NULL;

        LeaveCriticalSection(&TermCriticalSection);
        return iNewTerm;
}

/* FUNCTION: TermDelete
 *
 * PURPOSE:         This function makes a terminal entry in the Term array available
for reuse.
 *
 * ARGUMENTS:       int                                                     id
                    Terminal id of client exiting
 *
 */

void TermDelete(int id)
{
        if ( id > 0 && id < Term.iNumEntries )
        {
                delete Term.pClientData[id].pTxn;

                // put onto free list
                EnterCriticalSection(&TermCriticalSection);

                Term.pClientData[id].iNextFree = Term.iFreeList;
                Term.iFreeList = id;

                LeaveCriticalSection(&TermCriticalSection);
        }
}


/* FUNCTION: MakeErrorForm
 */

void ErrorForm(EXTENSION_CONTROL_BLOCK *pECB, int iType, int iErrorNum, int iTermId,
int iSyncId, char *szErrorText, char *szBuffer )
{
        wsprintf(szBuffer,
                "<HTML><HEAD><TITLE>TPC-C Error</TITLE></HEAD><BODY>"
                "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\" VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"ERROR\" VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"FORMID\" VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"TERMID\" VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\" VALUE=\"%d\">"
                "<BOLD>An Error Occurred</BOLD><BR><BR>"
                "%s"
                "<BR><BR><HR>"
                "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Payment..\">"
                "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Delivery..\">"
                "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Order-
Status..\">"
                "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Stock-Level..\">"
                "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Exit..\">"
                "</FORM></BODY></HTML>"
                , iType, iErrorNum, MAIN_MENU_FORM, iTermId, iSyncId,
szErrorText );
}

/* FUNCTION: MakeMainMenuForm
 */

void MakeMainMenuForm(int iTermId, int iSyncId, char *szForm)
{
        wsprintf(szForm,
                "<HTML><HEAD><TITLE>TPC-C Main Menu</TITLE></HEAD><BODY>"
                "Select Desired Transaction.<BR><HR>"
                "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\" VALUE=\"0\">"
                "<INPUT TYPE=\"hidden\" NAME=\"ERROR\" VALUE=\"0\">"
                "<INPUT TYPE=\"hidden\" NAME=\"FORMID\" VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"TERMID\" VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\" VALUE=\"%d\">"
                "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Payment..\">"
                "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Delivery..\">"
                "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Order-
Status..\">"
                "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Stock-Level..\">"
                "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Exit..\">"
                "</FORM></BODY></HTML>"
                , MAIN_MENU_FORM, iTermId, iSyncId);
}

/* FUNCTION: MakeStockLevelForm
 *
 * PURPOSE:         This function constructs the Stock Level HTML page.
 *
 * COMMENTS:        The internal client buffer is created when the terminal id is
assigned and should not
 *                                      be freed except when the client terminal id
is no longer needed.
 */

void MakeStockLevelForm(int iTermId, STOCK_LEVEL_DATA *pStockLevelData, BOOL bInput,
char *szForm)
{
        int       c;

        c = wsprintf(szForm,
                "<HTML><HEAD><TITLE>TPC-C Stock Level</TITLE></HEAD><FORM
ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\" VALUE=\"0\">"
                "<INPUT TYPE=\"hidden\" NAME=\"ERROR\" VALUE=\"0\">"
                "<INPUT TYPE=\"hidden\" NAME=\"FORMID\" VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"TERMID\" VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\" VALUE=\"%d\">"
                "<PRE><font face=\"Courier\">
Stock-Level<BR>"
                "Warehouse: %4.4d   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>";

        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: %4.4d   ",
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: %4.4d   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, "  %4.4d   %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: %4.4d"
                              "                              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: %4.4d
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: %4.4d  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: %4.4d   ",
                    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, "  %4.4d       %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: %4.4d<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 =
(short)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;

        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(pPaymentData->c_last) > LAST_NAME_LEN )
                            throw new CWEBCLNT_ERR( ERR_PAYMENT_LAST_NAME_TO_LONG
);
                  strcpy(pPaymentData->c_last, szTmp);
        }
        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;

          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(pOrderStatusData->c_last) > LAST_NAME_LEN )
                              throw new CWEBCLNT_ERR( ERR_ORDERSTATUS_CLT_RANGE );
                    strcpy(pOrderStatusData->c_last, szTmp);
          }
          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;};
                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(short w_id, short o_carrier_id);
BOOL IsNumeric(char *ptr);
BOOL IsDecimal(char *ptr);
void DeliveryWorkerThread(void *ptr);
```

tpcc.rc

```
//Microsoft Developer Studio generated resource script.
//
#include "resource.h"

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

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

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

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

#ifndef _MAC
////////////////////////////////////////////////////////////////////////////
//
// Version
//

VS_VERSION_INFO VERSIONINFO
 FILEVERSION 0,4,0,0
 PRODUCTVERSION 0,4,0,0
 FILEFLAGSMASK 0x3fL
#ifdef _DEBUG
 FILEFLAGS 0x1L
#else
 FILEFLAGS 0x0L
#endif
 FILEOS 0x40004L
 FILETYPE 0x2L
 FILESUBTYPE 0x0L
BEGIN
    BLOCK "StringFileInfo"
    BEGIN
        BLOCK "040904b0"
        BEGIN
            VALUE "Comments", "TPC-C HTML DLL Server (DBLIB)\0"
            VALUE "CompanyName", "Microsoft\0"
            VALUE "FileDescription", "TPC-C HTML DLL Server (DBLIB)\0"
            VALUE "FileVersion", "0, 4, 0, 0\0"
            VALUE "InternalName", "tpcc\0"
            VALUE "LegalCopyright", "Copyright © 1997\0"
            VALUE "OriginalFilename", "tpcc.dll\0"
            VALUE "ProductName", "Microsoft tpcc\0"
            VALUE "ProductVersion", "0, 4, 0, 0\0"
        END
    END
    BLOCK "VarFileInfo"
    BEGIN
        VALUE "Translation", 0x409, 1200
    END
END

#endif    // !_MAC


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

1 TEXTINCLUDE DISCARDABLE
BEGIN
    "resource.h\0"
END

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

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

#endif    // APSTUDIO_INVOKED


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

IDD_DIALOG1 DIALOG DISCARDABLE  0, 0, 186, 95
STYLE DS_MODALFRAME | WS_POPUP | WS_CAPTION | WS_SYSMENU
CAPTION "Dialog"
FONT 8, "MS Sans Serif"
BEGIN
    DEFPUSHBUTTON   "OK",IDOK,129,7,50,14
    PUSHBUTTON      "Cancel",IDCANCEL,129,24,50,14
END


////////////////////////////////////////////////////////////////////////////
//
```

```
// DESIGNINFO
//

#ifdef APSTUDIO_INVOKED
GUIDELINES DESIGNINFO DISCARDABLE
BEGIN
    IDD_DIALOG1, DIALOG
    BEGIN
        LEFTMARGIN, 7
        RIGHTMARGIN, 179
        TOPMARGIN, 7
        BOTTOMMARGIN, 88
    END
END
#endif    // APSTUDIO_INVOKED

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



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


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

tpcc_com.cpp

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

// needed for CoinitializeEx
#define _WIN32_WINNT 0x0400

#include <windows.h>

// need to declare functions for export
#define DllDecl  __declspec( dllexport )

#include "..\..\common\src\trans.h"              //tpckit transaction header
contains definations of structures specific to TPC-C
#include "..\..\common\src\error.h"
#include "..\..\common\src\txn_base.h"
#include "tpcc_com.h"
#include "..\..\tpcc_com_ps\src\tpcc_com_ps_i.c"
#include "..\..\tpcc_com_all\src\tpcc_com_all_i.c"

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_COM* CTPCC_COM_new(BOOL bSinglePool)
{
          return new CTPCC_COM(bSinglePool);
}

CTPCC_COM::CTPCC_COM(BOOL bSinglePool)
{
          HRESULT hr = NULL;
          long lRet = 0;
          ULONG ulTmpSize = 0;

          m_pTxn                        = NULL;
          m_pNewOrder                   = NULL;
          m_pPayment                    = NULL;
          m_pStockLevel       = NULL;
          m_pOrderStatus      = NULL;

          m_bSinglePool       = bSinglePool;

          ulTmpSize = (ULONG) sizeof(COM_DATA);
          VariantInit(&m_vTxn);
          m_vTxn.vt = VT_SAFEARRAY;

          m_vTxn.parray = SafeArrayCreateVector(VT_UI1, ulTmpSize, ulTmpSize);
          if (!m_vTxn.parray)
                    throw new CCOMERR( E_FAIL );

          memset((void*)m_vTxn.parray->pvData,0,ulTmpSize);
          m_pTxn = (COM_DATA*)m_vTxn.parray->pvData;

          hr = CoInitializeEx(NULL, COINIT_MULTITHREADED);
          if (FAILED(hr))
          {
                    throw new CCOMERR( hr );
          }

          // create components
          if (m_bSinglePool)
          {
                    hr = CoCreateInstance(CLSID_TPCC, NULL, CLSCTX_SERVER,
IID_ITPCC, (void **)&m_pNewOrder);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    // all txns will use same component
                    m_pPayment = m_pNewOrder;
                    m_pStockLevel = m_pNewOrder;
                    m_pOrderStatus = m_pNewOrder;
          }
          else
          {
                    // use different components for each txn

                    hr = CoCreateInstance(CLSID_NewOrder, NULL, CLSCTX_SERVER,
IID_ITPCC, (void **)&m_pNewOrder);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);
```

```
                    hr = CoCreateInstance(CLSID_Payment, NULL, CLSCTX_SERVER,
IID_ITPCC, (void **)&m_pPayment);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    hr = CoCreateInstance(CLSID_StockLevel, NULL, CLSCTX_SERVER,
IID_ITPCC, (void **)&m_pStockLevel);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    hr = CoCreateInstance(CLSID_OrderStatus, NULL, CLSCTX_SERVER,
IID_ITPCC, (void **)&m_pOrderStatus);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);
          }

          // call setcomplete to release each component back into pool
          hr = m_pNewOrder->CallSetComplete();
          if (FAILED(hr))
                    throw new CCOMERR(hr);

          if (!m_bSinglePool)
          {
                    hr = m_pPayment->CallSetComplete();
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    hr = m_pStockLevel->CallSetComplete();
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    hr = m_pOrderStatus->CallSetComplete();
                    if (FAILED(hr))
                              throw new CCOMERR(hr);
          }
}

CTPCC_COM::~CTPCC_COM()
{
          if (m_pTxn)
                    SafeArrayDestroy(m_vTxn.parray);

          ReleaseInterface(m_pNewOrder);
          if (!m_bSinglePool)
          {
                    ReleaseInterface(m_pPayment);
                    ReleaseInterface(m_pStockLevel);
                    ReleaseInterface(m_pOrderStatus);
          }
          CoUninitialize();
}

void CTPCC_COM::NewOrder()
{
          VARIANT   vTxn_out;

          HRESULT hr = m_pNewOrder->NewOrder(m_vTxn, &vTxn_out);
          if (FAILED(hr))
                    throw new CCOMERR( hr );
          memcpy(m_pTxn, (void *)vTxn_out.parray->pvData,vTxn_out.parray-
>rgsabound[0].cElements);
          SafeArrayDestroy(vTxn_out.parray);

          if ( m_pTxn->ErrorType != ERR_SUCCESS )
                    throw new CCOMERR( m_pTxn->ErrorType, m_pTxn->error );
}

void CTPCC_COM::Payment()
{
          VARIANT   vTxn_out;

          HRESULT hr = m_pPayment->Payment(m_vTxn, &vTxn_out);
          if (FAILED(hr))
                    throw new CCOMERR( hr );
          memcpy(m_pTxn, (void *)vTxn_out.parray->pvData,vTxn_out.parray-
>rgsabound[0].cElements);
          SafeArrayDestroy(vTxn_out.parray);

          if ( m_pTxn->ErrorType != ERR_SUCCESS )
                    throw new CCOMERR( m_pTxn->ErrorType, m_pTxn->error );
}

void CTPCC_COM::StockLevel()
{
          VARIANT   vTxn_out;

          HRESULT hr = m_pStockLevel->StockLevel(m_vTxn, &vTxn_out);
          if (FAILED(hr))
                    throw new CCOMERR( hr );
          memcpy(m_pTxn, (void *)vTxn_out.parray->pvData,vTxn_out.parray-
>rgsabound[0].cElements);
          SafeArrayDestroy(vTxn_out.parray);

          if ( m_pTxn->ErrorType != ERR_SUCCESS )
                    throw new CCOMERR( m_pTxn->ErrorType, m_pTxn->error );
}

void CTPCC_COM::OrderStatus()
{
          VARIANT   vTxn_out;

          HRESULT hr = m_pOrderStatus->OrderStatus(m_vTxn, &vTxn_out);
          if (FAILED(hr))
                    throw new CCOMERR( hr );
          memcpy(m_pTxn, (void *)vTxn_out.parray->pvData,vTxn_out.parray-
>rgsabound[0].cElements);
          SafeArrayDestroy(vTxn_out.parray);

          if ( m_pTxn->ErrorType != ERR_SUCCESS )
                    throw new CCOMERR( m_pTxn->ErrorType, m_pTxn->error );
}
```

tpcc_com.h

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

```
 */

#pragma once

#include <stdio.h>
#include "..\..\tpcc_com_ps\src\tpcc_com_ps.h"

// need to declare functions for import, unless define has already been created
// by the DLL's .cpp module for export.
#ifndef DllDecl
#define DllDecl  __declspec( dllimport )
#endif

class CCOMERR : public CBaseErr
{
          private:
                    char m_szErrorText[64];

          public:
                    // use this interface for genuine COM errors
                    CCOMERR( HRESULT hr )
                    {
                              m_hr = hr;
                              m_iErrorType = 0;
                              m_iError = 0;
                    }

                    // use this interface to impersonate a non-COM error type
                    CCOMERR( int iErrorType, int iError )
                    {
                              m_iErrorType = iErrorType;
                              m_iError = iError;
                              m_hr = S_OK;
                    }

                    int                 m_hr;
                    int                 m_iErrorType;
                    int                 m_iError;

                    // A CCOMERR class can impersonate another class, which happens
if the error
                    // was not actually a COM Services error, but was simply
transmitted back via COM.
                    int ErrorType()
                    {
                              if (m_iErrorType == 0)
                                        return ERR_TYPE_COM;
                              else
                                        return m_iErrorType;
                    }

                    int ErrorNum() {return m_hr;}

                    char *ErrorText()
                    {
                              if (m_hr == S_OK)
                                        sprintf( m_szErrorText, "Error: Class %d,
error # %d", m_iErrorType, m_iError );
                              else
                                        sprintf( m_szErrorText, "Error: COM HRESULT
%x", m_hr );
                              return m_szErrorText;
                    }
};

class DllDecl CTPCC_COM : public CTPCC_BASE
{
          private:
                    BOOL m_bSinglePool;

                    // COM Interface pointers
                    ITPCC*                          m_pNewOrder;
                    ITPCC*                          m_pPayment;
                    ITPCC*                          m_pStockLevel;
                    ITPCC*                          m_pOrderStatus;

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

                    VARIANT m_vTxn;
          public:
                    CTPCC_COM(BOOL bSinglePool);
                    ~CTPCC_COM(void);

                    inline PNEW_ORDER_DATA                  BuffAddr_NewOrder()
          { return &m_pTxn->u.NewOrder;    };
                    inline PPAYMENT_DATA                    BuffAddr_Payment()
          { return &m_pTxn->u.Payment;     };
                    inline PDELIVERY_DATA                   BuffAddr_Delivery()
          { return &m_pTxn->u.Delivery;    };
                    inline PSTOCK_LEVEL_DATA      BuffAddr_StockLevel()         {
return &m_pTxn->u.StockLevel;  };
                    inline PORDER_STATUS_DATA     BuffAddr_OrderStatus()        {
return &m_pTxn->u.OrderStatus; };

                    void NewOrder                 ();
                    void Payment                  ();
                    void StockLevel               ();
                    void OrderStatus    ();
                    void Delivery                 () { throw new CCOMERR(E_NOTIMPL);
}  // not supported
};


inline void ReleaseInterface(IUnknown *pUnk)
{
          if (pUnk)
          {
                    pUnk->Release();
                    pUnk = NULL;
          }
}


// wrapper routine for class constructor
```

```
extern "C" __declspec(dllexport) CTPCC_COM* CTPCC_COM_new(BOOL);

typedef CTPCC_COM* (TYPE_CTPCC_COM)(BOOL);
```

tpcc_com_all.cpp

```
/*        FILE:               TPCC_COM_ALL.CPP
 *                                    Microsoft TPC-C Kit Ver. 4.20.000
 *                                    Copyright Microsoft, 1999
 *             All Rights Reserved
 *
 *                                    Version 4.10.000 audited by Richard Gimarc,
Performance Metrics, 3/17/99
 *
 *        PURPOSE:  Implementation for TPC-C Tuxedo class.
 *        Contact:  Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *                 4.20.000 - updated rev number to match kit
 */

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

#include "resource.h"
#include "tpcc_com_all.h"
#include "tpcc_com_all_i.c"
#include "Methods.h"
#include "..\..\tpcc_com_ps\src\tpcc_com_ps_i.c"
#include "..\..\common\src\ReadRegistry.cpp"


CComModule _Module;

BEGIN_OBJECT_MAP(ObjectMap)
          OBJECT_ENTRY(CLSID_TPCC, CTPCC)
          OBJECT_ENTRY(CLSID_NewOrder, CNewOrder)
          OBJECT_ENTRY(CLSID_OrderStatus, COrderStatus)
          OBJECT_ENTRY(CLSID_Payment, CPayment)
          OBJECT_ENTRY(CLSID_StockLevel, CStockLevel)
END_OBJECT_MAP()


// configuration settings from registry
TPCCREGISTRYDATA    Reg;
char                                    szMyComputerName[MAX_COMPUTERNAME_LENGTH+1];

static  HINSTANCE hLibInstanceDb = NULL;

TYPE_CTPCC_DBLIB    *pCTPCC_DBLIB_new;
TYPE_CTPCC_ODBC             *pCTPCC_ODBC_new;


////////////////////////////////////////////////////////////////////////////
// DLL Entry Point

extern "C"
BOOL WINAPI DllMain(HINSTANCE hInstance, DWORD dwReason, LPVOID /*lpReserved*/)
{
          char szDllName[128];

          try
          {
                    if (dwReason == DLL_PROCESS_ATTACH)
                    {
                              _Module.Init(ObjectMap, hInstance);
                              DisableThreadLibraryCalls(hInstance);

                              DWORD dwSize = MAX_COMPUTERNAME_LENGTH+1;
                              GetComputerName(szMyComputerName, &dwSize);
                              szMyComputerName[dwSize] = 0;

                              if ( ReadTPCCRegistrySettings( &Reg ) )
                                        throw new CCOMPONENT_ERR(
ERR_MISSING_REGISTRY_ENTRIES );

                              if (Reg.eDB_Protocol == DBLIB)
                              {
                                        strcpy( szDllName, Reg.szPath );
                                        strcat( szDllName, "tpcc_dblib.dll");
                                        hLibInstanceDb = LoadLibrary( szDllName );
                                        if (hLibInstanceDb == NULL)
                                                  throw new CCOMPONENT_ERR(
ERR_LOADDLL_FAILED, szDllName, GetLastError() );

                                        // get function pointer to wrapper for class
constructor
                                        pCTPCC_DBLIB_new = (TYPE_CTPCC_DBLIB*)
GetProcAddress(hLibInstanceDb,"CTPCC_DBLIB_new");
                                        if (pCTPCC_DBLIB_new == NULL)
                                                  throw new CCOMPONENT_ERR(
ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                              }
                              else if (Reg.eDB_Protocol == ODBC)
                              {
                                        strcpy( szDllName, Reg.szPath );
```

```
                                        strcat( szDllName, "tpcc_odbc.dll");
                                        hLibInstanceDb = LoadLibrary( szDllName );
                                        if (hLibInstanceDb == NULL)
                                                throw new CCOMPONENT_ERR(
ERR_LOADDLL_FAILED, szDllName, GetLastError() );

                                        // get function pointer to wrapper for class
constructor
                                        pCTPCC_ODBC_new = (TYPE_CTPCC_ODBC*)
GetProcAddress(hLibInstanceDb,"CTPCC_ODBC_new");
                                        if (pCTPCC_ODBC_new == NULL)
                                                throw new CCOMPONENT_ERR(
ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                                }
                                else
                                        throw new CCOMPONENT_ERR(
ERR_UNKNOWN_DB_PROTOCOL );
                        }
                        else if (dwReason == DLL_PROCESS_DETACH)
                                _Module.Term();

        }
        catch (CBaseErr *e)
        {
                WriteMessageToEventLog(e->ErrorText());
                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()
{
          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
          {
                    if (Reg.eDB_Protocol == ODBC)
                              m_pTxn = pCTPCC_ODBC_new( Reg.szDbServer,
Reg.szDbUser, Reg.szDbPassword, szMyComputerName, Reg.szDbName );
                    else if (Reg.eDB_Protocol == DBLIB)
                              m_pTxn = pCTPCC_DBLIB_new( Reg.szDbServer,
Reg.szDbUser, Reg.szDbPassword, szMyComputerName, Reg.szDbName );
          }
          catch (CBaseErr *e)
          {
                    WriteMessageToEventLog(e->ErrorText());
                    delete e;
                    return E_FAIL;
          }
          catch (...)
          {
                    WriteMessageToEventLog(TEXT("Unhandled exception in object
::Construct"));
                    return E_FAIL;
          }

          return S_OK;
}

HRESULT CTPCC_Common::NewOrder(VARIANT txn_in, VARIANT* txn_out)
{
          PNEW_ORDER_DATA     pNewOrder;
          COM_DATA            *pData;
          try
          {
                    pData = (COM_DATA*)txn_in.parray->pvData;
                    pNewOrder = m_pTxn->BuffAddr_NewOrder();

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

                    m_pTxn->NewOrder();           // do the actual txn

                    VariantInit(txn_out);
                    txn_out->vt = VT_SAFEARRAY;
                    txn_out->parray = SafeArrayCreateVector(VT_UI1,
                                                                              txn_in.parray-
>rgsabound->cElements,
                                                                              txn_in.parray-
>rgsabound->cElements);
                    pData = (COM_DATA*) txn_out->parray->pvData;

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

                    pData->retval = ERR_SUCCESS;
                    pData->error = 0;
                    return S_OK;
```

```
	}
	catch (CBaseErr *e)
	{
		// check for lost database connection; if yes, component is
toast
		if ( ((e->ErrorType() == ERR_TYPE_DBLIB) && (e->ErrorNum() ==
10005)) ||
			((e->ErrorType() == ERR_TYPE_ODBC) && (e->ErrorNum()
== 10054)) )
			m_bCanBePooled = FALSE;

		pData->retval = e->ErrorType();
		pData->error = e->ErrorNum();
		delete e;
		return E_FAIL;
	}
	catch (...)
	{
		WriteMessageToEventLog(TEXT("Unhandled exception."));
		pData->retval = ERR_TYPE_LOGIC;
		pData->error = 0;
		m_bCanBePooled = FALSE;
		return E_FAIL;
	}
}

HRESULT CTPCC_Common::Payment(VARIANT txn_in, VARIANT* txn_out)
{
	PPAYMENT_DATA	pPayment;
	COM_DATA	*pData;
	try
	{
		pData = (COM_DATA*)txn_in.parray->pvData;
		pPayment = m_pTxn->BuffAddr_Payment();

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

		m_pTxn->Payment();		// do the actual txn

		VariantInit(txn_out);
		txn_out->vt = VT_SAFEARRAY;
		txn_out->parray = SafeArrayCreateVector( VT_UI1,
							txn_in.parray-
>rgsabound->cElements,
							txn_in.parray-
>rgsabound->cElements);
		pData = (COM_DATA*) txn_out->parray->pvData;

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

		pData->retval = ERR_SUCCESS;
		pData->error = 0;
		return S_OK;
	}
	catch (CBaseErr *e)
	{
		// check for lost database connection; if yes, component is
toast
		if ( ((e->ErrorType() == ERR_TYPE_DBLIB) && (e->ErrorNum() ==
10005)) ||
			((e->ErrorType() == ERR_TYPE_ODBC) && (e->ErrorNum()
== 10054)) )
			m_bCanBePooled = FALSE;

		pData->retval = e->ErrorType();
		pData->error = e->ErrorNum();
		delete e;
		return E_FAIL;
	}
	catch (...)
	{
		WriteMessageToEventLog(TEXT("Unhandled exception."));
		pData->retval = ERR_TYPE_LOGIC;
		pData->error = 0;
		m_bCanBePooled = FALSE;
		return E_FAIL;
	}
}

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

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

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

		m_pTxn->StockLevel();

		VariantInit(txn_out);
		txn_out->vt = VT_SAFEARRAY;
		txn_out->parray = SafeArrayCreateVector( VT_UI1,
							txn_in.parray-
>rgsabound->cElements,
							txn_in.parray-
>rgsabound->cElements);
		pData = (COM_DATA*)txn_out->parray->pvData;

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

		pData->retval = ERR_SUCCESS;
		pData->error = 0;
		return S_OK;
	}
	catch (CBaseErr *e)
	{
		// check for lost database connection; if yes, component is
toast
		if ( ((e->ErrorType() == ERR_TYPE_DBLIB) && (e->ErrorNum() ==
10005)) ||
			((e->ErrorType() == ERR_TYPE_ODBC) && (e->ErrorNum()
== 10054)) )
			m_bCanBePooled = FALSE;

		pData->retval = e->ErrorType();
		pData->error = e->ErrorNum();
		delete e;
		return E_FAIL;
	}
	catch (...)
```

```
        {
                WriteMessageToEventLog(TEXT("Unhandled exception."));
                pData->retval = ERR_TYPE_LOGIC;
                pData->error = 0;
                m_bCanBePooled = FALSE;
                return E_FAIL;
        }
}

HRESULT CTPCC_Common::OrderStatus(VARIANT txn_in, VARIANT* txn_out)
{
        PORDER_STATUS_DATA  pOrderStatus;
        COM_DATA                        *pData;
        try
        {
                pData = (COM_DATA*)txn_in.parray->pvData;
                pOrderStatus = m_pTxn->BuffAddr_OrderStatus();

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

                m_pTxn->OrderStatus();

                VariantInit(txn_out);
                txn_out->vt = VT_SAFEARRAY;
                txn_out->parray = SafeArrayCreateVector( VT_UI1,
                                                                        txn_in.parray-
>rgsabound->cElements,
                                                                        txn_in.parray-
>rgsabound->cElements);
                pData = (COM_DATA*)txn_out->parray->pvData;

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

                pData->retval = ERR_SUCCESS;
                pData->error = 0;
                return S_OK;
        }
        catch (CBaseErr *e)
        {
                // check for lost database connection; if yes, component is
toast
                if ( ((e->ErrorType() == ERR_TYPE_DBLIB) && (e->ErrorNum() ==
10005)) ||
                        ((e->ErrorType() == ERR_TYPE_ODBC) && (e->ErrorNum()
== 10054)) )
                        m_bCanBePooled = FALSE;

                pData->retval = e->ErrorType();
                pData->error = e->ErrorNum();
                delete e;
                return E_FAIL;
        }
        catch (...)
        {
                WriteMessageToEventLog(TEXT("Unhandled exception."));
                pData->retval = ERR_TYPE_LOGIC;
                pData->error = 0;
                m_bCanBePooled = FALSE;
                return E_FAIL;
        }
}
```

tpcc_com_all.def

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

LIBRARY      "tpcc_com_all.dll"

EXPORTS
          DllCanUnloadNow     @1 PRIVATE
          DllGetClassObject   @2 PRIVATE
          DllRegisterServer   @3 PRIVATE
          DllUnregisterServer @4 PRIVATE
```

tpcc_com_all.dsp

```
# Microsoft Developer Studio Project File - Name="tpcc_com_all" - Package Owner=<4>
# Microsoft Developer Studio Generated Build File, Format Version 6.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Dynamic-Link Library" 0x0102

CFG=tpcc_com_all - Win32 Debug
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "tpcc_com_all.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "tpcc_com_all.mak" CFG="tpcc_com_all - Win32 Debug"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "tpcc_com_all - Win32 Release" (based on "Win32 (x86) Dynamic-Link
Library")
!MESSAGE "tpcc_com_all - Win32 Debug" (based on "Win32 (x86) Dynamic-Link Library")
!MESSAGE

# Begin Project
# PROP AllowPerConfigDependencies 0
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "tpcc_com_all - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir "Release"
# PROP BASE Intermediate_Dir "Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
```

```
# ADD BASE CPP /nologo /MT /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /YX /FD
/c
# ADD CPP /nologo /MT /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /machine:I386
# ADD LINK32 ..\db_dblib_dll\bin\tpcc_dblib.lib ..\db_odbc_dll\bin\tpcc_odbc.lib
kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib advapi32.lib shell32.lib
ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib /nologo /subsystem:windows
/dll /machine:I386

!ELSEIF  "$(CFG)" == "tpcc_com_all - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "Debug"
# PROP BASE Intermediate_Dir "Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /MTd /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D "_WINDOWS"
/YX /FD /c
# ADD CPP /nologo /MTd /W3 /Gm /GX /ZI /Od /D "WIN32" /D "_DEBUG" /D "_WINDOWS" /YX
/FD /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /dll /debug /machine:I386 /pdbtype:sept
# ADD LINK32 ..\db_dblib_dll\bin\tpcc_dblib.lib ..\db_odbc_dll\bin\tpcc_odbc.lib
kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib advapi32.lib shell32.lib
ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib /nologo /subsystem:windows
/dll /debug /machine:I386 /pdbtype:sept

!ENDIF

# Begin Target

# Name "tpcc_com_all - Win32 Release"
# Name "tpcc_com_all - Win32 Debug"
# Begin Group "Source"

# PROP Default_Filter "*.cpp, *.c"
# Begin Source File

SOURCE=.\src\tpcc_com_all.cpp
# SUBTRACT CPP /YX
# End Source File
# Begin Source File

SOURCE=.\src\tpcc_com_all.def
# End Source File
# Begin Source File

SOURCE=.\src\tpcc_com_all.idl

!IF  "$(CFG)" == "tpcc_com_all - Win32 Release"

# PROP Ignore_Default_Tool 1
# Begin Custom Build - Performing MIDL step
InputPath=.\src\tpcc_com_all.idl

BuildCmds= \
        midl /Oicf /h "tpcc_com_all.h" /iid "tpcc_com_all_i.c"
".\src\tpcc_com_all.idl"   /out ".\src"

".\src\tpcc_com_all.tlb" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
   $(BuildCmds)

".\src\tpcc_com_all.h" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
   $(BuildCmds)

".\src\tpcc_com_all_i.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
   $(BuildCmds)
# End Custom Build

!ELSEIF  "$(CFG)" == "tpcc_com_all - Win32 Debug"

# PROP Ignore_Default_Tool 1
# Begin Custom Build - Performing MIDL step
InputPath=.\src\tpcc_com_all.idl

BuildCmds= \
        midl /Oicf /h "tpcc_com_all.h" /iid "tpcc_com_all_i.c"
".\src\tpcc_com_all.idl"   /out ".\src"

".\src\tpcc_com_all.tlb" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
   $(BuildCmds)

".\src\tpcc_com_all.h" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
   $(BuildCmds)

".\src\tpcc_com_all_i.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
   $(BuildCmds)
# End Custom Build

!ENDIF

# End Source File
# End Group
# Begin Group "Header"

# PROP Default_Filter "*.h"
# Begin Source File

SOURCE=.\src\Methods.h
# End Source File
# Begin Source File
```

```
SOURCE=.\src\resource.h
# End Source File
# End Group
# Begin Source File

SOURCE=.\src\tpcc_com_all.rc
# End Source File
# End Target
# End Project
```

tpcc_com_all.h

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

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


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jun 12 18:15:19 2000
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), ms_ext, c_ext
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )


/* verify that the <rpcndr.h> version is high enough to compile this file*/
#ifndef __REQUIRED_RPCNDR_H_VERSION__
#define __REQUIRED_RPCNDR_H_VERSION__ 440
#endif

#include "rpc.h"
#include "rpcndr.h"

#ifndef __tpcc_com_all_h__
#define __tpcc_com_all_h__

/* 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_FAR * __RPC_USER MIDL_user_allocate(size_t);
void __RPC_USER MIDL_user_free( void __RPC_FAR * );

/* 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.idl

```
/*        FILE:               TPCC.IDL
 *                                      Microsoft TPC-C Kit Ver. 4.20.000
 *                                      Copyright Microsoft, 1999
 *              All Rights Reserved
 *
 *                                      not yet audited
 *
 *        PURPOSE:  IDL source for TPCC.dll.  This file is processed by the MIDL
tool to
 *                                      produce the type library (TPCC.tlb) and
marshalling code.
 *
 *  Change history:
 *                  4.20.000 - first version
 */

interface TPCC;
interface NewOrder;
interface OrderStatus;
interface Payment;
interface StockLevel;


import "oaidl.idl";
import "ocidl.idl";
import "..\tpcc_com_ps\src\tpcc_com_ps.idl";

[
          uuid(122A3117-2520-11D3-BA71-00C04FBFE08B),
          version(1.0),
          helpstring("TPC-C 1.0 Type Library")
]
library TPCCLib
{
          importlib("stdole32.tlb");
          importlib("stdole2.tlb");

          [
                    uuid(122A3128-2520-11D3-BA71-00C04FBFE08B),
                    helpstring("All Txns Class")
          ]
          coclass TPCC
          {
                    [default] interface ITPCC;
          };


          [
                    uuid(975BAABF-84A7-11D2-BA47-00C04FBFE08B),
                    helpstring("NewOrder Class")
          ]
          coclass NewOrder
          {
                    [default] interface ITPCC;
          };
```

```
        [
                uuid(266836AD-A50D-11D2-BA4E-00C04FBFE08B),
                helpstring("OrderStatus Class")
        ]
        coclass OrderStatus
        {
                [default] interface ITPCC;
        };


        [
                uuid(CD02F7EF-A4FA-11D2-BA4E-00C04FBFE08B),
                helpstring("Payment Class")
        ]
        coclass Payment
        {
                [default] interface ITPCC;
        };


        [
                uuid(2668369E-A50D-11D2-BA4E-00C04FBFE08B),
                helpstring("StockLevel Class")
        ]
        coclass StockLevel
        {
                [default] interface ITPCC;
        };

};
```

tpcc_com_all.rc

```
//Microsoft Developer Studio generated resource script.
//
#include "resource.h"

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

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

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

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

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

1 TEXTINCLUDE DISCARDABLE
BEGIN
    "resource.h\0"
END

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

3 TEXTINCLUDE DISCARDABLE
BEGIN
    "1 TYPELIB ""tpcc_com_all.tlb""\r\n"
    "\0"
END

#endif    // APSTUDIO_INVOKED


#ifndef _MAC
/////////////////////////////////////////////////////////////////////////////
//
// Version
//

VS_VERSION_INFO VERSIONINFO
 FILEVERSION 1,0,0,1
 PRODUCTVERSION 1,0,0,1
 FILEFLAGSMASK 0x3fL
#ifdef _DEBUG
 FILEFLAGS 0x1L
#else
 FILEFLAGS 0x0L
#endif
 FILEOS 0x4L
 FILETYPE 0x2L
 FILESUBTYPE 0x0L
BEGIN
    BLOCK "StringFileInfo"
    BEGIN
        BLOCK "040904B0"
        BEGIN
            VALUE "CompanyName", "\0"
            VALUE "FileDescription", "tpcc_com_all Module\0"
            VALUE "FileVersion", "1, 0, 0, 1\0"
            VALUE "InternalName", "TPCCNEWORDER\0"
            VALUE "LegalCopyright", "Copyright 1997\0"
            VALUE "OriginalFilename", "tpcc_com_all.DLL\0"
            VALUE "ProductName", "tpcc_com_all Module\0"
            VALUE "ProductVersion", "1, 0, 0, 1\0"
            VALUE "OLESelfRegister", "\0"
        END
    END
    BLOCK "VarFileInfo"
    BEGIN
        VALUE "Translation", 0x409, 1200
    END
END

#endif    // !_MAC
```

```
////////////////////////////////////////////////////////////////////////////
//
// REGISTRY
//

IDR_TPCC                REGISTRY DISCARDABLE    "tpcc_com_all.rgs"
IDR_NEWORDER            REGISTRY DISCARDABLE    "tpcc_com_no.rgs"
IDR_ORDERSTATUS         REGISTRY DISCARDABLE    "tpcc_com_os.rgs"
IDR_PAYMENT             REGISTRY DISCARDABLE    "tpcc_com_pay.rgs"
IDR_STOCKLEVEL          REGISTRY DISCARDABLE    "tpcc_com_sl.rgs"

////////////////////////////////////////////////////////////////////////////
//
// String Table
//

STRINGTABLE DISCARDABLE
BEGIN
    IDS_PROJNAME            "tpcc_com_all"
END

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



#ifndef APSTUDIO_INVOKED
////////////////////////////////////////////////////////////////////////////
//
// Generated from the TEXTINCLUDE 3 resource.
//
1 TYPELIB "tpcc_com_all.tlb"

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

tpcc_com_all.rgs

```
HKCR
{
          TPCC.AllTxns.1 = s 'All Txns Class'
          {
                    CLSID = s '{122A3128-2520-11D3-BA71-00C04FBFE08B}'
          }
          TPCC.AllTxns = s 'TPCC Class'
          {
                    CurVer = s 'TPCC.AllTxns.1'
          }
          NoRemove CLSID
          {
                    ForceRemove {122A3128-2520-11D3-BA71-00C04FBFE08B} = s 'TPCC
Class'
                    {
                              ProgID = s 'TPCC.AllTxns.1'
                              VersionIndependentProgID = s 'TPCC.AllTxns'
                              InprocServer32 = s '%MODULE%'
                              {
                                        val ThreadingModel = s 'Both'
                              }
                    }
          }
}
```

tpcc_com_all_i.c

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

/* this ALWAYS GENERATED file contains the IIDs and CLSIDs */

/* link this file in with the server and any clients */


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jun 12 18:15:19 2000
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), 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_AXP64)

#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,0x71,0x00,0xC0,0x4F,0xBF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_NewOrder,0x975BAABF,0x84A7,0x11D2,0xBA,0x47,0x00,0xC0,0x4F,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,0x00,0xC0,0x4F,0xBF,0xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



#endif /* !defined(_M_IA64) && !defined(_M_AXP64)*/


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

/* this ALWAYS GENERATED file contains the IIDs and CLSIDs */

/* link this file in with the server and any clients */


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jun 12 18:15:19 2000
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win64 (32b run,appending), 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_AXP64)

#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,0x71,0x00,0xC0,0x4F,0xBF,0xE0,0x8B);


MIDL_DEFINE_GUID(CLSID,
CLSID_NewOrder,0x975BAABF,0x84A7,0x11D2,0xBA,0x47,0x00,0xC0,0x4F,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,0x00,0xC0,0x4F,0xBF,0xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



#endif /* defined(_M_IA64) || defined(_M_AXP64)*/
```

tpcc_com_no.rgs

```
HKCR
{
          TPCC.NewOrder.1 = s 'NewOrder Class'
          {
                    CLSID = s '{975BAABF-84A7-11D2-BA47-00C04FBFE08B}'
          }
          TPCC.NewOrder = s 'NewOrder Class'
          {
                    CurVer = s 'TPCC.NewOrder.1'
          }
          NoRemove CLSID
          {
                    ForceRemove {975BAABF-84A7-11D2-BA47-00C04FBFE08B} = s 'NewOrder
Class'
                    {
                              ProgID = s 'TPCC.NewOrder.1'
                              VersionIndependentProgID = s 'TPCC.NewOrder'
                              InprocServer32 = s '%MODULE%'
                              {
                                        val ThreadingModel = s 'Both'
                              }
                    }
          }
}
```

tpcc_com_os.rgs

```
HKCR
{
          TPCC.OrderStatus.1 = s 'OrderStatus Class'
          {
                    CLSID = s '{266836AD-A50D-11D2-BA4E-00C04FBFE08B}'
          }
          TPCC.OrderStatus = s 'OrderStatus Class'
          {
                    CurVer = s 'TPCC.OrderStatus.1'
          }
          NoRemove CLSID
          {
                    ForceRemove {266836AD-A50D-11D2-BA4E-00C04FBFE08B} = s
'OrderStatus Class'
                    {
                              ProgID = s 'TPCC.OrderStatus.1'
                              VersionIndependentProgID = s 'TPCC.OrderStatus'
                              InprocServer32 = s '%MODULE%'
                              {
                                        val ThreadingModel = s 'Both'
                              }
                    }
          }
}
```

tpcc_com_pay.rgs

```
HKCR
{
          TPCC.Payment.1 = s 'Payment Class'
          {
                    CLSID = s '{CD02F7EF-A4FA-11D2-BA4E-00C04FBFE08B}'
          }
          TPCC.Payment = s 'Payment Class'
          {
                    CurVer = s 'TPCC.Payment.1'
          }
          NoRemove CLSID
          {
                    ForceRemove {CD02F7EF-A4FA-11D2-BA4E-00C04FBFE08B} = s 'Payment
Class'
                    {
                              ProgID = s 'TPCC.Payment.1'
                              VersionIndependentProgID = s 'TPCC.Payment'
                              InprocServer32 = s '%MODULE%'
                              {
                                        val ThreadingModel = s 'Both'
                              }
                    }
          }
}
```

tpcc_com_ps.def

```
LIBRARY      "tpcc_com_ps"

DESCRIPTION  'Proxy/Stub DLL'

EXPORTS
          DllGetClassObject       @1    PRIVATE
          DllCanUnloadNow         @2    PRIVATE
          GetProxyDllInfo         @3    PRIVATE
          DllRegisterServer             @4        PRIVATE
          DllUnregisterServer           @5        PRIVATE
```

tpcc_com_ps.dsp

```
# Microsoft Developer Studio Project File - Name="tpcc_com_ps" - Package Owner=<4>
```

```
# Microsoft Developer Studio Generated Build File, Format Version 6.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Application" 0x0101

CFG=tpcc_com_ps - Win32 Debug
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "tpcc_com_ps.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "tpcc_com_ps.mak" CFG="tpcc_com_ps - Win32 Debug"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "tpcc_com_ps - Win32 Release" (based on "Win32 (x86) Application")
!MESSAGE "tpcc_com_ps - Win32 Debug" (based on "Win32 (x86) Application")
!MESSAGE

# Begin Project
# PROP AllowPerConfigDependencies 0
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "tpcc_com_ps - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir "Release"
# PROP BASE Intermediate_Dir "Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /YX /FD /c
# ADD CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D _WIN32_WINNT=0x0400 /D
"REGISTER_PROXY_DLL" /FD /c
# SUBTRACT CPP /YX
# ADD BASE MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /machine:I386
# ADD LINK32 kernel32.lib rpcndr.lib rpcns4.lib rpcrt4.lib oleaut32.lib uuid.lib
/nologo /entry:"DllMain" /subsystem:windows /dll /pdb:none /machine:I386
/def:".\src\tpcc_com_ps.def"
# Begin Custom Build - Copying tpcc_com_ps.h
InputPath=.\bin\tpcc_com_ps.dll
SOURCE="$(InputPath)"

"..\tpcc_com_all\src\tpcc_com_ps.h" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
        copy    .\src\tpcc_com_ps.h    ..\tpcc_com_all\src\

# End Custom Build

!ELSEIF  "$(CFG)" == "tpcc_com_ps - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "Debug"
# PROP BASE Intermediate_Dir "Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\bin"
# PROP Intermediate_Dir ".\obj"
# PROP Ignore_Export_Lib 0
# PROP Target_Dir ""
# ADD BASE CPP /nologo /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D "_WINDOWS" /YX
/FD /c
# ADD CPP /nologo /ZI /Od /D "WIN32" /D "_DEBUG" /D _WIN32_WINNT=0x0400 /D
"REGISTER_PROXY_DLL" /FD /c
# ADD BASE MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /o "NUL" /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /debug /machine:I386 /pdbtype:sept
# ADD LINK32 kernel32.lib rpcndr.lib rpcns4.lib rpcrt4.lib oleaut32.lib uuid.lib
/nologo /entry:"DllMain" /dll /debug /machine:IX86 /def:".\src\tpcc_com_ps.def"
/pdbtype:sept
# SUBTRACT LINK32 /pdb:none
# Begin Custom Build - Copying tpcc_com_ps.h
InputPath=.\bin\tpcc_com_ps.dll
SOURCE="$(InputPath)"

"..\tpcc_com_all\src\tpcc_com_ps.h" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
        copy    .\src\tpcc_com_ps.h    ..\tpcc_com_all\src\

# End Custom Build

!ENDIF

# Begin Target

# Name "tpcc_com_ps - Win32 Release"
# Name "tpcc_com_ps - Win32 Debug"
# Begin Group "Source"

# PROP Default_Filter ""
# Begin Source File

SOURCE=.\src\dlldata.c
# End Source File
# Begin Source File
```

```
SOURCE=.\src\tpcc_com_ps.def
# PROP Exclude_From_Build 1
# End Source File
# Begin Source File

SOURCE=.\src\tpcc_com_ps.idl

!IF  "$(CFG)" == "tpcc_com_ps - Win32 Release"

# PROP Ignore_Default_Tool 1
# Begin Custom Build
InputPath=.\src\tpcc_com_ps.idl

BuildCmds= \
          midl /Oicf /h "tpcc_com_ps.h" /iid "tpcc_com_ps_i.c"
".\src\tpcc_com_ps.idl"    /out ".\src"

".\src\tpcc_com_ps.h" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
   $(BuildCmds)

".\src\tpcc_com_ps_i.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
   $(BuildCmds)

".\src\dlldata.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
   $(BuildCmds)

".\src\tpcc_com_ps_p.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
   $(BuildCmds)
# End Custom Build

!ELSEIF  "$(CFG)" == "tpcc_com_ps - Win32 Debug"

# PROP Ignore_Default_Tool 1
# Begin Custom Build
InputPath=.\src\tpcc_com_ps.idl

BuildCmds= \
          midl /Oicf /h "tpcc_com_ps.h" /iid "tpcc_com_ps_i.c"
".\src\tpcc_com_ps.idl"    /out ".\src"

".\src\tpcc_com_ps.h" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
   $(BuildCmds)

".\src\tpcc_com_ps_i.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
   $(BuildCmds)

".\src\dlldata.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
   $(BuildCmds)

".\src\tpcc_com_ps_p.c" : $(SOURCE) "$(INTDIR)" "$(OUTDIR)"
   $(BuildCmds)
# End Custom Build

!ENDIF

# End Source File
# Begin Source File

SOURCE=.\src\tpcc_com_ps_i.c
# End Source File
# Begin Source File

SOURCE=.\src\tpcc_com_ps_p.c
# End Source File
# End Group
# End Target
# End Project
```

tpcc_com_ps.h

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

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


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jun 12 18:15:12 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), ms_ext, c_ext
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )


/* verify that the <rpcndr.h> version is high enough to compile this file*/
#ifndef __REQUIRED_RPCNDR_H_VERSION__
#define __REQUIRED_RPCNDR_H_VERSION__ 440
#endif

#include "rpc.h"
#include "rpcndr.h"

#ifndef __RPCNDR_H_VERSION__
#error this stub requires an updated version of <rpcndr.h>
#endif // __RPCNDR_H_VERSION__

#ifndef COM_NO_WINDOWS_H
#include "windows.h"
#include "ole2.h"
#endif /*COM_NO_WINDOWS_H*/

#ifndef __tpcc_com_ps_h__
#define __tpcc_com_ps_h__

/* 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_FAR * __RPC_USER MIDL_user_allocate(size_t);
void __RPC_USER MIDL_user_free( void __RPC_FAR * );

/* 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 __RPC_FAR *txn_out) = 0;

        virtual HRESULT __stdcall Payment(
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT __RPC_FAR *txn_out) = 0;

        virtual HRESULT __stdcall Delivery(
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT __RPC_FAR *txn_out) = 0;

        virtual HRESULT __stdcall StockLevel(
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT __RPC_FAR *txn_out) = 0;

        virtual HRESULT __stdcall OrderStatus(
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT __RPC_FAR *txn_out) = 0;

        virtual HRESULT __stdcall CallSetComplete( void) = 0;

    };

#else     /* C style interface */

    typedef struct ITPCCVtbl
    {
        BEGIN_INTERFACE

        HRESULT ( STDMETHODCALLTYPE __RPC_FAR *QueryInterface )(
            ITPCC __RPC_FAR * This,
            /* [in] */ REFIID riid,
            /* [iid_is][out] */ void __RPC_FAR *__RPC_FAR *ppvObject);

        ULONG ( STDMETHODCALLTYPE __RPC_FAR *AddRef )(
            ITPCC __RPC_FAR * This);

        ULONG ( STDMETHODCALLTYPE __RPC_FAR *Release )(
            ITPCC __RPC_FAR * This);

        HRESULT ( __stdcall __RPC_FAR *NewOrder )(
            ITPCC __RPC_FAR * This,
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT __RPC_FAR *txn_out);

        HRESULT ( __stdcall __RPC_FAR *Payment )(
            ITPCC __RPC_FAR * This,
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT __RPC_FAR *txn_out);

        HRESULT ( __stdcall __RPC_FAR *Delivery )(
            ITPCC __RPC_FAR * This,
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT __RPC_FAR *txn_out);

        HRESULT ( __stdcall __RPC_FAR *StockLevel )(
            ITPCC __RPC_FAR * This,
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT __RPC_FAR *txn_out);

        HRESULT ( __stdcall __RPC_FAR *OrderStatus )(
            ITPCC __RPC_FAR * This,
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT __RPC_FAR *txn_out);

        HRESULT ( __stdcall __RPC_FAR *CallSetComplete )(
            ITPCC __RPC_FAR * This);

        END_INTERFACE
    } ITPCCVtbl;

    interface ITPCC
    {
        CONST_VTBL struct ITPCCVtbl __RPC_FAR *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 __RPC_FAR * This,
    /* [in] */ VARIANT txn_in,
    /* [out] */ VARIANT __RPC_FAR *txn_out);


void __RPC_STUB ITPCC_NewOrder_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_Payment_Proxy(
    ITPCC __RPC_FAR * This,
    /* [in] */ VARIANT txn_in,
    /* [out] */ VARIANT __RPC_FAR *txn_out);


void __RPC_STUB ITPCC_Payment_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_Delivery_Proxy(
    ITPCC __RPC_FAR * This,
    /* [in] */ VARIANT txn_in,
    /* [out] */ VARIANT __RPC_FAR *txn_out);


void __RPC_STUB ITPCC_Delivery_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_StockLevel_Proxy(
    ITPCC __RPC_FAR * This,
    /* [in] */ VARIANT txn_in,
    /* [out] */ VARIANT __RPC_FAR *txn_out);


void __RPC_STUB ITPCC_StockLevel_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_OrderStatus_Proxy(
    ITPCC __RPC_FAR * This,
    /* [in] */ VARIANT txn_in,
    /* [out] */ VARIANT __RPC_FAR *txn_out);


void __RPC_STUB ITPCC_OrderStatus_Stub(
    IRpcStubBuffer *This,
    IRpcChannelBuffer *_pRpcChannelBuffer,
    PRPC_MESSAGE _pRpcMessage,
    DWORD *_pdwStubPhase);


HRESULT __stdcall ITPCC_CallSetComplete_Proxy(
    ITPCC __RPC_FAR * 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 __RPC_FAR
*, unsigned long           , VARIANT __RPC_FAR * );
unsigned char __RPC_FAR * __RPC_USER  VARIANT_UserMarshal(  unsigned long __RPC_FAR
*, unsigned char __RPC_FAR *, VARIANT __RPC_FAR * );
unsigned char __RPC_FAR * __RPC_USER  VARIANT_UserUnmarshal(unsigned long __RPC_FAR
*, unsigned char __RPC_FAR *, VARIANT __RPC_FAR * );
void                      __RPC_USER  VARIANT_UserFree(     unsigned long __RPC_FAR
*, VARIANT __RPC_FAR * );

/* 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

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

/* this ALWAYS GENERATED file contains the IIDs and CLSIDs */

/* link this file in with the server and any clients */


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jun 12 18:15:12 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), 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_AXP64)

#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,0x47,0x00,0xC0,0x4F,0xBF,0xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



#endif /* !defined(_M_IA64) && !defined(_M_AXP64)*/


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

/* this ALWAYS GENERATED file contains the IIDs and CLSIDs */

/* link this file in with the server and any clients */


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jun 12 18:15:12 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win64 (32b run,appending), 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_AXP64)

#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,0x47,0x00,0xC0,0x4F,0xBF,0xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



#endif /* defined(_M_IA64) || defined(_M_AXP64)*/
```

tpcc_com_ps_p.c

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

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


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jun 12 18:15:12 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), 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_AXP64)
#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   997
#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;


extern const MIDL_TYPE_FORMAT_STRING __MIDL_TypeFormatString;
extern const MIDL_PROC_FORMAT_STRING __MIDL_ProcFormatString;


/* Standard interface: __MIDL_itf_tpcc_com_ps_0000, ver. 0.0,
   GUID={0x00000000,0x0000,0x0000,{0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00}} */


/* Object interface: IUnknown, ver. 0.0,
   GUID={0x00000000,0x0000,0x0000,{0xC0,0x00,0x00,0x00,0x00,0x00,0x00,0x46}} */


/* Object interface: ITPCC, ver. 0.0,
   GUID={0xFEEE6AA2,0x84B1,0x11d2,{0xBA,0x47,0x00,0xC0,0x4F,0xBF,0xE0,0x8B}} */


extern const MIDL_STUB_DESC Object_StubDesc;


extern const MIDL_SERVER_INFO ITPCC_ServerInfo;

#pragma code_seg(".orpc")
static const unsigned short ITPCC_FormatStringOffsetTable[] =
    {
    0,
    34,
    68,
    102,
    136,
    170
    };

static const MIDL_SERVER_INFO ITPCC_ServerInfo =
    {
    &Object_StubDesc,
    0,
    __MIDL_ProcFormatString.Format,
    &ITPCC_FormatStringOffsetTable[-3],
    0,
    0,
    0,
    0
    };

static const MIDL_STUBLESS_PROXY_INFO ITPCC_ProxyInfo =
    {
    &Object_StubDesc,
    __MIDL_ProcFormatString.Format,
    &ITPCC_FormatStringOffsetTable[-3],
    0,
    0,
    0
    };

CINTERFACE_PROXY_VTABLE(9) _ITPCCProxyVtbl =
{
    &ITPCC_ProxyInfo,
    &IID_ITPCC,
    IUnknown_QueryInterface_Proxy,
    IUnknown_AddRef_Proxy,
    IUnknown_Release_Proxy ,
    (void *)-1 /* ITPCC::NewOrder */ ,
    (void *)-1 /* ITPCC::Payment */ ,
    (void *)-1 /* ITPCC::Delivery */ ,
    (void *)-1 /* ITPCC::StockLevel */ ,
    (void *)-1 /* ITPCC::OrderStatus */ ,
    (void *)-1 /* ITPCC::CallSetComplete */
};

const CInterfaceStubVtbl _ITPCCStubVtbl =
{
    &IID_ITPCC,
    &ITPCC_ServerInfo,
    9,
    0, /* pure interpreted */
    CStdStubBuffer_METHODS
};

extern const USER_MARSHAL_ROUTINE_QUADRUPLE UserMarshalRoutines[
WIRE_MARSHAL_TABLE_SIZE ];

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,
    0x5030118, /* MIDL Version 5.3.280 */
    0,
    UserMarshalRoutines,
    0,  /* notify & notify_flag routine table */
    0x1, /* MIDL flag */
    0,  /* Reserved3 */
    0,  /* Reserved4 */
    0   /* Reserved5 */
    };

#pragma data_seg(".rdata")

static const USER_MARSHAL_ROUTINE_QUADRUPLE UserMarshalRoutines[
WIRE_MARSHAL_TABLE_SIZE ] =
        {

            {
            VARIANT_UserSize
            ,VARIANT_UserMarshal
            ,VARIANT_UserUnmarshal
            ,VARIANT_UserFree
            }

        };


#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 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/*  8 */  NdrFcShort( 0x1c ), /* x86 Stack size/offset = 28 */
#else
                                NdrFcShort( 0x20 ), /*  MIPS Stack size/offset = 32 */
#endif
#else
                                NdrFcShort( 0x20 ), /* PPC Stack size/offset = 32 */
#endif
#else
                                NdrFcShort( 0x28 ), /* Alpha Stack size/offset = 40 */
#endif
/* 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, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 18 */  NdrFcShort( 0x4 ),  /* x86 Stack size/offset = 4 */
#else
                                NdrFcShort( 0x8 ),  /*  MIPS Stack size/offset = 8 */
#endif
#else
                                NdrFcShort( 0x8 ),  /* PPC Stack size/offset = 8 */
#endif
#else
                                NdrFcShort( 0x8 ),  /* Alpha Stack size/offset = 8 */
#endif
/* 20 */  NdrFcShort( 0x3c8 ),          /* Type Offset=968 */

          /* Parameter txn_out */

/* 22 */  NdrFcShort( 0x4113 ),         /* Flags:  must size, must free, out, simple
ref, srv alloc size=16 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 24 */  NdrFcShort( 0x14 ), /* x86 Stack size/offset = 20 */
#else
                                NdrFcShort( 0x18 ), /*  MIPS Stack size/offset = 24 */
#endif
#else
                                NdrFcShort( 0x18 ), /* PPC Stack size/offset = 24 */
#endif
#else
                                NdrFcShort( 0x18 ), /* Alpha Stack size/offset = 24 */
#endif
/* 26 */  NdrFcShort( 0x3da ),          /* Type Offset=986 */

          /* Return value */

/* 28 */  NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 30 */  NdrFcShort( 0x18 ), /* x86 Stack size/offset = 24 */
#else
                                NdrFcShort( 0x1c ), /*  MIPS Stack size/offset = 28 */
#endif
#else
                                NdrFcShort( 0x1c ), /* PPC Stack size/offset = 28 */
#endif
#else
                                NdrFcShort( 0x20 ), /* Alpha Stack size/offset = 32 */
#endif
```

```
/* 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 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 42 */  NdrFcShort( 0x1c ), /* x86 Stack size/offset = 28 */
#else
                               NdrFcShort( 0x20 ), /*  MIPS Stack size/offset = 32 */
#endif
#else
                               NdrFcShort( 0x20 ), /* PPC Stack size/offset = 32 */
#endif
#else
                               NdrFcShort( 0x28 ), /* Alpha Stack size/offset = 40 */
#endif
/* 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, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 52 */  NdrFcShort( 0x4 ),  /* x86 Stack size/offset = 4 */
#else
                               NdrFcShort( 0x8 ),  /*  MIPS Stack size/offset = 8 */
#endif
#else
                               NdrFcShort( 0x8 ),  /* PPC Stack size/offset = 8 */
#endif
#else
                               NdrFcShort( 0x8 ),  /* Alpha Stack size/offset = 8 */
#endif
/* 54 */  NdrFcShort( 0x3c8 ),          /* Type Offset=968 */

          /* Parameter txn_out */

/* 56 */  NdrFcShort( 0x4113 ),         /* Flags:  must size, must free, out, simple
ref, srv alloc size=16 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 58 */  NdrFcShort( 0x14 ), /* x86 Stack size/offset = 20 */
#else
                               NdrFcShort( 0x18 ), /*  MIPS Stack size/offset = 24 */
#endif
#else
                               NdrFcShort( 0x18 ), /* PPC Stack size/offset = 24 */
#endif
#else
                               NdrFcShort( 0x18 ), /* Alpha Stack size/offset = 24 */
#endif
/* 60 */  NdrFcShort( 0x3da ),          /* Type Offset=986 */

          /* Return value */

/* 62 */  NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 64 */  NdrFcShort( 0x18 ), /* x86 Stack size/offset = 24 */
#else
                               NdrFcShort( 0x1c ), /*  MIPS Stack size/offset = 28 */
#endif
#else
                               NdrFcShort( 0x1c ), /* PPC Stack size/offset = 28 */
#endif
#else
                               NdrFcShort( 0x20 ), /* Alpha Stack size/offset = 32 */
#endif
/* 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 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 76 */  NdrFcShort( 0x1c ), /* x86 Stack size/offset = 28 */
#else
                               NdrFcShort( 0x20 ), /*  MIPS Stack size/offset = 32 */
#endif
#else
                               NdrFcShort( 0x20 ), /* PPC Stack size/offset = 32 */
#endif
#else
                               NdrFcShort( 0x28 ), /* Alpha Stack size/offset = 40 */
#endif
/* 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, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 86 */  NdrFcShort( 0x4 ),  /* x86 Stack size/offset = 4 */
#else
                               NdrFcShort( 0x8 ),  /*  MIPS Stack size/offset = 8 */
#endif
#else
                               NdrFcShort( 0x8 ),  /* PPC Stack size/offset = 8 */
#endif
#else
                               NdrFcShort( 0x8 ),  /* Alpha Stack size/offset = 8 */
#endif
/* 88 */  NdrFcShort( 0x3c8 ),          /* Type Offset=968 */
```

```
        /* Parameter txn_out */

/* 90 */  NdrFcShort( 0x4113 ),         /* Flags:  must size, must free, out, simple
ref, srv alloc size=16 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 92 */  NdrFcShort( 0x14 ), /* x86 Stack size/offset = 20 */
#else
                              NdrFcShort( 0x18 ), /*  MIPS Stack size/offset = 24 */
#endif
#else
                              NdrFcShort( 0x18 ), /* PPC Stack size/offset = 24 */
#endif
#else
                              NdrFcShort( 0x18 ), /* Alpha Stack size/offset = 24 */
#endif
/* 94 */  NdrFcShort( 0x3da ),          /* Type Offset=986 */

        /* Return value */

/* 96 */  NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 98 */  NdrFcShort( 0x18 ), /* x86 Stack size/offset = 24 */
#else
                              NdrFcShort( 0x1c ), /*  MIPS Stack size/offset = 28 */
#endif
#else
                              NdrFcShort( 0x1c ), /* PPC Stack size/offset = 28 */
#endif
#else
                              NdrFcShort( 0x20 ), /* Alpha Stack size/offset = 32 */
#endif
/* 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 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 110 */ NdrFcShort( 0x1c ), /* x86 Stack size/offset = 28 */
#else
                              NdrFcShort( 0x20 ), /*  MIPS Stack size/offset = 32 */
#endif
#else
                              NdrFcShort( 0x20 ), /* PPC Stack size/offset = 32 */
#endif
#else
                              NdrFcShort( 0x28 ), /* Alpha Stack size/offset = 40 */
#endif
/* 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, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 120 */ NdrFcShort( 0x4 ),  /* x86 Stack size/offset = 4 */
#else
                              NdrFcShort( 0x8 ),  /*  MIPS Stack size/offset = 8 */
#endif
#else
                              NdrFcShort( 0x8 ),  /* PPC Stack size/offset = 8 */
#endif
#else
                              NdrFcShort( 0x8 ),  /* Alpha Stack size/offset = 8 */
#endif
/* 122 */ NdrFcShort( 0x3c8 ),          /* Type Offset=968 */

        /* Parameter txn_out */

/* 124 */ NdrFcShort( 0x4113 ),         /* Flags:  must size, must free, out, simple
ref, srv alloc size=16 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 126 */ NdrFcShort( 0x14 ), /* x86 Stack size/offset = 20 */
#else
                              NdrFcShort( 0x18 ), /*  MIPS Stack size/offset = 24 */
#endif
#else
                              NdrFcShort( 0x18 ), /* PPC Stack size/offset = 24 */
#endif
#else
                              NdrFcShort( 0x18 ), /* Alpha Stack size/offset = 24 */
#endif
/* 128 */ NdrFcShort( 0x3da ),          /* Type Offset=986 */

        /* Return value */

/* 130 */ NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 132 */ NdrFcShort( 0x18 ), /* x86 Stack size/offset = 24 */
#else
                              NdrFcShort( 0x1c ), /*  MIPS Stack size/offset = 28 */
#endif
#else
                              NdrFcShort( 0x1c ), /* PPC Stack size/offset = 28 */
#endif
#else
                              NdrFcShort( 0x20 ), /* Alpha Stack size/offset = 32 */
#endif
/* 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 */
```

```
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 144 */ NdrFcShort( 0x1c ), /* x86 Stack size/offset = 28 */
#else
                              NdrFcShort( 0x20 ), /*  MIPS Stack size/offset = 32 */
#endif
#else
                              NdrFcShort( 0x20 ), /* PPC Stack size/offset = 32 */
#endif
#else
                              NdrFcShort( 0x28 ), /* Alpha Stack size/offset = 40 */
#endif
/* 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, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 154 */ NdrFcShort( 0x4 ),  /* x86 Stack size/offset = 4 */
#else
                              NdrFcShort( 0x8 ),  /*  MIPS Stack size/offset = 8 */
#endif
#else
                              NdrFcShort( 0x8 ),  /* PPC Stack size/offset = 8 */
#endif
#else
                              NdrFcShort( 0x8 ),  /* Alpha Stack size/offset = 8 */
#endif
/* 156 */ NdrFcShort( 0x3c8 ),          /* Type Offset=968 */

          /* Parameter txn_out */

/* 158 */ NdrFcShort( 0x4113 ),         /* Flags:  must size, must free, out, simple
ref, srv alloc size=16 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 160 */ NdrFcShort( 0x14 ), /* x86 Stack size/offset = 20 */
#else
                              NdrFcShort( 0x18 ), /*  MIPS Stack size/offset = 24 */
#endif
#else
                              NdrFcShort( 0x18 ), /* PPC Stack size/offset = 24 */
#endif
#else
                              NdrFcShort( 0x18 ), /* Alpha Stack size/offset = 24 */
#endif
/* 162 */ NdrFcShort( 0x3da ),          /* Type Offset=986 */

          /* Return value */

/* 164 */ NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 166 */ NdrFcShort( 0x18 ), /* x86 Stack size/offset = 24 */
#else
                              NdrFcShort( 0x1c ), /*  MIPS Stack size/offset = 28 */
#endif
#else
                              NdrFcShort( 0x1c ), /* PPC Stack size/offset = 28 */
#endif
#else
                              NdrFcShort( 0x20 ), /* Alpha Stack size/offset = 32 */
#endif
/* 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 */
#ifndef _ALPHA_
/* 178 */ NdrFcShort( 0x8 ),  /* x86, MIPS, PPC Stack size/offset = 8 */
#else
                              NdrFcShort( 0x10 ), /* Alpha Stack size/offset = 16 */
#endif
/* 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, */
#ifndef _ALPHA_
/* 188 */ NdrFcShort( 0x4 ),  /* x86, MIPS, PPC Stack size/offset = 4 */
#else
                              NdrFcShort( 0x8 ),  /* Alpha Stack size/offset = 8 */
#endif
/* 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( 0x3b0 ),          /* Offset= 944 (948) */
/*  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( 0x2b ), /* 43 */
/* 18 */  NdrFcLong( 0x3 ),   /* 3 */
/* 22 */  NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 24 */  NdrFcLong( 0x11 ),  /* 17 */
```

```
/* 28 */  NdrFcShort( 0x8001 ),         /* Simple arm type: FC_BYTE */
/* 30 */  NdrFcLong( 0x2 ),   /* 2 */
/* 34 */  NdrFcShort( 0x8006 ),         /* Simple arm type: FC_SHORT */
/* 36 */  NdrFcLong( 0x4 ),   /* 4 */
/* 40 */  NdrFcShort( 0x800a ),         /* Simple arm type: FC_FLOAT */
/* 42 */  NdrFcLong( 0x5 ),   /* 5 */
/* 46 */  NdrFcShort( 0x800c ),         /* Simple arm type: FC_DOUBLE */
/* 48 */  NdrFcLong( 0xb ),   /* 11 */
/* 52 */  NdrFcShort( 0x8006 ),         /* Simple arm type: FC_SHORT */
/* 54 */  NdrFcLong( 0xa ),   /* 10 */
/* 58 */  NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 60 */  NdrFcLong( 0x6 ),   /* 6 */
/* 64 */  NdrFcShort( 0xd6 ), /* Offset= 214 (278) */
/* 66 */  NdrFcLong( 0x7 ),   /* 7 */
/* 70 */  NdrFcShort( 0x800c ),         /* Simple arm type: FC_DOUBLE */
/* 72 */  NdrFcLong( 0x8 ),   /* 8 */
/* 76 */  NdrFcShort( 0xd0 ), /* Offset= 208 (284) */
/* 78 */  NdrFcLong( 0xd ),   /* 13 */
/* 82 */  NdrFcShort( 0xe2 ), /* Offset= 226 (308) */
/* 84 */  NdrFcLong( 0x9 ),   /* 9 */
/* 88 */  NdrFcShort( 0xee ), /* Offset= 238 (326) */
/* 90 */  NdrFcLong( 0x2000 ),          /* 8192 */
/* 94 */  NdrFcShort( 0xfa ), /* Offset= 250 (344) */
/* 96 */  NdrFcLong( 0x24 ),  /* 36 */
/* 100 */ NdrFcShort( 0x308 ),          /* Offset= 776 (876) */
/* 102 */ NdrFcLong( 0x4024 ),          /* 16420 */
/* 106 */ NdrFcShort( 0x302 ),          /* Offset= 770 (876) */
/* 108 */ NdrFcLong( 0x4011 ),          /* 16401 */
/* 112 */ NdrFcShort( 0x300 ),          /* Offset= 768 (880) */
/* 114 */ NdrFcLong( 0x4002 ),          /* 16386 */
/* 118 */ NdrFcShort( 0x2fe ),          /* Offset= 766 (884) */
/* 120 */ NdrFcLong( 0x4003 ),          /* 16387 */
/* 124 */ NdrFcShort( 0x2fc ),          /* Offset= 764 (888) */
/* 126 */ NdrFcLong( 0x4004 ),          /* 16388 */
/* 130 */ NdrFcShort( 0x2fa ),          /* Offset= 762 (892) */
/* 132 */ NdrFcLong( 0x4005 ),          /* 16389 */
/* 136 */ NdrFcShort( 0x2f8 ),          /* Offset= 760 (896) */
/* 138 */ NdrFcLong( 0x400b ),          /* 16395 */
/* 142 */ NdrFcShort( 0x2e6 ),          /* Offset= 742 (884) */
/* 144 */ NdrFcLong( 0x400a ),          /* 16394 */
/* 148 */ NdrFcShort( 0x2e4 ),          /* Offset= 740 (888) */
/* 150 */ NdrFcLong( 0x4006 ),          /* 16390 */
/* 154 */ NdrFcShort( 0x2ea ),          /* Offset= 746 (900) */
/* 156 */ NdrFcLong( 0x4007 ),          /* 16391 */
/* 160 */ NdrFcShort( 0x2e0 ),          /* Offset= 736 (896) */
/* 162 */ NdrFcLong( 0x4008 ),          /* 16392 */
/* 166 */ NdrFcShort( 0x2e2 ),          /* Offset= 738 (904) */
/* 168 */ NdrFcLong( 0x400d ),          /* 16397 */
/* 172 */ NdrFcShort( 0x2e0 ),          /* Offset= 736 (908) */
/* 174 */ NdrFcLong( 0x4009 ),          /* 16393 */
/* 178 */ NdrFcShort( 0x2de ),          /* Offset= 734 (912) */
/* 180 */ NdrFcLong( 0x6000 ),          /* 24576 */
/* 184 */ NdrFcShort( 0x2dc ),          /* Offset= 732 (916) */
/* 186 */ NdrFcLong( 0x400c ),          /* 16396 */
/* 190 */ NdrFcShort( 0x2da ),          /* Offset= 730 (920) */
/* 192 */ NdrFcLong( 0x10 ),  /* 16 */
/* 196 */ NdrFcShort( 0x8002 ),         /* Simple arm type: FC_CHAR */
/* 198 */ NdrFcLong( 0x12 ),  /* 18 */
/* 202 */ NdrFcShort( 0x8006 ),         /* Simple arm type: FC_SHORT */
/* 204 */ NdrFcLong( 0x13 ),  /* 19 */
/* 208 */ NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 210 */ NdrFcLong( 0x16 ),  /* 22 */
/* 214 */ NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 216 */ NdrFcLong( 0x17 ),  /* 23 */
/* 220 */ NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 222 */ NdrFcLong( 0xe ),   /* 14 */
/* 226 */ NdrFcShort( 0x2be ),          /* Offset= 702 (928) */
/* 228 */ NdrFcLong( 0x400e ),          /* 16398 */
/* 232 */ NdrFcShort( 0x2c4 ),          /* Offset= 708 (940) */
/* 234 */ NdrFcLong( 0x4010 ),          /* 16400 */
/* 238 */ NdrFcShort( 0x2c2 ),          /* Offset= 706 (944) */
/* 240 */ NdrFcLong( 0x4012 ),          /* 16402 */
/* 244 */ NdrFcShort( 0x280 ),          /* Offset= 640 (884) */
/* 246 */ NdrFcLong( 0x4013 ),          /* 16403 */
/* 250 */ NdrFcShort( 0x27e ),          /* Offset= 638 (888) */
/* 252 */ NdrFcLong( 0x4016 ),          /* 16406 */
/* 256 */ NdrFcShort( 0x278 ),          /* Offset= 632 (888) */
/* 258 */ NdrFcLong( 0x4017 ),          /* 16407 */
/* 262 */ NdrFcShort( 0x272 ),          /* Offset= 626 (888) */
/* 264 */ NdrFcLong( 0x0 ),   /* 0 */
/* 268 */ NdrFcShort( 0x0 ),  /* Offset= 0 (268) */
/* 270 */ NdrFcLong( 0x1 ),   /* 1 */
/* 274 */ NdrFcShort( 0x0 ),  /* Offset= 0 (274) */
/* 276 */ NdrFcShort( 0xffffffff ),     /* Offset= -1 (275) */
/* 278 */
                                0x15,               /* FC_STRUCT */
                                0x7,                /* 7 */
/* 280 */ NdrFcShort( 0x8 ),  /* 8 */
/* 282 */ 0xb,                /* FC_HYPER */
                                0x5b,               /* FC_END */
/* 284 */
                                0x12, 0x0,          /* FC_UP */
/* 286 */ NdrFcShort( 0xc ),  /* Offset= 12 (298) */
/* 288 */
                                0x1b,               /* FC_CARRAY */
                                0x1,                /* 1 */
/* 290 */ NdrFcShort( 0x2 ),  /* 2 */
/* 292 */ 0x9,                /* Corr desc: FC_ULONG */
                                0x0,                /*  */
/* 294 */ NdrFcShort( 0xfffc ),         /* -4 */
/* 296 */ 0x6,                /* FC_SHORT */
                                0x5b,               /* FC_END */
/* 298 */
                                0x17,               /* FC_CSTRUCT */
                                0x3,                /* 3 */
/* 300 */ NdrFcShort( 0x8 ),  /* 8 */
/* 302 */ NdrFcShort( 0xfffffff2 ),     /* Offset= -14 (288) */
/* 304 */ 0x8,                /* FC_LONG */
                                0x8,                /* FC_LONG */
/* 306 */ 0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 308 */
                                0x2f,               /* FC_IP */
                                0x5a,               /* FC_CONSTANT_IID */
/* 310 */ NdrFcLong( 0x0 ),   /* 0 */
/* 314 */ NdrFcShort( 0x0 ),  /* 0 */
/* 316 */ NdrFcShort( 0x0 ),  /* 0 */
/* 318 */ 0xc0,               /* 192 */
                                0x0,                /* 0 */
/* 320 */ 0x0,                /* 0 */
                                0x0,                /* 0 */
/* 322 */ 0x0,                /* 0 */
                                0x0,                /* 0 */
/* 324 */ 0x0,                /* 0 */
                                0x46,               /* 70 */
/* 326 */
```

```
                            0x2f,               /* FC_IP */
                            0x5a,               /* FC_CONSTANT_IID */
/* 328 */ NdrFcLong( 0x20400 ),         /* 132096 */
/* 332 */ NdrFcShort( 0x0 ),  /* 0 */
/* 334 */ NdrFcShort( 0x0 ),  /* 0 */
/* 336 */ 0xc0,               /* 192 */
                            0x0,                /* 0 */
/* 338 */ 0x0,                /* 0 */
                            0x0,                /* 0 */
/* 340 */ 0x0,                /* 0 */
                            0x0,                /* 0 */
/* 342 */ 0x0,                /* 0 */
                            0x46,               /* 70 */
/* 344 */
                            0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 346 */ NdrFcShort( 0x2 ),  /* Offset= 2 (348) */
/* 348 */
                            0x12, 0x0,          /* FC_UP */
/* 350 */ NdrFcShort( 0x1fc ),          /* Offset= 508 (858) */
/* 352 */
                            0x2a,               /* FC_ENCAPSULATED_UNION */
                            0x49,               /* 73 */
/* 354 */ NdrFcShort( 0x18 ), /* 24 */
/* 356 */ NdrFcShort( 0xa ),  /* 10 */
/* 358 */ NdrFcLong( 0x8 ),   /* 8 */
/* 362 */ NdrFcShort( 0x58 ), /* Offset= 88 (450) */
/* 364 */ NdrFcLong( 0xd ),   /* 13 */
/* 368 */ NdrFcShort( 0x78 ), /* Offset= 120 (488) */
/* 370 */ NdrFcLong( 0x9 ),   /* 9 */
/* 374 */ NdrFcShort( 0x94 ), /* Offset= 148 (522) */
/* 376 */ NdrFcLong( 0xc ),   /* 12 */
/* 380 */ NdrFcShort( 0xbc ), /* Offset= 188 (568) */
/* 382 */ NdrFcLong( 0x24 ),  /* 36 */
/* 386 */ NdrFcShort( 0x114 ),          /* Offset= 276 (662) */
/* 388 */ NdrFcLong( 0x800d ),          /* 32781 */
/* 392 */ NdrFcShort( 0x130 ),          /* Offset= 304 (696) */
/* 394 */ NdrFcLong( 0x10 ),  /* 16 */
/* 398 */ NdrFcShort( 0x148 ),          /* Offset= 328 (726) */
/* 400 */ NdrFcLong( 0x2 ),   /* 2 */
/* 404 */ NdrFcShort( 0x160 ),          /* Offset= 352 (756) */
/* 406 */ NdrFcLong( 0x3 ),   /* 3 */
/* 410 */ NdrFcShort( 0x178 ),          /* Offset= 376 (786) */
/* 412 */ NdrFcLong( 0x14 ),  /* 20 */
/* 416 */ NdrFcShort( 0x190 ),          /* Offset= 400 (816) */
/* 418 */ NdrFcShort( 0xffffffff ),     /* Offset= -1 (417) */
/* 420 */
                            0x1b,               /* FC_CARRAY */
                            0x3,                /* 3 */
/* 422 */ NdrFcShort( 0x4 ),  /* 4 */
/* 424 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                            0x0,                /*  */
/* 426 */ NdrFcShort( 0x0 ),  /* 0 */
/* 428 */
                            0x4b,               /* FC_PP */
                            0x5c,               /* FC_PAD */
/* 430 */
                            0x48,               /* FC_VARIABLE_REPEAT */
                            0x49,               /* FC_FIXED_OFFSET */
/* 432 */ NdrFcShort( 0x4 ),  /* 4 */
/* 434 */ NdrFcShort( 0x0 ),  /* 0 */
/* 436 */ NdrFcShort( 0x1 ),  /* 1 */
/* 438 */ NdrFcShort( 0x0 ),  /* 0 */
/* 440 */ NdrFcShort( 0x0 ),  /* 0 */
/* 442 */ 0x12, 0x0,          /* FC_UP */
/* 444 */ NdrFcShort( 0xffffff6e ),     /* Offset= -146 (298) */
/* 446 */
                            0x5b,               /* FC_END */

                            0x8,                /* FC_LONG */
/* 448 */ 0x5c,               /* FC_PAD */
                            0x5b,               /* FC_END */
/* 450 */
                            0x16,               /* FC_PSTRUCT */
                            0x3,                /* 3 */
/* 452 */ NdrFcShort( 0x8 ),  /* 8 */
/* 454 */
                            0x4b,               /* FC_PP */
                            0x5c,               /* FC_PAD */
/* 456 */
                            0x46,               /* FC_NO_REPEAT */
                            0x5c,               /* FC_PAD */
/* 458 */ NdrFcShort( 0x4 ),  /* 4 */
/* 460 */ NdrFcShort( 0x4 ),  /* 4 */
/* 462 */ 0x11, 0x0,          /* FC_RP */
/* 464 */ NdrFcShort( 0xffffffd4 ),     /* Offset= -44 (420) */
/* 466 */
                            0x5b,               /* FC_END */

                            0x8,                /* FC_LONG */
/* 468 */ 0x8,                /* FC_LONG */
                            0x5b,               /* FC_END */
/* 470 */
                            0x21,               /* FC_BOGUS_ARRAY */
                            0x3,                /* 3 */
/* 472 */ NdrFcShort( 0x0 ),  /* 0 */
/* 474 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                            0x0,                /*  */
/* 476 */ NdrFcShort( 0x0 ),  /* 0 */
/* 478 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 482 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
                            0x0,                /* 0 */
/* 484 */ NdrFcShort( 0xffffff50 ),     /* Offset= -176 (308) */
/* 486 */ 0x5c,               /* FC_PAD */
                            0x5b,               /* FC_END */
/* 488 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x3,                /* 3 */
/* 490 */ NdrFcShort( 0x8 ),  /* 8 */
/* 492 */ NdrFcShort( 0x0 ),  /* 0 */
/* 494 */ NdrFcShort( 0x6 ),  /* Offset= 6 (500) */
/* 496 */ 0x8,                /* FC_LONG */
                            0x36,               /* FC_POINTER */
/* 498 */ 0x5c,               /* FC_PAD */
                            0x5b,               /* FC_END */
/* 500 */
                            0x11, 0x0,          /* FC_RP */
/* 502 */ NdrFcShort( 0xffffffe0 ),     /* Offset= -32 (470) */
/* 504 */
                            0x21,               /* FC_BOGUS_ARRAY */
                            0x3,                /* 3 */
/* 506 */ NdrFcShort( 0x0 ),  /* 0 */
/* 508 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                            0x0,                /*  */
/* 510 */ NdrFcShort( 0x0 ),  /* 0 */
/* 512 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 516 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
```

```
                                0x0,                /* 0 */
/* 518 */ NdrFcShort( 0xffffff40 ),     /* Offset= -192 (326) */
/* 520 */ 0x5c,                /* FC_PAD */
                                0x5b,               /* FC_END */
/* 522 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 524 */ NdrFcShort( 0x8 ),   /* 8 */
/* 526 */ NdrFcShort( 0x0 ),   /* 0 */
/* 528 */ NdrFcShort( 0x6 ),   /* Offset= 6 (534) */
/* 530 */ 0x8,                 /* FC_LONG */
                                0x36,               /* FC_POINTER */
/* 532 */ 0x5c,                /* FC_PAD */
                                0x5b,               /* FC_END */
/* 534 */
                                0x11, 0x0,          /* FC_RP */
/* 536 */ NdrFcShort( 0xffffffe0 ),     /* Offset= -32 (504) */
/* 538 */
                                0x1b,               /* FC_CARRAY */
                                0x3,                /* 3 */
/* 540 */ NdrFcShort( 0x4 ),   /* 4 */
/* 542 */ 0x19,                /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 544 */ NdrFcShort( 0x0 ),   /* 0 */
/* 546 */
                                0x4b,               /* FC_PP */
                                0x5c,               /* FC_PAD */
/* 548 */
                                0x48,               /* FC_VARIABLE_REPEAT */
                                0x49,               /* FC_FIXED_OFFSET */
/* 550 */ NdrFcShort( 0x4 ),   /* 4 */
/* 552 */ NdrFcShort( 0x0 ),   /* 0 */
/* 554 */ NdrFcShort( 0x1 ),   /* 1 */
/* 556 */ NdrFcShort( 0x0 ),   /* 0 */
/* 558 */ NdrFcShort( 0x0 ),   /* 0 */
/* 560 */ 0x12, 0x0,           /* FC_UP */
/* 562 */ NdrFcShort( 0x182 ),          /* Offset= 386 (948) */
/* 564 */
                                0x5b,               /* FC_END */

                                0x8,                /* FC_LONG */
/* 566 */ 0x5c,                /* FC_PAD */
                                0x5b,               /* FC_END */
/* 568 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 570 */ NdrFcShort( 0x8 ),   /* 8 */
/* 572 */ NdrFcShort( 0x0 ),   /* 0 */
/* 574 */ NdrFcShort( 0x6 ),   /* Offset= 6 (580) */
/* 576 */ 0x8,                 /* FC_LONG */
                                0x36,               /* FC_POINTER */
/* 578 */ 0x5c,                /* FC_PAD */
                                0x5b,               /* FC_END */
/* 580 */
                                0x11, 0x0,          /* FC_RP */
/* 582 */ NdrFcShort( 0xffffffd4 ),     /* Offset= -44 (538) */
/* 584 */
                                0x2f,               /* FC_IP */
                                0x5a,               /* FC_CONSTANT_IID */
/* 586 */ NdrFcLong( 0x2f ),   /* 47 */
/* 590 */ NdrFcShort( 0x0 ),   /* 0 */
/* 592 */ NdrFcShort( 0x0 ),   /* 0 */
/* 594 */ 0xc0,                /* 192 */
                                0x0,                /* 0 */
/* 596 */ 0x0,                 /* 0 */
                                0x0,                /* 0 */
/* 598 */ 0x0,                 /* 0 */
                                0x0,                /* 0 */
/* 600 */ 0x0,                 /* 0 */
                                0x46,               /* 70 */
/* 602 */
                                0x1b,               /* FC_CARRAY */
                                0x0,                /* 0 */
/* 604 */ NdrFcShort( 0x1 ),   /* 1 */
/* 606 */ 0x19,                /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 608 */ NdrFcShort( 0x4 ),   /* 4 */
/* 610 */ 0x1,                 /* FC_BYTE */
                                0x5b,               /* FC_END */
/* 612 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 614 */ NdrFcShort( 0x10 ),  /* 16 */
/* 616 */ NdrFcShort( 0x0 ),   /* 0 */
/* 618 */ NdrFcShort( 0xa ),   /* Offset= 10 (628) */
/* 620 */ 0x8,                 /* FC_LONG */
                                0x8,                /* FC_LONG */
/* 622 */ 0x4c,                /* FC_EMBEDDED_COMPLEX */
                                0x0,                /* 0 */
/* 624 */ NdrFcShort( 0xffffffd8 ),     /* Offset= -40 (584) */
/* 626 */ 0x36,                /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 628 */
                                0x12, 0x0,          /* FC_UP */
/* 630 */ NdrFcShort( 0xfffffffe4 ),    /* Offset= -28 (602) */
/* 632 */
                                0x1b,               /* FC_CARRAY */
                                0x3,                /* 3 */
/* 634 */ NdrFcShort( 0x4 ),   /* 4 */
/* 636 */ 0x19,                /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 638 */ NdrFcShort( 0x0 ),   /* 0 */
/* 640 */
                                0x4b,               /* FC_PP */
                                0x5c,               /* FC_PAD */
/* 642 */
                                0x48,               /* FC_VARIABLE_REPEAT */
                                0x49,               /* FC_FIXED_OFFSET */
/* 644 */ NdrFcShort( 0x4 ),   /* 4 */
/* 646 */ NdrFcShort( 0x0 ),   /* 0 */
/* 648 */ NdrFcShort( 0x1 ),   /* 1 */
/* 650 */ NdrFcShort( 0x0 ),   /* 0 */
/* 652 */ NdrFcShort( 0x0 ),   /* 0 */
/* 654 */ 0x12, 0x0,           /* FC_UP */
/* 656 */ NdrFcShort( 0xffffffd4 ),     /* Offset= -44 (612) */
/* 658 */
                                0x5b,               /* FC_END */

                                0x8,                /* FC_LONG */
/* 660 */ 0x5c,                /* FC_PAD */
                                0x5b,               /* FC_END */
/* 662 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 664 */ NdrFcShort( 0x8 ),   /* 8 */
/* 666 */ NdrFcShort( 0x0 ),   /* 0 */
```

```
/* 668 */ NdrFcShort( 0x6 ),  /* Offset= 6 (674) */
/* 670 */ 0x8,                /* FC_LONG */
                               0x36,               /* FC_POINTER */
/* 672 */ 0x5c,               /* FC_PAD */
                               0x5b,               /* FC_END */
/* 674 */
                               0x11, 0x0,          /* FC_RP */
/* 676 */ NdrFcShort( 0xffffffd4 ),     /* Offset= -44 (632) */
/* 678 */
                               0x1d,               /* FC_SMFARRAY */
                               0x0,                /* 0 */
/* 680 */ NdrFcShort( 0x8 ),  /* 8 */
/* 682 */ 0x2,                /* FC_CHAR */
                               0x5b,               /* FC_END */
/* 684 */
                               0x15,               /* FC_STRUCT */
                               0x3,                /* 3 */
/* 686 */ NdrFcShort( 0x10 ), /* 16 */
/* 688 */ 0x8,                /* FC_LONG */
                               0x6,                /* FC_SHORT */
/* 690 */ 0x6,                /* FC_SHORT */
                               0x4c,               /* FC_EMBEDDED_COMPLEX */
/* 692 */ 0x0,                /* 0 */
                               NdrFcShort( 0xfffffff1 ),     /* Offset= -15 (678) */
                               0x5b,               /* FC_END */
/* 696 */
                               0x1a,               /* FC_BOGUS_STRUCT */
                               0x3,                /* 3 */
/* 698 */ NdrFcShort( 0x18 ), /* 24 */
/* 700 */ NdrFcShort( 0x0 ),  /* 0 */
/* 702 */ NdrFcShort( 0xa ),  /* Offset= 10 (712) */
/* 704 */ 0x8,                /* FC_LONG */
                               0x36,               /* FC_POINTER */
/* 706 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
                               0x0,                /* 0 */
/* 708 */ NdrFcShort( 0xfffffff8 ),     /* Offset= -24 (684) */
/* 710 */ 0x5c,               /* FC_PAD */
                               0x5b,               /* FC_END */
/* 712 */
                               0x11, 0x0,          /* FC_RP */
/* 714 */ NdrFcShort( 0xffffff0c ),     /* Offset= -244 (470) */
/* 716 */
                               0x1b,               /* FC_CARRAY */
                               0x0,                /* 0 */
/* 718 */ NdrFcShort( 0x1 ),  /* 1 */
/* 720 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                               0x0,                /*  */
/* 722 */ NdrFcShort( 0x0 ),  /* 0 */
/* 724 */ 0x1,                /* FC_BYTE */
                               0x5b,               /* FC_END */
/* 726 */
                               0x16,               /* FC_PSTRUCT */
                               0x3,                /* 3 */
/* 728 */ NdrFcShort( 0x8 ),  /* 8 */
/* 730 */
                               0x4b,               /* FC_PP */
                               0x5c,               /* FC_PAD */
/* 732 */
                               0x46,               /* FC_NO_REPEAT */
                               0x5c,               /* FC_PAD */
/* 734 */ NdrFcShort( 0x4 ),  /* 4 */
/* 736 */ NdrFcShort( 0x4 ),  /* 4 */
/* 738 */ 0x12, 0x0,          /* FC_UP */
```

```
/* 740 */ NdrFcShort( 0xfffffff8 ),     /* Offset= -24 (716) */
/* 742 */
                               0x5b,               /* FC_END */

                               0x8,                /* FC_LONG */
/* 744 */ 0x8,                /* FC_LONG */
                               0x5b,               /* FC_END */
/* 746 */
                               0x1b,               /* FC_CARRAY */
                               0x1,                /* 1 */
/* 748 */ NdrFcShort( 0x2 ),  /* 2 */
/* 750 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                               0x0,                /*  */
/* 752 */ NdrFcShort( 0x0 ),  /* 0 */
/* 754 */ 0x6,                /* FC_SHORT */
                               0x5b,               /* FC_END */
/* 756 */
                               0x16,               /* FC_PSTRUCT */
                               0x3,                /* 3 */
/* 758 */ NdrFcShort( 0x8 ),  /* 8 */
/* 760 */
                               0x4b,               /* FC_PP */
                               0x5c,               /* FC_PAD */
/* 762 */
                               0x46,               /* FC_NO_REPEAT */
                               0x5c,               /* FC_PAD */
/* 764 */ NdrFcShort( 0x4 ),  /* 4 */
/* 766 */ NdrFcShort( 0x4 ),  /* 4 */
/* 768 */ 0x12, 0x0,          /* FC_UP */
/* 770 */ NdrFcShort( 0xfffffff8 ),     /* Offset= -24 (746) */
/* 772 */
                               0x5b,               /* FC_END */

                               0x8,                /* FC_LONG */
/* 774 */ 0x8,                /* FC_LONG */
                               0x5b,               /* FC_END */
/* 776 */
                               0x1b,               /* FC_CARRAY */
                               0x3,                /* 3 */
/* 778 */ NdrFcShort( 0x4 ),  /* 4 */
/* 780 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                               0x0,                /*  */
/* 782 */ NdrFcShort( 0x0 ),  /* 0 */
/* 784 */ 0x8,                /* FC_LONG */
                               0x5b,               /* FC_END */
/* 786 */
                               0x16,               /* FC_PSTRUCT */
                               0x3,                /* 3 */
/* 788 */ NdrFcShort( 0x8 ),  /* 8 */
/* 790 */
                               0x4b,               /* FC_PP */
                               0x5c,               /* FC_PAD */
/* 792 */
                               0x46,               /* FC_NO_REPEAT */
                               0x5c,               /* FC_PAD */
/* 794 */ NdrFcShort( 0x4 ),  /* 4 */
/* 796 */ NdrFcShort( 0x4 ),  /* 4 */
/* 798 */ 0x12, 0x0,          /* FC_UP */
/* 800 */ NdrFcShort( 0xfffffff8 ),     /* Offset= -24 (776) */
/* 802 */
                               0x5b,               /* FC_END */

                               0x8,                /* FC_LONG */
```

```
/* 804 */ 0x8,              /* FC_LONG */
                            0x5b,              /* FC_END */
/* 806 */
                            0x1b,              /* FC_CARRAY */
                            0x7,               /* 7 */
/* 808 */ NdrFcShort( 0x8 ),  /* 8 */
/* 810 */ 0x19,             /* Corr desc:  field pointer, FC_ULONG */
                            0x0,               /*  */
/* 812 */ NdrFcShort( 0x0 ),  /* 0 */
/* 814 */ 0xb,              /* FC_HYPER */
                            0x5b,              /* FC_END */
/* 816 */
                            0x16,              /* FC_PSTRUCT */
                            0x3,               /* 3 */
/* 818 */ NdrFcShort( 0x8 ),  /* 8 */
/* 820 */
                            0x4b,              /* FC_PP */
                            0x5c,              /* FC_PAD */
/* 822 */
                            0x46,              /* FC_NO_REPEAT */
                            0x5c,              /* FC_PAD */
/* 824 */ NdrFcShort( 0x4 ),  /* 4 */
/* 826 */ NdrFcShort( 0x4 ),  /* 4 */
/* 828 */ 0x12, 0x0,          /* FC_UP */
/* 830 */ NdrFcShort( 0xfffffff8 ),     /* Offset= -24 (806) */
/* 832 */
                            0x5b,              /* FC_END */

                            0x8,               /* FC_LONG */
/* 834 */ 0x8,              /* FC_LONG */
                            0x5b,              /* FC_END */
/* 836 */
                            0x15,              /* FC_STRUCT */
                            0x3,               /* 3 */
/* 838 */ NdrFcShort( 0x8 ),  /* 8 */
/* 840 */ 0x8,              /* FC_LONG */
                            0x8,               /* FC_LONG */
/* 842 */ 0x5c,             /* FC_PAD */
                            0x5b,              /* FC_END */
/* 844 */
                            0x1b,              /* FC_CARRAY */
                            0x3,               /* 3 */
/* 846 */ NdrFcShort( 0x8 ),  /* 8 */
/* 848 */ 0x7,              /* Corr desc: FC_USHORT */
                            0x0,               /*  */
/* 850 */ NdrFcShort( 0xffd8 ),        /* -40 */
/* 852 */ 0x4c,             /* FC_EMBEDDED_COMPLEX */
                            0x0,               /* 0 */
/* 854 */ NdrFcShort( 0xffffffee ),     /* Offset= -18 (836) */
/* 856 */ 0x5c,             /* FC_PAD */
                            0x5b,              /* FC_END */
/* 858 */
                            0x1a,              /* FC_BOGUS_STRUCT */
                            0x3,               /* 3 */
/* 860 */ NdrFcShort( 0x28 ), /* 40 */
/* 862 */ NdrFcShort( 0xffffffee ),     /* Offset= -18 (844) */
/* 864 */ NdrFcShort( 0x0 ),  /* Offset= 0 (864) */
/* 866 */ 0x6,              /* FC_SHORT */
                            0x6,               /* FC_SHORT */
/* 868 */ 0x38,             /* FC_ALIGNM4 */
                            0x8,               /* FC_LONG */
/* 870 */ 0x8,              /* FC_LONG */
                            0x4c,              /* FC_EMBEDDED_COMPLEX */
/* 872 */ 0x0,              /* 0 */
                            NdrFcShort( 0xfffffdf7 ),     /* Offset= -521 (352) */
                            0x5b,              /* FC_END */
/* 876 */
                            0x12, 0x0,         /* FC_UP */
/* 878 */ NdrFcShort( 0xfffffef6 ),     /* Offset= -266 (612) */
/* 880 */
                            0x12, 0x8,         /* FC_UP [simple_pointer] */
/* 882 */ 0x1,              /* FC_BYTE */
                            0x5c,              /* FC_PAD */
/* 884 */
                            0x12, 0x8,         /* FC_UP [simple_pointer] */
/* 886 */ 0x6,              /* FC_SHORT */
                            0x5c,              /* FC_PAD */
/* 888 */
                            0x12, 0x8,         /* FC_UP [simple_pointer] */
/* 890 */ 0x8,              /* FC_LONG */
                            0x5c,              /* FC_PAD */
/* 892 */
                            0x12, 0x8,         /* FC_UP [simple_pointer] */
/* 894 */ 0xa,              /* FC_FLOAT */
                            0x5c,              /* FC_PAD */
/* 896 */
                            0x12, 0x8,         /* FC_UP [simple_pointer] */
/* 898 */ 0xc,              /* FC_DOUBLE */
                            0x5c,              /* FC_PAD */
/* 900 */
                            0x12, 0x0,         /* FC_UP */
/* 902 */ NdrFcShort( 0xfffffd90 ),     /* Offset= -624 (278) */
/* 904 */
                            0x12, 0x10,        /* FC_UP [pointer_deref] */
/* 906 */ NdrFcShort( 0xfffffd92 ),     /* Offset= -622 (284) */
/* 908 */
                            0x12, 0x10,        /* FC_UP [pointer_deref] */
/* 910 */ NdrFcShort( 0xfffffda6 ),     /* Offset= -602 (308) */
/* 912 */
                            0x12, 0x10,        /* FC_UP [pointer_deref] */
/* 914 */ NdrFcShort( 0xfffffdb4 ),     /* Offset= -588 (326) */
/* 916 */
                            0x12, 0x10,        /* FC_UP [pointer_deref] */
/* 918 */ NdrFcShort( 0xfffffdc2 ),     /* Offset= -574 (344) */
/* 920 */
                            0x12, 0x10,        /* FC_UP [pointer_deref] */
/* 922 */ NdrFcShort( 0x2 ),  /* Offset= 2 (924) */
/* 924 */
                            0x12, 0x0,         /* FC_UP */
/* 926 */ NdrFcShort( 0x16 ), /* Offset= 22 (948) */
/* 928 */
                            0x15,              /* FC_STRUCT */
                            0x7,               /* 7 */
/* 930 */ NdrFcShort( 0x10 ), /* 16 */
/* 932 */ 0x6,              /* FC_SHORT */
                            0x1,               /* FC_BYTE */
/* 934 */ 0x1,              /* FC_BYTE */
                            0x38,              /* FC_ALIGNM4 */
/* 936 */ 0x8,              /* FC_LONG */
                            0x39,              /* FC_ALIGNM8 */
/* 938 */ 0xb,              /* FC_HYPER */
                            0x5b,              /* FC_END */
/* 940 */
                            0x12, 0x0,         /* FC_UP */
/* 942 */ NdrFcShort( 0xfffffff2 ),     /* Offset= -14 (928) */
/* 944 */
```

```
                            0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 946 */ 0x2,              /* FC_CHAR */
                            0x5c,               /* FC_PAD */
/* 948 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x7,                /* 7 */
/* 950 */ NdrFcShort( 0x20 ), /* 32 */
/* 952 */ NdrFcShort( 0x0 ),  /* 0 */
/* 954 */ NdrFcShort( 0x0 ),  /* Offset= 0 (954) */
/* 956 */ 0x8,              /* FC_LONG */
                            0x8,                /* FC_LONG */
/* 958 */ 0x6,              /* FC_SHORT */
                            0x6,                /* FC_SHORT */
/* 960 */ 0x6,              /* FC_SHORT */
                            0x6,                /* FC_SHORT */
/* 962 */ 0x4c,             /* FC_EMBEDDED_COMPLEX */
                            0x0,                /* 0 */
/* 964 */ NdrFcShort( 0xfffffc42 ),     /* Offset= -958 (6) */
/* 966 */ 0x5c,             /* FC_PAD */
                            0x5b,               /* FC_END */
/* 968 */ 0xb4,             /* FC_USER_MARSHAL */
                            0x83,               /* 131 */
/* 970 */ NdrFcShort( 0x0 ),  /* 0 */
/* 972 */ NdrFcShort( 0x10 ), /* 16 */
/* 974 */ NdrFcShort( 0x0 ),  /* 0 */
/* 976 */ NdrFcShort( 0xfffffc32 ),     /* Offset= -974 (2) */
/* 978 */
                            0x11, 0x4,          /* FC_RP [alloced_on_stack] */
/* 980 */ NdrFcShort( 0x6 ),  /* Offset= 6 (986) */
/* 982 */
                            0x13, 0x0,          /* FC_OP */
/* 984 */ NdrFcShort( 0xffffffdc ),     /* Offset= -36 (948) */
/* 986 */ 0xb4,             /* FC_USER_MARSHAL */
                            0x83,               /* 131 */
/* 988 */ NdrFcShort( 0x0 ),  /* 0 */
/* 990 */ NdrFcShort( 0x10 ), /* 16 */
/* 992 */ NdrFcShort( 0x0 ),  /* 0 */
/* 994 */ NdrFcShort( 0xfffffff4 ),     /* Offset= -12 (982) */

                            0x0
        }
    };

const CInterfaceProxyVtbl * _tpcc_com_ps_ProxyVtblList[] =
{
    ( CInterfaceProxyVtbl *) &_ITPCCProxyVtbl,
    0
};

const CInterfaceStubVtbl * _tpcc_com_ps_StubVtblList[] =
{
    ( CInterfaceStubVtbl *) &_ITPCCStubVtbl,
    0
};

PCInterfaceName const _tpcc_com_ps_InterfaceNamesList[] =
{
    "ITPCC",
    0
};

#define _tpcc_com_ps_CHECK_IID(n)       IID_GENERIC_CHECK_IID( _tpcc_com_ps, pIID,
n)

int __stdcall _tpcc_com_ps_IID_Lookup( const IID * pIID, int * pIndex )
{

    if(!_tpcc_com_ps_CHECK_IID(0))
        {
        *pIndex = 0;
        return 1;
        }

    return 0;
}

const ExtendedProxyFileInfo tpcc_com_ps_ProxyFileInfo =
{
    (PCInterfaceProxyVtblList *) & _tpcc_com_ps_ProxyVtblList,
    (PCInterfaceStubVtblList *) & _tpcc_com_ps_StubVtblList,
    (const PCInterfaceName * ) & _tpcc_com_ps_InterfaceNamesList,
    0, // no delegation
    & _tpcc_com_ps_IID_Lookup,
    1,
    2,
    0, /* table of [async_uuid] interfaces */
    0, /* Filler1 */
    0, /* Filler2 */
    0  /* Filler3 */
};


#endif /* !defined(_M_IA64) && !defined(_M_AXP64)*/


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

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


 /* File created by MIDL compiler version 5.03.0280 */
/* at Mon Jun 12 18:15:12 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win64 (32b run,appending), 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_AXP64)
#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   979
#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;


extern const MIDL_TYPE_FORMAT_STRING __MIDL_TypeFormatString;
extern const MIDL_PROC_FORMAT_STRING __MIDL_ProcFormatString;


/* Standard interface: __MIDL_itf_tpcc_com_ps_0000, ver. 0.0,
   GUID={0x00000000,0x0000,0x0000,{0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00}} */


/* Object interface: IUnknown, ver. 0.0,
   GUID={0x00000000,0x0000,0x0000,{0xC0,0x00,0x00,0x00,0x00,0x00,0x00,0x46}} */


/* Object interface: ITPCC, ver. 0.0,
   GUID={0xFEEE6AA2,0x84B1,0x11d2,{0xBA,0x47,0x00,0xC0,0x4F,0xBF,0xE0,0x8B}} */


extern const MIDL_STUB_DESC Object_StubDesc;


extern const MIDL_SERVER_INFO ITPCC_ServerInfo;

#pragma code_seg(".orpc")
static const unsigned short ITPCC_FormatStringOffsetTable[] =
    {
    0,
    44,
    88,
    132,
    176,
    220
    };

static const MIDL_SERVER_INFO ITPCC_ServerInfo =
    {
    &Object_StubDesc,
    0,
    __MIDL_ProcFormatString.Format,
    &ITPCC_FormatStringOffsetTable[-3],
    0,
    0,
    0,
    0
    };

static const MIDL_STUBLESS_PROXY_INFO ITPCC_ProxyInfo =
    {
    &Object_StubDesc,
    __MIDL_ProcFormatString.Format,
    &ITPCC_FormatStringOffsetTable[-3],
    0,
    0,
    0
    };

CINTERFACE_PROXY_VTABLE(9) _ITPCCProxyVtbl =
{
    &ITPCC_ProxyInfo,
    &IID_ITPCC,
    IUnknown_QueryInterface_Proxy,
    IUnknown_AddRef_Proxy,
    IUnknown_Release_Proxy ,
    (void *)-1 /* ITPCC::NewOrder */ ,
    (void *)-1 /* ITPCC::Payment */ ,
    (void *)-1 /* ITPCC::Delivery */ ,
    (void *)-1 /* ITPCC::StockLevel */ ,
    (void *)-1 /* ITPCC::OrderStatus */ ,
    (void *)-1 /* ITPCC::CallSetComplete */
};

const CInterfaceStubVtbl _ITPCCStubVtbl =
{
    &IID_ITPCC,
    &ITPCC_ServerInfo,
    9,
    0, /* pure interpreted */
    CStdStubBuffer_METHODS
};

extern const USER_MARSHAL_ROUTINE_QUADRUPLE UserMarshalRoutines[
WIRE_MARSHAL_TABLE_SIZE ];

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,
    0x5030118, /* MIDL Version 5.3.280 */
    0,
    UserMarshalRoutines,
    0,  /* notify & notify_flag routine table */
    0x1, /* MIDL flag */
    0,  /* Reserved3 */
    0,  /* Reserved4 */
```

```
    0   /* Reserved5 */
    };

#pragma data_seg(".rdata")

static const USER_MARSHAL_ROUTINE_QUADRUPLE UserMarshalRoutines[
WIRE_MARSHAL_TABLE_SIZE ] =
        {

            {
            VARIANT_UserSize
            ,VARIANT_UserMarshal
            ,VARIANT_UserUnmarshal
            ,VARIANT_UserFree
            }

        };


#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 */
#ifndef _ALPHA_
/*  8 */  NdrFcShort( 0x38 ), /* ia64 Stack size/offset = 56 */
#else
                                NdrFcShort( 0x30 ), /* axp64 Stack size/offset = 48 */
#endif
/* 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, */
#ifndef _ALPHA_
/* 28 */  NdrFcShort( 0x10 ), /* ia64 Stack size/offset = 16 */
#else
                                NdrFcShort( 0x8 ),  /* axp64 Stack size/offset = 8 */
#endif
/* 30 */  NdrFcShort( 0x3b6 ),          /* Type Offset=950 */

          /* Parameter txn_out */

/* 32 */  NdrFcShort( 0x6113 ),         /* Flags:  must size, must free, out, simple
ref, srv alloc size=24 */
#ifndef _ALPHA_
/* 34 */  NdrFcShort( 0x28 ), /* ia64 Stack size/offset = 40 */
#else
                                NdrFcShort( 0x20 ), /* axp64 Stack size/offset = 32 */
#endif
/* 36 */  NdrFcShort( 0x3c8 ),          /* Type Offset=968 */

          /* Return value */

/* 38 */  NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 40 */  NdrFcShort( 0x30 ), /* ia64 Stack size/offset = 48 */
#else
                                NdrFcShort( 0x28 ), /* axp64 Stack size/offset = 40 */
#endif
/* 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 */
#ifndef _ALPHA_
/* 52 */  NdrFcShort( 0x38 ), /* ia64 Stack size/offset = 56 */
#else
                                NdrFcShort( 0x30 ), /* axp64 Stack size/offset = 48 */
#endif
/* 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, */
#ifndef _ALPHA_
/* 72 */  NdrFcShort( 0x10 ), /* ia64 Stack size/offset = 16 */
#else
                                NdrFcShort( 0x8 ),  /* axp64 Stack size/offset = 8 */
#endif
/* 74 */  NdrFcShort( 0x3b6 ),          /* Type Offset=950 */

          /* Parameter txn_out */

/* 76 */  NdrFcShort( 0x6113 ),         /* Flags:  must size, must free, out, simple
ref, srv alloc size=24 */
#ifndef _ALPHA_
/* 78 */  NdrFcShort( 0x28 ), /* ia64 Stack size/offset = 40 */
#else
                                NdrFcShort( 0x20 ), /* axp64 Stack size/offset = 32 */
```

```
#endif
/* 80 */  NdrFcShort( 0x3c8 ),          /* Type Offset=968 */

          /* Return value */

/* 82 */  NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 84 */  NdrFcShort( 0x30 ), /* ia64 Stack size/offset = 48 */
#else
                              NdrFcShort( 0x28 ), /* axp64 Stack size/offset = 40 */
#endif
/* 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 */
#ifndef _ALPHA_
/* 96 */  NdrFcShort( 0x38 ), /* ia64 Stack size/offset = 56 */
#else
                              NdrFcShort( 0x30 ), /* axp64 Stack size/offset = 48 */
#endif
/* 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, */
#ifndef _ALPHA_
/* 116 */ NdrFcShort( 0x10 ), /* ia64 Stack size/offset = 16 */
#else
                              NdrFcShort( 0x8 ),  /* axp64 Stack size/offset = 8 */
#endif
/* 118 */ NdrFcShort( 0x3b6 ),          /* Type Offset=950 */

          /* Parameter txn_out */

/* 120 */ NdrFcShort( 0x6113 ),         /* Flags:  must size, must free, out, simple
ref, srv alloc size=24 */
#ifndef _ALPHA_
/* 122 */ NdrFcShort( 0x28 ), /* ia64 Stack size/offset = 40 */
#else
                              NdrFcShort( 0x20 ), /* axp64 Stack size/offset = 32 */
#endif
/* 124 */ NdrFcShort( 0x3c8 ),          /* Type Offset=968 */

          /* Return value */

/* 126 */ NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 128 */ NdrFcShort( 0x30 ), /* ia64 Stack size/offset = 48 */
#else
                              NdrFcShort( 0x28 ), /* axp64 Stack size/offset = 40 */
#endif
/* 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 */
#ifndef _ALPHA_
/* 140 */ NdrFcShort( 0x38 ), /* ia64 Stack size/offset = 56 */
#else
                              NdrFcShort( 0x30 ), /* axp64 Stack size/offset = 48 */
#endif
/* 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, */
#ifndef _ALPHA_
/* 160 */ NdrFcShort( 0x10 ), /* ia64 Stack size/offset = 16 */
#else
                              NdrFcShort( 0x8 ),  /* axp64 Stack size/offset = 8 */
#endif
/* 162 */ NdrFcShort( 0x3b6 ),          /* Type Offset=950 */

          /* Parameter txn_out */

/* 164 */ NdrFcShort( 0x6113 ),         /* Flags:  must size, must free, out, simple
ref, srv alloc size=24 */
#ifndef _ALPHA_
/* 166 */ NdrFcShort( 0x28 ), /* ia64 Stack size/offset = 40 */
#else
                              NdrFcShort( 0x20 ), /* axp64 Stack size/offset = 32 */
#endif
/* 168 */ NdrFcShort( 0x3c8 ),          /* Type Offset=968 */

          /* Return value */

/* 170 */ NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 172 */ NdrFcShort( 0x30 ), /* ia64 Stack size/offset = 48 */
#else
                              NdrFcShort( 0x28 ), /* axp64 Stack size/offset = 40 */
#endif
/* 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 */
#ifndef _ALPHA_
/* 184 */ NdrFcShort( 0x38 ), /* ia64 Stack size/offset = 56 */
#else
                              NdrFcShort( 0x30 ), /* axp64 Stack size/offset = 48 */
#endif
/* 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, */
#ifndef _ALPHA_
/* 204 */ NdrFcShort( 0x10 ), /* ia64 Stack size/offset = 16 */
#else
                              NdrFcShort( 0x8 ),  /* axp64 Stack size/offset = 8 */
#endif
/* 206 */ NdrFcShort( 0x3b6 ),          /* Type Offset=950 */

         /* Parameter txn_out */

/* 208 */ NdrFcShort( 0x6113 ),         /* Flags:  must size, must free, out, simple
ref, srv alloc size=24 */
#ifndef _ALPHA_
/* 210 */ NdrFcShort( 0x28 ), /* ia64 Stack size/offset = 40 */
#else
                              NdrFcShort( 0x20 ), /* axp64 Stack size/offset = 32 */
#endif
/* 212 */ NdrFcShort( 0x3c8 ),          /* Type Offset=968 */

         /* Return value */

/* 214 */ NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 216 */ NdrFcShort( 0x30 ), /* ia64 Stack size/offset = 48 */
#else
                              NdrFcShort( 0x28 ), /* axp64 Stack size/offset = 40 */
#endif
/* 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, axp64 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, axp64 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( 0x39e ),          /* Offset= 926 (930) */
/*  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( 0x2b ), /* 43 */
/* 20 */  NdrFcLong( 0x3 ),   /* 3 */
/* 24 */  NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 26 */  NdrFcLong( 0x11 ),  /* 17 */
/* 30 */  NdrFcShort( 0x8001 ),         /* Simple arm type: FC_BYTE */
/* 32 */  NdrFcLong( 0x2 ),   /* 2 */
/* 36 */  NdrFcShort( 0x8006 ),         /* Simple arm type: FC_SHORT */
/* 38 */  NdrFcLong( 0x4 ),   /* 4 */
/* 42 */  NdrFcShort( 0x800a ),         /* Simple arm type: FC_FLOAT */
/* 44 */  NdrFcLong( 0x5 ),   /* 5 */
/* 48 */  NdrFcShort( 0x800c ),         /* Simple arm type: FC_DOUBLE */
/* 50 */  NdrFcLong( 0xb ),   /* 11 */
/* 54 */  NdrFcShort( 0x8006 ),         /* Simple arm type: FC_SHORT */
/* 56 */  NdrFcLong( 0xa ),   /* 10 */
/* 60 */  NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 62 */  NdrFcLong( 0x6 ),   /* 6 */
/* 66 */  NdrFcShort( 0xd6 ), /* Offset= 214 (280) */
/* 68 */  NdrFcLong( 0x7 ),   /* 7 */
/* 72 */  NdrFcShort( 0x800c ),         /* Simple arm type: FC_DOUBLE */
/* 74 */  NdrFcLong( 0x8 ),   /* 8 */
/* 78 */  NdrFcShort( 0xd0 ), /* Offset= 208 (286) */
/* 80 */  NdrFcLong( 0xd ),   /* 13 */
/* 84 */  NdrFcShort( 0xe4 ), /* Offset= 228 (312) */
/* 86 */  NdrFcLong( 0x9 ),   /* 9 */
```

```
/* 90 */  NdrFcShort( 0xf0 ), /* Offset= 240 (330) */
/* 92 */  NdrFcLong( 0x2000 ),          /* 8192 */
/* 96 */  NdrFcShort( 0xfc ), /* Offset= 252 (348) */
/* 98 */  NdrFcLong( 0x24 ),  /* 36 */
/* 102 */ NdrFcShort( 0x2f4 ),          /* Offset= 756 (858) */
/* 104 */ NdrFcLong( 0x4024 ),          /* 16420 */
/* 108 */ NdrFcShort( 0x2ee ),          /* Offset= 750 (858) */
/* 110 */ NdrFcLong( 0x4011 ),          /* 16401 */
/* 114 */ NdrFcShort( 0x2ec ),          /* Offset= 748 (862) */
/* 116 */ NdrFcLong( 0x4002 ),          /* 16386 */
/* 120 */ NdrFcShort( 0x2ea ),          /* Offset= 746 (866) */
/* 122 */ NdrFcLong( 0x4003 ),          /* 16387 */
/* 126 */ NdrFcShort( 0x2e8 ),          /* Offset= 744 (870) */
/* 128 */ NdrFcLong( 0x4004 ),          /* 16388 */
/* 132 */ NdrFcShort( 0x2e6 ),          /* Offset= 742 (874) */
/* 134 */ NdrFcLong( 0x4005 ),          /* 16389 */
/* 138 */ NdrFcShort( 0x2e4 ),          /* Offset= 740 (878) */
/* 140 */ NdrFcLong( 0x400b ),          /* 16395 */
/* 144 */ NdrFcShort( 0x2d2 ),          /* Offset= 722 (866) */
/* 146 */ NdrFcLong( 0x400a ),          /* 16394 */
/* 150 */ NdrFcShort( 0x2d0 ),          /* Offset= 720 (870) */
/* 152 */ NdrFcLong( 0x4006 ),          /* 16390 */
/* 156 */ NdrFcShort( 0x2d6 ),          /* Offset= 726 (882) */
/* 158 */ NdrFcLong( 0x4007 ),          /* 16391 */
/* 162 */ NdrFcShort( 0x2cc ),          /* Offset= 716 (878) */
/* 164 */ NdrFcLong( 0x4008 ),          /* 16392 */
/* 168 */ NdrFcShort( 0x2ce ),          /* Offset= 718 (886) */
/* 170 */ NdrFcLong( 0x400d ),          /* 16397 */
/* 174 */ NdrFcShort( 0x2cc ),          /* Offset= 716 (890) */
/* 176 */ NdrFcLong( 0x4009 ),          /* 16393 */
/* 180 */ NdrFcShort( 0x2ca ),          /* Offset= 714 (894) */
/* 182 */ NdrFcLong( 0x6000 ),          /* 24576 */
/* 186 */ NdrFcShort( 0x2c8 ),          /* Offset= 712 (898) */
/* 188 */ NdrFcLong( 0x400c ),          /* 16396 */
/* 192 */ NdrFcShort( 0x2c6 ),          /* Offset= 710 (902) */
/* 194 */ NdrFcLong( 0x10 ),  /* 16 */
/* 198 */ NdrFcShort( 0x8002 ),         /* Simple arm type: FC_CHAR */
/* 200 */ NdrFcLong( 0x12 ),  /* 18 */
/* 204 */ NdrFcShort( 0x8006 ),         /* Simple arm type: FC_SHORT */
/* 206 */ NdrFcLong( 0x13 ),  /* 19 */
/* 210 */ NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 212 */ NdrFcLong( 0x16 ),  /* 22 */
/* 216 */ NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 218 */ NdrFcLong( 0x17 ),  /* 23 */
/* 222 */ NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 224 */ NdrFcLong( 0xe ),   /* 14 */
/* 228 */ NdrFcShort( 0x2aa ),          /* Offset= 682 (910) */
/* 230 */ NdrFcLong( 0x400e ),          /* 16398 */
/* 234 */ NdrFcShort( 0x2b0 ),          /* Offset= 688 (922) */
/* 236 */ NdrFcLong( 0x4010 ),          /* 16400 */
/* 240 */ NdrFcShort( 0x2ae ),          /* Offset= 686 (926) */
/* 242 */ NdrFcLong( 0x4012 ),          /* 16402 */
/* 246 */ NdrFcShort( 0x26c ),          /* Offset= 620 (866) */
/* 248 */ NdrFcLong( 0x4013 ),          /* 16403 */
/* 252 */ NdrFcShort( 0x26a ),          /* Offset= 618 (870) */
/* 254 */ NdrFcLong( 0x4016 ),          /* 16406 */
/* 258 */ NdrFcShort( 0x264 ),          /* Offset= 612 (870) */
/* 260 */ NdrFcLong( 0x4017 ),          /* 16407 */
/* 264 */ NdrFcShort( 0x25e ),          /* Offset= 606 (870) */
/* 266 */ NdrFcLong( 0x0 ),   /* 0 */
/* 270 */ NdrFcShort( 0x0 ),  /* Offset= 0 (270) */
/* 272 */ NdrFcLong( 0x1 ),   /* 1 */
/* 276 */ NdrFcShort( 0x0 ),  /* Offset= 0 (276) */
```

```
/* 278 */ NdrFcShort( 0xffffffff ),     /* Offset= -1 (277) */
/* 280 */
                                0x15,               /* FC_STRUCT */
                                0x7,                /* 7 */
/* 282 */ NdrFcShort( 0x8 ),  /* 8 */
/* 284 */ 0xb,                 /* FC_HYPER */
                                0x5b,               /* FC_END */
/* 286 */
                                0x12, 0x0,          /* FC_UP */
/* 288 */ NdrFcShort( 0xe ),  /* Offset= 14 (302) */
/* 290 */
                                0x1b,               /* FC_CARRAY */
                                0x1,                /* 1 */
/* 292 */ NdrFcShort( 0x2 ),  /* 2 */
/* 294 */ 0x9,                 /* Corr desc: FC_ULONG */
                                0x0,                /*  */
/* 296 */ NdrFcShort( 0xfffc ),         /* -4 */
/* 298 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 300 */ 0x6,                 /* FC_SHORT */
                                0x5b,               /* FC_END */
/* 302 */
                                0x17,               /* FC_CSTRUCT */
                                0x3,                /* 3 */
/* 304 */ NdrFcShort( 0x8 ),  /* 8 */
/* 306 */ NdrFcShort( 0xfffffff0 ),     /* Offset= -16 (290) */
/* 308 */ 0x8,                 /* FC_LONG */
                                0x8,                /* FC_LONG */
/* 310 */ 0x5c,                /* FC_PAD */
                                0x5b,               /* FC_END */
/* 312 */
                                0x2f,               /* FC_IP */
                                0x5a,               /* FC_CONSTANT_IID */
/* 314 */ NdrFcLong( 0x0 ),   /* 0 */
/* 318 */ NdrFcShort( 0x0 ),  /* 0 */
/* 320 */ NdrFcShort( 0x0 ),  /* 0 */
/* 322 */ 0xc0,                /* 192 */
                                0x0,                /* 0 */
/* 324 */ 0x0,                 /* 0 */
                                0x0,                /* 0 */
/* 326 */ 0x0,                 /* 0 */
                                0x0,                /* 0 */
/* 328 */ 0x0,                 /* 0 */
                                0x46,               /* 70 */
/* 330 */
                                0x2f,               /* FC_IP */
                                0x5a,               /* FC_CONSTANT_IID */
/* 332 */ NdrFcLong( 0x20400 ),         /* 132096 */
/* 336 */ NdrFcShort( 0x0 ),  /* 0 */
/* 338 */ NdrFcShort( 0x0 ),  /* 0 */
/* 340 */ 0xc0,                /* 192 */
                                0x0,                /* 0 */
/* 342 */ 0x0,                 /* 0 */
                                0x0,                /* 0 */
/* 344 */ 0x0,                 /* 0 */
                                0x0,                /* 0 */
/* 346 */ 0x0,                 /* 0 */
                                0x46,               /* 70 */
/* 348 */
                                0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 350 */ NdrFcShort( 0x2 ),  /* Offset= 2 (352) */
/* 352 */
                                0x12, 0x0,          /* FC_UP */
/* 354 */ NdrFcShort( 0x1e6 ),          /* Offset= 486 (840) */
```

```
/* 356 */
                                0x2a,               /* FC_ENCAPSULATED_UNION */
                                0x89,               /* 137 */
/* 358 */ NdrFcShort( 0x20 ), /* 32 */
/* 360 */ NdrFcShort( 0xa ),  /* 10 */
/* 362 */ NdrFcLong( 0x8 ),   /* 8 */
/* 366 */ NdrFcShort( 0x50 ), /* Offset= 80 (446) */
/* 368 */ NdrFcLong( 0xd ),   /* 13 */
/* 372 */ NdrFcShort( 0x70 ), /* Offset= 112 (484) */
/* 374 */ NdrFcLong( 0x9 ),   /* 9 */
/* 378 */ NdrFcShort( 0x90 ), /* Offset= 144 (522) */
/* 380 */ NdrFcLong( 0xc ),   /* 12 */
/* 384 */ NdrFcShort( 0xb0 ), /* Offset= 176 (560) */
/* 386 */ NdrFcLong( 0x24 ),  /* 36 */
/* 390 */ NdrFcShort( 0x104 ),          /* Offset= 260 (650) */
/* 392 */ NdrFcLong( 0x800d ),          /* 32781 */
/* 396 */ NdrFcShort( 0x120 ),          /* Offset= 288 (684) */
/* 398 */ NdrFcLong( 0x10 ),  /* 16 */
/* 402 */ NdrFcShort( 0x13a ),          /* Offset= 314 (716) */
/* 404 */ NdrFcLong( 0x2 ),   /* 2 */
/* 408 */ NdrFcShort( 0x150 ),          /* Offset= 336 (744) */
/* 410 */ NdrFcLong( 0x3 ),   /* 3 */
/* 414 */ NdrFcShort( 0x166 ),          /* Offset= 358 (772) */
/* 416 */ NdrFcLong( 0x14 ),  /* 20 */
/* 420 */ NdrFcShort( 0x17c ),          /* Offset= 380 (800) */
/* 422 */ NdrFcShort( 0xffffffff ),     /* Offset= -1 (421) */
/* 424 */
                                0x21,               /* FC_BOGUS_ARRAY */
                                0x3,                /* 3 */
/* 426 */ NdrFcShort( 0x0 ),  /* 0 */
/* 428 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 430 */ NdrFcShort( 0x0 ),  /* 0 */
/* 432 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 434 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 438 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 440 */
                                0x12, 0x0,          /* FC_UP */
/* 442 */ NdrFcShort( 0xffffff74 ),     /* Offset= -140 (302) */
/* 444 */ 0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 446 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 448 */ NdrFcShort( 0x10 ), /* 16 */
/* 450 */ NdrFcShort( 0x0 ),  /* 0 */
/* 452 */ NdrFcShort( 0x6 ),  /* Offset= 6 (458) */
/* 454 */ 0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 456 */ 0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 458 */
                                0x11, 0x0,          /* FC_RP */
/* 460 */ NdrFcShort( 0xfffffffdc ),    /* Offset= -36 (424) */
/* 462 */
                                0x21,               /* FC_BOGUS_ARRAY */
                                0x3,                /* 3 */
/* 464 */ NdrFcShort( 0x0 ),  /* 0 */
/* 466 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 468 */ NdrFcShort( 0x0 ),  /* 0 */
/* 470 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 472 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 476 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 478 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                /* 0 */
/* 480 */ NdrFcShort( 0xffffff58 ),     /* Offset= -168 (312) */
/* 482 */ 0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 484 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 486 */ NdrFcShort( 0x10 ), /* 16 */
/* 488 */ NdrFcShort( 0x0 ),  /* 0 */
/* 490 */ NdrFcShort( 0x6 ),  /* Offset= 6 (496) */
/* 492 */ 0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 494 */ 0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 496 */
                                0x11, 0x0,          /* FC_RP */
/* 498 */ NdrFcShort( 0xfffffffdc ),    /* Offset= -36 (462) */
/* 500 */
                                0x21,               /* FC_BOGUS_ARRAY */
                                0x3,                /* 3 */
/* 502 */ NdrFcShort( 0x0 ),  /* 0 */
/* 504 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 506 */ NdrFcShort( 0x0 ),  /* 0 */
/* 508 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 510 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 514 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 516 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                /* 0 */
/* 518 */ NdrFcShort( 0xffffff44 ),     /* Offset= -188 (330) */
/* 520 */ 0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 522 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 524 */ NdrFcShort( 0x10 ), /* 16 */
/* 526 */ NdrFcShort( 0x0 ),  /* 0 */
/* 528 */ NdrFcShort( 0x6 ),  /* Offset= 6 (534) */
/* 530 */ 0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 532 */ 0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 534 */
                                0x11, 0x0,          /* FC_RP */
/* 536 */ NdrFcShort( 0xfffffffdc ),    /* Offset= -36 (500) */
/* 538 */
                                0x21,               /* FC_BOGUS_ARRAY */
                                0x3,                /* 3 */
/* 540 */ NdrFcShort( 0x0 ),  /* 0 */
/* 542 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 544 */ NdrFcShort( 0x0 ),  /* 0 */
/* 546 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 548 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 552 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 554 */
                                0x12, 0x0,          /* FC_UP */
/* 556 */ NdrFcShort( 0x176 ),          /* Offset= 374 (930) */
/* 558 */ 0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 560 */
```

```
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 562 */ NdrFcShort( 0x10 ), /* 16 */
/* 564 */ NdrFcShort( 0x0 ),  /* 0 */
/* 566 */ NdrFcShort( 0x6 ),  /* Offset= 6 (572) */
/* 568 */ 0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 570 */ 0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 572 */
                                0x11, 0x0,          /* FC_RP */
/* 574 */ NdrFcShort( 0xffffffdc ),     /* Offset= -36 (538) */
/* 576 */
                                0x2f,               /* FC_IP */
                                0x5a,               /* FC_CONSTANT_IID */
/* 578 */ NdrFcLong( 0x2f ),  /* 47 */
/* 582 */ NdrFcShort( 0x0 ),  /* 0 */
/* 584 */ NdrFcShort( 0x0 ),  /* 0 */
/* 586 */ 0xc0,               /* 192 */
                                0x0,                /* 0 */
/* 588 */ 0x0,                /* 0 */
                                0x0,                /* 0 */
/* 590 */ 0x0,                /* 0 */
                                0x0,                /* 0 */
/* 592 */ 0x0,                /* 0 */
                                0x46,               /* 70 */
/* 594 */
                                0x1b,               /* FC_CARRAY */
                                0x0,                /* 0 */
/* 596 */ NdrFcShort( 0x1 ),  /* 1 */
/* 598 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 600 */ NdrFcShort( 0x4 ),  /* 4 */
/* 602 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 604 */ 0x1,                /* FC_BYTE */
                                0x5b,               /* FC_END */
/* 606 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 608 */ NdrFcShort( 0x18 ), /* 24 */
/* 610 */ NdrFcShort( 0x0 ),  /* 0 */
/* 612 */ NdrFcShort( 0xc ),  /* Offset= 12 (624) */
/* 614 */ 0x8,                /* FC_LONG */
                                0x8,                /* FC_LONG */
/* 616 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                /* 0 */
/* 618 */ NdrFcShort( 0xfffffffd6 ),    /* Offset= -42 (576) */
/* 620 */ 0x39,               /* FC_ALIGNM8 */
                                0x36,               /* FC_POINTER */
/* 622 */ 0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 624 */
                                0x12, 0x0,          /* FC_UP */
/* 626 */ NdrFcShort( 0xfffffffe0 ),    /* Offset= -32 (594) */
/* 628 */
                                0x21,               /* FC_BOGUS_ARRAY */
                                0x3,                /* 3 */
/* 630 */ NdrFcShort( 0x0 ),  /* 0 */
/* 632 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 634 */ NdrFcShort( 0x0 ),  /* 0 */
/* 636 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 638 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 642 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 644 */
                                0x12, 0x0,          /* FC_UP */
/* 646 */ NdrFcShort( 0xfffffffd8 ),    /* Offset= -40 (606) */
/* 648 */ 0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 650 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 652 */ NdrFcShort( 0x10 ), /* 16 */
/* 654 */ NdrFcShort( 0x0 ),  /* 0 */
/* 656 */ NdrFcShort( 0x6 ),  /* Offset= 6 (662) */
/* 658 */ 0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 660 */ 0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 662 */
                                0x11, 0x0,          /* FC_RP */
/* 664 */ NdrFcShort( 0xffffffdc ),     /* Offset= -36 (628) */
/* 666 */
                                0x1d,               /* FC_SMFARRAY */
                                0x0,                /* 0 */
/* 668 */ NdrFcShort( 0x8 ),  /* 8 */
/* 670 */ 0x2,                /* FC_CHAR */
                                0x5b,               /* FC_END */
/* 672 */
                                0x15,               /* FC_STRUCT */
                                0x3,                /* 3 */
/* 674 */ NdrFcShort( 0x10 ), /* 16 */
/* 676 */ 0x8,                /* FC_LONG */
                                0x6,                /* FC_SHORT */
/* 678 */ 0x6,                /* FC_SHORT */
                                0x4c,               /* FC_EMBEDDED_COMPLEX */
/* 680 */ 0x0,                /* 0 */
                                NdrFcShort( 0xfffffff1 ),    /* Offset= -15 (666) */
                                0x5b,               /* FC_END */
/* 684 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 686 */ NdrFcShort( 0x20 ), /* 32 */
/* 688 */ NdrFcShort( 0x0 ),  /* 0 */
/* 690 */ NdrFcShort( 0xa ),  /* Offset= 10 (700) */
/* 692 */ 0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 694 */ 0x36,               /* FC_POINTER */
                                0x4c,               /* FC_EMBEDDED_COMPLEX */
/* 696 */ 0x0,                /* 0 */
                                NdrFcShort( 0xfffffffe7 ),    /* Offset= -25 (672) */
                                0x5b,               /* FC_END */
/* 700 */
                                0x11, 0x0,          /* FC_RP */
/* 702 */ NdrFcShort( 0xffffff10 ),     /* Offset= -240 (462) */
/* 704 */
                                0x1b,               /* FC_CARRAY */
                                0x0,                /* 0 */
/* 706 */ NdrFcShort( 0x1 ),  /* 1 */
/* 708 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 710 */ NdrFcShort( 0x0 ),  /* 0 */
/* 712 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 714 */ 0x1,                /* FC_BYTE */
                                0x5b,               /* FC_END */
/* 716 */
```

```
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 718 */ NdrFcShort( 0x10 ), /* 16 */
/* 720 */ NdrFcShort( 0x0 ),  /* 0 */
/* 722 */ NdrFcShort( 0x6 ),  /* Offset= 6 (728) */
/* 724 */ 0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 726 */ 0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 728 */
                                0x12, 0x0,          /* FC_UP */
/* 730 */ NdrFcShort( 0xfffffffe6 ),     /* Offset= -26 (704) */
/* 732 */
                                0x1b,               /* FC_CARRAY */
                                0x1,                /* 1 */
/* 734 */ NdrFcShort( 0x2 ),  /* 2 */
/* 736 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 738 */ NdrFcShort( 0x0 ),  /* 0 */
/* 740 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 742 */ 0x6,                /* FC_SHORT */
                                0x5b,               /* FC_END */
/* 744 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 746 */ NdrFcShort( 0x10 ), /* 16 */
/* 748 */ NdrFcShort( 0x0 ),  /* 0 */
/* 750 */ NdrFcShort( 0x6 ),  /* Offset= 6 (756) */
/* 752 */ 0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 754 */ 0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 756 */
                                0x12, 0x0,          /* FC_UP */
/* 758 */ NdrFcShort( 0xfffffffe6 ),     /* Offset= -26 (732) */
/* 760 */
                                0x1b,               /* FC_CARRAY */
                                0x3,                /* 3 */
/* 762 */ NdrFcShort( 0x4 ),  /* 4 */
/* 764 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 766 */ NdrFcShort( 0x0 ),  /* 0 */
/* 768 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 770 */ 0x8,                /* FC_LONG */
                                0x5b,               /* FC_END */
/* 772 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 774 */ NdrFcShort( 0x10 ), /* 16 */
/* 776 */ NdrFcShort( 0x0 ),  /* 0 */
/* 778 */ NdrFcShort( 0x6 ),  /* Offset= 6 (784) */
/* 780 */ 0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 782 */ 0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 784 */
                                0x12, 0x0,          /* FC_UP */
/* 786 */ NdrFcShort( 0xfffffffe6 ),     /* Offset= -26 (760) */
/* 788 */
                                0x1b,               /* FC_CARRAY */
                                0x7,                /* 7 */
/* 790 */ NdrFcShort( 0x8 ),  /* 8 */
/* 792 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 794 */ NdrFcShort( 0x0 ),  /* 0 */
/* 796 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 798 */ 0xb,                /* FC_HYPER */
                                0x5b,               /* FC_END */
/* 800 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 802 */ NdrFcShort( 0x10 ), /* 16 */
/* 804 */ NdrFcShort( 0x0 ),  /* 0 */
/* 806 */ NdrFcShort( 0x6 ),  /* Offset= 6 (812) */
/* 808 */ 0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 810 */ 0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 812 */
                                0x12, 0x0,          /* FC_UP */
/* 814 */ NdrFcShort( 0xfffffffe6 ),     /* Offset= -26 (788) */
/* 816 */
                                0x15,               /* FC_STRUCT */
                                0x3,                /* 3 */
/* 818 */ NdrFcShort( 0x8 ),  /* 8 */
/* 820 */ 0x8,                /* FC_LONG */
                                0x8,                /* FC_LONG */
/* 822 */ 0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 824 */
                                0x1b,               /* FC_CARRAY */
                                0x3,                /* 3 */
/* 826 */ NdrFcShort( 0x8 ),  /* 8 */
/* 828 */ 0x7,                /* Corr desc: FC_USHORT */
                                0x0,                /*  */
/* 830 */ NdrFcShort( 0xffc8 ),          /* -56 */
/* 832 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 834 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                /* 0 */
/* 836 */ NdrFcShort( 0xffffffec ),      /* Offset= -20 (816) */
/* 838 */ 0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 840 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 842 */ NdrFcShort( 0x38 ), /* 56 */
/* 844 */ NdrFcShort( 0xffffffec ),      /* Offset= -20 (824) */
/* 846 */ NdrFcShort( 0x0 ),  /* Offset= 0 (846) */
/* 848 */ 0x6,                /* FC_SHORT */
                                0x6,                /* FC_SHORT */
/* 850 */ 0x38,               /* FC_ALIGNM4 */
                                0x8,                /* FC_LONG */
/* 852 */ 0x8,                /* FC_LONG */
                                0x4c,               /* FC_EMBEDDED_COMPLEX */
/* 854 */ 0x4,                /* 4 */
                                NdrFcShort( 0xfffffe0d ),     /* Offset= -499 (356) */
                                0x5b,               /* FC_END */
/* 858 */
                                0x12, 0x0,          /* FC_UP */
/* 860 */ NdrFcShort( 0xffffff02 ),      /* Offset= -254 (606) */
/* 862 */
                                0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 864 */ 0x1,                /* FC_BYTE */
                                0x5c,               /* FC_PAD */
/* 866 */
                                0x12, 0x8,          /* FC_UP [simple_pointer] */
```

```
/* 868 */ 0x6,              /* FC_SHORT */
                            0x5c,              /* FC_PAD */
/* 870 */
                            0x12, 0x8,         /* FC_UP [simple_pointer] */
/* 872 */ 0x8,              /* FC_LONG */
                            0x5c,              /* FC_PAD */
/* 874 */
                            0x12, 0x8,         /* FC_UP [simple_pointer] */
/* 876 */ 0xa,              /* FC_FLOAT */
                            0x5c,              /* FC_PAD */
/* 878 */
                            0x12, 0x8,         /* FC_UP [simple_pointer] */
/* 880 */ 0xc,              /* FC_DOUBLE */
                            0x5c,              /* FC_PAD */
/* 882 */
                            0x12, 0x0,         /* FC_UP */
/* 884 */ NdrFcShort( 0xfffffda4 ),     /* Offset= -604 (280) */
/* 886 */
                            0x12, 0x10,        /* FC_UP [pointer_deref] */
/* 888 */ NdrFcShort( 0xfffffda6 ),     /* Offset= -602 (286) */
/* 890 */
                            0x12, 0x10,        /* FC_UP [pointer_deref] */
/* 892 */ NdrFcShort( 0xfffffdbc ),     /* Offset= -580 (312) */
/* 894 */
                            0x12, 0x10,        /* FC_UP [pointer_deref] */
/* 896 */ NdrFcShort( 0xfffffdca ),     /* Offset= -566 (330) */
/* 898 */
                            0x12, 0x10,        /* FC_UP [pointer_deref] */
/* 900 */ NdrFcShort( 0xfffffdd8 ),     /* Offset= -552 (348) */
/* 902 */
                            0x12, 0x10,        /* FC_UP [pointer_deref] */
/* 904 */ NdrFcShort( 0x2 ),  /* Offset= 2 (906) */
/* 906 */
                            0x12, 0x0,         /* FC_UP */
/* 908 */ NdrFcShort( 0x16 ), /* Offset= 22 (930) */
/* 910 */
                            0x15,              /* FC_STRUCT */
                            0x7,               /* 7 */
/* 912 */ NdrFcShort( 0x10 ), /* 16 */
/* 914 */ 0x6,              /* FC_SHORT */
                            0x1,               /* FC_BYTE */
/* 916 */ 0x1,              /* FC_BYTE */
                            0x38,              /* FC_ALIGNM4 */
/* 918 */ 0x8,              /* FC_LONG */
                            0x39,              /* FC_ALIGNM8 */
/* 920 */ 0xb,              /* FC_HYPER */
                            0x5b,              /* FC_END */
/* 922 */
                            0x12, 0x0,         /* FC_UP */
/* 924 */ NdrFcShort( 0xfffffff2 ),     /* Offset= -14 (910) */
/* 926 */
                            0x12, 0x8,         /* FC_UP [simple_pointer] */
/* 928 */ 0x2,              /* FC_CHAR */
                            0x5c,              /* FC_PAD */
/* 930 */
                            0x1a,              /* FC_BOGUS_STRUCT */
                            0x7,               /* 7 */
/* 932 */ NdrFcShort( 0x20 ), /* 32 */
/* 934 */ NdrFcShort( 0x0 ),  /* 0 */
/* 936 */ NdrFcShort( 0x0 ),  /* Offset= 0 (936) */
/* 938 */ 0x8,              /* FC_LONG */
                            0x8,               /* FC_LONG */
/* 940 */ 0x6,              /* FC_SHORT */
                            0x6,               /* FC_SHORT */
/* 942 */ 0x6,              /* FC_SHORT */
                            0x6,               /* FC_SHORT */
/* 944 */ 0x4c,             /* FC_EMBEDDED_COMPLEX */
                            0x0,               /* 0 */
/* 946 */ NdrFcShort( 0xfffffc54 ),     /* Offset= -940 (6) */
/* 948 */ 0x5c,             /* FC_PAD */
                            0x5b,              /* FC_END */
/* 950 */ 0xb4,             /* FC_USER_MARSHAL */
                            0x83,              /* 131 */
/* 952 */ NdrFcShort( 0x0 ),  /* 0 */
/* 954 */ NdrFcShort( 0x18 ), /* 24 */
/* 956 */ NdrFcShort( 0x0 ),  /* 0 */
/* 958 */ NdrFcShort( 0xfffffc44 ),     /* Offset= -956 (2) */
/* 960 */
                            0x11, 0x4,         /* FC_RP [alloced_on_stack] */
/* 962 */ NdrFcShort( 0x6 ),  /* Offset= 6 (968) */
/* 964 */
                            0x13, 0x0,         /* FC_OP */
/* 966 */ NdrFcShort( 0xfffffffc ),     /* Offset= -36 (930) */
/* 968 */ 0xb4,             /* FC_USER_MARSHAL */
                            0x83,              /* 131 */
/* 970 */ NdrFcShort( 0x0 ),  /* 0 */
/* 972 */ NdrFcShort( 0x18 ), /* 24 */
/* 974 */ NdrFcShort( 0x0 ),  /* 0 */
/* 976 */ NdrFcShort( 0xfffffff4 ),     /* Offset= -12 (964) */

                            0x0
        }
    };

const CInterfaceProxyVtbl * _tpcc_com_ps_ProxyVtblList[] =
{
    ( CInterfaceProxyVtbl *) &_ITPCCProxyVtbl,
    0
};

const CInterfaceStubVtbl * _tpcc_com_ps_StubVtblList[] =
{
    ( CInterfaceStubVtbl *) &_ITPCCStubVtbl,
    0
};

PCInterfaceName const _tpcc_com_ps_InterfaceNamesList[] =
{
    "ITPCC",
    0
};


#define _tpcc_com_ps_CHECK_IID(n)       IID_GENERIC_CHECK_IID( _tpcc_com_ps, pIID,
n)

int __stdcall _tpcc_com_ps_IID_Lookup( const IID * pIID, int * pIndex )
{

    if(!_tpcc_com_ps_CHECK_IID(0))
        {
        *pIndex = 0;
        return 1;
        }

    return 0;
```

```
}

const ExtendedProxyFileInfo tpcc_com_ps_ProxyFileInfo =
{
    (PCInterfaceProxyVtblList *) & _tpcc_com_ps_ProxyVtblList,
    (PCInterfaceStubVtblList *) & _tpcc_com_ps_StubVtblList,
    (const PCInterfaceName * ) & _tpcc_com_ps_InterfaceNamesList,
    0, // no delegation
    & _tpcc_com_ps_IID_Lookup,
    1,
    2,
    0, /* table of [async_uuid] interfaces */
    0, /* Filler1 */
    0, /* Filler2 */
    0  /* Filler3 */
};


#endif /* defined(_M_IA64) || defined(_M_AXP64)*/
```

tpcc_com_sl.rgs

```
HKCR
{
          TPCC.StockLevel.1 = s 'StockLevel Class'
          {
                    CLSID = s '{2668369E-A50D-11D2-BA4E-00C04FBFE08B}'
          }
          TPCC.StockLevel = s 'StockLevel Class'
          {
                    CurVer = s 'TPCC.StockLevel.1'
          }
          NoRemove CLSID
          {
                    ForceRemove {2668369E-A50D-11D2-BA4E-00C04FBFE08B} = s
'StockLevel Class'
                    {
                              ProgID = s 'TPCC.StockLevel.1'
                              VersionIndependentProgID = s 'TPCC.StockLevel'
                              InprocServer32 = s '%MODULE%'
                              {
                                        val ThreadingModel = s 'Both'
                              }
                    }
          }
}
```

tpcc_dblib.cpp

```
/*        FILE:               TPCC_DBLIB.CPP
 *                                  Microsoft TPC-C Kit Ver. 4.20.000
 *                                  Copyright Microsoft, 1999
 *              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:
 *                  4.20.000 - 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[] = "4.10.000";

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);

          // set connection properties to match those used by ODBC
          dbcmd(m_dbproc, "set ANSI_DEFAULTS ON ");
          dbcmd(m_dbproc, "set CURSOR_CLOSE_ON_COMMIT OFF ");
          dbcmd(m_dbproc, "set IMPLICIT_TRANSACTIONS OFF ");
          dbcmd(m_dbproc, "set NOCOUNT ON ");                         // do not
return row counts
          dbcmd(m_dbproc, "set XACT_ABORT ON ");            // rollback transaction
on abort

          // for coyote
//        dbcmd(m_dbproc, "set ansi_warnings on ");         //
//        dbcmd(m_dbproc, "set ansi_nulls on ");            //

          if (dbsqlexec(m_dbproc) == FAIL)
                    ThrowError(CDBLIBERR::eDbSqlExec);

          // This value must match the number of commands above.
//        DiscardNextResults(2);
          DiscardNextResults(5);        // coyote

          // 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, SQLINT2, -1, -1, (BYTE
*) &m_txn.StockLevel.w_id);          // @w_id smallint
                              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, SQLINT2, -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, SQLINT2, -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_generic, 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) != SUCCED)
                                        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, SQLINT2, -1, -1, (BYTE
*) &m_txn.Payment.w_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT2, -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, SQLINT2, -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.minute = daterec.minute;

        m_txn.OrderStatus.OL[i].ol_delivery_d.second = 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, SQLINT2, -1, -1, (BYTE
*) &m_txn.Delivery.w_id);
                                dbrpcparam(m_dbproc, NULL, 0, SQLINT1, -1, -1, (BYTE
*) &m_txn.Delivery.o_carrier_id);

                                if (dbrpcexec(m_dbproc) == FAIL)
                                        ThrowError(CDBLIBERR::eDbRpcExec);

                                if (dbresults(m_dbproc) != SUCCEED)
                                        ThrowError(CDBLIBERR::eDbResults);

                                if (dbnextrow(m_dbproc) != REG_ROW)
                                        ThrowError(CDBLIBERR::eDbNextRow);

                                if (dbnumcols(m_dbproc) != 10)
                                        ThrowError(CDBLIBERR::eWrongNumCols);

                                for (i=0; i<10; i++)
                                {
                                        if (pData = dbdata(m_dbproc, i+1))
                                                m_txn.Delivery.o_id[i] = *((DBINT
*)pData);
                                }

                                DiscardNextRows(0);
                                DiscardNextResults(0);

                                m_txn.Delivery.exec_status_code = eOK;
                                return;
                        }
                        catch (CSQLERR *e)
                        {
                                if ((e->m_msgno == 1205 ||
                                        (e->m_msgno == iErrOleDbProvider &&
                                        strstr(e->m_msgtext, sErrTimeoutExpired) !=
NULL)) &&
                                        (++iTryCount <= iMaxRetries))
                                {
                                        // hit deadlock; backoff for increasingly
longer period
                                        delete e;
                                        Sleep(10 * iTryCount);
                                }
                                else
                                        throw;
                        }
                }         // while (TRUE)

//              if (iTryCount)
//                      throw new CTPCC_DBLIB_ERR(CTPCC_DBLIB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}

void CTPCC_DBLIB::ResetError()
{
                if (m_DbLibErr != NULL)
                {
                        delete m_DbLibErr;
                        m_DbLibErr = (CDBLIBERR*)NULL;
                }

                if (m_SqlErr != NULL)
                {
                        delete m_SqlErr;
                        m_SqlErr = (CSQLERR*)NULL;
                }
                return;
}
```

tpcc_dblib.h

```
/*              FILE:                   TPCC_DBLIB.H
 *                                              Microsoft TPC-C Kit Ver. 4.20.000
 *                                              Copyright Microsoft, 1999
 *                      All Rights Reserved
 *
 *                                              Version 4.10.000 audited by Richard Gimarc,
Performance Metrics, 3/17/99
 *
 *              PURPOSE:  Header file for TPC-C txn class implementation.
 *
 *  Change history:
```

```
 *                  4.20.000 - updated rev number to match kit
 */
#pragma once

#ifndef PDBPROCESS
#define DBPROCESS void   // dbprocess structure type
typedef DBPROCESS * PDBPROCESS;
#endif

// need to declare functions for import, unless define has already been created
// by the DLL's .cpp module for export.
#ifndef DllDecl
#define DllDecl  __declspec( dllimport )
#endif

class CSQLERR : public CBaseErr
{
          public:

                    CSQLERR(void)
                    {
                              m_msgno = 0;
                              m_msgstate = 0;
                              m_severity = 0;
                              m_msgtext = NULL;
                    };

                    ~CSQLERR()
                    {
                              delete [] m_msgtext;
                    };

                    int                 m_msgno;
                    int                 m_msgstate;
                    int                 m_severity;
                    char   *m_msgtext;

                    int ErrorType() {return ERR_TYPE_SQL;};
                    int ErrorNum() {return m_msgno;};
                    char *ErrorText() {return m_msgtext;};

};

class CDBLIBERR : public CBaseErr
{
          public:
                    enum ACTION
                    {
                              eNone,
                              eUnknown,
                              eLogin,                                   // error from
dblogin
                              eDbOpen,                        // error from dbopen
                              eDbUse,                                   // error from
dbuse
                              eDbSqlExec,                               // error from
dbsqlexec
                              eDbSet,                                   // error from
one of the dbset* routines
                              eDbNextRow,                               // error from
dbnextrow
                              eWrongRowCount,               // more or less rows
returned than expected
                              eWrongNumCols,                // more or less columns
returned than expected
                              eDbResults,                               // error from
dbresults
                              eDbRpcExec,                               // error from
dbrpcexec
                              eDbSetMaxProcs,               // error from
dbsetmaxprocs
                              eDbProcHandler                // error from either
dbprocerrhandle or dbprocmsghandle
                    };

                    CDBLIBERR(ACTION eAction, int severity = 0, int dberror = 0, int
oserr = 0)
                    {
                              m_eAction = eAction;
                              m_severity = severity;
                              m_dberror = dberror;
                              m_oserr = oserr;

                              m_dberrstr = NULL;
                              m_oserrstr = NULL;
                    };

                    ~CDBLIBERR()
                    {
                              delete [] m_dberrstr;
                              delete [] m_oserrstr;
                    };

                    ACTION    m_eAction;
                    int                 m_severity;
                    int                 m_dberror;
                    int                 m_oserr;
                    char   *m_dberrstr;
                    char   *m_oserrstr;

                    int ErrorType() {return ERR_TYPE_DBLIB;};
                    int ErrorNum() {return m_dberror;};
                    char *ErrorText() {return m_dberrstr;};

};

class CTPCC_DBLIB_ERR : public CBaseErr
{
          public:
                    enum CTPCC_DBLIB_ERRS
                    {
                              ERR_WRONG_SP_VERSION = 1,     // "Wrong version of
stored procs on database server"
                              ERR_INVALID_CUST,                         // "Invalid
Customer id,name."
                              ERR_NO_SUCH_ORDER,                        // "No orders
found for customer."
                              ERR_RETRIED_TRANS,                        // "Retries
before transaction succeeded."
                    };

                    CTPCC_DBLIB_ERR( int iErr ) { m_errno = iErr; m_iTryCount = 0;
};

                    CTPCC_DBLIB_ERR( int iErr, int iTryCount ) { m_errno = iErr;
m_iTryCount = iTryCount; };
```

```
                    int                 m_errno;
                    int                 m_iTryCount;

                    int ErrorType() {return ERR_TYPE_TPCC_DBLIB;};
                    int ErrorNum() {return m_errno;};

                    char *ErrorText();
};

class DllDecl CTPCC_DBLIB : public CTPCC_BASE
{
          private:
                    // declare variables and private functions here...
                    PDBPROCESS          m_dbproc;
                    CDBLIBERR *m_DbLibErr;                  // not allocated until
needed (maybe never)
                    CSQLERR             *m_SqlErr;                                  //
not allocated until needed (maybe never)
                    int                             m_MaxRetries;               //
retry count on deadlock

                    void DiscardNextRows(int iExpectedCount);
                    void DiscardNextResults(int iExpectedCount);
                    void ThrowError( CDBLIBERR::ACTION eAction );
                    void ResetError();

                    union
                    {
                              NEW_ORDER_DATA                NewOrder;
                              PAYMENT_DATA                  Payment;
                              DELIVERY_DATA                 Delivery;
                              STOCK_LEVEL_DATA    StockLevel;
                              ORDER_STATUS_DATA   OrderStatus;
                    }                               m_txn;

          public:
                    CTPCC_DBLIB(LPCSTR szServer, LPCSTR szUser, LPCSTR szPassword,
LPCSTR szHost, LPCSTR szDatabase );
                    ~CTPCC_DBLIB(void);

                    inline PNEW_ORDER_DATA                  BuffAddr_NewOrder()
          { return &m_txn.NewOrder;    };
                    inline PPAYMENT_DATA                    BuffAddr_Payment()
          { return &m_txn.Payment;     };
                    inline PDELIVERY_DATA                   BuffAddr_Delivery()
          { return &m_txn.Delivery;    };
                    inline PSTOCK_LEVEL_DATA      BuffAddr_StockLevel()         {
return &m_txn.StockLevel;  };
                    inline PORDER_STATUS_DATA     BuffAddr_OrderStatus()        {
return &m_txn.OrderStatus; };

                    void NewOrder                 ();
                    void Payment                  ();
                    void Delivery                 ();
                    void StockLevel               ();
                    void OrderStatus    ();


                    // these are public because they must be called from the dblib
err_handler and msg_hangler
                    // outside of the class
                    void SetDbLibError(int severity, int dberr, int oserr, LPCSTR
dberrstr, LPCSTR oserrstr);
                    void SetSqlError( int msgno, int msgstate, int severity, LPCSTR
msgtext );

};

extern "C" DllDecl CTPCC_DBLIB* CTPCC_DBLIB_new
          ( LPCSTR szServer, LPCSTR szUser, LPCSTR szPassword, LPCSTR szHost, LPCSTR
szDatabase );

typedef CTPCC_DBLIB* (TYPE_CTPCC_DBLIB)(LPCSTR, LPCSTR, LPCSTR, LPCSTR, LPCSTR);
```

tpcc_odbc.cpp

```
/*        FILE:                TPCC_ODBC.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:  Implements ODBC calls for TPC-C txns.
 *        Contact:  Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *                  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>
#include <odbcss.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_odbc.h"

// version string; must match return value from tpcc_version stored proc
const char          sVersion[] = "4.10.000";

const iMaxRetries = 10;                 // how many retries on deadlock

const int iErrOleDbProvider = 7312;
const char sErrTimeoutExpired[] = "Timeout expired";
```

```
static SQLHENV henv = SQL_NULL_HENV;                                    // ODBC
environment handle

BOOL APIENTRY DllMain(HMODULE hModule, DWORD ul_reason_for_call, LPVOID lpReserved)
{
          switch( ul_reason_for_call )
          {
                    case DLL_PROCESS_ATTACH:
                              DisableThreadLibraryCalls(hModule);
                              if ( SQLAllocHandleStd(SQL_HANDLE_ENV,
SQL_NULL_HANDLE, &henv) != SQL_SUCCESS )
                                        return FALSE;
                              break;

                    case DLL_PROCESS_DETACH:
                              if (henv != NULL)
                                        SQLFreeEnv(henv);
                              break;

                    default:
                              /* nothing */;
          }
          return TRUE;
}

/* FUNCTION: CTPCC_ODBC_ERR::ErrorText
 *
 */

char* CTPCC_ODBC_ERR::ErrorText(void)
{
          int i;

          static SERRORMSG errorMsgs[] =
          {
                    { ERR_WRONG_SP_VERSION,                 "Wrong version of stored
procs on database server"     },
                    { ERR_INVALID_CUST,                     "Invalid Customer
id,name."                                                       },
                    { ERR_NO_SUCH_ORDER,                    "No orders found for
customer."                                                        },
                    { ERR_RETRIED_TRANS,                    "Retries before
transaction succeeded."                                   },
                    { 0,                                                    ""

                                                  }
          };

          static char szNotFound[] = "Unknown error number.";

          for(i=0; errorMsgs[i].szMsg[0]; i++)
          {
                    if ( m_errno == errorMsgs[i].iError )
                              break;
          }
          if ( !errorMsgs[i].szMsg[0] )
                    return szNotFound;
          else
                    return errorMsgs[i].szMsg;
}

// wrapper routine for class constructor

__declspec(dllexport) CTPCC_ODBC* CTPCC_ODBC_new(
          LPCSTR szServer,              // name of SQL server
          LPCSTR szUser,                          // user name for login
          LPCSTR szPassword,            // password for login
          LPCSTR szHost,                          // not used
          LPCSTR szDatabase )           // name of database to use
{
          return new CTPCC_ODBC( szServer, szUser, szPassword, szHost, szDatabase );
}


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
          )
{
          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;


          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;

                    sprintf( szConnectStr, "DRIVER=SQL
Server;SERVER=%s;UID=%s;PWD=%s;DATABASE=%s",
                              szServer, szUser, szPassword, szDatabase );

                    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 ");
                strcat(buffer, "set XACT_ABORT ON " );

                // for coyote
                strcat(buffer, "set ansi_warnings on " );
                strcat(buffer, "set ansi_nulls on " );

                rc = SQLExecDirect(m_hstmt, (unsigned char *)buffer, SQL_NTS);
                if (rc != SQL_SUCCESS && rc != SQL_SUCCESS_WITH_INFO)
                        ThrowError(CODBCERR::eExecDirect);

                // verify that version of stored procs on server is correct
                char db_sp_version[10];
                strcpy(buffer, "{call tpcc_version}");
                rc = SQLExecDirect(m_hstmt, (unsigned char *)buffer, SQL_NTS);
                if (rc != SQL_SUCCESS && rc != SQL_SUCCESS_WITH_INFO)
                        ThrowError(CODBCERR::eExecDirect);
                if ( SQLBindCol(m_hstmt, 1, SQL_C_CHAR, &db_sp_version,
sizeof(db_sp_version), NULL) != SQL_SUCCESS )
                        ThrowError(CODBCERR::eBindCol);
                if ( SQLFetch(m_hstmt) == SQL_ERROR )
                        ThrowError(CODBCERR::eFetch);
                if (strcmp(db_sp_version,sVersion))
                        throw new CTPCC_ODBC_ERR(
CTPCC_ODBC_ERR::ERR_WRONG_SP_VERSION );

                SQLFreeHandle(SQL_HANDLE_STMT, m_hstmt);
        }

        // Bind parameters for each of the transactions
        InitNewOrderParams();
        InitPaymentParams();
        InitOrderStatusParams();
        InitDeliveryParams();
        InitStockLevelParams();
}

CTPCC_ODBC::~CTPCC_ODBC( void )
{
        // note: descriptors are automatically released when the connection is
dropped
        SQLFreeHandle(SQL_HANDLE_STMT, m_hstmtNewOrder);
        SQLFreeHandle(SQL_HANDLE_STMT, m_hstmtPayment);
        SQLFreeHandle(SQL_HANDLE_STMT, m_hstmtDelivery);
        SQLFreeHandle(SQL_HANDLE_STMT, m_hstmtOrderStatus);
        SQLFreeHandle(SQL_HANDLE_STMT, m_hstmtStockLevel);

        SQLDisconnect(m_hdbc);
        SQLFreeHandle(SQL_HANDLE_DBC, m_hdbc);
}

void CTPCC_ODBC::ThrowError( CODBCERR::ACTION eAction )
{
        RETCODE             rc;
        SDWORD              lNativeError;
        char                szState[6];
        char                szMsg[SQL_MAX_MESSAGE_LENGTH];
        char                szTmp[6*SQL_MAX_MESSAGE_LENGTH];
        CODBCERR   *pODBCErr;                               // not allocated until
needed (maybe never)

        pODBCErr = new CODBCERR();

        pODBCErr->m_NativeError = 0;
        pODBCErr->m_eAction = eAction;
        pODBCErr->m_bDeadLock = FALSE;

        szTmp[0] = 0;
        while (TRUE)
        {
                rc = SQLError(henv, m_hdbc, m_hstmt, (BYTE *)&szState,
&lNativeError,
                                                    (BYTE *)&szMsg, sizeof(szMsg),
NULL);
                if (rc == SQL_NO_DATA)
                        break;

                // check for deadlock
                if (lNativeError == 1205 || (lNativeError == iErrOleDbProvider
&&
                        strstr(szMsg, sErrTimeoutExpired) != NULL))
                        pODBCErr->m_bDeadLock = TRUE;

                // capture the (first) database error
                if (pODBCErr->m_NativeError == 0 && lNativeError != 0)
                        pODBCErr->m_NativeError = lNativeError;

                // quit if there isn't enough room to concatenate error text
                if ( (strlen(szMsg) + 2) > (sizeof(szTmp) - strlen(szTmp)) )
                        break;

                // include line break after first error msg
                if (szTmp[0] != 0)
                        strcat( szTmp, "\n");
                strcat( szTmp, szMsg );
        }

        if (pODBCErr->m_odbcerrstr != NULL)
        {
                delete [] pODBCErr->m_odbcerrstr;
                pODBCErr->m_odbcerrstr = NULL;
        }

        if (strlen(szTmp) > 0)
        {
                pODBCErr->m_odbcerrstr = new char[ strlen(szTmp)+1 ];
                strcpy( pODBCErr->m_odbcerrstr, szTmp );
        }

        SQLFreeStmt(m_hstmt, SQL_CLOSE);
        throw pODBCErr;
}

void CTPCC_ODBC::InitStockLevelParams()
{
        if (   SQLAllocHandle(SQL_HANDLE_STMT, m_hdbc, &m_hstmtStockLevel) !=
SQL_SUCCESS )
                ThrowError(CODBCERR::eAllocHandle);
```

```
          m_hstmt = m_hstmtStockLevel;

          int i = 0;
          if (   SQLBindParameter(m_hstmt, ++i, SQL_PARAM_INPUT, SQL_C_SSHORT,
SQL_SMALLINT, 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);
}

void CTPCC_ODBC::StockLevel()
{
          RETCODE             rc;
          int                           iTryCount = 0;

          m_hstmt = m_hstmtStockLevel;

          while (TRUE)
          {
                    try
                    {
                              rc = SQLExecDirectW(m_hstmt, (SQLWCHAR*)L"{call
tpcc_stocklevel(?,?,?)}", 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_DESC, m_hdbc, &m_descNewOrderCols1)
!= SQL_SUCCESS
                    || SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc, &m_descNewOrderCols2)
!= 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_SSHORT,
SQL_SMALLINT, 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_SSHORT, SQL_SMALLINT, 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);
          }

#ifndef new_order_strstr
          // 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);
#else
          // prototype to eliminate patindex in server; shift work to client
          i = 0;
          if (   SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,   &m_ol_i_name,
sizeof(m_ol_i_name), NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_SSHORT, &m_ol_stock, 0, NULL)
!= SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,   &m_i_data,
sizeof(m_i_data), NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,   &m_s_data,
sizeof(m_s_data), NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_DOUBLE, &m_ol_i_price, 0,
NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_DOUBLE, &m_ol_amount, 0, NULL)
!= SQL_SUCCESS
                    )
                    ThrowError(CODBCERR::eBindCol);
#endif

          // 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);
}

void CTPCC_ODBC::NewOrder()
{
          int                                             i;
          RETCODE                                   rc;
          int                                             iTryCount = 0;

                     // 0         1         2

                     // 012345678901234567890123456789
          wchar_t                                   szSqlTemplate[] = 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
          i = 29 + 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, (SQLWCHAR*)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++)
                              {
#ifndef new_order_strstr
                                        // set the bind offset value...
                                        m_BindOffset = i *
sizeof(m_txn.NewOrder.OL[0]);

                                        if ( SQLFetch(m_hstmt) == SQL_ERROR)
                                                  ThrowError(CODBCERR::eFetch);
#else
                                        if ( SQLFetch(m_hstmt) == SQL_ERROR)
                                                  ThrowError(CODBCERR::eFetch);

                                        strcpy( m_txn.NewOrder.OL[i].ol_i_name,
m_ol_i_name );

                                        if ( strstr(m_i_data, "ORIGINAL") != NULL &&
strstr(m_s_data, "ORIGINAL") != NULL )

          m_txn.NewOrder.OL[i].ol_brand_generic[0] = 'B';
                                        else

          m_txn.NewOrder.OL[i].ol_brand_generic[0] = 'G';
                                        m_txn.NewOrder.OL[i].ol_brand_generic[1] =
0;
```

```
                                        m_txn.NewOrder.OL[i].ol_stock
        = m_ol_stock;
                                        m_txn.NewOrder.OL[i].ol_i_price
                = m_ol_i_price;
                                        m_txn.NewOrder.OL[i].ol_amount
                = m_ol_amount;
#endif

                                        // 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);
}

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_SSHORT,
SQL_SMALLINT, 0, 0, &m_txn.Payment.w_id, 0, NULL) != SQL_SUCCESS
                || SQLBindParameter(m_hstmt, ++i, SQL_PARAM_INPUT, SQL_C_SSHORT,
SQL_SMALLINT, 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);
}

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, (SQLWCHAR*)L"{call
tpcc_payment(?,?,?,?,?,?,?,?)}", 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_SSHORT,
SQL_SMALLINT, 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_SSHORT,
&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);
}

void CTPCC_ODBC::OrderStatus()
{
          int                                                       iTryCount = 0;
          RETCODE                                         rc;

          m_hstmt = m_hstmtOrderStatus;

          if ( SQLSetStmtAttrW( m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descOrderStatusCols1, SQL_IS_POINTER ) != SQL_SUCCESS )
                    ThrowError(CODBCERR::eSetStmtAttr);

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

          while (TRUE)
          {
                    try
                    {
                              // configure block cursor
                              if ( SQLSetStmtAttrW(m_hstmt, SQL_ATTR_ROW_ARRAY_SIZE,
(SQLPOINTER)1, 0) != SQL_SUCCESS )
                                        ThrowError(CODBCERR::eSetStmtAttr);

                              rc = SQLExecDirectW(m_hstmt, (SQLWCHAR*)L"{call
tpcc_orderstatus(?,?,?,?)}", SQL_NTS);
                              if ( ((rc == SQL_SUCCESS_WITH_INFO) && (m_RowsFetched
!= 0)) || (rc == SQL_ERROR) )
                                        ThrowError(CODBCERR::eExecDirect);

                              // configure block cursor
                              if ( SQLSetStmtAttrW(m_hstmt, SQL_ATTR_ROW_ARRAY_SIZE,
(SQLPOINTER)MAX_OL_ORDER_STATUS_ITEMS, 0) != SQL_SUCCESS )
                                        ThrowError(CODBCERR::eSetStmtAttr);

                              rc = SQLFetchScroll( m_hstmt, SQL_FETCH_NEXT, 0 );
                              if ( ((rc == SQL_SUCCESS_WITH_INFO) && (m_RowsFetched
!= 0)) || (rc == SQL_ERROR) )
                                        ThrowError(CODBCERR::eFetchScroll);

                              m_txn.OrderStatus.o_ol_cnt = (short)m_RowsFetched;

                              if (m_txn.OrderStatus.o_ol_cnt != 0)
                              {
                                        if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC, m_descOrderStatusCols2, SQL_IS_POINTER ) != SQL_SUCCESS )

          ThrowError(CODBCERR::eSetStmtAttr);

                                        if ( SQLMoreResults(m_hstmt) == SQL_ERROR )

          ThrowError(CODBCERR::eMoreResults);

                                        if ( (rc = SQLFetch(m_hstmt)) == SQL_ERROR)
                                                  ThrowError(CODBCERR::eFetch);
                              }

                              SQLFreeStmt(m_hstmt, SQL_CLOSE);

                              if (m_txn.OrderStatus.o_ol_cnt == 0)
                                        throw new CTPCC_ODBC_ERR(
CTPCC_ODBC_ERR::ERR_NO_SUCH_ORDER );
                              else if (m_txn.OrderStatus.c_id == 0 &&
m_txn.OrderStatus.c_last[0] == 0)
                                        throw new CTPCC_ODBC_ERR(
CTPCC_ODBC_ERR::ERR_INVALID_CUST );
                              else
                                        m_txn.OrderStatus.exec_status_code = eOK;

                              break;
                    }
                    catch (CODBCERR *e)
                    {
                              if ((!e->m_bDeadLock) || (++iTryCount > iMaxRetries))
                                        throw;

                              // hit deadlock; backoff for increasingly longer
period
                              delete e;
                              Sleep(10 * iTryCount);
                    }
          }

//        if (iTryCount)
//                  throw new CTPCC_ODBC_ERR(CTPCC_ODBC_ERR::ERR_RETRIED_TRANS,
iTryCount);
}

void CTPCC_ODBC::InitDeliveryParams()
{
          if (   SQLAllocHandle(SQL_HANDLE_STMT, m_hdbc, &m_hstmtDelivery) !=
SQL_SUCCESS )
                    ThrowError(CODBCERR::eAllocHandle);
```

```
        m_hstmt = m_hstmtDelivery;

        int i = 0;
        if (   SQLBindParameter(m_hstmt, ++i, SQL_PARAM_INPUT, SQL_C_SSHORT,
SQL_SMALLINT, 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);
        }
}

void CTPCC_ODBC::Delivery()
{
        RETCODE             rc;
        int                         iTryCount = 0;

        m_hstmt = m_hstmtDelivery;

        while (TRUE)
        {
               try
               {
                       rc = SQLExecDirectW(m_hstmt, (SQLWCHAR*)L"{call
tpcc_delivery(?,?)}", 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

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;};
                    int ErrorNum() {return m_NativeError;};
                    char *ErrorText() {return m_odbcerrstr;};

};

class CTPCC_ODBC_ERR : public CBaseErr
{
          public:
                    enum TPCC_ODBC_ERRS
                    {
                              ERR_WRONG_SP_VERSION = 1,     // "Wrong version of
stored procs on database server"
                              ERR_INVALID_CUST,                         // "Invalid
Customer id,name."
                              ERR_NO_SUCH_ORDER,                        // "No orders
found for customer."
                              ERR_RETRIED_TRANS,                        // "Retries
before transaction succeeded."
                    };

                    CTPCC_ODBC_ERR( int iErr ) { m_errno = iErr; m_iTryCount = 0; };

                    CTPCC_ODBC_ERR( int iErr, int iTryCount ) { m_errno = iErr;
m_iTryCount = iTryCount; };

                    int                m_errno;
                    int                m_iTryCount;

                    int ErrorType() {return ERR_TYPE_TPCC_ODBC;};
                    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_hstmtPayment;
                    SQLHSTMT  m_hstmtDelivery;
                    SQLHSTMT  m_hstmtOrderStatus;
                    SQLHSTMT  m_hstmtStockLevel;

                    SQLHDESC  m_descNewOrderCols1;
                    SQLHDESC  m_descNewOrderCols2;
                    SQLHDESC  m_descOrderStatusCols1;
                    SQLHDESC  m_descOrderStatusCols2;

                    // new-order specific fields
                    SQLUINTEGER         m_BindOffset;
                    SQLUINTEGER         m_RowsFetched;
                    int                           m_no_commit_flag;

#ifdef new_order_strstr
                    // for new-order txn;
                    // output params
                    char                m_ol_i_name[I_NAME_LEN+1];
                    double              m_ol_i_price;
                    double              m_ol_amount;
                    short               m_ol_stock;
                    // used locally, but not returned to caller
                    char                m_i_data[I_DATA_LEN];
                    char                m_s_data[S_DATA_LEN];
#endif

                    void ThrowError( CODBCERR::ACTION eAction );

                    void InitNewOrderParams();
                    void InitPaymentParams();
                    void InitDeliveryParams();
                    void InitStockLevelParams();
                    void InitOrderStatusParams();

                    union
                    {
                              NEW_ORDER_DATA                NewOrder;
                              PAYMENT_DATA                  Payment;
                              DELIVERY_DATA                 Delivery;
                              STOCK_LEVEL_DATA    StockLevel;
                              ORDER_STATUS_DATA   OrderStatus;
                    }                                       m_txn;

          public:
                    CTPCC_ODBC(LPCSTR szServer, LPCSTR szUser, LPCSTR szPassword,
LPCSTR szHost, LPCSTR szDatabase);
                    ~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 );

typedef CTPCC_ODBC* (TYPE_CTPCC_ODBC)(LPCSTR, LPCSTR, LPCSTR, LPCSTR, LPCSTR);
```

trans.h

```
/*        FILE:                TRANS.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 structure templates.
 *
 *  Change history:
 *                  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
        short                                   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
        short               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
          short                                   w_id;
          short                                   d_id;
          long                                    c_id;
          short                                   c_d_id;
          short                                   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;
          short                                  ol_supply_w_id;
          short                                  ol_quantity;
          double                                 ol_amount;
          TIMESTAMP_STRUCT    ol_delivery_d;
} OL_ORDER_STATUS_DATA;

typedef struct
{         // input params
          short                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
          short                          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
          short               w_id;                          //delivery warehouse
          short               o_carrier_id;       //carrier id
} DELIVERY_TRANSACTION;

typedef struct
{         // input params
          short                                      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;
};
```

txnlog.h

```
/*        FILE:               TXNLOG.H
 *                                    Microsoft TPC-C Kit Ver. 4.10.000
 *                                    not yet audited
 *
 *        PURPOSE:  Header file for txn log class
 *                                    Copyright Microsoft, 1999
 *              All Rights Reserved
 *
 */

#pragma once

    typedef struct _TXN_NEWORDER
          {
        BYTE        OL_Count;           //range 0 to 31
        BYTE        OL_Remote_Count;    //range 0 to 31
        WORD        c_id;
        int                     o_id;
          } TXN_NEWORDER;

    typedef struct _TXN_PAYMENT
          {
        BYTE        CustByName;
        BYTE        IsRemote;
          } TXN_PAYMENT;

    typedef struct _TXN_ORDERSTATUS
          {
                    BYTE      CustByName;
          } TXN_ORDERSTATUS;

          typedef union _TXN_DETAILS
          {
                    TXN_NEWORDER        NewOrder;
                    TXN_PAYMENT                 Payment;
                    TXN_ORDERSTATUS     OrderStatus;
          } TXN_DETAILS;

          // Common header for all records in txn log.  The TxnType field is
          // a switch which identifies the particular variant.
          #define TXN_REC_TYPE_CONTROL            1         //
          #define TXN_REC_TYPE_TPCC                         2         // replaces
TRANSACTION_TYPE_TPCC
          #define TXN_REC_TYPE_TPCC_DELIV_DEF     3

          typedef struct _TXN_RECORD_HEADER
          {
                    JULIAN_TIME         TxnStartT0;                   // start of
txn
                    BYTE      TxnType;                      // one of TXN_REC_TYPE_*
                    BYTE      TxnSubType;                             // depends on
TxnType
          } TXN_RECORD_HEADER, *PTXN_RECORD_HEADER;


          typedef struct _TXN_RECORD_CONTROL
          {
                    // common header; must exactly match TXN_RECORD_HEADER
                    JULIAN_TIME         TxnStartT0;                   // start of
txn
                    BYTE      TxnType;                      // =
TXN_REC_TYPE_CONTROL
                    BYTE      TxnSubType;                             // depends on
TxnType
                    // end of common header

                    DWORD     Len;                                    // number of
bytes after this field
          } TXN_RECORD_CONTROL, *PTXN_RECORD_CONTROL;


          // TPC-C Txn Record Layout:
          //
    //'TxnStartT0' is a Julian timestamp corresponding to the moment the
    //txn is sent to the SUT, i.e., beginning of response time.  Deltas
    //are in milliseconds.  Note that if RTDelay > 0, then the txn was
    //delayed by this amount.  The delay occurs at the beginning of the
    //response time.  So if RTDelay > 0, then the txn was actually sent
    //at TxnStartT0 + RTDelay.
    //
    //Graphically:
    //
    //  time -->
    //
    //    |--- Menu  ---|-- Keying  --|-- Response --|--- Think  --|
    //     <- DeltaT1 -> <- DeltaT2 -> <- DeltaT4  -> <- DeltaT3 ->
    //                                 ^
    //                                 ^ TxnStartT0
    //
    //RTDelay is the amount of response time delay included in DeltaT4.
    //RTDelay is recorded per txn because this value can be changed on
    //the fly, and so may vary from txn to txn.
    //
    //TxnStatus is the txn completion code.  It is used to indicate errors.
    //For example, in the New Order txn, 1% of txns abort.  TxnStatus will
    //reflect this.

          typedef struct _TXN_RECORD_TPCC
          {
                    // common header; must exactly match TXN_RECORD_HEADER
```

```
                    JULIAN_TIME         TxnStartT0;                   // start of
txn
                    BYTE      TxnType;                      // = TXN_REC_TYPE_TPCC
                    BYTE      TxnSubType;                             // depends on
TxnType
                    // end of common header

                    int     DeltaT1;              // menu time (ms)
                    int     DeltaT2;              // keying time (ms)
                    int     DeltaT3;              // think time (ms)
                    int     DeltaT4;              // response time (ms)
                    int     RTDelay;              // response time delay (ms)
                    int                 TxnError;           // error code providing
more detail for TxnStatus
                    WORD      w_id;                         // warehouse ID
                    BYTE      d_id;                         // assigned district ID
for this thread
                    BYTE      d_id_ThisTxn;       // district ID chosen for this
particular
                    BYTE      TxnStatus;                    // completion status for
txn to indicate errors
                    BYTE      reserved;           // for word alignment
                    TXN_DETAILS         TxnDetails;         //
          } TXN_RECORD_TPCC, *PTXN_RECORD_TPCC;

          // TPC-C Deferred Delivery Txn Record Layout:
          //
    //Incorporating delivery transaction information into the above
          //structure would increase the size of TXN_DETAILS from 8 to 42 bytes.
    //Hence, we store delivery transaction details in a separate structure.
    //
          typedef struct _TXN_RECORD_TPCC_DELIV_DEF
          {
                    // common header; must exactly match TXN_RECORD_HEADER
                    JULIAN_TIME         TxnStartT0;                   // start of
txn
                    BYTE      TxnType;                      // =
TXN_REC_TYPE_TPCC_DELIV_DEF
                    BYTE      TxnSubType;                             // = 0
                    // end of common header

                    int     DeltaT4;              // response time (ms)
                    int                 DeltaTxnExec;       // execution time (ms)
                    WORD      w_id;                         // warehouse ID
                    BYTE      TxnStatus;                    // completion status for
txn to indicate errors
                    BYTE      reserved;           // for word alignment
                    short   o_carrier_id;         // carrier id
                    long      o_id[10];           // returned delivery transaction
ids
          } TXN_RECORD_TPCC_DELIV_DEF, *PTXN_RECORD_TPCC_DELIV_DEF;



#define             TXN_LOG_VERSION               1
#define             TXN_DATA_START                4096      // offset in log file
where log records start
#define             TXN_LOG_EYE_CATCHER "BC"      // signature bytes at the start of
log file


          ////////////////////////////////////////////////////////////////////////
///
          // The transaction log has a header as the first 4K block.
          //
          typedef struct _TXN_LOG_HEADER
          {
                    char                          EyeCatcher[2];      // signature
bytes; should always be "BC"
                    int                                     LogVersion;
          // set to TXN_LOG_VERSION
                    JULIAN_TIME                   BeginTxnTS;                   //
timestamp of first (lowest) txn start
                    JULIAN_TIME                   EndTxnTS;           // timestamp
of last (highest) txn completion time
                    int                                     iRecCount;
          // number of records in log file
                    BOOL                          bLogSorted;
                    int                                     iFileSize;
          // file size in bytes

                    // the record map provides a fast way to get close to a
particular timestamp in a sorted log file.
          //        struct
          //        {
          //                  JULIAN_TIME                   TS;
          // timestamp of record
          //                  int                                     iPos;
          // byte position in file
          //        }                                       RecMap[RecMapSize];
          //#define           RecMapSize                    200

          } TXN_LOG_HEADER, *PTXN_LOG_HEADER;



#define   READ_BUFFER_SIZE              64*1024
#define   WRITE_BUFFER_SIZE              8*1024

#define   NUM_READ_BUFFERS              1
#define   NUM_WRITE_BUFFERS             2
#define   MAX_NUM_BUFFERS                         2

// flags passed in to the constructor
#define   TXN_LOG_WRITE                 0x01
#define   TXN_LOG_READ                  0x02
#define   TXN_LOG_SORTED                0x04

#define   TXN_LOG_OS_ERROR    1
#define   TXN_LOG_NOT_SORTED  2

#define SKIP_CTRL_RECS                  1

class CTxnLog
{
          private:
                    DWORD               iBufferSize;
          //buffer allocated size
                    DWORD               iBytesFreeInBuffer;           //total bytes
available for use in buffer
                    int                             iNumBuffers;
          //buffers in use
                    int                             iActiveBuffer;
          //indicates which buffer is active: 0 or 1
```

```
                int                             iIoBuffer;
                //buffer for any pending IO operation
                int                             iFilePointer;
        //position in file.
                int                             iNextRec;
        //when reading, ordinal value of next record

                // A "save point" is remembered each time GetNextRecord is
called with a start time specified.
                // The next time it is called, if start time is after the save
point, we start scanning from the
                // save point.  This is particularly useful in FindBestInterval,
where the log is scanned repeatedly.
                JULIAN_TIME                     SavePtTime;
                int                                     iSavePtFilePointer;
                int                                     iSavePtNextRec;

                JULIAN_TIME         lastTS;
        //when writing sorted output, used to verify records are sorted
                BOOL                bWrite;
        //writing log file

                BOOL                            bLogSorted;
        // is log file sorted?  applies to both input and output
                JULIAN_TIME                     BeginTxnTS;
        // timestamp of first (lowest) txn start
                JULIAN_TIME                     EndTxnTS;                       //
timestamp of last (highest) txn completion time
                int                                     iRecCount;
                // number of records in log file

                BYTE                *pCurrent;
        //ptr to current buffer
                BYTE                *pBuffer[MAX_NUM_BUFFERS];

                PTXN_RECORD_HEADER  *TxnArray;                      //transaction
record pointer array for sort

                DWORD               dwError;
                HANDLE              hTxnFile;
        //handle to log file
                HANDLE              hMapFile;
        //map file used when sorting the log
                HANDLE              hIoComplete;
        //event to signify that there are no pending IOs
                HANDLE              hLogFileIo;
        //event to signal the IO thread to write the inactive buffer

                Spinlock  Spin;
        //spin lock to protect the txn log file buffers

                int Write(BYTE *ptr, DWORD Size);
                static void LogFileIO(CTxnLog *);

        public:
                CTxnLog::CTxnLog(LPCTSTR szFileName, DWORD dwOpts);
                ~CTxnLog(void);

                int WriteToLog(PTXN_RECORD_TPCC pTxnRcrd);
                int WriteToLog(PTXN_RECORD_TPCC_DELIV_DEF pTxnRcrd);
                int WriteToLog(PTXN_RECORD_CONTROL pCtrlRec);
                int WriteToLog(PTXN_RECORD_HEADER pCtrlRec);
                int WriteCtrlRecToLog(BYTE SubType, LPTSTR lpStr, DWORD dwLen);

                void CloseTransactionLogFile(void);

                PTXN_RECORD_HEADER GetNextRecord(BOOL bSkipCtrlRecs = FALSE);
                PTXN_RECORD_HEADER GetNextRecord(JULIAN_TIME SeekTimeT0, BOOL
bSkipCtrlRecs = FALSE);

                int Sort(void);
                PTXN_RECORD_HEADER GetSortedRecord(int index);

                inline BOOL IsSorted(void) { return bLogSorted; };
                inline JULIAN_TIME BeginTS(void) { return BeginTxnTS; };
                inline JULIAN_TIME EndTS(void) { return EndTxnTS; };
                inline int RecordCount(void) { return iRecCount; };
};

class CTXNLOG_ERR : public CBaseErr
{
        public:
                enum CTXNLOG_ERRS
                {
                        ERR_BAD_FILE_FORMAT,                    // "File
format is invalid."
                        ERR_UNKNOWN_LOG_VERSION,      // "Log file version is
unknown."
                        ERR_BROKEN_LOG_FILE,                    // "Log file
is broken."
                        ERR_LOG_NOT_SORTED,                     // "Log file
is not sorted"
                        ERR_INVALID_TIME_SEQ,                   // "Internal
Error: Record Time Sequence invalid."
                };

                CTXNLOG_ERR(int iErr) : CBaseErr(iErr) {};

                int ErrorType() {return ERR_TYPE_TXNLOG;};

                char *ErrorText()
                {
                        static char *szMsgs[] = {
                                "File format is invalid.",
                                "Log file version is unknown.",
                                "Log file is broken.",
                                "Log file is not sorted",
                                "Internal Error: Record Time Sequence
invalid.",
                                ""
                        };

                        for(int i = 0; szMsgs[i][0]; i++)
                        {
                                if ( m_idMsg == i )
                                        break;
                        }

                        return(szMsgs[i][0] ? szMsgs[i] : ERR_UNKNOWN);
                };
};
```

Appendix B: Database Design

The TPC-C database was created with the following Transact-SQL scripts:

VerifyTpccLoad.sql

```
--  File:     VERIFYTPCCLOAD.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Performs series of TPCC database checks to verify
--              that database load completed correctly

print     " "
select    convert(char(30), getdate(),9)
print     " "

use tpcc
go

--        ************************************
--
--        Check rows per table from SYSINDEXES
--
--        ************************************

print     'WAREHOUSE TABLE'

select    rows
from      sysindexes
where     id        = object_id("warehouse")
go

print     'DISTRICT TABLE = (10 * No of warehouses)'

select    rows
from      sysindexes
where     id        =object_id("district")
go

print     'ITEM TABLE = 100,000'

select    rows
from      sysindexes
where     id        =object_id("item")
go

print     'CUSTOMER TABLE = (30,000 * No of warehouses)'

select    rows
from      sysindexes
where     id        =object_id("customer")
go

print 'ORDERS TABLE = (30,000 * No of warehouses)'

select    rows
from      sysindexes
where     id        =object_id("orders")
go

print     'HISTORY TABLE = (30,000 * No of warehouses)'

select    rows
from      sysindexes
where     id        =object_id("history")
go

print     'STOCK TABLE = (100,000 * No of warehouses)'

select    rows
from      sysindexes
where     id        =object_id("stock")
go

print     'ORDER_LINE TABLE = (300,000 * No of warehouses + some change)'

select    rows
from      sysindexes
where     id        =object_id("order_line")
go

print     'NEW_ORDER TABLE = (9000 * No of warehouses)'

select    rows
from      sysindexes
where     id        =object_id("new_order")
go

--        *************
--
--        Check indices
--
--        *************

print '**************Index Check*****************'

use tpcc
go

sp_helpindex        customer
go

sp_helpindex        stock
go

sp_helpindex        district
go

sp_helpindex        item
go
```

```
sp_helpindex        new_order
go

sp_helpindex        orders
go

sp_helpindex        order_line
go

sp_helpindex        warehouse
go
```

backup.sql

```
--  File:     BACKUP.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates backup of tpcc database


declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

dump database tpcc to tpccback1, tpccback2, tpccback3, tpccback4 with init, stats =
1

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

backupdev.sql

```
--  File:     BACKUPDEVB.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates tpcc database Backup Devices


use master
go

--  create backup devices

exec sp_addumpdevice 'disk','tpccback1','W:\tpccback1.dmp'
go
exec sp_addumpdevice 'disk','tpccback2','X:\tpccback2.dmp'
go
exec sp_addumpdevice 'disk','tpccback3','Y:\tpccback3.dmp'
go
exec sp_addumpdevice 'disk','tpccback4','Z:\tpccback4.dmp'
go
```

createdb.sql

```
File:     CREATEDB.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 1999, 2000
--  Purpose:  Creates tpcc database and backup files for 3248 warehouses


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)
)

insert    into tpcc_timer values (0,0)
go

--        Store starting time

update    tpcc_timer
set       start_date          = (select convert(char(30), getdate(),9))
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_cs_fg
(         NAME                = MSSQL_CS1,
          FILENAME  = "G:",
          SIZE                = 54000MB,
          FILEGROWTH          = 0),

(         NAME                = MSSQL_CS2,
          FILENAME  = "H:",
          SIZE                = 54000MB,
          FILEGROWTH          = 0),

(         NAME                = MSSQL_CS3,
          FILENAME  = "I:",
          SIZE                = 54000MB,
          FILEGROWTH          = 0),

(         NAME                = MSSQL_CS4,
          FILENAME  = "J:",
          SIZE                = 54000MB,
          FILEGROWTH          = 0),


FILEGROUP MSSQL_misc_fg
(         NAME                = MSSQL_Misc1,
          FILENAME  = "K:",
```

```
          SIZE                = 26800MB,
          FILEGROWTH          =0),

(         NAME                = MSSQL_Misc2,
          FILENAME  = "L:",
          SIZE                = 26800MB,
          FILEGROWTH          =0),

(         NAME                = MSSQL_Misc3,
          FILENAME  = "M:",
          SIZE                = 26800MB,
          FILEGROWTH          =0),

(         NAME                = MSSQL_Misc4,
          FILENAME  = "N:",
          SIZE                = 26800MB,
          FILEGROWTH          =0)


LOG ON
(         NAME                =MSSQL_tpcc_log,
          FILENAME  ="F:",
          SIZE                =  121500MB,
          FILEGROWTH          = 0)
COLLATE Latin1_General_Bin
go

-- Store ending time
update    tpcc_timer
set       end_date  = (select convert(char(30), getdate(),9))
go

select "Elapsed time (in seconds): ", datediff(second,(select start_date from
tpcc_timer),(select end_date from tpcc_timer))

--        remove temporary table

if exists ( select name from sysobjects where name = 'tpcc_timer' )
          drop table tpcc_timer
go
```

config.sql

```
--  File:     CONFIG.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 1996
--  Purpose:  Collects SQL Server configuration parameters


print " "
select convert(char(30), getdate(),9)
print " "
go

sp_configure "show advanced",1
go
reconfigure with override
go
exec sp_configure "affinity mask",              3
exec sp_configure "cost threshold for parallelism",          5
exec sp_configure "index create memory",        0
exec sp_configure "lightweight pooling",        1
exec sp_configure "awe enabled",                1
exec sp_configure "locks",                      5000
exec sp_configure "max degree of parallelism",  1
exec sp_configure "max server memory",          2147483647
exec sp_configure "max worker threads",         110
exec sp_configure "min memory per query",       1024
exec sp_configure "min server memory",          0
exec sp_configure "nested triggers",            1
exec sp_configure "network packet size",        512
exec sp_configure "open objects",               0
exec sp_configure "priority boost",               1
exec sp_configure "recovery interval",          300
exec sp_configure "set working set size",       0
exec sp_configure "user connections",           0

go

reconfigure with override
go
sp_configure
go
```

dbopt1.sql

```
--  File:     DBOPT1.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Sets database options for data load


use master
go

exec sp_dboption tpcc,'select into/bulkcopy',true
exec sp_dboption tpcc,'trunc. log on chkpt.',true
go

use tpcc
go

checkpoint
go
```

dbopt2.sql

```
--  File:     DBOPT2.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Resets database options after data load

sp_dboption tpcc,'select into/bulkcopy',FALSE
GO

sp_dboption tpcc,'trunc. log on chkpt.',FALSE
GO
```

```
USE tpcc
GO

CHECKPOINT
GO

sp_configure 'allow updates',1
GO

RECONFIGURE WITH OVERRIDE
GO

DECLARE   @msg                varchar(50)

--                                          --
--        OPTIONS FOR SQL SERVER 8.0        --
-- 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

EXEC sp_tableoption 'district',         'pintable',true
EXEC sp_tableoption 'warehouse',        'pintable',true
EXEC sp_tableoption 'new_order',        'pintable',true
EXEC sp_tableoption 'item',             'pintable',true
GO
```

delivery.sql

```
--  File:     DELIVERY.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates delivery transaction stored procedure
--
--        Interface Level: 4.10.000

use tpcc
go

if exists (select name from sysobjects where name = "tpcc_delivery" )
          drop procedure tpcc_delivery
go

create proc tpcc_delivery     @w_id           smallint,

                                          @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

select @d_id = 0

begin tran 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 (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 tran d

-- return delivery data to client

select @oid1,
       @oid2,
       @oid3,
       @oid4,
       @oid5,
       @oid6,
       @oid7,
       @oid8,
       @oid9,
       @oid10

go
```

getargs.c

```
//        File:               GETARGS.C
//                                      Microsoft TPC-C Kit Ver. 4.22
//                                      Copyright Microsoft, 1996, 1997, 1998, 1999,
2000, 2001
//        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->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 'h':     /* Fall throught */
                case 'H':
                                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 '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("-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);
}
```

idxcuscl.sql

```
--  File:     IDXCUSCL.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates clustered index on customer table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'customer_c1' )
          drop index customer.customer_c1

create unique clustered index customer_c1 on customer(c_w_id, c_d_id, c_id)
          on MSSQL_cs_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxcusnc.sql

```
--  File:     IDXCUSNC.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates non-clustered index on customer table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'customer_nc1' )
          drop index customer.customer_nc1

create unique nonclustered index customer_nc1 on customer(c_w_id, c_d_id, c_last,
c_first, c_id)
          on MSSQL_cs_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxdiscl.sql

```
--  File:     IDXDISCL.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates clustered index on district table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
```

```
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

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,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxitmcl.sql

```
--  File:     IDXITMCL.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates clustered index on item table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

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,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxnodcl.sql

```
--  File:     IDXNODCL.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates clustered index on new_order table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

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,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxodlcl.sql

```
--  File:     IDXODLCL.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates clustered index on order_line table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'order_line_c1' )
          drop index order_line.order_line_c1

create unique clustered index order_line_c1 on order_line(ol_w_id, ol_d_id, ol_o_id,
ol_number)
          on MSSQL_misc_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxordcl.sql

```
--  File:     IDXORDCL.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates clustered index on orders table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)
```

```
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,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxordnc.sql

```
--  File:     IDXORDNC.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates non-clustered index on orders table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

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,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxstkcl.sql

```
--  File:     IDXSTKCL.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates clustered index on stock table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'stock_c1' )
          drop index stock.stock_c1

create unique clustered index stock_c1 on stock(s_i_id, s_w_id)
          on MSSQL_cs_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxwarcl.sql

```
--  File:     IDXWARCL.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates clustered index on warehouse table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

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,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

neword.sql

```
--  File:     NEWORD.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates new order transaction stored procedure
--
--        Interface Level: 4.10.000

use tpcc
go

if exists ( select name from sysobjects where name = "tpcc_neworder" )
          drop procedure tpcc_neworder
go

create proc tpcc_neworder
                                                    @w_id           smallint,
                                                    @d_id           tinyint,
                                                    @c_id           int,
```

```
smallint = 0, @ol_qty1  smallint = 0,

smallint = 0, @ol_qty2  smallint = 0,

smallint = 0, @ol_qty3  smallint = 0,

smallint = 0, @ol_qty4  smallint = 0,

smallint = 0, @ol_qty5  smallint = 0,

smallint = 0, @ol_qty6  smallint = 0,

smallint = 0, @ol_qty7  smallint = 0,

smallint = 0, @ol_qty8  smallint = 0,

smallint = 0, @ol_qty9  smallint = 0,

smallint = 0, @ol_qty10 smallint = 0,

smallint = 0, @ol_qty11 smallint = 0,

smallint = 0, @ol_qty12 smallint = 0,

smallint = 0, @ol_qty13 smallint = 0,

smallint = 0, @ol_qty14 smallint = 0,

smallint = 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),
        @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      smallint,
        @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
```

```
@o_ol_cnt       tinyint,
@o_all_local    tinyint,
@i_id1  int = 0, @s_w_id1

@i_id2  int = 0, @s_w_id2

@i_id3  int = 0, @s_w_id3

@i_id4  int = 0, @s_w_id4

@i_id5  int = 0, @s_w_id5

@i_id6  int = 0, @s_w_id6

@i_id7  int = 0, @s_w_id7

@i_id8  int = 0, @s_w_id8

@i_id9  int = 0, @s_w_id9

@i_id10 int = 0, @s_w_id10

@i_id11 int = 0, @s_w_id11

@i_id12 int = 0, @s_w_id12

@i_id13 int = 0, @s_w_id13

@i_id14 int = 0, @s_w_id14

@i_id15 int = 0, @s_w_id15
```

```
        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 (tablock 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,
                                                            @li_s_w_id,
                                                            "dec 31, 1899",
                                                            @li_qty,
                                                                        @i_price *
@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 (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,
                                                            @o_entry_d,
                                                            0,
                                                            @o_ol_cnt,
                                                            @o_all_local)

--  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 (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
```

ordstat.sql

```
--  File:     ORDSTAT.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates order status transaction stored procedure
--
--        Interface Level: 4.10.000

use tpcc
go

if exists ( select name from sysobjects where name = "tpcc_orderstatus" )
          drop procedure   tpcc_orderstatus
go

create proc tpcc_orderstatus  @w_id     smallint,
                                        @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,
        @cnt                            smallint

begin tran o

if (@c_id = 0)
          begin

--  get customer id and info using last name

                    select    @cnt      = (count(*)+1)/2
                    from      customer (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 (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 (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 (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 (repeatableread)
          where     ol_o_id = @o_id and
                    ol_d_id = @d_id and
                    ol_w_id = @w_id

custnotfound:

commit tran 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. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates payment transaction stored procedure
--
--        Interface Level: 4.10.000

use tpcc
go

if exists (select name from sysobjects where name = "tpcc_payment" )
          drop procedure tpcc_payment
go

create proc tpcc_payment      @w_id           smallint,
                                      @c_w_id         smallint,
                                      @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         smallint,
           @c_id_local         int

select @screen_data = ""

begin tran 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 (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 (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,
                    @data               = c_data,
                    @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) +
                                          substring(@data, 1, 458)


--  update customer info

                    update    customer
                    set       c_data    = @c_data
                    where     c_id      = @c_id and
                              c_w_id    = @c_w_id and
                              c_d_id    = @c_d_id

                    select    @screen_data = substring (@c_data,1,200)
          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 tran 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
```

random.c

```
//        File:               RANDOM.C
//                                      Microsoft TPC-C Kit Ver. 4.22
//                                      Copyright Microsoft, 1996, 1997, 1998, 1999,
2000, 2001
//        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;
}
```

removedb.sql

```
--  File:     REMOVEDB.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Removes tpcc database and backup files


use master
go

--  remove any existing database and backup files

exec sp_dbremove tpcc, dropdev
go

exec sp_dropdevice 'tpccback1'
exec sp_dropdevice 'tpccback2'
exec sp_dropdevice 'tpccback3'
exec sp_dropdevice 'tpccback4'
go
```

restore.sql

```
--  File:     RESTORE.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Loads database backup from backup files


declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

load database tpcc from tpccback1, tpccback2, tpccback3, tpccback4 with stats = 1,
replace

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

sqlshutdown.sql

```
use tpcc
go
checkpoint
go
shutdown
go
```

stocklev.sql

```
--  File:     STOCKLEV.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates stock level transaction stored procedure
--
--        Interface Level: 4.10.000

use tpcc
go

if exists (select name from sysobjects where name = "tpcc_stocklevel" )
        drop procedure tpcc_stocklevel
go

create proc tpcc_stocklevel   @w_id              smallint,
                                        @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

go
```

strings.c

```
//        File:               STRINGS.C
//                                  Microsoft TPC-C Kit Ver. 4.22
//                                  Copyright Microsoft, 1996, 1997, 1998, 1999,
2000, 2001
//        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++)
          {
                    cc = chArray[RandomNumber(0, chArrayMax)];
        str[i] = cc;
    }
          if ( len < z )
                    memset(str+len, ' ', z - len);
          str[len] = 0;

    return len;
}


//=============================================================================
//
// 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 + y) <= 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 strlen(str);
}


//====================================================================
//
// 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;
}
```

tables.sql

```
--  File:     TABLES.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Creates TPC-C tables


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                                    smallint,
         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),
         w_tax                                   numeric(4,4),
         w_ytd                                   numeric(12,2)
) on MSSQL_misc_fg
go

create table district
(
         d_id                                    tinyint,
         d_w_id                                  smallint,
         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),
         d_tax                                   numeric(4,4),
         d_ytd                                   numeric(12,2),
         d_next_o_id                             int
) on MSSQL_misc_fg
go

create table customer
(
         c_id                                            int,
         c_d_id                                          tinyint,
         c_w_id                                          smallint,
         c_first                                         char(16),
         c_middle                                char(2),
         c_last                                          char(16),
         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_discount                                      numeric(4,4),
         c_balance                               numeric(12,2),
         c_ytd_payment                           numeric(12,2),
         c_payment_cnt                           smallint,
         c_delivery_cnt                          smallint,
         c_data                                          char(500)
) on MSSQL_cs_fg
go

create table history
(
         h_c_id                                          int,
         h_c_d_id                                tinyint,
         h_c_w_id                                smallint,
         h_d_id                                          tinyint,
         h_w_id                                          smallint,
         h_date                                          datetime,
         h_amount                                numeric(6,2),
         h_data                                          char(24)
) on MSSQL_misc_fg
go

create table new_order
(
         no_o_id                                         int,
         no_d_id                                         tinyint,
         no_w_id                                         smallint
) on MSSQL_misc_fg
go

create table orders
(
         o_id                                            int,
         o_d_id                                          tinyint,
         o_w_id                                          smallint,
         o_c_id                                          int,
         o_entry_d                               datetime,
         o_carrier_id                            tinyint,
         o_ol_cnt                                tinyint,
         o_all_local                                     tinyint
) on MSSQL_misc_fg
go

create table order_line
(
```

```
        ol_o_id                                 int,
        ol_d_id                                 tinyint,
        ol_w_id                                 smallint,
        ol_number                       tinyint,
        ol_i_id                                 int,
        ol_supply_w_id                  smallint,
        ol_delivery_d                   datetime,
        ol_quantity                             smallint,
        ol_amount                       numeric(6,2),
        ol_dist_info                    char(24)
) on MSSQL_misc_fg
go

create table item
(
        i_id                                    int,
        i_im_id                                 int,
        i_name                                  char(24),
        i_price                                 numeric(5,2),
        i_data                                  char(50)
) on MSSQL_misc_fg
go

create table stock
(
        s_i_id                                  int,
        s_w_id                                  smallint,
        s_quantity                              smallint,
        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),
        s_ytd                                   int,
        s_order_cnt                             smallint,
        s_remote_cnt                    smallint,
        s_data                                  char(50)
) on MSSQL_cs_fg
go
```

time.c

```
//        File:               TIME.C
//                                  Microsoft TPC-C Kit Ver. 4.22
//                                  Copyright Microsoft, 1996, 1997, 1998, 1999,
2000, 2001
//        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. 4.22
//                                  Copyright Microsoft, 1996, 1997, 1998, 1999,
2000, 2001
//        Purpose:  Header file for TPC-C database loader


// Build number of TPC Benchmark Kit
#define TPCKIT_VER  "4.22"

// 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>

// 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                   "logs\\load.out"
#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                                  *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       MakeOriginalAlphaString();
int       MakeNumberString();
int       MakeZipNumberString();
void      InitString();
void      InitAddress();
void      PaddString();
```

tpccldr.c

```
//        File:               TPCCLDR.C
//                                      Microsoft TPC-C Kit Ver. 4.22
//                                      Copyright Microsoft, 2000, 2001
//        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

// Functions declarations

void HandleErrorDBC (SQLHDBC  hdbc1);

void CheckSQL();
void CheckDataBase();

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 OpenConnections();
void BuildIndex();
void FormatDate ();

// Shared memory structures

typedef struct
{
    long                ol;
    long                ol_i_id;
    short               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;
    short               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;
    short                               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;
//  fix to avoid ODBC float to numeric conversion problem.
//  double                                      c_balance;
          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;

ORDERS_STRUCT   orders_buf[ORDERS_PER_DISTRICT];
CUSTOMER_STRUCT customer_buf[CUSTOMERS_PER_DISTRICT];
long            orders_rows_loaded;
long            new_order_rows_loaded;
long            order_line_rows_loaded;
long            history_rows_loaded;
long            customer_rows_loaded;
long            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);

          // verify database and tables exist before attempting to load
          CheckSQL();
          CheckDataBase();

          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);

          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()
{
    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];

          // Seed with unique number
          seed(1);

          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");

          rc = bcp_init(i_hdbc1, name, NULL, "logs\\item.err", 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);
          }

          rc = bcp_bind(i_hdbc1, (BYTE *) &i_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 1);
          if (rc != SUCCEED)
                    HandleErrorDBC(i_hdbc1);

          rc = bcp_bind(i_hdbc1, (BYTE *) &i_im_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 2);
          if (rc != SUCCEED)
                    HandleErrorDBC(i_hdbc1);

          rc = bcp_bind(i_hdbc1, (BYTE *) i_name, 0, I_NAME_LEN, NULL, 0, 0, 3);
          if (rc != SUCCEED)
                    HandleErrorDBC(i_hdbc1);

          rc = bcp_bind(i_hdbc1, (BYTE *) &i_price, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 4);
          if (rc != SUCCEED)
                    HandleErrorDBC(i_hdbc1);

          rc = bcp_bind(i_hdbc1, (BYTE *) i_data, 0, I_DATA_LEN, NULL, 0, 0, 5);
          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);

                    MakeAlphaString(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()
{
    short 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];


          // 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");

        rc = bcp_init(w_hdbc1, name, NULL, "logs\\whouse.err", 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);
        }

        rc = bcp_bind(w_hdbc1, (BYTE *) &w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 1);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) w_name, 0, W_NAME_LEN, NULL, 0, 0, 2);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) w_street_1, 0, ADDRESS_LEN, NULL, 0, 0,
3);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) w_street_2, 0, ADDRESS_LEN, NULL, 0, 0,
4);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) w_city, 0, ADDRESS_LEN, NULL, 0, 0, 5);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) w_state, 0, STATE_LEN, NULL, 0, 0, 6);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) w_zip, 0, ZIP_LEN, NULL, 0, 0, 7);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) &w_tax, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 8);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) &w_ytd, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 9);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        time_start = (TimeNow() / MILLI);

        warehouse_rows_loaded = 0;

        for (w_id = (short)aptr->starting_warehouse; w_id <= aptr->num_warehouses;
w_id++)
        {
                MakeAlphaString(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()
{
    short d_id;
    short 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;
        int                 w_id;
        RETCODE     rc;
        DBINT       rcint;
        char        bcphint[128];

        // 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");

        rc = bcp_init(w_hdbc1, name, NULL, "logs\\district.err", 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);
        }

        rc = bcp_bind(w_hdbc1, (BYTE *) &d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 1);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) &d_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 2);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) d_name, 0, D_NAME_LEN, NULL, 0, 0, 3);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) d_street_1, 0, ADDRESS_LEN, NULL, 0, 0,
4);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) d_street_2, 0, ADDRESS_LEN, NULL, 0, 0,
5);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) d_city, 0, ADDRESS_LEN, NULL, 0, 0, 6);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) d_state, 0, STATE_LEN, NULL, 0, 0, 7);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) d_zip, 0, ZIP_LEN, NULL, 0, 0, 8);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) &d_tax, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 9);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) &d_ytd, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 10);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) &d_next_o_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 11);
        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++)
                {
                        MakeAlphaString(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()
{
    long  s_i_id;
    short 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];

          // 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");

          rc = bcp_init(w_hdbc1, name, NULL, "logs\\stock.err", 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);
          }

          rc = bcp_bind(w_hdbc1, (BYTE *) &s_i_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 1);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          bcp_bind(w_hdbc1, (BYTE *) &s_w_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
2);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          rc = bcp_bind(w_hdbc1, (BYTE *) &s_quantity, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 3);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_01, 0, S_DIST_LEN, NULL, 0, 0, 4);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_02, 0, S_DIST_LEN, NULL, 0, 0, 5);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_03, 0, S_DIST_LEN, NULL, 0, 0, 6);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_04, 0, S_DIST_LEN, NULL, 0, 0, 7);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_05, 0, S_DIST_LEN, NULL, 0, 0, 8);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_06, 0, S_DIST_LEN, NULL, 0, 0, 9);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_07, 0, S_DIST_LEN, NULL, 0, 0, 10);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_08, 0, S_DIST_LEN, NULL, 0, 0, 11);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_09, 0, S_DIST_LEN, NULL, 0, 0, 12);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_10, 0, S_DIST_LEN, NULL, 0, 0, 13);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          rc = bcp_bind(w_hdbc1, (BYTE *) &s_ytd, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 14);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          rc = bcp_bind(w_hdbc1, (BYTE *) &s_order_cnt, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 15);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          rc = bcp_bind(w_hdbc1, (BYTE *) &s_remote_cnt, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT2, 16);
          if (rc != SUCCEED)
```

```
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) s_data, 0, S_DATA_LEN, NULL, 0, 0, 17);
        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 = (short)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(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;
        short                           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];
        // SQLRETURN                                            rc_1;
        // SQLSMALLINT                                          recnum, MsgLen;
        // SQLCHAR                                                      SqlState[6],
Msg[SQL_MAX_MESSAGE_LENGTH];
        // SQLINTEGER                                           NativeError;

        // 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");

        // Initialize bulk copy
        sprintf(name, "%s..%s", aptr->database, "customer");

        rc = bcp_init(c_hdbc1, name, NULL, "logs\\customer.err", 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);
        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 = (short)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");

        // 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, "isql -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\" >
logs\\nurand_load.log",
                                        aptr->server,
                                        aptr->user,
                                        aptr->password,
                                        aptr->database,
                                        LOADER_NURAND_C);

        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()
{
          int     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;

                    //  fix to avoid ODBC float to numeric conversion problem.
                    //        customer_buf[i].c_balance = 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, int 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);

                    MakeAlphaString(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;

                    // Generate CUSTOMER and HISTORY data

                    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;

                    //  fix to avoid ODBC float to numeric conversion problem.
```

```
                    //  customer_buf[i].c_balance = -10.0;
                    strcpy(customer_buf[i].c_balance,"-10.0");

                    MakeAlphaString(300, 500, C_DATA_LEN, customer_buf[i].c_data);


                    // Generate HISTORY data
                    MakeAlphaString(12, 24, H_DATA_LEN, customer_buf[i].h_data);

          }
}

//============================================================================
//
// Function   : LoadCustomerTable
//
//============================================================================

void LoadCustomerTable(LOADER_TIME_STRUCT *customer_time_start)
{
          int         i;
    long        c_id;
    short       c_d_id;
    short       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;

          //  fix to avoid ODBC float to numeric conversion problem.
          //  double                    c_balance;
          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;

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT4, 1);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
2);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

          rc = bcp_bind(c_hdbc1, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 3);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_first, 0, FIRST_NAME_LEN, NULL, 0, 0, 4);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_middle, 0, MIDDLE_NAME_LEN,NULL, 0, 0, 5);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_last, 0, LAST_NAME_LEN, NULL, 0, 0, 6);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_street_1, 0, ADDRESS_LEN, NULL, 0, 0, 7);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_street_2, 0, ADDRESS_LEN, NULL,0,0, 8);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_city, 0, ADDRESS_LEN, NULL, 0, 0, 9);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_state, 0, STATE_LEN, NULL, 0, 0, 10);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_zip, 0, ZIP_LEN, NULL, 0, 0, 11);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_phone, 0, PHONE_LEN, NULL, 0, 0, 12);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

          rc = bcp_bind(c_hdbc1, (BYTE *) &c_since, 0, C_SINCE_LEN, NULL, 0,
SQLCHARACTER, 13);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_credit, 0, CREDIT_LEN, NULL, 0, 0, 14);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_credit_lim, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 15);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_discount, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 16);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);


          //  fix to avoid ODBC float to numeric conversion problem.

    //  rc = bcp_bind(c_hdbc1, (BYTE *) &c_balance, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 17);
          //  if (rc != SUCCEED)
          //        HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) c_balance, 0, 5, NULL, 0, SQLCHARACTER, 17);
          if (rc != SUCCEED)
```

```
                    HandleErrorDBC(c_hdbc1);


    rc = bcp_bind(c_hdbc1, (BYTE *) &c_ytd_payment, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 18);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_payment_cnt, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 19);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_delivery_cnt,0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 20);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_data, 0, 500, NULL, 0, 0, 21);
          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;

                    //  fix to avoid ODBC float to numeric conversion problem.

                    //  c_balance = customer_buf[i].c_balance;
                    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)
{
          int         i;
    long        c_id;
    short       c_d_id;
    short       c_w_id;
          double    h_amount;
    char        h_data[H_DATA_LEN+1];
          char              h_date[H_DATE_LEN+1];
          RETCODE           rc;

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT4, 1);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
2);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
3);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
4);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
5);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);

          rc = bcp_bind(c_hdbc2, (BYTE *) &h_date, 0, H_DATE_LEN, NULL, 0,
SQLCHARACTER, 6);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &h_amount, 0, SQL_VARLEN_DATA, NULL, 0, SQLFLT8,
7);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) h_data, 0, H_DATA_LEN, NULL, 0, 0, 8);
          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;
          short                             w_id;
    short                         d_id;
          DWORD                             dwThreadID[MAX_ORDER_THREADS];
          HANDLE                            hThread[MAX_ORDER_THREADS];
          char                              name[20];
          RETCODE                                             rc;
          char                                                bcphint[128];

          // 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);
          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);
          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);
          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 = (short)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(int d_id, int w_id)
{

        int     cust[ORDERS_PER_DISTRICT+1];
        long    o_id;
        short   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;
        short     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
    rc = bcp_bind(o_hdbc1, (BYTE *) &o_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT4, 1);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);

    rc = bcp_bind(o_hdbc1, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
2);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);

    rc = bcp_bind(o_hdbc1, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
3);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);
```

```
    rc = bcp_bind(o_hdbc1, (BYTE *) &o_c_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT4,
4);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc1);

          rc = bcp_bind(o_hdbc1, (BYTE *) &o_entry_d, 0, O_ENTRY_D_LEN, NULL, 0,
SQLCHARACTER, 5);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc1);

    rc = bcp_bind(o_hdbc1, (BYTE *) &o_carrier_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 6);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc1);

    rc = bcp_bind(o_hdbc1, (BYTE *) &o_ol_cnt, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
7);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc1);

    rc = bcp_bind(o_hdbc1, (BYTE *) &o_all_local, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 8);
          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);
    }

          // rcint = bcp_batch(o_hdbc1);
          // if (rcint < 0)
          //        HandleErrorDBC(o_hdbc1);

          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)
{
    int         i;
    long        o_id;
    short       o_d_id;
    short       o_w_id;
          RETCODE             rc;
          DBINT               rcint;

          // Bind NEW-ORDER data

    rc = bcp_bind(o_hdbc2, (BYTE *) &o_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT4, 1);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc2);

    rc = bcp_bind(o_hdbc2, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
2);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc2);

    rc = bcp_bind(o_hdbc2, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
3);
          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(o_hdbc2, o_hstmt2, new_order_rows_loaded,
"new_order", &new_order_time_start->time_start);
          }

          // rcint = bcp_batch(o_hdbc2);
          // if (rcint < 0)
          //        HandleErrorDBC(o_hdbc2);

          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)
{
          int         i,j;
    long        o_id;
          short     o_d_id;
          short     o_w_id;
    long        ol;
          long      ol_i_id;
    short       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
    rc = bcp_bind(o_hdbc3, (BYTE *) &o_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT4, 1);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
2);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
3);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT4, 4);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_i_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT4,
5);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_supply_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 6);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);

          rc = bcp_bind(o_hdbc3, (BYTE *) &ol_delivery_d, 0, OL_DELIVERY_D_LEN,
NULL, 0, SQLCHARACTER, 7);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_quantity, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 8);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_amount, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 9);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) ol_dist_info, 0, DIST_INFO_LEN, NULL, 0, 0, 10);
          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(o_hdbc3, o_hstmt3,
order_line_rows_loaded, "order_line", &order_line_time_start->time_start);
                    }

          }

          // rcint = bcp_batch(o_hdbc3);
          // if (rcint < 0)
          //        HandleErrorDBC(o_hdbc3);

          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,
                                int rows_loaded,
                                        char *table_name,
                                long *time_start)
{

    long  time_end, time_diff;
        // DBINT  rcint;

    if ( !(rows_loaded % aptr->batch) )
    {

                // rcint = bcp_batch(hdbc);
                // if (rcint < 0)
                //        HandleErrorDBC(hdbc);

                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   : 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)
                HandleErrorDBC(i_hdbc1);

        // 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)
                HandleErrorDBC(w_hdbc1);

        // 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)
                HandleErrorDBC(c_hdbc1);

        // 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)
                HandleErrorDBC(c_hdbc2);

        // 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)
                HandleErrorDBC(o_hdbc1);

        // 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)
                HandleErrorDBC(o_hdbc2);

        // 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)
                HandleErrorDBC(o_hdbc3);

}

//====================================================================
//
// Function name: BuildIndex
//
//====================================================================

void BuildIndex(char          *index_script)
{
        char      cmd[256];

        printf("Starting index creation:  %s\n",index_script);

        sprintf(cmd, "isql -S%s -U%s -P%s -e -i%s\\%s.sql > logs\\%s.log",
                                        aptr->server,
                                        aptr->user,
                                        aptr->password,
                                        aptr->index_script_path,
                                        index_script,
                                        index_script);

        system(cmd);

        printf("Finished index creation:  %s\n",index_script);
}


void HandleErrorDBC (SQLHDBC  hdbc1)
{

        SQLCHAR             SqlState[6], Msg[SQL_MAX_MESSAGE_LENGTH];
        SQLINTEGER  NativeError;
        SQLSMALLINT i, MsgLen;
        SQLRETURN   rc2;
        char                timebuf[128];
        char                datebuf[128];
        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" , datebuf, timebuf, szLastError);

                    fp1 = fopen("logs\\tpccldr.err","w");
                    if (fp1 == NULL)
                              printf("ERROR:  Unable to open errorlog file.\n");
                    else
                    {
                              fprintf(fp1, "[%s : %s] %s\n" , datebuf, timebuf,
szLastError);
                              fclose(fp1);
                    }

                    i++;

          }
}

void HandleErrorSTMT (HSTMT  hstmt1)
{

          SQLCHAR             SqlState[6], Msg[SQL_MAX_MESSAGE_LENGTH];
          SQLINTEGER  NativeError;
          SQLSMALLINT i, MsgLen;
          SQLRETURN   rc2;
          char                timebuf[128];
          char                datebuf[128];
          FILE                *fp1;

          i = 1;
          while (( rc2 = SQLGetDiagRec(SQL_HANDLE_STMT , hstmt1, i, SqlState ,
&NativeError,
                                        Msg, sizeof(Msg) , &MsgLen )) !=
SQL_NO_DATA )
          {

                    sprintf( szLastError , "%s" ,  Msg );

                    _strtime(timebuf);
                    _strdate(datebuf);

                    printf( "[%s : %s] %s\n" , datebuf, timebuf, szLastError);

                    fp1 = fopen("logs\\tpccldr.err","w");
                    if (fp1 == NULL)
                              printf("ERROR:  Unable to open errorlog file.\n");
                    else
                    {
                              fprintf(fp1, "[%s : %s] %s\n" , datebuf, timebuf,
szLastError);
                              fclose(fp1);
                    }

                    i++;

          }
}


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;

}

//=====================================================================
//
// Function   : CheckSQL
//
//=====================================================================

void CheckSQL()
{

          RETCODE         rc;

          char                          szDriverString[300];
          char                          szDriverStringOut[1024];
          int                                     SQLBuildFlag;
          char                          resp;

          SQLSMALLINT                   cbDriverStringOut;
          SQLCHAR                       SQLVersion[19];
          SQLINTEGER                    SQLVersionInd;



          SQLAllocHandle(SQL_HANDLE_ENV, SQL_NULL_HANDLE, &henv );

          SQLSetEnvAttr(henv, SQL_ATTR_ODBC_VERSION, (void*)SQL_OV_ODBC3, 0 );

          SQLAllocHandle(SQL_HANDLE_DBC, henv , &v_hdbc);

          SQLSetConnectAttr(v_hdbc, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );

          // Open connection to SQL Server

          sprintf( szDriverString , "DRIVER={SQL Server};SERVER=%s;UID=%s;PWD=%s" ,
                                                            aptr->server,
                                                            aptr->user,
                                                            aptr->password );

          if ( SQLSetConnectAttr( v_hdbc, SQL_ATTR_PACKET_SIZE, (SQLPOINTER)aptr-
>pack_size, SQL_IS_UINTEGER ) != SQL_SUCCESS )
                    HandleErrorDBC(v_hdbc);

          rc = SQLDriverConnect ( v_hdbc,
                                                      NULL,

          (SQLCHAR*)&szDriverString[0] ,
                                                                SQL_NTS,

          (SQLCHAR*)&szDriverStringOut[0],
```

```
        sizeof(szDriverStringOut),
                                                &cbDriverStringOut,
                                                SQL_DRIVER_NOPROMPT );

        if ((rc != SQL_SUCCESS) && (rc != SQL_SUCCESS_WITH_INFO))
                HandleErrorDBC(v_hdbc);

        if ( SQLAllocHandle(SQL_HANDLE_STMT, v_hdbc , &v_hstmt) != SQL_SUCCESS )
                HandleErrorSTMT(v_hstmt);

        rc = SQLBindCol(v_hstmt, 4, SQL_C_CHAR, &SQLVersion, sizeof(SQLVersion),
&SQLVersionInd);

        // issue SQL Server extended stored procedure (xp_msver) to determine
installed version
        rc = SQLExecDirect(v_hstmt, "EXECUTE xp_msver ProductVersion", SQL_NTS);

        if ((rc != SQL_SUCCESS) && (rc != SQL_SUCCESS_WITH_INFO))
                HandleErrorSTMT(v_hstmt);

        rc = SQLFetch(v_hstmt);

        if (rc != SQL_SUCCESS)
                HandleErrorDBC(v_hdbc);

        // Check build number to ensure 8.00.194 or higher

        SQLBuildFlag = 1;

        // first check the Major version

        if ( SQLVersion[0] == '8' )
        {
                if (( SQLVersion[2] == '0') & ( SQLVersion[3] == '0' )      )
                {
                        if ( SQLVersion[5] == '1' )
                        {
                                if ( (SQLVersion[6] == '9') &
(SQLVersion[7] == '4') )
                                {
                                        SQLBuildFlag = 0;
                                        printf("You are using SQL Server
version = %9s\n\n", SQLVersion);
                                }
                                else
                                {
                                        SQLBuildFlag = 1;
                                }
                        }
                        else
                        {
                                if ( SQLVersion[5] == '3' )
                                {
                                        if ( (SQLVersion[6] >= 53) &
(SQLVersion[7] >= 48) )
                                        {
                                                SQLBuildFlag = 0;
                                                printf("You are using
SQL Server version = %9s\n\n", SQLVersion);
                                        }
                                        else
                                        {
                                                SQLBuildFlag = 1;
                                        }
                                }
                                else
                                {
                                        SQLBuildFlag = 1;
                                }
                        }
                }
                else
                {
                        SQLBuildFlag = 1;
                }

                if ( SQLBuildFlag == 1 )
                {
                        printf("NOTE:  The SQL Server version you are using is not
supported\n");
                        printf("for TPC-C benchmarking.  You currently have SQL Server
version %9s\n",SQLVersion);
                        printf("installed.  Please upgrade to Microsoft SQL Server 2000
(8.00.0194) or better.\n");
                        printf("and re-run the SETUP program.\n\n");
                        printf("Do you wish to continue with setup? (Y/N): ");
                        resp = getchar();
                        if ( ( resp == 'N' ) || (resp == 'n') )
                        {
                                printf("\nSetup Aborted!\n");
                                exit(1);
                        }
                }

                SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
                SQLDisconnect(v_hdbc);
                SQLFreeHandle(SQL_HANDLE_DBC, v_hdbc);

                return;
}


//=============================================================================
//
// Function   : CheckDataBase
//
//=============================================================================

void CheckDataBase()
{

        RETCODE         rc;

        char                            szDriverString[300];
        char                            szDriverStringOut[1024];
        char                            TablesBitMap[9] = {"000000000"};
        int                                     i, ExitFlag;

        SQLSMALLINT                     cbDriverStringOut;
        SQLCHAR                         TabName[10];
        SQLINTEGER                      TabNameInd, TabCount, TabCountInd;


        ExitFlag = 0;

        SQLAllocHandle(SQL_HANDLE_ENV, SQL_NULL_HANDLE, &henv );
```

```
        SQLSetEnvAttr(henv, SQL_ATTR_ODBC_VERSION, (void*)SQL_OV_ODBC3, 0 );

        SQLAllocHandle(SQL_HANDLE_DBC, henv , &v_hdbc);

        SQLSetConnectAttr(v_hdbc, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );

        // Open connection to SQL Server

        sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
                                                        aptr->server,
                                                        aptr->user,
                                                        aptr->password,
                                                        aptr->database );


        rc = SQLSetConnectAttr( v_hdbc, SQL_ATTR_PACKET_SIZE, (SQLPOINTER)aptr-
>pack_size, SQL_IS_UINTEGER );
        if (rc != SQL_SUCCESS)
                HandleErrorDBC(v_hdbc);

        rc = SQLDriverConnect ( v_hdbc,
                                                NULL,

        (SQLCHAR*)&szDriverString[0] ,
                                                        SQL_NTS,

        (SQLCHAR*)&szDriverStringOut[0],

        sizeof(szDriverStringOut),
                                                        &cbDriverStringOut,
                                                        SQL_DRIVER_NOPROMPT );

        // if the rc is SQL_ERROR, the the TPCC database probably does not exist
        if (rc == SQL_ERROR)
        {
                printf("The database TPCC does not appear to exist!\n");
                printf("\nCheck LOGS\\ directory for database creation
errors.\n");

                // cleanup database connections and handles
                SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
                SQLDisconnect(v_hdbc);
                SQLFreeHandle(SQL_HANDLE_DBC, v_hdbc);

                // since there is not a database, exit back to SETUP.CMD
                exit(1);
        }

        if ( SQLAllocHandle(SQL_HANDLE_STMT, v_hdbc , &v_hstmt) != SQL_SUCCESS )
                HandleErrorDBC(v_hdbc);

        if ( SQLBindCol(v_hstmt, 1, SQL_C_ULONG, &TabCount, 0, &TabCountInd) !=
SQL_SUCCESS )
                HandleErrorSTMT(v_hstmt);

        // count the number of user tables from sysobjects
        rc = SQLExecDirect(v_hstmt, "select count(*) from sysobjects where xtype =
\'U\'", SQL_NTS);
        if ((rc != SQL_SUCCESS) && (rc != SQL_SUCCESS_WITH_INFO))
                HandleErrorSTMT(v_hstmt);

        if ( SQLFetch(v_hstmt) != SQL_SUCCESS )
                HandleErrorSTMT(v_hstmt);

        // if the number of tables is less than 9, select all the user tables in
TPCC
        if (TabCount != 9)
        {
                SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);

                SQLAllocHandle(SQL_HANDLE_STMT, v_hdbc , &v_hstmt);

                if ( SQLBindCol(v_hstmt, 1, SQL_C_CHAR, &TabName,
sizeof(TabName), &TabNameInd) != SQL_SUCCESS )
                        HandleErrorSTMT(v_hstmt);

                // select the list of user tables into a result set
                rc = SQLExecDirect(v_hstmt, "select * from sysobjects where
xtype = \'U\'", SQL_NTS);
                if ((rc != SQL_SUCCESS) && (rc != SQL_SUCCESS_WITH_INFO))
                        HandleErrorSTMT(v_hstmt);

                // go through the result set and set the bitmap for each found
table
                // set the bitmap to '1' if the table name is found

                while ((rc = SQLFetch(v_hstmt)) != SQL_NO_DATA)
                {
                        switch( TabName[0] )
                        {
                        case 'w':
                                TablesBitMap[0] = '1';
                                break;
                        case 'd':
                                TablesBitMap[1] = '1';
                                break;
                        case 'c':
                                TablesBitMap[2] = '1';
                                break;
                        case 'h':
                                TablesBitMap[3] = '1';
                                break;
                        case 'n':
                                TablesBitMap[4] = '1';
                                break;
                        case 'o':
                                if (TabName[5] = 's')
                                        TablesBitMap[5] = '1';
                                if (TabName[5] = '_')
                                        TablesBitMap[6] = '1';
                                break;
                        case 'i':
                                TablesBitMap[7] = '1';
                                break;
                        case 's':
                                TablesBitMap[8] = '1';
                                break;
                        }
                }

                // a '0' ExitFlag means do NOT exit the loader early, a '1'
means exit the loader early
                ExitFlag = 0;
```

```
                    // interate through the bitmap to display which table(s) is
actually missing
                    for (i = 0; i <= 8; i++)
                    {
                              switch(i)
                              {
                              case 0:
                                        if (TablesBitMap[i] == '0')
                                        {
                                                  printf("The Warehouse table is
missing or damaged.\n");
                                                  ExitFlag = 1;
                                        }
                                        break;
                              case 1:
                                        if (TablesBitMap[i] == '0')
                                        {
                                                  printf("The District table is
missing or damaged.\n");
                                                  ExitFlag = 1;
                                        }
                                        break;
                              case 2:
                                        if (TablesBitMap[i] == '0')
                                        {
                                                  printf("The Customer table is
missing or damaged.\n");
                                                  ExitFlag = 1;
                                        }
                                        break;
                              case 3:
                                        if (TablesBitMap[i] == '0')
                                        {
                                                  printf("The History table is
missing or damaged.\n");
                                                  ExitFlag = 1;
                                        }
                                        break;
                              case 4:
                                        if (TablesBitMap[i] == '0')
                                        {
                                                  printf("The New_Order table is
missing or damaged.\n");
                                                  ExitFlag = 1;
                                        }
                                        break;
                              case 5:
                                        if (TablesBitMap[i] == '0')
                                        {
                                                  printf("The Orders table is
missing or damaged.\n");
                                                  ExitFlag = 1;
                                        }
                                        break;
                              case 6:
                                        if (TablesBitMap[i] == '0')
                                        {
                                                  printf("The Order_Line table is
missing or damaged.\n");
                                                  ExitFlag = 1;
                                        }
                                        break;
                              case 7:
                                        if (TablesBitMap[i] == '0')
                                        {
                                                  printf("The Item table is missing
or damaged.\n");
                                                  ExitFlag = 1;
                                        }
                                        break;
                              case 8:
                                        if (TablesBitMap[i] == '0')
                                        {
                                                  printf("The Stock table is missing
or damaged.\n");
                                                  ExitFlag = 1;
                                        }
                                        break;
                              }
                    }

                    // if one or more tables are missing, display message and exit
the loader
                    if (ExitFlag = 1)
                    {
                              printf("\nExiting TPC-C Loader!\n");
                              printf("\nCheck LOGS\\ directory for database\n");
                              printf("or table creation errors.\n");

                              // cleanup database connections and handles
                              SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
                              SQLDisconnect(v_hdbc);
                              SQLFreeHandle(SQL_HANDLE_DBC, v_hdbc);

                              exit(1);
                    }
          }

          // cleanup database connections and handles
          SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
          SQLDisconnect(v_hdbc);
          SQLFreeHandle(SQL_HANDLE_DBC, v_hdbc);

          return;
}
```

version.sql

```
--  File:     VERSION.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Returns SQL Server version string



print " "
select convert(char(30), getdate(),9)
print " "
go

select @@version
go
```

Appendix C: Tunable Parameters

Microsoft SQL Server 2000 Startup Parameters

C:\Program Files\Microsoft SQL Server\MSSQL\BINN\sqlservr.exe -eC:\Program Files\Microsoft SQL Server\MSSQL\LOG\ERRORLOG -x -c -t3502 –g100

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

-g100 Specify the amount of virtual address space in MB, SQL Server will leave available for memory allocations, excluding the buffer pool and threads stack, such as dynamically-loaded DLLs, extended procedure calls, etc. Incorrect use of this option can lead to conditions under which SQL Server may not start or may encounter runtime errors.

Boot.ini Parameters

```
[boot loader]
timeout=30
default=multi(0)disk(0)rdisk(0)partition(2)\WINNT
[operating systems]
multi(0)disk(0)rdisk(0)partition(2)\WINNT="Microsoft
Windows 2000 Server" /pae /fastdetect
```

Microsoft SQL Server 2000 Configuration Parameters

```
  name                                minimum
maximum     config_value
         run_value
 ----------------------------------- ----------- ----
------- ------------
           -----------
 affinity mask                      -2147483648
2147483647           15
                  15
 allow updates                                0
1            0
                   0
 awe enabled                                  0
1            1
                   1
 c2 audit mode                                0
1            0
                   0
 cost threshold for parallelism               0
32767            5
                   5
 cursor threshold                            -1
2147483647          -1
                  -1
 default full-text language                   0
2147483647         1033
                1033
 default language                             0
9999            0
                   0
 fill factor (%)                              0
100            0
                   0
 index create memory (KB)                   704
2147483647          704
                 704
 lightweight pooling                          0
1            1
                   1
 locks                                     5000
2147483647         9000
                9000
 max degree of parallelism                    0
32            1
                   1
 max server memory (MB)                       4
2147483647   2147483647
          2147483647
 max text repl size (B)                       0
2147483647        65536
                65536
 max worker threads                          32
32767          230
                 230
 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
65536          512
                 512
 open objects                                 0
2147483647            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           67
                  67
 remote access                                0
1            1
                   1
 remote login timeout (s)                     0
2147483647           20
                  20
 remote proc trans                            0
1            0
                   0
 remote query timeout (s)                     0
2147483647          600
                 600
 scan for startup procs                       0
1            0
                   0
 set working set size                         0
1            0
                   0
 show advanced options                        0
1            1
                   1
```

```
 two digit year cutoff                          1753
9999         2049
               2049
 user connections                                 0
32767            0
                 0
 user options                                     0
32767            0
                 0

1> 2> 3>
```

Benchcraft Profile

```
Profile:  Art_3140_4cl
File Path:          C:\BenchCraft\Art_3140_4cl.pro
Version:  3

         Number of Engines: 4

                  Name: cl81
                  Description:
                  Directory: c:\blog\cl81.log
                  Machine: N17
                  Parameter Set: 1.005
                  Index: 0
                  Seed: 18546
                  Configured Users: 7850
                  Pipe Name: DRIVER185943500
                  Connect Rate: 10000
                  Start Rate: 10000
                  Max. Concurrency: 7850
                  Concurrency Rate: 0
                  CLIENT_NURAND: 233
                  CPU: 0

                  Name: cl82
                  Description:
                  Directory: c:\blog\cl82.log
                  Machine: N17
                  Parameter Set: 1.005
                  Index: 50000000
                  Seed: 18546
                  Configured Users: 7850
                  Pipe Name: DRIVER286005718
                  Connect Rate: 10000
                  Start Rate: 10000
                  Max. Concurrency: 7850
                  Concurrency Rate: 0
                  CLIENT_NURAND: 233
                  CPU: 1

                  Name: cl83
                  Description:
                  Directory: c:\blog\cl83.log
                  Machine: N18
                  Parameter Set: 1.005
                  Index: 200000000
                  Seed: 18546
                  Configured Users: 7850
                  Pipe Name: DRIVER34682171
                  Connect Rate: 10000
                  Start Rate: 10000
                  Max. Concurrency: 7850
                  Concurrency Rate: 0
                  CLIENT_NURAND: 233
                  CPU: 0

                  Name: cl84
                  Description:
                  Directory: c:\blog\cl84.log
                  Machine: N18
                  Parameter Set: 1.005
                  Index: 300000000
                  Seed: 18546
                  Configured Users: 7850
                  Pipe Name: DRIVER4145701593
                  Connect Rate: 10000
                  Start Rate: 10000
                  Max. Concurrency: 7850
                  Concurrency Rate: 0
                  CLIENT_NURAND: 233
                  CPU: 1

Number of User groups: 4

                  Driver Engine: cl81
                  IIS Server: cl81c
                  SQL Server: Art
                  Database: tpcc
                  User: sa
                  Protocol: HTML
                  w_id Range: 1 - 785
                  w_id Min Warehouse: 1
                  w_id Max Warehouse: 3140
                  Scale: Normal
                  User Count: 7850
                  District id: 1
                  Scale Down: No

                  Driver Engine: cl82
                  IIS Server: cl82c
                  SQL Server: Art
                  Database: tpcc
                  User: sa
                  Protocol: HTML
                  w_id Range: 786 - 1570
                  w_id Min Warehouse: 1
                  w_id Max Warehouse: 3140
                  Scale: Normal
                  User Count: 7850
                  District id: 1
                  Scale Down: No

                  Driver Engine: cl83
                  IIS Server: cl83c
                  SQL Server: Art
                  Database: tpcc
                  User: sa
                  Protocol: HTML
                  w_id Range: 1571 - 2355
                  w_id Min Warehouse: 1
                  w_id Max Warehouse: 3140
                  Scale: Normal
                  User Count: 7850
                  District id: 1
                  Scale Down: No

                  Driver Engine: cl84
                  IIS Server: cl84c
                  SQL Server: Art
                  Database: tpcc
                  User: sa
                  Protocol: HTML
                  w_id Range: 2356 - 3140
                  w_id Min Warehouse: 1
                  w_id Max Warehouse: 3140
                  Scale: Normal
                  User Count: 7850
                  District id: 1
                  Scale Down: No

          Number of Parameter Sets: 28


                  ~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          44.75
16.00       18.01       0.10       5.00       0.10
                    Payment            43.10
16.00        3.01       0.10       5.00       0.10
                    Delivery            4.05
9.00         2.01       0.10       5.00       0.10
                    Stock Level         4.05
9.00         2.01       0.10      20.00       0.10
                    Order Status        4.05
14.00        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
19.28       18.01       0.10       5.00       0.10
                    Payment            43.10
19.28        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

                    2.0
                    2.0 tt
                                          Txn      Think
Key      RT       RT       Menu
                                       Weight   Time
Time     Delay    Fence    Delay
                    New Order          44.88
24.10       24.10       0.10       5.00       0.10
                    Payment            43.03
24.10       24.10       0.10       5.00       0.10
                    Delivery            4.03
10.10       10.10       0.10       5.00       0.10
                    Stock Level         4.03
10.10       10.10       0.10      20.00       0.10
                    Order Status        4.03
20.10       20.10       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
31.33       18.01       0.10       5.00       0.10
                    Payment            43.10
31.33        3.01       0.10       5.00       0.10
                    Delivery            4.05
13.13        2.01       0.10       5.00       0.10
                    Stock Level         4.05
13.13        2.01       0.10      20.00       0.10
                    Order Status        4.05
26.13        2.01       0.10       5.00       0.10

                    3.0
                    3.0 tt
                                          Txn      Think
Key      RT       RT       Menu
                                       Weight   Time
Time     Delay    Fence    Delay
                    New Order          44.75
36.15       18.01       0.10       5.00       0.10
                    Payment            43.10
36.15        3.01       0.10       5.00       0.10
                    Delivery            4.05
15.15        2.01       0.10       5.00       0.10
                    Stock Level         4.05
15.15        2.01       0.10      20.00       0.10
                    Order Status        4.05
30.15        2.01       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
45.80       18.01       0.10       5.00       0.10
                    Payment            43.10
45.80        3.01       0.10       5.00       0.10
                    Delivery            4.05
19.20        2.01       0.10       5.00       0.10
                    Stock Level         4.05
19.20        2.01       0.10      20.00       0.10
                    Order Status        4.05
38.20        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
43.38       18.01       0.10       5.00       0.10
                    Payment            43.10
43.38        3.01       0.10       5.00       0.10
                    Delivery            4.05
18.18        2.01       0.10       5.00       0.10
                    Stock Level         4.05
18.18        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
40.97       18.01       0.10       5.00       0.10
                    Payment            43.10
40.97        3.01       0.10       5.00       0.10
                    Delivery            4.05
17.17        2.01       0.10       5.00       0.10
                    Stock Level         4.05
17.17        2.01       0.10      20.00       0.10
                    Order Status        4.05
34.17        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
38.56       18.01       0.10       5.00       0.10
                    Payment            43.10
38.56        3.01       0.10       5.00       0.10
                    Delivery            4.05
16.16        2.01       0.10       5.00       0.10
                    Stock Level         4.05
16.16        2.01       0.10      20.00       0.10
                    Order Status        4.05
32.16        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


                    2.4
                    2.4 tt
                                          Txn      Think
Key      RT       RT       Menu
                                       Weight   Time
Time     Delay    Fence    Delay
                    New Order          44.88
28.92       18.01       0.10       5.00       0.10
                    Payment            43.03
28.92        3.01       0.10       5.00       0.10
                    Delivery            4.03
12.12        2.01       0.10       5.00       0.10
                    Stock Level         4.03
12.12        2.01       0.10      20.00       0.10
                    Order Status        4.03
24.12        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          44.86
26.51       18.01       0.10       5.00       0.10
                    Payment            43.05
26.51        3.01       0.10       5.00       0.10
                    Delivery            4.03
11.11        2.01       0.10       5.00       0.10
                    Stock Level         4.03
11.11        2.01       0.10      20.00       0.10
                    Order Status        4.03
22.11        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          44.86
13.25       18.01       0.10       5.00       0.10
                    Payment            43.05
13.25        3.01       0.10       5.00       0.10
                    Delivery            4.03
5.55         2.01       0.10       5.00       0.10
                    Stock Level         4.03
5.55         2.01       0.10      20.00       0.10
                    Order Status        4.03
11.05        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          44.86
14.46       18.01       0.10       5.00       0.10
                    Payment            43.05
14.46        3.01       0.10       5.00       0.10
                    Delivery            4.03
6.06         2.01       0.10       5.00       0.10
                    Stock Level         4.03
6.06         2.01       0.10      20.00       0.10
                    Order Status        4.03
12.06        2.01       0.10       5.00       0.10


                    1.05
                    1.05tt
                                          Txn      Think
Key      RT       RT       Menu
                                       Weight   Time
Time     Delay    Fence    Delay
                    New Order          44.86
12.65       18.01       0.10       5.00       0.10
                    Payment            43.05
12.65        3.01       0.10       5.00       0.10
                    Delivery            4.03
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        4.03
10.55        2.01       0.10       5.00       0.10


                    1.01
                    1.01tt
                                          Txn      Think
Key      RT       RT       Menu
                                       Weight   Time
Time     Delay    Fence    Delay
                    New Order          44.86
12.17       18.01       0.10       5.00       0.10
                    Payment            43.05
12.17        3.01       0.10       5.00       0.10
                    Delivery            4.03
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        4.03
10.15        2.01       0.10       5.00       0.10


                    1.02
                    1.02tt
                                          Txn      Think
Key      RT       RT       Menu
                                       Weight   Time
Time     Delay    Fence    Delay
                    New Order          44.86
12.29       18.01       0.10       5.00       0.10
                    Payment            43.05
12.29        3.01       0.10       5.00       0.10
                    Delivery            4.03
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        4.03
10.25        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          44.86
13.01       18.01       0.10       5.00       0.10
                    Payment            43.05
13.01        3.01       0.10       5.00       0.10
                    Delivery            4.03
5.45         2.01       0.10       5.00       0.10
                    Stock Level         4.03
5.45         2.01       0.10      20.00       0.10
                    Order Status        4.03
10.85        2.01       0.10       5.00       0.10


                    1.06
                    1.06tt
                                          Txn      Think
Key      RT       RT       Menu
                                       Weight   Time
Time     Delay    Fence    Delay
                    New Order          44.86
12.77       18.01       0.10       5.00       0.10
                    Payment            43.05
12.77        3.01       0.10       5.00       0.10
                    Delivery            4.03
5.35         2.01       0.10       5.00       0.10
                    Stock Level         4.03
5.35         2.01       0.10      20.00       0.10
                    Order Status        4.03
10.65        2.01       0.10       5.00       0.10


                    1.07
                    1.07tt
                                          Txn      Think
Key      RT       RT       Menu
                                       Weight   Time
Time     Delay    Fence    Delay
```

```
                    New Order          44.86
12.89       18.01       0.10       5.00       0.10
                    Payment            43.05
12.89        3.01       0.10       5.00       0.10
                    Delivery            4.03
5.40         2.01       0.10       5.00       0.10
                    Stock Level         4.03
5.40         2.01       0.10      20.00       0.10
                    Order Status        4.03
10.75        2.01       0.10       5.00       0.10

                    1.03
                    1.03tt
                                       Txn      Think
Key      RT       RT       Menu
                                      Weight   Time
Time     Delay    Fence    Delay
                    New Order          44.86
12.41       18.01       0.10       5.00       0.10
                    Payment            43.05
12.41        3.01       0.10       5.00       0.10
                    Delivery            4.03
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        4.03
10.35        2.01       0.10       5.00       0.10

                    1.04
                    1.04tt
                                       Txn      Think
Key      RT       RT       Menu
                                      Weight   Time
Time     Delay    Fence    Delay
                    New Order          44.86
12.53       18.01       0.10       5.00       0.10
                    Payment            43.05
12.53        3.01       0.10       5.00       0.10
                    Delivery            4.03
5.25         2.01       0.10       5.00       0.10
                    Stock Level         4.03
5.25         2.01       0.10      20.00       0.10
                    Order Status        4.03
10.45        2.01       0.10       5.00       0.10

                    1.005
                    1.005
                                       Txn      Think
Key      RT       RT       Menu
                                      Weight   Time
Time     Delay    Fence    Delay
                    New Order          44.86
12.11       18.01       0.10       5.00       0.10
                    Payment            43.05
12.11        3.01       0.10       5.00       0.10
                    Delivery            4.03
5.08         2.01       0.10       5.00       0.10
                    Stock Level         4.03
5.08         2.01       0.10      20.00       0.10
                    Order Status        4.03
10.10        2.01       0.10       5.00       0.10
```

Internet Information Server Registry Parameters

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\InetInfo]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\InetInfo\Parameters]
"ListenBackLog"=dword:00002710
"DispatchEntries"=hex(7):4c,00,44,00,41,00,50,00,53,0
0,56,00,43,00,00,00,00,00
"PoolThreadLimit"=dword:00000258
"ThreadTimeout"=dword:00015180
"MaxConnections"=dword:00002af8

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\InetInfo\Performance]
"Library"="infoctrs.dll"
"Open"="OpenINFOPerformanceData"
"Close"="CloseINFOPerformanceData"
"Collect"="CollectINFOPerformanceData"
"Last Counter"=dword:00000842
"Last Help"=dword:00000843
"First Counter"=dword:00000802
"First Help"=dword:00000803
"Library Validation
Code"=hex:78,d4,04,90,33,e8,bf,01,10,25,00,00,00,00,0
0,00
"WbemAdapFileTime"=hex:00,33,eb,ce,35,f3,bf,01
"WbemAdapFileSize"=dword:00002510
"WbemAdapStatus"=dword:00000000
```

World Wide Web Service Registry Parameters

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC]
"Type"=dword:00000020
"Start"=dword:00000002
"ErrorControl"=dword:00000001
"ImagePath"=hex(2):43,00,3a,00,5c,00,57,00,49,00,4e,0
0,4e,00,54,00,5c,00,53,00,\

79,00,73,00,74,00,65,00,6d,00,33,00,32,00,5c,00,69,00
,6e,00,65,00,74,00,73,\

00,72,00,76,00,5c,00,69,00,6e,00,65,00,74,00,69,00,6e
,00,66,00,6f,00,2e,00,\
  65,00,78,00,65,00,00,00
"DisplayName"="World Wide Web Publishing Service"
"DependOnService"=hex(7):49,00,49,00,53,00,41,00,44,0
0,4d,00,49,00,4e,00,00,00,\
  00,00
"DependOnGroup"=hex(7):00,00
"ObjectName"="LocalSystem"
"Description"="Provides Web connectivity and
administration through the Internet Information
Services snap-in."

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\ASP]
"NOTE"="This is for backward compatibility only."

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\ASP\Parameters]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters]
"MajorVersion"=dword:00000005
"MinorVersion"=dword:00000000
"InstallPath"="C:\\WINNT\\System32\\inetsrv"
"CertMapList"="C:\\WINNT\\System32\\inetsrv\\iiscrmap
.dll"
"AccessDeniedMessage"="Error: Access is Denied."
"Filter DLLs"=""
"LogFileDirectory"="C:\\WINNT\\System32\\LogFiles"
"AcceptExOutstanding"=dword:00000028

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\ADCLaunch]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\ADCLaunch\AdvancedDataFactory]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\ADCLaunch\RDSServer.DataFactory]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\Script Map]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\Virtual Roots]
"/"="c:\\inetpub\\wwwroot,,207"
"/Scripts"="c:\\inetpub\\scripts,,204"
"/IISHelp"="c:\\winnt\\help\\iishelp,,201"
"/IISAdmin"="C:\\WINNT\\System32\\inetsrv\\iisadmin,,
201"
"/IISSamples"="c:\\inetpub\\iissamples,,201"
"/MSADC"="c:\\program files\\common
files\\system\\msadc,,205"
"/Printers"="C:\\WINNT\\web\\printers,,201"
```

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Performance]
"Library"="w3ctrs.dll"
"Open"="OpenW3PerformanceData"
"Close"="CloseW3PerformanceData"
"Collect"="CollectW3PerformanceData"
"Last Counter"=dword:000008e6
"Last Help"=dword:000008e7
"First Counter"=dword:00000844
"First Help"=dword:00000845
"Library Validation
Code"=hex:8c,fa,76,93,33,e8,bf,01,10,3d,00,00,00,00,0
0,00
"WbemAdapFileTime"=hex:00,4e,d8,65,ab,1e,c1,01
"WbemAdapFileSize"=dword:00001d10
"WbemAdapStatus"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Security]
"Security"=hex:01,00,14,80,a0,00,00,00,ac,00,00,00,14
,00,00,00,30,00,00,00,02,\

00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00
,00,00,00,00,01,00,00,\

00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,74,00,6f,00,00,00,1c,00,ff,01,0f,00,01
,02,00,00,00,00,00,05,\

20,00,00,00,20,02,00,00,72,00,73,00,00,00,18,00,8d,01
,02,00,01,01,00,00,00,\

00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02
,00,01,02,00,00,00,00,\

00,05,20,00,00,00,23,02,00,00,72,00,73,00,01,01,00,00
,00,00,00,05,12,00,00,\
  00,01,01,00,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Enum]
"0"="Root\\LEGACY_W3SVC\\0000"
"Count"=dword:00000001
"NextInstance"=dword:00000001
```

Server Registry Parameters

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\
Session Manager\I/O System]
"LargeIrpStackLocations"=dword:00000007
"CountOperations"=dword:00000000
```

TPCC Application Registry Parameters

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\TPCC]
"Path"="c:\\inetpub\\wwwroot\\"
"NumberOfDeliveryThreads"=dword:00000008
"MaxConnections"=dword:00002710
"MaxPendingDeliveries"=dword:000003e8
"DB_Protocol"="dblib"
"TxnMonitor"="COM"
"DbServer"="art"
"DbName"="tpcc"
"DbUser"="sa"
"DbPassword"=""
"COM_SinglePool"="YES"
```

Server Bus Performance Driver Registry Parameters

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\cpqcissb]
"Type"=dword:00000001
"Start"=dword:00000000
"ErrorControl"=dword:00000001
"Tag"=dword:00000102
"ImagePath"=hex(2):53,00,79,00,73,00,74,00,65,00,6d,0
0,33,00,32,00,5c,00,44,00,\

52,00,49,00,56,00,45,00,52,00,53,00,5c,00,63,00,70,00
,71,00,63,00,69,00,73,\
  00,73,00,62,00,2e,00,73,00,79,00,73,00,00,00
"DisplayName"="Compaq CISS Controllers Device Driver"
"Group"="port"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\cpqcissb\Parameters]
"CompletionMode"=dword:00000002
"CosTimerRate"=dword:00000008

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\cpqcissb\Parameters\Controller0]
"CompletionMode"=dword:00000001

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\cpqcissb\Security]
"Security"=hex:01,00,14,80,a0,00,00,00,ac,00,00,00,14
,00,00,00,30,00,00,00,02,\

00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00
,00,00,00,00,01,00,00,\

00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,74,00,69,00,00,00,1c,00,ff,01,0f,00,01
,02,00,00,00,00,00,05,\

20,00,00,00,20,02,00,00,76,00,65,00,00,00,18,00,8d,01
,02,00,01,01,00,00,00,\

00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02
,00,01,02,00,00,00,00,\

00,05,20,00,00,00,23,02,00,00,76,00,65,00,01,01,00,00
,00,00,00,05,12,00,00,\
  00,01,01,00,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\cpqcissb\Enum]
"0"="PCI\\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_02\\3
&13c0b0c5&0&30"
"Count"=dword:00000005
"NextInstance"=dword:00000005
"1"="PCI\\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_02\\3
&13c0b0c5&0&40"
"2"="PCI\\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_02\\3
&13c0b0c5&0&48"
"3"="PCI\\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_02\\3
&1070020&0&30"
"4"="PCI\\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_02\\3
&1070020&0&38"
```

Server Disk Device Performance Driver Registry Parameters

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\cpqcissd]
"Type"=dword:00000001
"Start"=dword:00000000
"ErrorControl"=dword:00000001
```

```
"Tag"=dword:00000102
"ImagePath"=hex(2):53,00,79,00,73,00,74,00,65,00,6d,0
0,33,00,32,00,5c,00,44,00,\

52,00,49,00,56,00,45,00,52,00,53,00,5c,00,63,00,70,00
,71,00,63,00,69,00,73,\
  00,73,00,64,00,2e,00,73,00,79,00,73,00,00,00
"DisplayName"="Compaq CISS Controllers Disk Driver"
"Group"="Primary Disk"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\cpqcissd\Security]
"Security"=hex:01,00,14,80,a0,00,00,00,ac,00,00,00,14
,00,00,00,30,00,00,00,02,\

00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00
,00,00,00,00,01,00,00,\

00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,74,00,69,00,00,00,1c,00,ff,01,0f,00,01
,02,00,00,00,00,00,05,\

20,00,00,00,20,02,00,00,76,00,65,00,00,00,18,00,8d,01
,02,00,01,01,00,00,00,\

00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02
,00,01,02,00,00,00,00,\

00,05,20,00,00,00,23,02,00,00,76,00,65,00,01,01,00,00
,00,00,00,05,12,00,00,\
  00,01,01,00,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\cpqcissd\Enum]
"0"="CPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
1fa7999c&0&0000004000000000"
"Count"=dword:0000000d
"NextInstance"=dword:0000000d
"1"="CPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
2b81de8b&0&0000004000000000"
"2"="CPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
2b81de8b&0&0100004000000000"
"3"="CPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
2b81de8b&0&0200004000000000"
"4"="CPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
2eb0dc96&0&0000004000000000"
"5"="CPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
2eb0dc96&0&0100004000000000"
"6"="CPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
2eb0dc96&0&0200004000000000"
"7"="CPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
87bf8e0&0&0000004000000000"
"8"="CPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
87bf8e0&0&0100004000000000"
"9"="CPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
87bf8e0&0&0200004000000000"
"10"="CPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4
&161bf83a&0&0000004000000000"
"11"="CPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4
&161bf83a&0&0100004000000000"
"12"="CPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4
&161bf83a&0&0200004000000000"
```

Client cLAN setting

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniConMgr]
"Type"=dword:00000010
"Start"=dword:00000002
"ErrorControl"=dword:00000001
"ImagePath"=hex(2):25,00,53,00,79,00,73,00,74,00,65,0
0,6d,00,52,00,6f,00,6f,00,\

74,00,25,00,5c,00,53,00,79,00,73,00,74,00,65,00,6d,00
,33,00,32,00,5c,00,47,\

00,6e,00,43,00,6f,00,6e,00,4d,00,67,00,72,00,2e,00,65
,00,78,00,65,00,00,00
"DisplayName"="cLAN Connection Manager"
"Group"="TDI"
"DependOnService"=hex(7):47,00,6e,00,69,00,56,00,49,0
0,41,00,00,00,00,00
"DependOnGroup"=hex(7):00,00
"ObjectName"="LocalSystem"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniConMgr\Parameters]
"NicName"="GniVIA"
"nodeTimeout"=dword:00000023

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniConMgr\Security]
"Security"=hex:01,00,14,80,a0,00,00,00,ac,00,00,00,14
,00,00,00,30,00,00,00,02,\

00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00
,00,00,00,00,01,00,00,\

00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,6e,00,61,00,00,00,1c,00,ff,01,0f,00,01
,02,00,00,00,00,00,05,\

20,00,00,00,20,02,00,00,67,00,65,00,00,00,18,00,8d,01
,02,00,01,01,00,00,00,\

00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02
,00,01,02,00,00,00,00,\

00,05,20,00,00,00,23,02,00,00,67,00,65,00,01,01,00,00
,00,00,00,05,12,00,00,\
  00,01,01,00,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniConMgr\Enum]
"0"="Root\\LEGACY_GNICONMGR\\0000"
"Count"=dword:00000001
"NextInstance"=dword:00000001

?Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GNINDIS]
"Type"=dword:00000001
"Start"=dword:00000002
"ErrorControl"=dword:00000001
"Tag"=dword:0000000c
"ImagePath"=hex(2):53,00,79,00,73,00,74,00,65,00,6d,0
0,33,00,32,00,5c,00,44,00,\

52,00,49,00,56,00,45,00,52,00,53,00,5c,00,67,00,6e,00
,69,00,6e,00,64,00,69,\
  00,73,00,2e,00,73,00,79,00,73,00,00,00
"DisplayName"="cLAN NDIS Driver"
"Group"="NDIS"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GNINDIS\Security]
"Security"=hex:01,00,14,80,a0,00,00,00,ac,00,00,00,14
,00,00,00,30,00,00,00,02,\

00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00
,00,00,00,00,01,00,00,\

00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,00,00,00,00,00,00,1c,00,ff,01,0f,00,01
,02,00,00,00,00,00,05,\

20,00,00,00,20,02,00,00,00,00,00,00,00,00,18,00,8d,01
,02,00,01,01,00,00,00,\

00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02
,00,01,02,00,00,00,00,\

00,05,20,00,00,00,23,02,00,00,00,00,00,00,01,01,00,00
,00,00,00,05,12,00,00,\
  00,01,01,00,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GNINDIS\Enum]
"0"="PCI\\VEN_135B&DEV_0001&SUBSYS_00000000&REV_00\\3
&13c0b0c5&0&30"
"Count"=dword:00000001
"NextInstance"=dword:00000001

?Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniVIA]
"Type"=dword:00000001
"Start"=dword:00000002
"ErrorControl"=dword:00000001
"Tag"=dword:00000006
"ImagePath"=hex(2):53,00,79,00,73,00,74,00,65,00,6d,0
0,33,00,32,00,5c,00,44,00,\
```

```
52,00,49,00,56,00,45,00,52,00,53,00,5c,00,47,00,6e,00
,69,00,56,00,49,00,41,\
  00,2e,00,73,00,79,00,73,00,00,00
"DisplayName"="cLAN VIA Driver"
"Group"="PNP_TDI"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniVIA\Linkage]
"Bind"=hex(7):5c,00,44,00,65,00,76,00,69,00,63,00,65,
00,5c,00,7b,00,30,00,36,\

00,42,00,34,00,45,00,36,00,38,00,44,00,2d,00,35,00,44
,00,39,00,43,00,2d,00,\

34,00,34,00,34,00,38,00,2d,00,39,00,44,00,43,00,37,00
,2d,00,46,00,41,00,39,\

00,41,00,42,00,45,00,35,00,44,00,31,00,46,00,36,00,44
,00,7d,00,00,00,00,00
"Route"=hex(7):22,00,7b,00,30,00,36,00,42,00,34,00,45
,00,36,00,38,00,44,00,2d,\

00,35,00,44,00,39,00,43,00,2d,00,34,00,34,00,34,00,38
,00,2d,00,39,00,44,00,\

43,00,37,00,2d,00,46,00,41,00,39,00,41,00,42,00,45,00
,35,00,44,00,31,00,46,\
  00,36,00,44,00,7d,00,22,00,00,00,00,00
"Export"=hex(7):5c,00,44,00,65,00,76,00,69,00,63,00,6
5,00,5c,00,47,00,6e,00,69,\

00,56,00,49,00,41,00,5f,00,7b,00,30,00,36,00,42,00,34
,00,45,00,36,00,38,00,\

44,00,2d,00,35,00,44,00,39,00,43,00,2d,00,34,00,34,00
,34,00,38,00,2d,00,39,\

00,44,00,43,00,37,00,2d,00,46,00,41,00,39,00,41,00,42
,00,45,00,35,00,44,00,\
  31,00,46,00,36,00,44,00,7d,00,00,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniVIA\Parameters]
@=""
"MaxNumberNics"=dword:00000002

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniVIA\Performance]
"Open"="OpenNicPerformanceData"
"Close"="CloseNicPerformanceData"
"Collect"="CollectNicPerformanceData"
"Library"="gni_perf.dll"
"WbemAdapFileTime"=hex:00,85,27,cd,1d,92,c0,01
"WbemAdapFileSize"=dword:0000c000
"WbemAdapStatus"=dword:00000000
"Last Counter"=dword:00000ab4
"Last Help"=dword:00000ab5
"First Counter"=dword:00000a76
"First Help"=dword:00000a77

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniVIA\Security]
"Security"=hex:01,00,14,80,a0,00,00,00,ac,00,00,00,14
,00,00,00,30,00,00,00,02,\

00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00
,00,00,00,00,01,00,00,\

00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,6e,00,61,00,00,00,1c,00,ff,01,0f,00,01
,02,00,00,00,00,00,05,\

20,00,00,00,20,02,00,00,67,00,65,00,00,00,18,00,8d,01
,02,00,01,01,00,00,00,\

00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02
,00,01,02,00,00,00,00,\

00,05,20,00,00,00,23,02,00,00,67,00,65,00,01,01,00,00
,00,00,00,05,12,00,00,\
  00,01,01,00,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniVIA\Enum]
"0"="Root\\LEGACY_GNIVIA\\0000"
"Count"=dword:00000001
"NextInstance"=dword:00000001
```

Server cLAN setting

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GNINDIS]
"Type"=dword:00000001
"Start"=dword:00000002
"ErrorControl"=dword:00000001
"Tag"=dword:0000000c
"ImagePath"=hex(2):53,00,79,00,73,00,74,00,65,00,6d,0
0,33,00,32,00,5c,00,44,00,\

52,00,49,00,56,00,45,00,52,00,53,00,5c,00,67,00,6e,00
,69,00,6e,00,64,00,69,\
  00,73,00,2e,00,73,00,79,00,73,00,00,00
"DisplayName"="cLAN NDIS Driver"
"Group"="NDIS"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GNINDIS\Security]
"Security"=hex:01,00,14,80,a0,00,00,00,ac,00,00,00,14
,00,00,00,30,00,00,00,02,\

00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00
,00,00,00,00,01,00,00,\

00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,74,00,69,00,00,00,1c,00,ff,01,0f,00,01
,02,00,00,00,00,00,05,\

20,00,00,00,20,02,00,00,76,00,65,00,00,00,18,00,8d,01
,02,00,01,01,00,00,00,\

00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02
,00,01,02,00,00,00,00,\

00,05,20,00,00,00,23,02,00,00,76,00,65,00,01,01,00,00
,00,00,00,05,12,00,00,\
  00,01,01,00,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GNINDIS\Enum]
"0"="PCI\\VEN_135B&DEV_0001&SUBSYS_00000000&REV_00\\3
&13c0b0c5&0&30"
"Count"=dword:00000001
"NextInstance"=dword:00000001

?Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GNINDIS]
"Type"=dword:00000001
"Start"=dword:00000002
"ErrorControl"=dword:00000001
"Tag"=dword:0000000c
"ImagePath"=hex(2):53,00,79,00,73,00,74,00,65,00,6d,0
0,33,00,32,00,5c,00,44,00,\

52,00,49,00,56,00,45,00,52,00,53,00,5c,00,67,00,6e,00
,69,00,6e,00,64,00,69,\
  00,73,00,2e,00,73,00,79,00,73,00,00,00
"DisplayName"="cLAN NDIS Driver"
"Group"="NDIS"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GNINDIS\Security]
"Security"=hex:01,00,14,80,a0,00,00,00,ac,00,00,00,14
,00,00,00,30,00,00,00,02,\

00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00
,00,00,00,00,01,00,00,\

00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,74,00,69,00,00,00,1c,00,ff,01,0f,00,01
,02,00,00,00,00,00,05,\

20,00,00,00,20,02,00,00,76,00,65,00,00,00,18,00,8d,01
,02,00,01,01,00,00,00,\

00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02
,00,01,02,00,00,00,00,\

00,05,20,00,00,00,23,02,00,00,76,00,65,00,01,01,00,00
,00,00,00,05,12,00,00,\
  00,01,01,00,00,00,00,00,05,12,00,00,00
```

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GNINDIS\Enum]
"0"="PCI\\VEN_135B&DEV_0001&SUBSYS_00000000&REV_00\\3
&267a616a&0&38"
"Count"=dword:00000001
"NextInstance"=dword:00000001

?Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniVIA]
"Type"=dword:00000001
"Start"=dword:00000002
"ErrorControl"=dword:00000001
"Tag"=dword:00000006
"ImagePath"=hex(2):53,00,79,00,73,00,74,00,65,00,6d,0
0,33,00,32,00,5c,00,44,00,\

52,00,49,00,56,00,45,00,52,00,53,00,5c,00,47,00,6e,00
,69,00,56,00,49,00,41,\
  00,2e,00,73,00,79,00,73,00,00,00
"DisplayName"="cLAN VIA Driver"
"Group"="PNP_TDI"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniVIA\Linkage]
"Bind"=hex(7):5c,00,44,00,65,00,76,00,69,00,63,00,65,
00,5c,00,7b,00,30,00,33,\

00,37,00,30,00,43,00,37,00,45,00,46,00,2d,00,34,00,37
,00,36,00,43,00,2d,00,\

34,00,45,00,37,00,46,00,2d,00,38,00,30,00,39,00,45,00
,2d,00,38,00,43,00,45,\

00,31,00,44,00,35,00,34,00,41,00,39,00,43,00,37,00,34
,00,7d,00,00,00,00,00
"Route"=hex(7):22,00,7b,00,30,00,33,00,37,00,30,00,43
,00,37,00,45,00,46,00,2d,\

00,34,00,37,00,36,00,43,00,2d,00,34,00,45,00,37,00,46
,00,2d,00,38,00,30,00,\

39,00,45,00,2d,00,38,00,43,00,45,00,31,00,44,00,35,00
,34,00,41,00,39,00,43,\
  00,37,00,34,00,7d,00,22,00,00,00,00,00
"Export"=hex(7):5c,00,44,00,65,00,76,00,69,00,63,00,6
5,00,5c,00,47,00,6e,00,69,\

00,56,00,49,00,41,00,5f,00,7b,00,30,00,33,00,37,00,30
,00,43,00,37,00,45,00,\

46,00,2d,00,34,00,37,00,36,00,43,00,2d,00,34,00,45,00
,37,00,46,00,2d,00,38,\

00,30,00,39,00,45,00,2d,00,38,00,43,00,45,00,31,00,44
,00,35,00,34,00,41,00,\
  39,00,43,00,37,00,34,00,7d,00,00,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniVIA\Parameters]
@=""
"MaxNumberNics"=dword:00000002

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniVIA\Performance]
"Open"="OpenNicPerformanceData"
"Close"="CloseNicPerformanceData"
"Collect"="CollectNicPerformanceData"
"Library"="gni_perf.dll"
"WbemAdapFileTime"=hex:00,85,27,cd,1d,92,c0,01
"WbemAdapFileSize"=dword:0000c000
"WbemAdapStatus"=dword:00000000
"Last Counter"=dword:00001996
"Last Help"=dword:00001997
"First Counter"=dword:00001958
"First Help"=dword:00001959

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniVIA\Security]
"Security"=hex:01,00,14,80,a0,00,00,00,ac,00,00,00,14
,00,00,00,30,00,00,00,02,\

00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00
,00,00,00,00,01,00,00,\

00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,6c,00,65,00,00,00,1c,00,ff,01,0f,00,01
,02,00,00,00,00,00,05,\

20,00,00,00,20,02,00,00,73,00,00,00,00,00,18,00,8d,01
,02,00,01,01,00,00,00,\

00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02
,00,01,02,00,00,00,00,\

00,05,20,00,00,00,23,02,00,00,73,00,00,00,01,01,00,00
,00,00,00,05,12,00,00,\
  00,01,01,00,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\GniVIA\Enum]
"0"="Root\\LEGACY_GNIVIA\\0000"
"Count"=dword:00000001
"NextInstance"=dword:00000001
```

System Summary

```
System Information report written at: 09/26/2001
02:16:00 PM
[System Information]

[ Following are sub-categories of this main category
]

[System Summary]

Item      Value
OS Name   Microsoft Windows 2000 Advanced Server
Version   5.0.2195 Service Pack 2 Build 2195
OS Manufacturer     Microsoft Corporation
System Name         ART
System Manufacturer Compaq
System Model        ProLiant DL580
System Type         X86-based PC
Processor x86 Family 6 Model 10 Stepping 4
GenuineIntel ~902 Mhz
Processor x86 Family 6 Model 10 Stepping 4
GenuineIntel ~902 Mhz
Processor x86 Family 6 Model 10 Stepping 4
GenuineIntel ~902 Mhz
Processor x86 Family 6 Model 10 Stepping 4
GenuineIntel ~902 Mhz
BIOS Version        01/05/01
Windows Directory   C:\WINNT
System Directory    C:\WINNT\System32
Boot Device         \Device\Harddisk0\Partition2
Locale    United States
User Name ART\Administrator
Time Zone Central Daylight Time
Total Physical Memory         8,125,784 KB
Available Physical Memory     7,870,884 KB
Total Virtual Memory          18,145,604 KB
Available Virtual Memory      17,804,952 KB
Page File Space     10,019,820 KB
Page File C:\pagefile.sys

[Hardware Resources]

[ Following are sub-categories of this main category
]

[Conflicts/Sharing]

Resource  Device
IRQ 15    Compaq PCI Hotplug Controller
IRQ 15    Compaq PCI Hotplug Controller

[DMA]

Channel   Device    Status
7         Direct memory access controller         OK
2         Standard floppy disk controller         OK

[Forced Hardware]

Device    PNP Device ID
No Forced Hardware

[I/O]

Address Range       Device    Status
0x0000-0x0CFF       PCI bus   OK
0x0000-0x0CFF       PCI bus   OK
0x0000-0x0CFF       Direct memory access controller
          OK
0x1800-0x18FF       Compaq Advanced System Management
Controller          OK
0x2000-0x20FF       Compaq Smart Array Controller OK
0x2400-0x24FF       ATI Technologies Inc. 3D RAGE IIC
PCI       OK
```

```
0x03B0-0x03BB       ATI Technologies Inc. 3D RAGE IIC
PCI       OK
0x03C0-0x03DF       ATI Technologies Inc. 3D RAGE IIC
PCI       OK
0x0A79-0x0A79       ISAPNP Read Data Port          OK
0x0279-0x0279       ISAPNP Read Data Port          OK
0x02F4-0x02F7       ISAPNP Read Data Port          OK
0x0F50-0x0F58       Motherboard resources          OK
0x0020-0x0021       Programmable interrupt controller
          OK
0x00A0-0x00A1       Programmable interrupt controller
          OK
0x0C00-0x0C01       Programmable interrupt controller
          OK
0x0040-0x0043       System timer        OK
0x0080-0x008F       Direct memory access controller
          OK
0x00C0-0x00DF       Direct memory access controller
          OK
0x040B-0x040B       Direct memory access controller
          OK
0x04D6-0x04D6       Direct memory access controller
          OK
0x0061-0x0061       System speaker      OK
0x0060-0x0060       Standard 101/102-Key or Microsoft
Natural PS/2 Keyboard         OK
0x0064-0x0064       Standard 101/102-Key or Microsoft
Natural PS/2 Keyboard         OK
0x015C-0x015D       Extended IO Bus     OK
0x0220-0x0223       Extended IO Bus     OK
0x0230-0x0231       Extended IO Bus     OK
0x0240-0x0243       Extended IO Bus     OK
0x0250-0x0253       Extended IO Bus     OK
0x0254-0x0257       Extended IO Bus     OK
0x0258-0x025B       Extended IO Bus     OK
0x025D-0x025F       Extended IO Bus     OK
0x0378-0x037F       Printer Port (LPT1) OK
0x03F2-0x03F5       Standard floppy disk controller
          OK
0x03F7-0x03F7       Standard floppy disk controller
          OK
0x03F8-0x03FF       Communications Port (COM1)    OK
0x02F8-0x02FF       Communications Port (COM2)    OK
0x2800-0x280F       Standard Dual Channel PCI IDE
Controller          OK
0x01F0-0x01F7       Primary IDE Channel OK
0x03F6-0x03F6       Primary IDE Channel OK
0x0170-0x0177       Secondary IDE Channel         OK
0x0376-0x0376       Secondary IDE Channel         OK
0x3000-0x38FF       PCI bus   OK
0x3000-0x38FF       Compaq Smart Array 5300
Controller (Non-Miniport)     OK
0x3400-0x34FF       Compaq Smart Array 5300
Controller (Non-Miniport)     OK
0x3800-0x38FF       Compaq Smart Array 5300
Controller (Non-Miniport)     OK
0x4000-0x44FF       PCI bus   OK
0x4000-0x44FF       Compaq Smart Array 5300
Controller (Non-Miniport)     OK
0x4400-0x44FF       Compaq Smart Array 5300
Controller (Non-Miniport)     OK

[IRQs]

IRQ Number          Device
9         Microsoft ACPI-Compliant System
29        Compaq Smart Array Controller
26        cLAN Host Adapter
12        PS/2 Compatible Mouse
1         Standard 101/102-Key or Microsoft Natural
PS/2 Keyboard
6         Standard floppy disk controller
4         Communications Port (COM1)
3         Communications Port (COM2)
14        Primary IDE Channel
15        Compaq PCI Hotplug Controller
15        Compaq PCI Hotplug Controller
16        Compaq Smart Array 5300 Controller (Non-
Miniport)
18        Compaq Smart Array 5300 Controller (Non-
Miniport)
20        Compaq Smart Array 5300 Controller (Non-
Miniport)
22        Compaq Smart Array 5300 Controller (Non-
Miniport)
24        Compaq Smart Array 5300 Controller (Non-
Miniport)

[Memory]

Range     Device    Status
0xA0000-0xBFFFF     PCI bus   OK
0xA0000-0xBFFFF     ATI Technologies Inc. 3D RAGE IIC
PCI       OK
0xF1000000-0xF75FFFFF         PCI bus   OK
0xF1000000-0xF75FFFFF         ATI Technologies Inc.
3D RAGE IIC PCI     OK
0xF75F0000-0xF75F00FF         Compaq Advanced System
Management Controller         OK
0xF6000000-0xF6FFFFFF         Compaq Smart Array
Controller          OK
0xF5000000-0xF5FFFFFF         Compaq Smart Array
Controller          OK
0xF4FF0000-0xF4FF0FFF         ATI Technologies Inc.
3D RAGE IIC PCI     OK
0xF4FC0000-0xF4FDFFFF         cLAN Host Adapter   OK
0xF4C00000-0xF4DFFFFF         cLAN Host Adapter   OK
0xF3000000-0xF3FFFFFF         cLAN Host Adapter   OK
0xF2FF0000-0xF2FFFFFF         cLAN Host Adapter   OK
0xF7600000-0xF7BFFFFF         PCI bus   OK
0xF7600000-0xF7BFFFFF         Compaq Smart Array 5300
Controller (Non-Miniport)     OK
0xF7BF0000-0xF7BF00FF         Compaq PCI Hotplug
Controller          OK
0xF7B80000-0xF7BBFFFF         Compaq Smart Array 5300
Controller (Non-Miniport)     OK
0xF7A00000-0xF7AFFFFF         Compaq Smart Array 5300
Controller (Non-Miniport)     OK
0xF79C0000-0xF79FFFFF         Compaq Smart Array 5300
Controller (Non-Miniport)     OK
0xF7800000-0xF78FFFFF         Compaq Smart Array 5300
Controller (Non-Miniport)     OK
0xF77C0000-0xF77FFFFF         Compaq Smart Array 5300
Controller (Non-Miniport)     OK
0xF7C00000-0xF7FFFFFF         PCI bus   OK
0xF7C00000-0xF7FFFFFF         Compaq Smart Array 5300
Controller (Non-Miniport)     OK
0xF7FF0000-0xF7FF00FF         Compaq PCI Hotplug
Controller          OK
0xF7F80000-0xF7FBFFFF         Compaq Smart Array 5300
Controller (Non-Miniport)     OK
0xF7E00000-0xF7EFFFFF         Compaq Smart Array 5300
Controller (Non-Miniport)     OK
0xF7DC0000-0xF7DFFFFF         Compaq Smart Array 5300
Controller (Non-Miniport)     OK

[Components]

[ Following are sub-categories of this main category
]

[Multimedia]

[ Following are sub-categories of this main category
]

[Audio Codecs]

Codec     Manufacturer        Description
          Status    File      Version   Size
          Creation Date
c:\winnt\system32\msg711.acm  Microsoft Corporation
                    OK
          C:\WINNT\System32\MSG711.ACM  5.00.2134.1
          10.27 KB (10,512 bytes)       12/7/1999
6:00:00 AM
c:\winnt\system32\iac25_32.ax Intel Corporation
          Indeo® audio software         OK
          C:\WINNT\System32\IAC25_32.AX 2.05.53
          195.00 KB (199,680 bytes)     12/7/1999
6:00:00 AM
c:\winnt\system32\tssoft32.acm          DSP GROUP,
INC.                OK
          C:\WINNT\System32\TSSOFT32.ACM
          1.01      9.27 KB (9,488 bytes)
          12/7/1999 6:00:00 AM
c:\winnt\system32\msadp32.acm Microsoft Corporation
                    OK
          C:\WINNT\System32\MSADP32.ACM 5.00.2134.1
          14.77 KB (15,120 bytes)       12/7/1999
6:00:00 AM
c:\winnt\system32\msg723.acm  Microsoft Corporation
                    OK
          C:\WINNT\System32\MSG723.ACM  4.4.3385
          106.77 KB (109,328 bytes)     6/14/2001
11:32:06 AM
c:\winnt\system32\msgsm32.acm Microsoft Corporation
                    OK
          C:\WINNT\System32\MSGSM32.ACM 5.00.2134.1
          22.27 KB (22,800 bytes)       12/7/1999
6:00:00 AM
c:\winnt\system32\imaadp32.acm          Microsoft
Corporation         OK
          C:\WINNT\System32\IMAADP32.ACM
          5.00.2134.1         16.27 KB (16,656 bytes)
          12/7/1999 6:00:00 AM
c:\winnt\system32\lhacm.acm   Microsoft Corporation
                    OK
```

```
          C:\WINNT\System32\LHACM.ACM   4.4.3385
          33.27 KB (34,064 bytes)       6/14/2001
11:32:07 AM

[Video Codecs]

Codec     Manufacturer        Description
          Status    File      Version   Size
          Creation Date
c:\winnt\system32\ir50_32.dll Intel Corporation
          Indeo® video 5.10   OK
          C:\WINNT\System32\IR50_32.DLL
          R.5.10.15.2.55      737.50 KB (755,200
bytes)    12/7/1999 6:00:00 AM
c:\winnt\system32\msh261.drv  Microsoft Corporation
                    OK
          C:\WINNT\System32\MSH261.DRV  4.4.3385
          163.77 KB (167,696 bytes)     6/14/2001
11:32:07 AM
c:\winnt\system32\msh263.drv  Microsoft Corporation
                    OK
          C:\WINNT\System32\MSH263.DRV  4.4.3385
          252.27 KB (258,320 bytes)     6/14/2001
11:31:40 AM
c:\winnt\system32\ir32_32.dll Intel(R) Corporation
                    OK
          C:\WINNT\System32\IR32_32.DLL Not Available
          194.50 KB (199,168 bytes)     12/7/1999
6:00:00 AM
c:\winnt\system32\iccvid.dll  Radius Inc.
          OK        C:\WINNT\System32\ICCVID.DLL
          1.10.0.6  108.00 KB (110,592 bytes)
          12/7/1999 6:00:00 AM
c:\winnt\system32\msrle32.dll Microsoft Corporation
                    OK
          C:\WINNT\System32\MSRLE32.DLL 5.00.2134.1
          10.77 KB (11,024 bytes)       12/7/1999
6:00:00 AM
c:\winnt\system32\msvidc32.dll          Microsoft
Corporation               OK
          C:\WINNT\System32\MSVIDC32.DLL
          5.00.2134.1         27.27 KB (27,920 bytes)
          12/7/1999 6:00:00 AM

[CD-ROM]

Item      Value
Drive     D:
Description         CD-ROM Drive
Media Loaded        False
Media Type          CD-ROM
Name      COMPAQ CD-ROM CRN-8241B
Manufacturer        (Standard CD-ROM drives)
Status    OK
Transfer Rate       Not Available
SCSI Target ID      0
PNP Device ID       IDE\CDROMCOMPAQ_CD-ROM_CRN-
8241B_____________2.23____\39313939312F2F31333120
202020202020202020


[Sound Device]

Item      Value
No sound devices

[Display]

Item      Value
Name      ATI Technologies Inc. 3D RAGE IIC PCI
PNP Device ID
          PCI\VEN_1002&DEV_4756&SUBSYS_00000000&REV_7
A\3&267A616A&0&28
Adapter Type        ATI 3D RAGE IIC PCI (A21), ATI
Technologies Inc. compatible
Adapter Description ATI Technologies Inc. 3D RAGE IIC
PCI
Adapter RAM         4.00 MB (4,194,304 bytes)
Installed Drivers   atiraged.dll
Driver Version      5.00.2174.1
INF File  display.inf (atirage section)
Color Planes        1
Color Table Entries 16777216
Resolution          1024 x 768 x 60 hertz
Bits/Pixel          24


[Infrared]

Item      Value
No infrared devices

[Input]

[ Following are sub-categories of this main category
]

[Keyboard]

Item      Value
Description         Standard 101/102-Key or Microsoft
Natural PS/2 Keyboard
Name      Enhanced (101- or 102-key)
Layout    00000409
PNP Device ID       ACPI\PNP0303\4&F0B8F99&0
NumberOfFunctionKeys          12


[Pointing Device]

Item      Value
Hardware Type       PS/2 Compatible Mouse
Number of Buttons   3
Status    OK
PNP Device ID       ACPI\PNP0F13\4&F0B8F99&0
Power Management Supported    False
Double Click Threshold        6
Handedness          Right Handed Operation


[Modem]

Item      Value
No modems

[Network]

[ Following are sub-categories of this main category
]

[Adapter]

Item      Value
Name      [00000000] cLAN Host Adapter
Adapter Type        Ethernet 802.3
Product Name        cLAN Host Adapter
Installed True
PNP Device ID
          PCI\VEN_135B&DEV_0001&SUBSYS_00000000&REV_0
0\3&267A616A&0&38
Last Reset          9/25/2001 11:32:39 AM
Index     0
Service Name        GNINDIS
IP Address          144.168.1.80
IP Subnet 255.255.0.0
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         00:90:FA:00:16:23
Service Name        GNINDIS
IRQ Number          26
Driver    c:\winnt\system32\drivers\gnindis.sys
(22726, 4.2.0.75)

Name      [00000002] RAS Async Adapter
Adapter Type        Not Available
Product Name        RAS Async Adapter
Installed True
PNP Device ID       Not Available
Last Reset          9/25/2001 11:32:39 AM
Index     2
Service Name        AsyncMac
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Service Name        Not Available

Name      [00000003] WAN Miniport (L2TP)
Adapter Type        Not Available
Product Name        WAN Miniport (L2TP)
Installed True
PNP Device ID       ROOT\MS_L2TPMINIPORT\0000
Last Reset          9/25/2001 11:32:39 AM
Index     3
Service Name        Rasl2tp
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
```

```
MAC Address          Not Available
Service Name         Rasl2tp
Driver    c:\winnt\system32\drivers\rasl2tp.sys
(50800, 5.00.2179.1)

Name      [00000004] WAN Miniport (PPTP)
Adapter Type         Wide Area Network (WAN)
Product Name         WAN Miniport (PPTP)
Installed True
PNP Device ID        ROOT\MS_PPTPMINIPORT\0000
Last Reset           9/25/2001 11:32:39 AM
Index     4
Service Name         PptpMiniport
IP Address           Not Available
IP Subnet Not Available
Default IP Gateway   Not Available
DHCP Enabled         False
DHCP Server          Not Available
DHCP Lease Expires   Not Available
DHCP Lease Obtained Not Available
MAC Address          50:50:54:50:30:30
Service Name         PptpMiniport
Driver    c:\winnt\system32\drivers\raspptp.sys
(47856, 5.00.2160.1)

Name      [00000005] Direct Parallel
Adapter Type         Not Available
Product Name         Direct Parallel
Installed True
PNP Device ID        ROOT\MS_PTIMINIPORT\0000
Last Reset           9/25/2001 11:32:39 AM
Index     5
Service Name         Raspti
IP Address           Not Available
IP Subnet Not Available
Default IP Gateway   Not Available
DHCP Enabled         False
DHCP Server          Not Available
DHCP Lease Expires   Not Available
DHCP Lease Obtained Not Available
MAC Address          Not Available
Service Name         Raspti
Driver    c:\winnt\system32\drivers\raspti.sys
(16880, 5.00.2146.1)

Name      [00000006] WAN Miniport (IP)
Adapter Type         Not Available
Product Name         WAN Miniport (IP)
Installed True
PNP Device ID        ROOT\MS_NDISWANIP\0000
Last Reset           9/25/2001 11:32:39 AM
Index     6
Service Name         NdisWan
IP Address           Not Available
IP Subnet Not Available
Default IP Gateway   Not Available
DHCP Enabled         False
DHCP Server          Not Available
DHCP Lease Expires   Not Available
DHCP Lease Obtained Not Available
MAC Address          Not Available
Service Name         NdisWan
Driver    c:\winnt\system32\drivers\ndiswan.sys
(90096, 5.00.2195.2779)


[Protocol]

Item      Value
Name      MSAFD Tcpip [TCP/IP]
ConnectionlessService          False
GuaranteesDelivery   True
GuaranteesSequencing           True
MaximumAddressSize   16 bytes
MaximumMessageSize   0 bytes
MessageOriented      False
MinimumAddressSize   16 bytes
PseudoStreamOriented           False
SupportsBroadcasting           False
SupportsConnectData False
SupportsDisconnectData         False
SupportsEncryption   False
SupportsExpeditedData          True
SupportsGracefulClosing        True
SupportsGuaranteedBandwidth    False
SupportsMulticasting           False

Name      MSAFD Tcpip [UDP/IP]
ConnectionlessService          True
GuaranteesDelivery   False
GuaranteesSequencing           False
MaximumAddressSize   16 bytes
MaximumMessageSize   65467 bytes
MessageOriented      True
MinimumAddressSize   16 bytes
PseudoStreamOriented           False
SupportsBroadcasting           True
SupportsConnectData False
SupportsDisconnectData         False
SupportsEncryption   False
SupportsExpeditedData          False
SupportsGracefulClosing        False
SupportsGuaranteedBandwidth    False
SupportsMulticasting           True

Name      RSVP UDP Service Provider
ConnectionlessService          True
GuaranteesDelivery   False
GuaranteesSequencing           False
MaximumAddressSize   16 bytes
MaximumMessageSize   65467 bytes
MessageOriented      True
MinimumAddressSize   16 bytes
PseudoStreamOriented           False
SupportsBroadcasting           True
SupportsConnectData False
SupportsDisconnectData         False
SupportsEncryption   True
SupportsExpeditedData          False
SupportsGracefulClosing        False
SupportsGuaranteedBandwidth    False
SupportsMulticasting           True

Name      RSVP TCP Service Provider
ConnectionlessService          False
GuaranteesDelivery   True
GuaranteesSequencing           True
MaximumAddressSize   16 bytes
MaximumMessageSize   0 bytes
MessageOriented      False
MinimumAddressSize   16 bytes
PseudoStreamOriented           False
SupportsBroadcasting           False
SupportsConnectData False
SupportsDisconnectData         False
SupportsEncryption   True
SupportsExpeditedData          True
SupportsGracefulClosing        True
SupportsGuaranteedBandwidth    False
SupportsMulticasting           False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{0370C7EF-476C-4E7F-809E-
8CE1D54A9C74}] SEQPACKET 0
ConnectionlessService          False
GuaranteesDelivery   True
GuaranteesSequencing           True
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented           False
SupportsBroadcasting           False
SupportsConnectData False
SupportsDisconnectData         False
SupportsEncryption   False
SupportsExpeditedData          False
SupportsGracefulClosing        False
SupportsGuaranteedBandwidth    False
SupportsMulticasting           False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{0370C7EF-476C-4E7F-809E-
8CE1D54A9C74}] DATAGRAM 0
ConnectionlessService          True
GuaranteesDelivery   False
GuaranteesSequencing           False
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented           False
SupportsBroadcasting           True
SupportsConnectData False
SupportsDisconnectData         False
SupportsEncryption   False
SupportsExpeditedData          False
SupportsGracefulClosing        False
SupportsGuaranteedBandwidth    False
SupportsMulticasting           False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{28136119-D465-4EC0-BC62-
58CB12EA8FB4}] SEQPACKET 2
ConnectionlessService          False
GuaranteesDelivery   True
GuaranteesSequencing           True
MaximumAddressSize   20 bytes
```

```
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{28136119-D465-4EC0-BC62-
58CB12EA8FB4}] DATAGRAM 2
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{9A042959-DD79-4A35-BAA9-
E28F3C5EF97E}] SEQPACKET 3
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{9A042959-DD79-4A35-BAA9-
E28F3C5EF97E}] DATAGRAM 3
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False


[WinSock]

Item      Value
File      c:\winnt\system32\winsock.dll
Version   3.10
Size      2.80 KB (2,864 bytes)

File      c:\winnt\system32\wsock32.dll
Version   5.00.2195.2871
Size      21.27 KB (21,776 bytes)


[Ports]

[ Following are sub-categories of this main category
]

[Serial]

Item      Value
Name      COM1
Status    OK
PNP Device ID       ACPI\PNP0501\0
Maximum Input Buffer Size     0
Maximum Output Buffer Size    False
Settable Baud Rate  True
Settable Data Bits  True
Settable Flow Control         True
Settable Parity     True
Settable Parity Check         True
Settable Stop Bits  True
Settable RLSD       True
Supports RLSD       True
Supports 16 Bit Mode          False
Supports Special Characters   False
Baud Rate 9600
Bits/Byte 8
Stop Bits 1
Parity    None
Busy      0
Abort Read/Write on Error     0
Binary Mode Enabled -1
Continue XMit on XOff         0
CTS Outflow Control 0
Discard NULL Bytes  0
DSR Outflow Control 0
DSR Sensitivity     0
DTR Flow Control Type         Enable
EOF Character       0
Error Replace Character       0
Error Replacement Enabled     0
Event Character     0
Parity Check Enabled          0
RTS Flow Control Type         Enable
XOff Character      19
XOffXMit Threshold  512
XOn Character       17
XOnXMit Threshold   2048
XOnXOff InFlow Control        0
XOnXOff OutFlow Control       0
IRQ Number          4
I/O Port  0x03F8-0x03FF
Driver    c:\winnt\system32\drivers\serial.sys
(62416, 5.00.2195.2780)

Name      COM2
Status    OK
PNP Device ID       ACPI\PNP0501\1
Maximum Input Buffer Size     0
Maximum Output Buffer Size    False
Settable Baud Rate  True
Settable Data Bits  True
Settable Flow Control         True
Settable Parity     True
Settable Parity Check         True
Settable Stop Bits  True
Settable RLSD       True
Supports RLSD       True
Supports 16 Bit Mode          False
Supports Special Characters   False
Baud Rate 9600
Bits/Byte 8
Stop Bits 1
Parity    None
Busy      0
Abort Read/Write on Error     0
Binary Mode Enabled -1
Continue XMit on XOff         0
CTS Outflow Control 0
Discard NULL Bytes  0
DSR Outflow Control 0
DSR Sensitivity     0
DTR Flow Control Type         Enable
EOF Character       0
Error Replace Character       0
Error Replacement Enabled     0
Event Character     0
Parity Check Enabled          0
RTS Flow Control Type         Enable
XOff Character      19
XOffXMit Threshold  512
XOn Character       17
XOnXMit Threshold   2048
XOnXOff InFlow Control        0
XOnXOff OutFlow Control       0
IRQ Number          3
I/O Port  0x02F8-0x02FF
Driver    c:\winnt\system32\drivers\serial.sys
(62416, 5.00.2195.2780)


[Parallel]

Item      Value
Name      LPT1
```

```
PNP Device ID       ACPI\PNP0400\5&24F21E77&0


[Storage]

[ Following are sub-categories of this main category
]

[Drives]

Item      Value
Drive     A:
Description         3 1/2 Inch Floppy Drive

Drive     C:
Description         Local Fixed Disk
Compressed          False
File System         NTFS
Size      8.43 GB (9,049,370,624 bytes)
Free Space          4.76 GB (5,110,607,872 bytes)
Volume Name
Volume Serial Number          B4627329
Partition Disk #13, Partition #1
Partition Size      8.43 GB (9,049,374,720 bytes)
Starting Offset     37601280 bytes
Drive Description   Compaq SCSI Drive Array
Drive Manufacturer  Compaq
Drive Model         Compaq Disk Array SCSI Disk
Device
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    2
Drive SCSIBus       0
Drive SCSILogicalUnit         0
Drive SCSIPort      2
Drive SCSITargetId  0
Drive SectorsPerTrack         32
Drive Size          9091153920 bytes
Drive TotalCylinders          2176
Drive TotalSectors  17756160
Drive TotalTracks   554880
Drive TracksPerCylinder       255

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
Partition Disk #0, Partition #0
Partition Size      118.70 GB (127,450,681,344 bytes)
Starting Offset     32256 bytes
Drive Description   \\.\PHYSICALDRIVE0
Drive Manufacturer  Not Available
Drive Model         Not Available
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       Not Available
Drive SCSILogicalUnit         Not Available
Drive SCSIPort      Not Available
Drive SCSITargetId  Not Available
Drive SectorsPerTrack         63
Drive Size          127458938880 bytes
Drive TotalCylinders          15496
Drive TotalSectors  248943240
Drive TotalTracks   3951480
Drive TracksPerCylinder       255

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
Partition Disk #1, Partition #0
Partition Size      53.71 GB (57,667,405,824 bytes)
Starting Offset     32256 bytes
Drive Description   \\.\PHYSICALDRIVE1
Drive Manufacturer  Not Available
Drive Model         Not Available
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       Not Available
Drive SCSILogicalUnit         Not Available
Drive SCSIPort      Not Available
Drive SCSITargetId  Not Available
Drive SectorsPerTrack         63
Drive Size          57667438080 bytes
Drive TotalCylinders          7011
Drive TotalSectors  112631715
Drive TotalTracks   1787805
Drive TracksPerCylinder       255

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
Partition Disk #4, Partition #0
Partition Size      53.71 GB (57,667,405,824 bytes)
Starting Offset     32256 bytes
Drive Description   \\.\PHYSICALDRIVE4
Drive Manufacturer  Not Available
Drive Model         Not Available
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       Not Available
Drive SCSILogicalUnit         Not Available
Drive SCSIPort      Not Available
Drive SCSITargetId  Not Available
Drive SectorsPerTrack         63
Drive Size          57667438080 bytes
Drive TotalCylinders          7011
Drive TotalSectors  112631715
Drive TotalTracks   1787805
Drive TracksPerCylinder       255

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
Partition Disk #7, Partition #0
Partition Size      53.71 GB (57,667,405,824 bytes)
Starting Offset     32256 bytes
Drive Description   \\.\PHYSICALDRIVE7
Drive Manufacturer  Not Available
Drive Model         Not Available
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       Not Available
Drive SCSILogicalUnit         Not Available
Drive SCSIPort      Not Available
Drive SCSITargetId  Not Available
Drive SectorsPerTrack         63
Drive Size          57667438080 bytes
Drive TotalCylinders          7011
Drive TotalSectors  112631715
Drive TotalTracks   1787805
Drive TracksPerCylinder       255

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
Partition Disk #10, Partition #0
Partition Size      53.71 GB (57,667,405,824 bytes)
Starting Offset     32256 bytes
Drive Description   \\.\PHYSICALDRIVE10
Drive Manufacturer  Not Available
Drive Model         Not Available
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       Not Available
Drive SCSILogicalUnit         Not Available
Drive SCSIPort      Not Available
Drive SCSITargetId  Not Available
Drive SectorsPerTrack         63
Drive Size          57667438080 bytes
Drive TotalCylinders          7011
Drive TotalSectors  112631715
Drive TotalTracks   1787805
Drive TracksPerCylinder       255
```

```
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
Partition Disk #2, Partition #0
Partition Size      26.36 GB (28,303,156,224 bytes)
Starting Offset     32256 bytes
Drive Description   \\.\PHYSICALDRIVE2
Drive Manufacturer  Not Available
Drive Model         Not Available
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       Not Available
Drive SCSILogicalUnit         Not Available
Drive SCSIPort      Not Available
Drive SCSITargetId  Not Available
Drive SectorsPerTrack         63
Drive Size          28303188480 bytes
Drive TotalCylinders          3441
Drive TotalSectors  55279665
Drive TotalTracks   877455
Drive TracksPerCylinder       255

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
Partition Disk #5, Partition #0
Partition Size      26.36 GB (28,303,156,224 bytes)
Starting Offset     32256 bytes
Drive Description   \\.\PHYSICALDRIVE5
Drive Manufacturer  Not Available
Drive Model         Not Available
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       Not Available
Drive SCSILogicalUnit         Not Available
Drive SCSIPort      Not Available
Drive SCSITargetId  Not Available
Drive SectorsPerTrack         63
Drive Size          28303188480 bytes
Drive TotalCylinders          3441
Drive TotalSectors  55279665
Drive TotalTracks   877455
Drive TracksPerCylinder       255

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
Partition Disk #8, Partition #0
Partition Size      26.36 GB (28,303,156,224 bytes)
Starting Offset     32256 bytes
Drive Description   \\.\PHYSICALDRIVE8
Drive Manufacturer  Not Available
Drive Model         Not Available
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       Not Available
Drive SCSILogicalUnit         Not Available
Drive SCSIPort      Not Available
Drive SCSITargetId  Not Available
Drive SectorsPerTrack         63
Drive Size          28303188480 bytes
Drive TotalCylinders          3441
Drive TotalSectors  55279665
Drive TotalTracks   877455
Drive TracksPerCylinder       255

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
Partition Disk #11, Partition #0
Partition Size      26.36 GB (28,303,156,224 bytes)
Starting Offset     32256 bytes
Drive Description   \\.\PHYSICALDRIVE11
Drive Manufacturer  Not Available
Drive Model         Not Available
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       Not Available
Drive SCSILogicalUnit         Not Available
Drive SCSIPort      Not Available
Drive SCSITargetId  Not Available
Drive SectorsPerTrack         63
Drive Size          28303188480 bytes
Drive TotalCylinders          3441
Drive TotalSectors  55279665
Drive TotalTracks   877455
Drive TracksPerCylinder       255

Drive     W:
Description         Local Fixed Disk
Compressed          False
File System         NTFS
Size      316.07 GB (339,375,017,984 bytes)
Free Space          199.86 GB (214,600,847,360 bytes)
Volume Name         back1
Volume Serial Number          60C0E590
Partition Disk #3, Partition #0
Partition Size      316.07 GB (339,375,020,544 bytes)
Starting Offset     32256 bytes
Drive Description   \\.\PHYSICALDRIVE3
Drive Manufacturer  Not Available
Drive Model         Not Available
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       Not Available
Drive SCSILogicalUnit         Not Available
Drive SCSIPort      Not Available
Drive SCSITargetId  Not Available
Drive SectorsPerTrack         63
Drive Size          339383278080 bytes
Drive TotalCylinders          41261
Drive TotalSectors  662857965
Drive TotalTracks   10521555
Drive TracksPerCylinder       255

Drive     X:
Description         Local Fixed Disk
Compressed          False
File System         NTFS
Size      316.07 GB (339,375,017,984 bytes)
Free Space          187.49 GB (201,319,596,032 bytes)
Volume Name         back2
Volume Serial Number          6CFBFD50
Partition Disk #6, Partition #0
Partition Size      316.07 GB (339,375,020,544 bytes)
Starting Offset     32256 bytes
Drive Description   \\.\PHYSICALDRIVE6
Drive Manufacturer  Not Available
Drive Model         Not Available
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       Not Available
Drive SCSILogicalUnit         Not Available
Drive SCSIPort      Not Available
Drive SCSITargetId  Not Available
Drive SectorsPerTrack         63
Drive Size          339383278080 bytes
Drive TotalCylinders          41261
Drive TotalSectors  662857965
Drive TotalTracks   10521555
Drive TracksPerCylinder       255

Drive     Y:
Description         Local Fixed Disk
Compressed          False
File System         NTFS
Size      316.07 GB (339,375,017,984 bytes)
Free Space          187.92 GB (201,775,390,720 bytes)
Volume Name         back3
Volume Serial Number          1836BA46
Partition Disk #9, Partition #0
Partition Size      316.07 GB (339,375,020,544 bytes)
Starting Offset     32256 bytes
Drive Description   \\.\PHYSICALDRIVE9
Drive Manufacturer  Not Available
Drive Model         Not Available
Drive BytesPerSector          512
```

```
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       Not Available
Drive SCSILogicalUnit         Not Available
Drive SCSIPort      Not Available
Drive SCSITargetId  Not Available
Drive SectorsPerTrack         63
Drive Size          339383278080 bytes
Drive TotalCylinders          41261
Drive TotalSectors  662857965
Drive TotalTracks   10521555
Drive TracksPerCylinder       255

Drive     Z:
Description         Local Fixed Disk
Compressed          False
File System         NTFS
Size      316.07 GB (339,375,017,984 bytes)
Free Space          199.86 GB (214,599,569,408 bytes)
Volume Name         back4
Volume Serial Number          486E2424
Partition Disk #12, Partition #0
Partition Size      316.07 GB (339,375,020,544 bytes)
Starting Offset     32256 bytes
Drive Description   \\.\PHYSICALDRIVE12
Drive Manufacturer  Not Available
Drive Model         Not Available
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       Not Available
Drive SCSILogicalUnit         Not Available
Drive SCSIPort      Not Available
Drive SCSITargetId  Not Available
Drive SectorsPerTrack         63
Drive Size          339383278080 bytes
Drive TotalCylinders          41261
Drive TotalSectors  662857965
Drive TotalTracks   10521555
Drive TracksPerCylinder       255

Drive     E:
Description         Network Connection
Provider Name       \\cl81\c$


[SCSI]

Item      Value
Name      Compaq Smart Array Controller
Caption   Compaq Smart Array Controller
Driver    cpqarry2
Status    OK
PNP Device ID
          PCI\VEN_1000&DEV_0010&SUBSYS_40400E11&REV_0
2\3&267A616A&0&20
Device ID
          PCI\VEN_1000&DEV_0010&SUBSYS_40400E11&REV_0
2\3&267A616A&0&20
Device Map          Not Available
Index     Not Available
Max Number Controlled         Not Available
IRQ Number          29
I/O Port  0x2000-0x20FF
Driver    c:\winnt\system32\drivers\cpqarry2.sys
(13424, 5.00.2139.1)

Name      Compaq Smart Array 5300 Controller (Non-
Miniport)
Caption   Compaq Smart Array 5300 Controller (Non-
Miniport)
Driver    cpqcissb
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_0
2\3&13C0B0C5&0&30
Device ID
          PCI\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_0
2\3&13C0B0C5&0&30
Device Map          Not Available
Index     Not Available
Max Number Controlled         Not Available
IRQ Number          16
I/O Port  0x3000-0x38FF
Driver    c:\winnt\system32\drivers\cpqcissb.sys
(36096, 5.01.10.02)

Name      Compaq Smart Array 5300 Controller (Non-
Miniport)
Caption   Compaq Smart Array 5300 Controller (Non-
Miniport)
Driver    cpqcissb
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_0
2\3&13C0B0C5&0&40
Device ID
          PCI\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_0
2\3&13C0B0C5&0&40
Device Map          Not Available
Index     Not Available
Max Number Controlled         Not Available
IRQ Number          18
I/O Port  0x3400-0x34FF
Driver    c:\winnt\system32\drivers\cpqcissb.sys
(36096, 5.01.10.02)

Name      Compaq Smart Array 5300 Controller (Non-
Miniport)
Caption   Compaq Smart Array 5300 Controller (Non-
Miniport)
Driver    cpqcissb
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_0
2\3&13C0B0C5&0&48
Device ID
          PCI\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_0
2\3&13C0B0C5&0&48
Device Map          Not Available
Index     Not Available
Max Number Controlled         Not Available
IRQ Number          20
I/O Port  0x3800-0x38FF
Driver    c:\winnt\system32\drivers\cpqcissb.sys
(36096, 5.01.10.02)

Name      Compaq Smart Array 5300 Controller (Non-
Miniport)
Caption   Compaq Smart Array 5300 Controller (Non-
Miniport)
Driver    cpqcissb
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_0
2\3&1070020&0&30
Device ID
          PCI\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_0
2\3&1070020&0&30
Device Map          Not Available
Index     Not Available
Max Number Controlled         Not Available
IRQ Number          22
I/O Port  0x4000-0x44FF
Driver    c:\winnt\system32\drivers\cpqcissb.sys
(36096, 5.01.10.02)

Name      Compaq Smart Array 5300 Controller (Non-
Miniport)
Caption   Compaq Smart Array 5300 Controller (Non-
Miniport)
Driver    cpqcissb
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_0
2\3&1070020&0&38
Device ID
          PCI\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_0
2\3&1070020&0&38
Device Map          Not Available
Index     Not Available
Max Number Controlled         Not Available
IRQ Number          24
I/O Port  0x4400-0x44FF
Driver    c:\winnt\system32\drivers\cpqcissb.sys
(36096, 5.01.10.02)


[Printing]

Name      Port Name Server Name
No printing information

[Problem Devices]

Device    PNP Device ID       Error Code
No Problem Devices

[USB]

Device    PNP Device ID
No USB Devices

[Software Environment]

[ Following are sub-categories of this main category
]
```

```
[Drivers]

Name      Description         File      Type
          Started   Start Mode          State
          Status    Error Control       Accept Pause
          Accept Stop
abiosdsk  Abiosdsk  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Ignore    False     False
abp480n5  abp480n5  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
acpi      Microsoft ACPI Driver
          c:\winnt\system32\drivers\acpi.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
acpiec    ACPIEC
          c:\winnt\system32\drivers\acpiec.sys
          Kernel Driver       False     Disabled
          Stopped   OK        Normal    False
          False
adpu160m  adpu160m  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
afd       AFD Networking Support Environment
          c:\winnt\system32\drivers\afd.sys
          Kernel Driver       True      Auto
          Running   OK        Normal    False
          True
aha154x   Aha154x   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
aic116x   aic116x   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
aic78u2   aic78u2   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
aic78xx   aic78xx   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ami0nt    ami0nt    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
amsint    amsint    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
asc       asc       Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
asc3350p  asc3350p  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
asc3550   asc3550   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
asyncmac  RAS Asynchronous Media Driver
          c:\winnt\system32\drivers\asyncmac.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
atapi     Standard IDE/ESDI Hard Disk Controller
          c:\winnt\system32\drivers\atapi.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
atdisk    Atdisk    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Ignore    False     False
atirage   atirage
          c:\winnt\system32\drivers\atiragem.sys
          Kernel Driver       True      Manual
          Running   OK        Ignore    False
          True
atmarpc   ATM ARP Client Protocol
          c:\winnt\system32\drivers\atmarpc.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
audstub   Audio Stub Driver
          c:\winnt\system32\drivers\audstub.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
beep      Beep
          c:\winnt\system32\drivers\beep.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
buslogic  BusLogic  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
cd20xrnt  cd20xrnt  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
cdaudio   Cdaudio
          c:\winnt\system32\drivers\cdaudio.sys
          Kernel Driver       False     System
          Stopped   OK        Ignore    False
          False
cdfs      Cdfs
          c:\winnt\system32\drivers\cdfs.sys
          File System Driver  True      Disabled
          Running   OK        Normal    False
          True
cdrom     CD-ROM Driver
          c:\winnt\system32\drivers\cdrom.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
changer   Changer   Not Available       Kernel Driver
          False     System    Stopped   OK
          Ignore    False     False
cpqarray  Cpqarray  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
cpqarry2  cpqarry2
          c:\winnt\system32\drivers\cpqarry2.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
cpqcissb  Compaq CISS Controllers Device Driver
          c:\winnt\system32\drivers\cpqcissb.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
cpqcissd  Compaq CISS Controllers Disk Driver
          c:\winnt\system32\drivers\cpqcissd.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
cpqfcalm  cpqfcalm  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
cpqfws2e  cpqfws2e  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
dac960nt  dac960nt  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
deckzpsx  deckzpsx  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
dfsdriver DfsDriver c:\winnt\system32\drivers\dfs.sys
          File System Driver  True      Boot
          Running   OK        Normal    False
          True
disk      Disk Driver
          c:\winnt\system32\drivers\disk.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
diskperf  Diskperf
          c:\winnt\system32\drivers\diskperf.sys
          Kernel Driver       False     Disabled
          Stopped   OK        Normal    False
          False
dmboot    dmboot
          c:\winnt\system32\drivers\dmboot.sys
          Kernel Driver       False     Disabled
          Stopped   OK        Normal    False
          False
dmio      Logical Disk Manager Driver
          c:\winnt\system32\drivers\dmio.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
dmload    dmload
          c:\winnt\system32\drivers\dmload.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
efs       EFS       c:\winnt\system32\drivers\efs.sys
          File System Driver  True      Disabled
          Running   OK        Normal    False
          True
fastfat   Fastfat
          c:\winnt\system32\drivers\fastfat.sys
          File System Driver  True      Disabled
          Running   OK        Normal    False
          True
fd16_700  Fd16_700  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
fdc       Floppy Disk Controller Driver
          c:\winnt\system32\drivers\fdc.sys
          Kernel Driver       True      Manual
```

```
          Running   OK        Normal    False
          True
fips      Fips
          c:\winnt\system32\drivers\fips.sys
          Kernel Driver       True      Auto
          Running   OK        Normal    False
          True
fireport  fireport  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
flashpnt  flashpnt  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
flpydisk  Floppy Disk Driver
          c:\winnt\system32\drivers\flpydisk.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ftdisk    Volume Manager Driver
          c:\winnt\system32\drivers\ftdisk.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
gnindis   cLAN NDIS Driver
          c:\winnt\system32\drivers\gnindis.sys
          Kernel Driver       True      Auto
          Running   OK        Normal    False
          True
gnivia    cLAN VIA Driver
          c:\winnt\system32\drivers\gnivia.sys
          Kernel Driver       True      Auto
          Running   OK        Normal    False
          True
gpc       Generic Packet Classifier
          c:\winnt\system32\drivers\msgpc.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
i8042prt  i8042 Keyboard and PS/2 Mouse Port Driver
          c:\winnt\system32\drivers\i8042prt.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
ini910u   ini910u   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
intelide  IntelIde  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ipfilterdriver      IP Traffic Filter Driver
          c:\winnt\system32\drivers\ipfltdrv.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
ipinip    IP in IP Tunnel Driver
          c:\winnt\system32\drivers\ipinip.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
ipnat     IP Network Address Translator
          c:\winnt\system32\drivers\ipnat.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
ipsec     IPSEC driver
          c:\winnt\system32\drivers\ipsec.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ipsraidn  ipsraidn  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
isapnp    PnP ISA/EISA Bus Driver
          c:\winnt\system32\drivers\isapnp.sys
          Kernel Driver       True      Boot
          Running   OK        Critical  False
          True
kbdclass  Keyboard Class Driver
          c:\winnt\system32\drivers\kbdclass.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
ksecdd    KSecDD
          c:\winnt\system32\drivers\ksecdd.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
lbrtfdc   lbrtfdc   Not Available       Kernel Driver
          False     System    Stopped   OK
          Ignore    False     False
lp6nds35  lp6nds35  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
mnmdd     mnmdd
          c:\winnt\system32\drivers\mnmdd.sys
          Kernel Driver       True      System
          Running   OK        Ignore    False
          True
modem     Modem
          c:\winnt\system32\drivers\modem.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
mouclass  Mouse Class Driver
          c:\winnt\system32\drivers\mouclass.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
mountmgr  MountMgr
          c:\winnt\system32\drivers\mountmgr.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
mraid35x  mraid35x  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
mrxsmb    MRXSMB
          c:\winnt\system32\drivers\mrxsmb.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
msfs      Msfs
          c:\winnt\system32\drivers\msfs.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
msksrv    Microsoft Streaming Service Proxy
          c:\winnt\system32\drivers\msksrv.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
mspclock  Microsoft Streaming Clock Proxy
          c:\winnt\system32\drivers\mspclock.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
mspqm     Microsoft Streaming Quality Manager Proxy
          c:\winnt\system32\drivers\mspqm.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
mup       Mup       c:\winnt\system32\drivers\mup.sys
          File System Driver  True      Boot
          Running   OK        Normal    False
          True
n100      Compaq Ethernet or Fast Ethernet NIC NT
Driver    c:\winnt\system32\drivers\n100nt5.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
ncrc710   Ncrc710   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ndis      NDIS System Driver
          c:\winnt\system32\drivers\ndis.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
ndistapi  Remote Access NDIS TAPI Driver
          c:\winnt\system32\drivers\ndistapi.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ndiswan   Remote Access NDIS WAN Driver
          c:\winnt\system32\drivers\ndiswan.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ndproxy   NDIS Proxy
          c:\winnt\system32\drivers\ndproxy.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
netbios   NetBIOS Interface
          c:\winnt\system32\drivers\netbios.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
netbt     NetBios over Tcpip
          c:\winnt\system32\drivers\netbt.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
netdetect NetDetect
          c:\winnt\system32\drivers\netdtect.sys
          Kernel Driver       False     Manual
```

```
          Stopped   OK        Normal    False
          False
npfs      Npfs
          c:\winnt\system32\drivers\npfs.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
ntfs      Ntfs
          c:\winnt\system32\drivers\ntfs.sys
          File System Driver  True      Disabled
          Running   OK        Normal    False
          True
null      Null
          c:\winnt\system32\drivers\null.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
nwlnkflt  IPX Traffic Filter Driver
          c:\winnt\system32\drivers\nwlnkflt.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
nwlnkfwd  IPX Traffic Forwarder Driver
          c:\winnt\system32\drivers\nwlnkfwd.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
parallel  Parallel class driver
          c:\winnt\system32\drivers\parallel.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
parport   Parallel port driver
          c:\winnt\system32\drivers\parport.sys
          Kernel Driver       True      System
          Running   OK        Ignore    False
          True
partmgr   PartMgr
          c:\winnt\system32\drivers\partmgr.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
parvdm    ParVdm
          c:\winnt\system32\drivers\parvdm.sys
          Kernel Driver       True      Auto
          Running   OK        Ignore    False
          True
pci       PCI Bus Driver
          c:\winnt\system32\drivers\pci.sys
          Kernel Driver       True      Boot
          Running   OK        Critical  False
          True
pcidump   PCIDump   Not Available       Kernel Driver
          False     System    Stopped   OK
          Ignore    False     False
pciide    PCIIde
          c:\winnt\system32\drivers\pciide.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
pcmcia    Pcmcia
          c:\winnt\system32\drivers\pcmcia.sys
          Kernel Driver       False     Disabled
          Stopped   OK        Normal    False
          False
pdcomp    PDCOMP    Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False
pdframe   PDFRAME   Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False
pdreli    PDRELI    Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False
pdrframe  PDRFRAME  Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False
pptpminiport        WAN Miniport (PPTP)
          c:\winnt\system32\drivers\raspptp.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ptilink   Direct Parallel Link Driver
          c:\winnt\system32\drivers\ptilink.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ql1080    ql1080    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ql10wnt   Ql10wnt   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ql1240    ql1240    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ql2100    ql2100    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
rasacd    Remote Access Auto Connection Driver
          c:\winnt\system32\drivers\rasacd.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
rasl2tp   WAN Miniport (L2TP)
          c:\winnt\system32\drivers\rasl2tp.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
raspti    Direct Parallel
          c:\winnt\system32\drivers\raspti.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
rca       Microsoft Streaming Network Raw Channel
Access    c:\winnt\system32\drivers\rca.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
rdbss     Rdbss
          c:\winnt\system32\drivers\rdbss.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
rdpdr     Terminal Server Device Redirector Driver
          c:\winnt\system32\drivers\rdpdr.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
rdpwd     RDPWD
          c:\winnt\system32\drivers\rdpwd.sys
          Kernel Driver       True      Manual
          Running   OK        Ignore    False
          True
redbook   Digital CD Audio Playback Filter Driver
          c:\winnt\system32\drivers\redbook.sys
          Kernel Driver       False     System
          Stopped   OK        Normal    False
          False
serenum   Serenum Filter Driver
          c:\winnt\system32\drivers\serenum.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
serial    Serial port driver
          c:\winnt\system32\drivers\serial.sys
          Kernel Driver       True      System
          Running   OK        Ignore    False
          True
sfloppy   Sfloppy
          c:\winnt\system32\drivers\sfloppy.sys
          Kernel Driver       False     System
          Stopped   OK        Ignore    False
          False
sglfb     sglfb     Not Available       Kernel Driver
          False     System    Stopped   OK
          Normal    False     False
simbad    Simbad    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
sparrow   Sparrow   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
srv       Srv       c:\winnt\system32\drivers\srv.sys
          File System Driver  True      Manual
          Running   OK        Normal    False
          True
swenum    Software Bus Driver
          c:\winnt\system32\drivers\swenum.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
symc810   symc810   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
symc8xx   symc8xx   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
sym_hi    sym_hi    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
tcpip     TCP/IP Protocol Driver
          c:\winnt\system32\drivers\tcpip.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
tdasync   TDASYNC
          c:\winnt\system32\drivers\tdasync.sys
          Kernel Driver       False     Manual
```

```
          Stopped   OK        Ignore    False
          False
tdipx     TDIPX
          c:\winnt\system32\drivers\tdipx.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
tdnetb    TDNETB
          c:\winnt\system32\drivers\tdnetb.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
tdpipe    TDPIPE
          c:\winnt\system32\drivers\tdpipe.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
tdspx     TDSPX
          c:\winnt\system32\drivers\tdspx.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
tdtcp     TDTCP
          c:\winnt\system32\drivers\tdtcp.sys
          Kernel Driver       True      Manual
          Running   OK        Ignore    False
          True
termdd    Terminal Device Driver
          c:\winnt\system32\drivers\termdd.sys
          Kernel Driver       True      Auto
          Running   OK        Normal    False
          True
tga       tga       Not Available       Kernel Driver
          False     System    Stopped   OK
          Ignore    False     False
udfs      Udfs
          c:\winnt\system32\drivers\udfs.sys
          File System Driver  False     Disabled
          Stopped   OK        Normal    False
          False
ultra66   ultra66   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
update    Microcode Update Driver
          c:\winnt\system32\drivers\update.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
vgasave   VgaSave   c:\winnt\system32\drivers\vga.sys
          Kernel Driver       True      System
          Running   OK        Ignore    False
          True
wanarp    Remote Access IP ARP Driver
          c:\winnt\system32\drivers\wanarp.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
wdica     WDICA     Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False

[Environment Variables]

Variable  Value     User Name
ComSpec   %SystemRoot%\system32\cmd.exe <SYSTEM>
NUMBER_OF_PROCESSORS          4         <SYSTEM>
OS        Windows_NT          <SYSTEM>
Os2LibPath          %SystemRoot%\system32\os2\dll;
          <SYSTEM>
path      C:\winnt\;C:\winnt\system32;C:\SQL
Server\MSSQL\Binn;C:\Program Files\Microsoft SQL
Server\80\Tools\Binn          <SYSTEM>
PATHEXT
          .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF
;.WSH     <SYSTEM>
PROCESSOR_ARCHITECTURE        x86       <SYSTEM>
PROCESSOR_IDENTIFIER          x86 Family 6 Model 10
Stepping 4, GenuineIntel      <SYSTEM>
PROCESSOR_LEVEL     6         <SYSTEM>
PROCESSOR_REVISION  0a04      <SYSTEM>
TEMP      %SystemRoot%\TEMP   <SYSTEM>
TMP       %SystemRoot%\TEMP   <SYSTEM>
windir    %SystemRoot%        <SYSTEM>
TEMP      %USERPROFILE%\Local Settings\Temp
          ART\Administrator
TMP       %USERPROFILE%\Local Settings\Temp
          ART\Administrator


[Jobs]

[ Following are sub-categories of this main category
]

[Print]

Document  Size      Owner     Notify    Status
          Time Submitted      Start Time
          Until Time          Elapsed Time
          Pages Printed       Job ID    Priority
          Parameters          Driver Name
          Print Processor     Host Print Queue
          Data Type Name
No print jobs




[Network Connections]

Local Name          Remote Name         Type
          Status    User Name
E:        \\cl81\c$ Disk      OK
          ART\Administrator

[Running Tasks]

Name      Path      Process ID          Priority  Min
Working Set         Max Working Set     Start Time
          Version   Size      File Date
system idle process Not Available       0         0
          Not Available       Not Available       Not
Available Unknown   Unknown   Unknown
system    Not Available       8         8         0
          1413120   Not Available       Unknown
          Unknown   Unknown

smss.exe  c:\winnt\system32\smss.exe    184       11
          204800    1413120   9/25/2001 4:36:20 PM
          5.00.2195.2901      44.27 KB (45,328 bytes)
          12/7/1999 6:00:00 AM
csrss.exe Not Available       212       13        Not
Available Not Available       9/25/2001 4:36:27 PM
          Unknown   Unknown   Unknown
winlogon.exe        c:\winnt\system32\winlogon.exe
          236       13        204800    1413120
          9/25/2001 4:36:28 PM
          5.00.2195.2953      173.77 KB (177,936
bytes)    12/7/1999 6:00:00 AM
services.exe        c:\winnt\system32\services.exe
          264       9         204800    1413120
          9/25/2001 4:36:30 PM
          5.00.2195.2780      86.77 KB (88,848 bytes)
          12/7/1999 6:00:00 AM
lsass.exe c:\winnt\system32\lsass.exe   276       9
          204800    1413120   9/25/2001 4:36:30 PM
          5.00.2195.2964      32.77 KB (33,552 bytes)
          12/7/1999 6:00:00 AM
termsrv.exe         c:\winnt\system32\termsrv.exe 376
          10        204800    1413120   9/25/2001
4:36:31 PM          5.00.2195.2342      137.27 KB
(140,560 bytes)     8/27/2001 3:04:25 PM
gnconmgr.exe        c:\winnt\system32\gnconmgr.exe
          448       8         204800    1413120
          9/25/2001 4:36:33 PM          4.2.0.75
          168.05 KB (172,079 bytes)     8/31/2001
8:44:49 AM
svchost.exe         c:\winnt\system32\svchost.exe 516
          8         204800    1413120   9/25/2001
4:36:34 PM          5.00.2134.1         7.77 KB
(7,952 bytes)       12/7/1999 6:00:00 AM
spoolsv.exe         c:\winnt\system32\spoolsv.exe 548
          8         204800    1413120   9/25/2001
4:36:34 PM          5.00.2161.1         43.77 KB
(44,816 bytes)      6/14/2001 6:15:29 AM
msdtc.exe c:\winnt\system32\msdtc.exe   576       8
          204800    1413120   9/25/2001 4:36:34 PM
          1999.9.3421.3       6.77 KB (6,928 bytes)
          6/14/2001 6:29:58 AM
cisvc.exe c:\winnt\system32\cisvc.exe   744       8
          204800    1413120   9/25/2001 4:36:36 PM
          5.00.2134.1         5.27 KB (5,392 bytes)
          12/7/1999 6:00:00 AM
svchost.exe         c:\winnt\system32\svchost.exe 760
          8         204800    1413120   9/25/2001
4:36:36 PM          5.00.2134.1         7.77 KB
(7,952 bytes)       12/7/1999 6:00:00 AM
llssrv.exe          c:\winnt\system32\llssrv.exe  780
          9         204800    1413120   9/25/2001
4:36:36 PM          5.00.2195.2649      114.27 KB
(117,008 bytes)     5/4/2001 12:05:02 PM
regsvc.exe          c:\winnt\system32\regsvc.exe  828
          8         204800    1413120   9/25/2001
4:36:37 PM          5.00.2195.2104      65.27 KB
(66,832 bytes)      8/27/2001 3:04:20 PM
mstask.exe          c:\winnt\system32\mstask.exe  852
          8         204800    1413120   9/25/2001
4:36:37 PM          4.71.2195.1         115.27 KB
(118,032 bytes)     8/27/2001 3:04:13 PM
```

```
winmgmt.exe
          c:\winnt\system32\wbem\winmgmt.exe      940
          8         204800    1413120   9/25/2001
4:36:38 PM          1.50.1085.0029      192.08 KB
(196,685 bytes)     8/27/2001 3:04:33 PM
mssearch.exe        c:\program files\common
files\system\mssearch\bin\mssearch.exe  980       8
          204800    1413120   9/25/2001 4:36:38 PM
          9.107.6223.2        64.00 KB (65,536 bytes)
          9/17/2001 4:49:26 PM
dfssvc.exe          c:\winnt\system32\dfssvc.exe
          1044      8         204800    1413120
          9/25/2001 4:36:43 PM
          5.00.2195.2841      88.27 KB (90,384 bytes)
          8/27/2001 3:03:57 PM
svchost.exe         c:\winnt\system32\svchost.exe
          1244      8         204800    1413120
          9/25/2001 4:37:05 PM          5.00.2134.1
          7.77 KB (7,952 bytes)         12/7/1999
6:00:00 AM
cidaemon.exe        c:\winnt\system32\cidaemon.exe
          320       4         204800    1413120
          9/25/2001 4:40:27 PM          5.00.2134.1
          9.27 KB (9,488 bytes)         12/7/1999
6:00:00 AM
explorer.exe        c:\winnt\explorer.exe
          1356      8         204800    1413120
          9/26/2001 8:14:26 AM
          5.00.3315.2846      237.27 KB (242,960
bytes)    8/27/2001 3:04:28 PM
sqlmangr.exe        c:\program files\microsoft sql
server\80\tools\binn\sqlmangr.exe       1228      8
          204800    1413120   9/26/2001 8:14:27 AM
          2000.080.0382.00    72.57 KB (74,308 bytes)
          8/31/2001 9:06:42 AM
regedit.exe         c:\winnt\regedit.exe
          1216      8         204800    1413120
          9/26/2001 1:25:49 PM          5.00.2134.1
          70.77 KB (72,464 bytes)       12/7/1999
6:00:00 AM
mmc.exe   c:\winnt\system32\mmc.exe     628       8
          204800    1413120   9/26/2001 2:13:22 PM
          5.00.2195.2301      589.27 KB (603,408
bytes)    8/27/2001 3:04:05 PM
rsvp.exe  c:\winnt\system32\rsvp.exe    1512      8
          204800    1413120   9/26/2001 2:15:19 PM
          5.00.2167.1         172.77 KB (176,912
bytes)    12/7/1999 6:00:00 AM

[Loaded Modules]

Name      Version   Size      File Date Manufacturer
          Path
traffic.dll         5.00.2139.1         30.77 KB
(31,504 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\traffic.dll
rsvp.exe  5.00.2167.1         172.77 KB (176,912
bytes)    12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\rsvp.exe
wbemprox.dll        1.50.1085.0045      40.08 KB
(41,040 bytes)      8/27/2001 3:04:33 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\wbemprox.dll
mlang.dll 5.00.3103.1000      510.77 KB (523,024
bytes)    8/27/2001 3:04:05 PM          Microsoft
Corporation         c:\winnt\system32\mlang.dll
rassapi.dll         5.00.2188.1         14.27 KB
(14,608 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\rassapi.dll
adsnt.dll 5.00.2195.2778      195.27 KB (199,952
bytes)    8/27/2001 3:03:52 PM          Microsoft
Corporation         c:\winnt\system32\adsnt.dll
dbghelp.dll         5.00.2195.2104      159.27 KB
(163,088 bytes)     5/4/2001 12:05:02 PM
          Microsoft Corporation
          c:\winnt\system32\dbghelp.dll
localsec.dll        5.00.2195.2130      230.27 KB
(235,792 bytes)     8/27/2001 3:04:05 PM
          Microsoft Corporation
          c:\winnt\system32\localsec.dll
devmgr.dll          5.00.2166.1         215.77 KB
(220,944 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\devmgr.dll
filemgmt.dll        5.00.2195.2165      287.27 KB
(294,160 bytes)     8/27/2001 3:04:01 PM
          Microsoft Corporation
          c:\winnt\system32\filemgmt.dll
pdh.dll   5.00.2195.2739      147.77 KB (151,312
bytes)    8/27/2001 3:04:19 PM          Microsoft
Corporation         c:\winnt\system32\pdh.dll
smlogcfg.dll        5.00.2195.2485      273.27 KB
(279,824 bytes)     8/27/2001 3:04:23 PM
          Microsoft Corporation
          c:\winnt\system32\smlogcfg.dll
cabinet.dll         5.00.2147.1         54.77 KB
(56,080 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\cabinet.dll
msinfo32.dll        5.00.2177.1         312.27 KB
(319,760 bytes)     6/14/2001 11:32:03 AM
          Microsoft Corporation         c:\program
files\common files\microsoft
shared\msinfo\msinfo32.dll
riched20.dll        5.30.23.1205        421.27 KB
(431,376 bytes)     8/27/2001 3:04:20 PM
          Microsoft Corporation
          c:\winnt\system32\riched20.dll
riched32.dll        5.00.2134.1         3.77 KB
(3,856 bytes)       12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\riched32.dll
els.dll   5.00.2175.1         151.27 KB (154,896
bytes)    12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\els.dll
ntmsmgr.dll         1,0,0,1   427.77 KB (438,032
bytes)    12/7/1999 6:00:00 AM          Microsoft
Corporation and HighGround Systems, Inc.
          c:\winnt\system32\ntmsmgr.dll
mmfutil.dll         1.50.1085.0000      32.06 KB
(32,829 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mmfutil.dll
logdrive.dll        1.50.1085.0000      200.06 KB
(204,863 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\logdrive.dll
dfrgres.dll         5.00.2150.1         27.50 KB
(28,160 bytes)      12/7/1999 6:00:00 AM
          Executive Software International, Inc.
          c:\winnt\system32\dfrgres.dll
dfrgsnap.dll        5.00.2195.2104      41.77 KB
(42,768 bytes)      8/27/2001 3:03:57 PM
          Executive Software International, Inc.
          c:\winnt\system32\dfrgsnap.dll
dmdskres.dll        2195.2104.297.3     119.50 KB
(122,368 bytes)     8/27/2001 3:03:58 PM
          Microsoft Corp., VERITAS Software
          c:\winnt\system32\dmdskres.dll
dmutil.dll          2195.2104.297.3     42.27 KB
(43,280 bytes)      8/27/2001 3:03:58 PM
          VERITAS Software Corp.
          c:\winnt\system32\dmutil.dll
ntmsapi.dll         5.00.1948.1         51.77 KB
(53,008 bytes)      8/27/2001 3:04:16 PM
          Microsoft Corporation
          c:\winnt\system32\ntmsapi.dll
dmdskmgr.dll        2215.2215.297.3     160.27 KB
(164,112 bytes)     8/27/2001 3:03:58 PM
          Microsoft Corp., VERITAS Software
          c:\winnt\system32\dmdskmgr.dll
mycomput.dll        5.00.2134.1         107.77 KB
(110,352 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mycomput.dll
mmcndmgr.dll        5.00.2178.1         815.27 KB
(834,832 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mmcndmgr.dll
mmc.exe   5.00.2195.2301      589.27 KB (603,408
bytes)    8/27/2001 3:04:05 PM          Microsoft
Corporation         c:\winnt\system32\mmc.exe
regedit.exe         5.00.2134.1         70.77 KB
(72,464 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\regedit.exe
sqlmangr.rll        2000.080.0194.00    96.00 KB
(98,304 bytes)      8/31/2001 9:06:42 AM
          Microsoft Corporation         c:\program
files\microsoft sql
server\80\tools\binn\resources\1033\sqlmangr.rll
sqlsvc.rll          2000.080.0194.00    24.00 KB
(24,576 bytes)      8/31/2001 9:06:37 AM
          Microsoft Corporation         c:\program
files\microsoft sql
server\80\tools\binn\resources\1033\sqlsvc.rll
odbcint.dll         3.520.7326.0        88.00 KB
(90,112 bytes)      7/26/2001 12:39:13 PM
          Microsoft Corporation
          c:\winnt\system32\odbcint.dll
sqlresld.dll        2000.080.0382.00    28.56 KB
(29,248 bytes)      8/31/2001 9:06:37 AM
          Microsoft Corporation         c:\program
files\microsoft sql server\80\tools\binn\sqlresld.dll
odbcbcp.dll          2000.080.0381.00   28.57 KB
(29,252 bytes)      7/26/2001 12:39:17 PM
```

```
          Microsoft Corporation
          c:\winnt\system32\odbcbcp.dll
sqlsvc.dll          2000.080.0382.00    92.56 KB
(94,784 bytes)      8/31/2001 9:06:37 AM
          Microsoft Corporation         c:\program
files\microsoft sql server\80\tools\binn\sqlsvc.dll
odbc32.dll          3.520.7326.0        216.27 KB
(221,456 bytes)     7/26/2001 12:39:12 PM
          Microsoft Corporation
          c:\winnt\system32\odbc32.dll
w95scm.dll          2000.080.0194.00    48.56 KB
(49,728 bytes)      8/31/2001 9:06:37 AM
          Microsoft Corporation         c:\program
files\microsoft sql server\80\tools\binn\w95scm.dll
sqlunirl.dll        2000.080.0381.00    176.56 KB
(180,800 bytes)     4/9/2001 10:46:18 AM
          Microsoft Corporation
          c:\winnt\system32\sqlunirl.dll
sqlmangr.exe        2000.080.0382.00    72.57 KB
(74,308 bytes)      8/31/2001 9:06:42 AM
          Microsoft Corporation         c:\program
files\microsoft sql server\80\tools\binn\sqlmangr.exe
mstask.dll          4.71.2137.1         213.27 KB
(218,384 bytes)     6/14/2001 11:31:56 AM
          Microsoft Corporation
          c:\winnt\system32\mstask.dll
msxml.dll 8.0.5718.1          493.27 KB (505,104
bytes)    8/27/2001 3:04:14 PM          Microsoft
Corporation         c:\winnt\system32\msxml.dll
dsuiext.dll         5.00.2195.2779      107.77 KB
(110,352 bytes)     8/27/2001 3:03:59 PM
          Microsoft Corporation
          c:\winnt\system32\dsuiext.dll
dsquery.dll         5.00.2195.2854      153.27 KB
(156,944 bytes)     8/27/2001 3:03:59 PM
          Microsoft Corporation
          c:\winnt\system32\dsquery.dll
wininet.dll         5.00.3315.1000      456.77 KB
(467,728 bytes)     8/27/2001 3:04:27 PM
          Microsoft Corporation
          c:\winnt\system32\wininet.dll
actxprxy.dll        5.00.3103.1000      70.27 KB
(71,952 bytes)      8/27/2001 3:03:42 PM
          Microsoft Corporation
          c:\winnt\system32\actxprxy.dll
shdoclc.dll         5.00.3315.2879      324.50 KB
(332,288 bytes)     8/27/2001 3:04:22 PM
          Microsoft Corporation
          c:\winnt\system32\shdoclc.dll
netplwiz.dll        5.00.2195.2370      169.77 KB
(173,840 bytes)     8/27/2001 3:04:15 PM
          Microsoft Corporation
          c:\winnt\system32\netplwiz.dll
netmsg.dll          5.00.2137.1         152.50 KB
(156,160 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\netmsg.dll
comdlg32.dll        5.00.3103.1000      236.77 KB
(242,448 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\comdlg32.dll
netui2.dll          5.00.2134.1         280.27 KB
(286,992 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\netui2.dll
mprui.dll 5.00.2195.2104      54.77 KB (56,080 bytes)
          8/27/2001 3:04:06 PM          Microsoft
Corporation         c:\winnt\system32\mprui.dll
urlmon.dll          5.00.3315.1000      441.27 KB
(451,856 bytes)     8/27/2001 3:04:25 PM
          Microsoft Corporation
          c:\winnt\system32\urlmon.dll
faxshell.dll        5.00.2134.1         8.27 KB
(8,464 bytes)       12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\faxshell.dll
msacm32.dll         5.00.2134.1         65.27 KB
(66,832 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msacm32.dll
avifil32.dll        5.00.2134.1         76.27 KB
(78,096 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\avifil32.dll
msvfw32.dll         5.00.2134.1         113.77 KB
(116,496 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msvfw32.dll
docprop2.dll        5.00.2178.1         297.77 KB
(304,912 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\docprop2.dll
browselc.dll        5.00.3315.2846      34.50 KB
(35,328 bytes)      8/27/2001 3:03:53 PM
          Microsoft Corporation
          c:\winnt\system32\browselc.dll
linkinfo.dll        5.00.2134.1         15.77 KB
(16,144 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\linkinfo.dll
powrprof.dll        5.00.3103.1000      13.27 KB
(13,584 bytes)      8/27/2001 3:04:19 PM
          Microsoft Corporation
          c:\winnt\system32\powrprof.dll
batmeter.dll        5.00.3103.1000      20.27 KB
(20,752 bytes)      8/27/2001 3:03:53 PM
          Microsoft Corporation
          c:\winnt\system32\batmeter.dll
stobject.dll        5.00.2195.2780      79.27 KB
(81,168 bytes)      8/27/2001 3:04:24 PM
          Microsoft Corporation
          c:\winnt\system32\stobject.dll
msi.dll   1.11.2405.0         1.69 MB (1,767,184
bytes)    8/27/2001 3:04:09 PM          Microsoft
Corporation         c:\winnt\system32\msi.dll
webcheck.dll        5.00.3315.1000      251.77 KB
(257,808 bytes)     8/27/2001 3:04:26 PM
          Microsoft Corporation
          c:\winnt\system32\webcheck.dll
ntshrui.dll         5.00.2134.1         46.77 KB
(47,888 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\ntshrui.dll
mydocs.dll          5.00.2920.0000      55.77 KB
(57,104 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mydocs.dll
browseui.dll        5.00.3315.2846      788.77 KB
(807,696 bytes)     8/27/2001 3:03:53 PM
          Microsoft Corporation
          c:\winnt\system32\browseui.dll
shdocvw.dll         5.00.3315.2879      1.05 MB
(1,104,144 bytes)   8/27/2001 3:04:22 PM
          Microsoft Corporation
          c:\winnt\system32\shdocvw.dll
explorer.exe        5.00.3315.2846      237.27 KB
(242,960 bytes)     8/27/2001 3:04:28 PM
          Microsoft Corporation
          c:\winnt\explorer.exe
cidaemon.exe        5.00.2134.1         9.27 KB
(9,488 bytes)       12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\cidaemon.exe
tapisrv.dll         5.00.2195.2955      169.27 KB
(173,328 bytes)     8/27/2001 3:04:24 PM
          Microsoft Corporation
          c:\winnt\system32\tapisrv.dll
dfssvc.exe          5.00.2195.2841      88.27 KB
(90,384 bytes)      8/27/2001 3:03:57 PM
          Microsoft Corporation
          c:\winnt\system32\dfssvc.exe
iprop.dll 5.00.2195.2815      4.27 KB (4,368 bytes)
          8/27/2001 3:04:03 PM          Microsoft
Corporation         c:\winnt\system32\iprop.dll
srchidx.dll         9.107.6223.2        380.00 KB
(389,120 bytes)     9/17/2001 4:49:29 PM
          Microsoft Corporation
          c:\progra~1\common~1\system\mssearch\bin\sr
chidx.dll
propdefs.dll        9.107.6223.2        136.00 KB
(139,264 bytes)     9/17/2001 4:49:28 PM
          Microsoft Corporation
          c:\progra~1\common~1\system\mssearch\bin\pr
opdefs.dll
lcdetect.dll        9.107.6223.2        28.00 KB
(28,672 bytes)      9/17/2001 4:49:26 PM
          Microsoft Corporation         c:\program
files\common files\system\mssearch\bin\lcdetect.dll
tquery.dll          9.107.6223.2        1.45 MB
(1,515,520 bytes)   9/17/2001 4:49:29 PM
          Microsoft Corporation         c:\program
files\common files\system\mssearch\bin\tquery.dll
security.dll        5.00.2154.1         5.77 KB
(5,904 bytes)       12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\security.dll
mssrch.dll          9.107.6223.2        1.23 MB
(1,290,240 bytes)   9/17/2001 4:49:27 PM
          Microsoft Corporation
          c:\progra~1\common~1\system\mssearch\bin\ms
srch.dll
mssws.dll 9.107.6223.2        36.00 KB (36,864 bytes)
          9/17/2001 4:49:27 PM          Microsoft
Corporation         c:\program files\common
files\system\mssearch\bin\mssws.dll
mssearch.exe        9.107.6223.2        64.00 KB
(65,536 bytes)      9/17/2001 4:49:26 PM
```

```
          Microsoft Corporation         c:\program
files\common files\system\mssearch\bin\mssearch.exe
netui1.dll          5.00.2134.1         210.27 KB
(215,312 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\netui1.dll
netui0.dll          5.00.2134.1         70.27 KB
(71,952 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\netui0.dll
ntlanman.dll        5.00.2157.1         35.27 KB
(36,112 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\ntlanman.dll
wshnetbs.dll        5.00.2134.1         7.77 KB
(7,952 bytes)       12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\wshnetbs.dll
ntmarta.dll         5.00.2195.2862      98.77 KB
(101,136 bytes)     8/27/2001 3:04:16 PM
          Microsoft Corporation
          c:\winnt\system32\ntmarta.dll
provthrd.dll        1.50.1085.0000      68.07 KB
(69,708 bytes)      6/14/2001 11:31:56 AM
          Microsoft Corporation
          c:\winnt\system32\wbem\provthrd.dll
ntevt.dll 1.50.1085.0000      192.06 KB (196,669
bytes)    12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\wbem\ntevt.dll
perfos.dll          5.00.2155.1         21.27 KB
(21,776 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\perfos.dll
psapi.dll 5.00.2134.1         28.27 KB (28,944 bytes)
          12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\psapi.dll
framedyn.dll        1.50.1085.0000      164.05 KB
(167,992 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\wbem\framedyn.dll
cimwin32.dll        1.50.1085.0038      1.02 MB
(1,073,232 bytes)   8/27/2001 3:04:31 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\cimwin32.dll
wbemsvc.dll         1.50.1085.0007      40.07 KB
(41,036 bytes)      8/27/2001 3:04:33 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\wbemsvc.dll
wbemess.dll         1.50.1085.0039      364.07 KB
(372,804 bytes)     8/27/2001 3:04:32 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\wbemess.dll
fastprox.dll        1.50.1085.0037      144.08 KB
(147,536 bytes)     8/27/2001 3:04:31 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\fastprox.dll
wbemcore.dll        1.50.1085.0036      628.07 KB
(643,140 bytes)     8/27/2001 3:04:32 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\wbemcore.dll
wbemcomn.dll        1.50.1085.0021      692.07 KB
(708,675 bytes)     8/27/2001 3:04:32 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\wbemcomn.dll
winmgmt.exe         1.50.1085.0029      192.08 KB
(196,685 bytes)     8/27/2001 3:04:33 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\winmgmt.exe
msidle.dll          5.00.2920.0000      6.27 KB
(6,416 bytes)       12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msidle.dll
mstask.exe          4.71.2195.1         115.27 KB
(118,032 bytes)     8/27/2001 3:04:13 PM
          Microsoft Corporation
          c:\winnt\system32\mstask.exe
regsvc.exe          5.00.2195.2104      65.27 KB
(66,832 bytes)      8/27/2001 3:04:20 PM
          Microsoft Corporation
          c:\winnt\system32\regsvc.exe
llsrpc.dll          5.00.2149.1         45.77 KB
(46,864 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\llsrpc.dll
llssrv.exe          5.00.2195.2649      114.27 KB
(117,008 bytes)     5/4/2001 12:05:02 PM
          Microsoft Corporation
          c:\winnt\system32\llssrv.exe
wmi.dll   5.00.2191.1         6.27 KB (6,416 bytes)
          12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\wmi.dll
netshell.dll        5.00.2195.2779      457.27 KB
(468,240 bytes)     8/27/2001 3:04:15 PM
          Microsoft Corporation
          c:\winnt\system32\netshell.dll
netman.dll          5.00.2195.2779      89.27 KB
(91,408 bytes)      8/27/2001 3:04:15 PM
          Microsoft Corporation
          c:\winnt\system32\netman.dll
ntmsdba.dll         5.00.2195.2779      167.27 KB
(171,280 bytes)     8/27/2001 3:04:16 PM
          Microsoft Corporation
          c:\winnt\system32\ntmsdba.dll
rasdlg.dll          5.00.2195.2671      514.27 KB
(526,608 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\rasdlg.dll
netcfgx.dll         5.00.2195.2228      534.77 KB
(547,600 bytes)     8/27/2001 3:04:14 PM
          Microsoft Corporation
          c:\winnt\system32\netcfgx.dll
rasmans.dll         5.00.2195.2728      147.27 KB
(150,800 bytes)     8/27/2001 3:04:20 PM
          Microsoft Corporation
          c:\winnt\system32\rasmans.dll
sens.dll  5.00.2163.1         36.77 KB (37,648 bytes)
          12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\sens.dll
ntmssvc.dll         5.00.2195.2779      391.27 KB
(400,656 bytes)     8/27/2001 3:04:16 PM
          Microsoft Corporation
          c:\winnt\system32\ntmssvc.dll
es.dll    2000.2.3471.1       222.27 KB (227,600
bytes)    8/27/2001 3:04:00 PM          Microsoft
Corporation         c:\winnt\system32\es.dll
infosoft.dll        5.00.2195.2104      200.77 KB
(205,584 bytes)     8/27/2001 3:04:03 PM
          Microsoft Corporation
          c:\winnt\system32\infosoft.dll
query.dll 5.00.2195.2495      1.35 MB (1,416,464
bytes)    8/27/2001 3:04:19 PM          Microsoft
Corporation         c:\winnt\system32\query.dll
cisvc.exe 5.00.2134.1         5.27 KB (5,392 bytes)
          12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\cisvc.exe
mtxoci.dll          2000.2.3471.1       101.77 KB
(104,208 bytes)     8/27/2001 3:04:14 PM
          Microsoft Corporation
          c:\winnt\system32\mtxoci.dll
resutils.dll        5.00.2195.2787      39.77 KB
(40,720 bytes)      8/27/2001 3:04:20 PM
          Microsoft Corporation
          c:\winnt\system32\resutils.dll
clusapi.dll         5.00.2195.2104      54.27 KB
(55,568 bytes)      8/27/2001 3:03:55 PM
          Microsoft Corporation
          c:\winnt\system32\clusapi.dll
msvcp50.dll         5.00.7051 552.50 KB (565,760
bytes)    12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\msvcp50.dll
xolehlp.dll         1999.9.3421.3       17.27 KB
(17,680 bytes)      6/14/2001 6:29:58 AM
          Microsoft Corporation
          c:\winnt\system32\xolehlp.dll
msdtclog.dll        1999.9.3421.3       89.77 KB
(91,920 bytes)      6/14/2001 6:29:58 AM
          Microsoft Corporation
          c:\winnt\system32\msdtclog.dll
mtxclu.dll          2000.2.3471.1       51.27 KB
(52,496 bytes)      8/27/2001 3:04:14 PM
          Microsoft Corporation
          c:\winnt\system32\mtxclu.dll
msdtcprx.dll        2000.2.3471.1       665.77 KB
(681,744 bytes)     8/27/2001 3:04:07 PM
          Microsoft Corporation
          c:\winnt\system32\msdtcprx.dll
txfaux.dll          2000.2.3471.1       374.27 KB
(383,248 bytes)     8/27/2001 3:04:25 PM
          Microsoft Corporation
          c:\winnt\system32\txfaux.dll
msdtctm.dll         2000.2.3471.1       1.07 MB
(1,120,528 bytes)   8/27/2001 3:04:07 PM
          Microsoft Corporation
          c:\winnt\system32\msdtctm.dll
msdtc.exe 1999.9.3421.3       6.77 KB (6,928 bytes)
          6/14/2001 6:29:58 AM          Microsoft
Corporation         c:\winnt\system32\msdtc.exe
inetpp.dll          5.00.2195.2842      65.27 KB
(66,832 bytes)      8/27/2001 3:04:02 PM
          Microsoft Corporation
          c:\winnt\system32\inetpp.dll
win32spl.dll        5.00.2195.2780      92.27 KB
(94,480 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\win32spl.dll
usbmon.dll          5.00.2195.2780      11.27 KB
(11,536 bytes)      8/27/2001 3:04:25 PM
```

```
          Microsoft Corporation
          c:\winnt\system32\usbmon.dll
tcpmon.dll          5.00.2195.2780      40.77 KB
(41,744 bytes)      8/27/2001 3:04:24 PM
          Microsoft Corporation
          c:\winnt\system32\tcpmon.dll
pjlmon.dll          5.00.2165.1         12.77 KB
(13,072 bytes)      11/30/1999 5:39:36 PM
          Microsoft Corporation
          c:\winnt\system32\pjlmon.dll
cnbjmon.dll         5.00.2134.1         43.77 KB
(44,816 bytes)      11/30/1999 5:38:48 PM
          Microsoft Corporation
          c:\winnt\system32\cnbjmon.dll
localspl.dll        5.00.2195.2793      246.77 KB
(252,688 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\localspl.dll
spoolss.dll         5.00.2161.1         61.77 KB
(63,248 bytes)      6/14/2001 6:15:29 AM
          Microsoft Corporation
          c:\winnt\system32\spoolss.dll
spoolsv.exe         5.00.2161.1         43.77 KB
(44,816 bytes)      6/14/2001 6:15:29 AM
          Microsoft Corporation
          c:\winnt\system32\spoolsv.exe
rpcss.dll 5.00.2195.2815      231.27 KB (236,816
bytes)    8/27/2001 3:04:21 PM          Microsoft
Corporation         c:\winnt\system32\rpcss.dll
svchost.exe         5.00.2134.1         7.77 KB
(7,952 bytes)       12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\svchost.exe
vipl.dll  4.2.0.75  80.00 KB (81,920 bytes)
          8/31/2001 8:44:49 AM          Giganet
Incorporated        c:\winnt\system32\vipl.dll
gnconmgr.exe        4.2.0.75  168.05 KB (172,079
bytes)    8/31/2001 8:44:49 AM          Giganet
Incorporated        c:\winnt\system32\gnconmgr.exe
rdpwsx.dll          5.00.2180.1         94.40 KB
(96,664 bytes)      6/14/2001 6:30:00 AM
          Microsoft Corporation
          c:\winnt\system32\rdpwsx.dll
ntlsapi.dll         5.00.2134.1         6.77 KB
(6,928 bytes)       12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\ntlsapi.dll
mstlsapi.dll        5.00.2181.1         24.77 KB
(25,360 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mstlsapi.dll
icaapi.dll          5.00.2134.1         118.77 KB
(121,616 bytes)     6/14/2001 6:29:59 AM
          Microsoft Corporation
          c:\winnt\system32\icaapi.dll
regapi.dll          5.00.2155.1         35.27 KB
(36,112 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\regapi.dll
termsrv.exe         5.00.2195.2342      137.27 KB
(140,560 bytes)     8/27/2001 3:04:25 PM
          Microsoft Corporation
          c:\winnt\system32\termsrv.exe
dssenh.dll          5.00.2195.2228      142.77 KB
(146,192 bytes)     8/27/2001 3:05:16 PM
          Microsoft Corporation
          c:\winnt\system32\dssenh.dll
oakley.dll          5.00.2195.2785      378.77 KB
(387,856 bytes)     8/27/2001 3:04:17 PM
          Microsoft Corporation
          c:\winnt\system32\oakley.dll
mfc42u.dll          6.00.8665.0         972.05 KB
(995,384 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mfc42u.dll
polagent.dll        5.00.2183.1         108.27 KB
(110,864 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\polagent.dll
scecli.dll          5.00.2195.2780      105.27 KB
(107,792 bytes)     8/27/2001 3:04:21 PM
          Microsoft Corporation
          c:\winnt\system32\scecli.dll
atl.dll   3.00.8449 57.56 KB (58,938 bytes)
          12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\atl.dll
certcli.dll         5.00.2195.2778      130.77 KB
(133,904 bytes)     8/27/2001 3:03:55 PM
          Microsoft Corporation
          c:\winnt\system32\certcli.dll
ntdsatq.dll         5.00.2195.2878      31.27 KB
(32,016 bytes)      8/27/2001 3:04:16 PM
          Microsoft Corporation
          c:\winnt\system32\ntdsatq.dll
ntdsa.dll 5.00.2195.2899      990.77 KB (1,014,544
bytes)    8/27/2001 3:04:15 PM          Microsoft
Corporation         c:\winnt\system32\ntdsa.dll
kdcsvc.dll          5.00.2195.2878      137.77 KB
(141,072 bytes)     8/27/2001 3:04:04 PM
          Microsoft Corporation
          c:\winnt\system32\kdcsvc.dll
sfmapi.dll          5.00.2134.1         38.77 KB
(39,696 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\sfmapi.dll
rassfm.dll          5.00.2195.2671      21.27 KB
(21,776 bytes)      8/27/2001 3:04:20 PM
          Microsoft Corporation
          c:\winnt\system32\rassfm.dll
mpr.dll   5.00.2195.2779      53.27 KB (54,544 bytes)
          8/27/2001 3:04:06 PM          Microsoft
Corporation         c:\winnt\system32\mpr.dll
rsabase.dll         5.00.2195.2228      128.27 KB
(131,344 bytes)     5/4/2001 12:05:02 PM
          Microsoft Corporation
          c:\winnt\system32\rsabase.dll
schannel.dll        5.00.2195.2922      138.27 KB
(141,584 bytes)     5/4/2001 12:05:02 PM
          Microsoft Corporation
          c:\winnt\system32\schannel.dll
netlogon.dll        5.00.2195.2865      357.77 KB
(366,352 bytes)     8/27/2001 3:04:15 PM
          Microsoft Corporation
          c:\winnt\system32\netlogon.dll
msv1_0.dll          5.00.2195.2900      111.77 KB
(114,448 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msv1_0.dll
kerberos.dll        5.00.2195.2913      198.77 KB
(203,536 bytes)     8/27/2001 3:04:05 PM
          Microsoft Corporation
          c:\winnt\system32\kerberos.dll
msprivs.dll         5.00.2154.1         41.50 KB
(42,496 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msprivs.dll
samsrv.dll          5.00.2195.2918      369.77 KB
(378,640 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\samsrv.dll
lsasrv.dll          5.00.2195.2964      492.77 KB
(504,592 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\lsasrv.dll
lsass.exe 5.00.2195.2964      32.77 KB (33,552 bytes)
          12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\lsass.exe
xactsrv.dll         5.00.2134.1         90.27 KB
(92,432 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\xactsrv.dll
esent.dll 6.0.3940.13         1.08 MB (1,135,376
bytes)    8/27/2001 3:04:00 PM          Microsoft
Corporation         c:\winnt\system32\esent.dll
wmicore.dll         5.00.2195.2842      72.27 KB
(74,000 bytes)      8/27/2001 3:04:27 PM
          Microsoft Corporation
          c:\winnt\system32\wmicore.dll
rasadhlp.dll        5.00.2168.1         7.27 KB
(7,440 bytes)       12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\rasadhlp.dll
winrnr.dll          5.00.2160.1         18.77 KB
(19,216 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\winrnr.dll
rnr20.dll 5.00.2195.2871      35.77 KB (36,624 bytes)
          8/27/2001 3:04:20 PM          Microsoft
Corporation         c:\winnt\system32\rnr20.dll
wshtcpip.dll        5.00.2195.2104      17.27 KB
(17,680 bytes)      8/27/2001 3:04:27 PM
          Microsoft Corporation
          c:\winnt\system32\wshtcpip.dll
msafd.dll 5.00.2195.2779      106.77 KB (109,328
bytes)    8/27/2001 3:04:06 PM          Microsoft
Corporation         c:\winnt\system32\msafd.dll
mswsock.dll         5.00.2195.2871      62.77 KB
(64,272 bytes)      8/27/2001 3:04:13 PM
          Microsoft Corporation
          c:\winnt\system32\mswsock.dll
msgsvc.dll          5.00.2195.2939      34.27 KB
(35,088 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msgsvc.dll
browser.dll         5.00.2195.2778      48.27 KB
(49,424 bytes)      8/27/2001 3:03:53 PM
          Microsoft Corporation
          c:\winnt\system32\browser.dll
```

```
alrsvc.dll          5.00.2134.1         17.77 KB
(18,192 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\alrsvc.dll
trkwks.dll          5.00.2166.1         88.77 KB
(90,896 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\trkwks.dll
seclogon.dll        5.00.2135.1         15.77 KB
(16,144 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\seclogon.dll
psbase.dll          5.00.2195.2779      111.77 KB
(114,448 bytes)     8/27/2001 3:04:19 PM
          Microsoft Corporation
          c:\winnt\system32\psbase.dll
cryptsvc.dll        5.00.2181.1         61.77 KB
(63,248 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\cryptsvc.dll
cryptdll.dll        5.00.2135.1         41.27 KB
(42,256 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\cryptdll.dll
wkssvc.dll          5.00.2195.2780      95.27 KB
(97,552 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\wkssvc.dll
srvsvc.dll          5.00.2195.2904      79.27 KB
(81,168 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\srvsvc.dll
cfgmgr32.dll        5.00.2134.1         16.77 KB
(17,168 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\cfgmgr32.dll
dmserver.dll        2195.2778.297.3     11.77 KB
(12,048 bytes)      8/27/2001 3:03:58 PM
          VERITAS Software Corp.
          c:\winnt\system32\dmserver.dll
lmhsvc.dll          5.00.2195.2778      9.77 KB
(10,000 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\lmhsvc.dll
dnsrslvr.dll        5.00.2195.2778      88.77 KB
(90,896 bytes)      8/27/2001 3:03:58 PM
          Microsoft Corporation
          c:\winnt\system32\dnsrslvr.dll
tapi32.dll          5.00.2182.1         123.27 KB
(126,224 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\tapi32.dll
rasman.dll          5.00.2195.2780      54.77 KB
(56,080 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\rasman.dll
rasapi32.dll        5.00.2195.2671      189.77 KB
(194,320 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\rasapi32.dll
rtutils.dll         5.00.2168.1         43.77 KB
(44,816 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\rtutils.dll
adsldpc.dll         5.00.2195.2842      127.27 KB
(130,320 bytes)     8/27/2001 3:03:52 PM
          Microsoft Corporation
          c:\winnt\system32\adsldpc.dll
activeds.dll        5.00.2195.2778      174.77 KB
(178,960 bytes)     8/27/2001 3:03:42 PM
          Microsoft Corporation
          c:\winnt\system32\activeds.dll
mprapi.dll          5.00.2181.1         79.27 KB
(81,168 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mprapi.dll
iphlpapi.dll        5.00.2173.2         67.77 KB
(69,392 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\iphlpapi.dll
icmp.dll  5.00.2134.1         7.27 KB (7,440 bytes)
          12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\icmp.dll
dhcpcsvc.dll        5.00.2195.2778      88.77 KB
(90,896 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\dhcpcsvc.dll
eventlog.dll        5.00.2178.1         43.77 KB
(44,816 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\eventlog.dll
ntdsapi.dll         5.00.2195.2661      55.77 KB
(57,104 bytes)      8/27/2001 3:04:16 PM
          Microsoft Corporation
          c:\winnt\system32\ntdsapi.dll
scesrv.dll          5.00.2195.2780      226.27 KB
(231,696 bytes)     8/27/2001 3:04:21 PM
          Microsoft Corporation
          c:\winnt\system32\scesrv.dll
umpnpmgr.dll        5.00.2182.1         86.27 KB
(88,336 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\umpnpmgr.dll
services.exe        5.00.2195.2780      86.77 KB
(88,848 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\services.exe
clbcatq.dll         2000.2.3471.1       496.77 KB
(508,688 bytes)     8/27/2001 3:03:55 PM
          Microsoft Corporation
          c:\winnt\system32\clbcatq.dll
oleaut32.dll        2.40.4517 612.27 KB (626,960
bytes)    12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\oleaut32.dll
cscui.dll 5.00.2195.2959      228.27 KB (233,744
bytes)    8/27/2001 3:03:56 PM          Microsoft
Corporation         c:\winnt\system32\cscui.dll
winspool.drv        5.00.2195.2780      109.77 KB
(112,400 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\winspool.drv
winscard.dll        5.00.2134.1         77.27 KB
(79,120 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\winscard.dll
wlnotify.dll        5.00.2195.2780      53.77 KB
(55,056 bytes)      8/27/2001 3:04:27 PM
          Microsoft Corporation
          c:\winnt\system32\wlnotify.dll
cscdll.dll          5.00.2195.2401      98.27 KB
(100,624 bytes)     8/27/2001 3:03:56 PM
          Microsoft Corporation
          c:\winnt\system32\cscdll.dll
lz32.dll  5.00.2134.1         9.77 KB (10,000 bytes)
          12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\lz32.dll
version.dll         5.00.2134.1         15.77 KB
(16,144 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\version.dll
rsaenh.dll          5.00.2195.2228      130.77 KB
(133,904 bytes)     8/27/2001 3:05:17 PM
          Microsoft Corporation
          c:\winnt\system32\rsaenh.dll
mscat32.dll         5.131.2134.1        7.77 KB
(7,952 bytes)       12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mscat32.dll
ole32.dll 5.00.2195.2887      969.77 KB (993,040
bytes)    8/27/2001 3:04:18 PM          Microsoft
Corporation         c:\winnt\system32\ole32.dll
imagehlp.dll        5.00.2195.2778      125.77 KB
(128,784 bytes)     5/4/2001 12:05:02 PM
          Microsoft Corporation
          c:\winnt\system32\imagehlp.dll
msasn1.dll          5.00.2134.1         51.27 KB
(52,496 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msasn1.dll
crypt32.dll         5.131.2195.2833     451.27 KB
(462,096 bytes)     8/27/2001 3:03:56 PM
          Microsoft Corporation
          c:\winnt\system32\crypt32.dll
wintrust.dll        5.131.2195.2779     162.27 KB
(166,160 bytes)     8/27/2001 3:04:27 PM
          Microsoft Corporation
          c:\winnt\system32\wintrust.dll
shlwapi.dll         5.00.3315.1000      282.77 KB
(289,552 bytes)     8/27/2001 3:04:23 PM
          Microsoft Corporation
          c:\winnt\system32\shlwapi.dll
shell32.dll         5.00.3315.2902      2.25 MB
(2,359,056 bytes)   8/27/2001 3:04:23 PM
          Microsoft Corporation
          c:\winnt\system32\shell32.dll
msgina.dll          5.00.2195.2779      324.27 KB
(332,048 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msgina.dll
comctl32.dll        5.81      537.77 KB (550,672
bytes)    12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\comctl32.dll
setupapi.dll        5.00.2195.2663      555.77 KB
(569,104 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\setupapi.dll
```

```
winmm.dll 5.00.2161.1         184.77 KB (189,200
bytes)    12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\winmm.dll
winsta.dll          5.00.2195.2386      36.77 KB
(37,648 bytes)      8/27/2001 3:04:27 PM
          Microsoft Corporation
          c:\winnt\system32\winsta.dll
wsock32.dll         5.00.2195.2871      21.27 KB
(21,776 bytes)      8/27/2001 3:04:28 PM
          Microsoft Corporation
          c:\winnt\system32\wsock32.dll
dnsapi.dll          5.00.2195.2785      130.77 KB
(133,904 bytes)     8/27/2001 3:03:58 PM
          Microsoft Corporation
          c:\winnt\system32\dnsapi.dll
wldap32.dll         5.00.2195.2797      125.27 KB
(128,272 bytes)     8/27/2001 3:04:27 PM
          Microsoft Corporation
          c:\winnt\system32\wldap32.dll
ws2help.dll         5.00.2134.1         17.77 KB
(18,192 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\ws2help.dll
ws2_32.dll          5.00.2195.2780      67.77 KB
(69,392 bytes)      8/27/2001 3:04:27 PM
          Microsoft Corporation
          c:\winnt\system32\ws2_32.dll
samlib.dll          5.00.2195.2780      49.77 KB
(50,960 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\samlib.dll
netrap.dll          5.00.2134.1         11.27 KB
(11,536 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\netrap.dll
netapi32.dll        5.00.2195.2808      303.77 KB
(311,056 bytes)     8/27/2001 3:04:14 PM
          Microsoft Corporation
          c:\winnt\system32\netapi32.dll
profmap.dll         5.00.2181.1         29.27 KB
(29,968 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\profmap.dll
secur32.dll         5.00.2195.2862      46.77 KB
(47,888 bytes)      8/27/2001 3:04:22 PM
          Microsoft Corporation
          c:\winnt\system32\secur32.dll
sfc.dll   5.00.2195.2896      92.11 KB (94,320 bytes)
          8/27/2001 3:04:22 PM          Microsoft
Corporation         c:\winnt\system32\sfc.dll
nddeapi.dll         5.00.2137.1         15.27 KB
(15,632 bytes)      12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\nddeapi.dll
userenv.dll         5.00.2195.2780      361.77 KB
(370,448 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\userenv.dll
user32.dll          5.00.2195.2821      392.77 KB
(402,192 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\user32.dll
```

```
gdi32.dll 5.00.2195.2778      228.77 KB (234,256
bytes)    12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\gdi32.dll
rpcrt4.dll          5.00.2195.2832      437.27 KB
(447,760 bytes)     8/27/2001 3:04:21 PM
          Microsoft Corporation
          c:\winnt\system32\rpcrt4.dll
advapi32.dll        5.00.2195.2867      351.77 KB
(360,208 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\advapi32.dll
kernel32.dll        5.00.2195.2778      714.77 KB
(731,920 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\kernel32.dll
msvcrt.dll          6.10.8924.0         284.05 KB
(290,869 bytes)     5/4/2001 12:05:02 PM
          Microsoft Corporation
          c:\winnt\system32\msvcrt.dll
winlogon.exe        5.00.2195.2953      173.77 KB
(177,936 bytes)     12/7/1999 6:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\winlogon.exe
sfcfiles.dll        5.00.2195.2967      948.27 KB
(971,024 bytes)     8/27/2001 3:04:22 PM
          Microsoft Corporation
          c:\winnt\system32\sfcfiles.dll
ntdll.dll 5.00.2195.2779      478.77 KB (490,256
bytes)    5/4/2001 12:05:02 PM          Microsoft
Corporation         c:\winnt\system32\ntdll.dll
smss.exe  5.00.2195.2901      44.27 KB (45,328 bytes)
          12/7/1999 6:00:00 AM          Microsoft
Corporation         c:\winnt\system32\smss.exe

[Services]

Display Name        Name      State     Start Mode
          Service Type        Path      Error Control
          Start Name          Tag ID
Alerter   Alerter   Running   Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Application Management        AppMgmt   Stopped
          Manual    Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Computer Browser    Browser   Running   Auto
          Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Indexing Service    cisvc     Running   Auto
          Share Process
          c:\winnt\system32\cisvc.exe   Normal
          LocalSystem         0
ClipBook  ClipSrv   Stopped   Manual    Own Process
          c:\winnt\system32\clipsrv.exe Normal
          LocalSystem         0
Distributed File System       Dfs       Running
          Auto      Own Process
          c:\winnt\system32\dfssvc.exe  Normal
          LocalSystem         0
DHCP Client         Dhcp      Running   Auto
          Share Process
```

```
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Logical Disk Manager Administrative Service
          dmadmin   Stopped   Manual    Share Process
          c:\winnt\system32\dmadmin.exe /com
          Normal    LocalSystem         0
Logical Disk Manager          dmserver  Running
          Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
DNS Client          Dnscache  Running   Auto
          Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Event Log Eventlog  Running   Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
COM+ Event System   EventSystem         Running
          Manual    Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Fax Service         Fax       Stopped   Manual    Own
Process   c:\winnt\system32\faxsvc.exe  Normal
          LocalSystem         0
cLAN Connection Manager       GniConMgr Running
          Auto      Own Process
          c:\winnt\system32\gnconmgr.exe
          Normal    LocalSystem         0
Intersite Messaging IsmServ   Stopped   Disabled  Own
Process   c:\winnt\system32\ismserv.exe Normal
          LocalSystem         0
Kerberos Key Distribution Center        kdc
          Stopped   Disabled  Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
Server    lanmanserver        Running   Auto
          Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Workstation         lanmanworkstation   Running
          Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
License Logging Service       LicenseService
          Running   Auto      Own Process
          c:\winnt\system32\llssrv.exe  Normal
          LocalSystem         0
TCP/IP NetBIOS Helper Service LmHosts   Running
          Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Messenger Messenger Running   Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
NetMeeting Remote Desktop Sharing       mnmsrvc
          Stopped   Manual    Own Process
          c:\winnt\system32\mnmsrvc.exe Normal
          LocalSystem         0
Distributed Transaction Coordinator     MSDTC
          Running   Auto      Own Process
          c:\winnt\system32\msdtc.exe   Normal
          LocalSystem         0
```

```
Windows Installer   MSIServer Stopped   Manual
          Share Process
          c:\winnt\system32\msiexec.exe /v
          Normal    LocalSystem         0
Microsoft Search    MSSEARCH  Running   Auto
          Share Process       "c:\program
files\common files\system\mssearch\bin\mssearch.exe"
          Normal    LocalSystem         0
MSSQLSERVER         MSSQLSERVER         Stopped
          Manual    Own Process
          c:\sqlser~1\mssql\binn\sqlservr.exe
          Normal    LocalSystem         0
MSSQLServerADHelper MSSQLServerADHelper Stopped
          Manual    Own Process         c:\program
files\microsoft sql server\80\tools\binn\sqladhlp.exe
          Normal    LocalSystem         0
Network DDE         NetDDE    Stopped   Manual
          Share Process
          c:\winnt\system32\netdde.exe  Normal
          LocalSystem         0
Network DDE DSDM    NetDDEdsdm          Stopped
          Manual    Share Process
          c:\winnt\system32\netdde.exe  Normal
          LocalSystem         0
Net Logon Netlogon  Stopped   Manual    Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
Network Connections Netman    Running   Manual
          Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
File Replication    NtFrs     Stopped   Manual    Own
Process   c:\winnt\system32\ntfrs.exe   Ignore
          LocalSystem         0
NT LM Security Support Provider         NtLmSsp
          Running   Manual    Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
Removable Storage   NtmsSvc   Running   Auto
          Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Plug and Play       PlugPlay  Running   Auto
          Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
IPSEC Policy Agent  PolicyAgent         Running
          Auto      Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
Protected Storage   ProtectedStorage    Running
          Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Remote Access Auto Connection Manager   RasAuto
          Stopped   Manual    Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Remote Access Connection Manager        RasMan
          Stopped   Manual    Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Routing and Remote Access     RemoteAccess
          Stopped   Disabled  Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Remote Registry Service       RemoteRegistry
          Running   Auto      Own Process
          c:\winnt\system32\regsvc.exe  Normal
          LocalSystem         0
Remote Procedure Call (RPC) Locator     RpcLocator
          Stopped   Manual    Own Process
          c:\winnt\system32\locator.exe Normal
          LocalSystem         0
Remote Procedure Call (RPC)   RpcSs      Running
          Auto      Share Process
          c:\winnt\system32\svchost -k rpcss
          Normal    LocalSystem         0
QoS RSVP  RSVP      Running   Manual    Own Process
          c:\winnt\system32\rsvp.exe -s Normal
          LocalSystem         0
Security Accounts Manager     SamSs     Running
          Auto      Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
Smart Card Helper   SCardDrv  Stopped   Manual
          Share Process
          c:\winnt\system32\scardsvr.exe
          Ignore    LocalSystem         0
Smart Card          SCardSvr  Stopped   Manual
          Share Process
          c:\winnt\system32\scardsvr.exe
          Ignore    LocalSystem         0
Task Scheduler      Schedule  Running   Auto
          Share Process
          c:\winnt\system32\mstask.exe  Normal
          LocalSystem         0
RunAs Service       seclogon  Running   Auto
          Share Process
          c:\winnt\system32\services.exe
          Ignore    LocalSystem         0
System Event Notification     SENS      Running
          Auto      Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Internet Connection Sharing   SharedAccess
          Stopped   Manual    Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Print Spooler       Spooler   Running   Auto      Own
Process   c:\winnt\system32\spoolsv.exe Normal
          LocalSystem         0
SQLSERVERAGENT      SQLSERVERAGENT      Stopped
          Manual    Own Process
          c:\sqlser~1\mssql\binn\sqlagent.exe
          Normal    LocalSystem         0
Performance Logs and Alerts   SysmonLog Stopped
          Manual    Own Process
          c:\winnt\system32\smlogsvc.exe
          Normal    LocalSystem         0
Telephony TapiSrv   Running   Manual    Share Process
          c:\winnt\system32\svchost.exe -k tapisrv
          Normal    LocalSystem         0
Tardis time service Tardis    Stopped   Manual    Own
Process   c:\winnt\system32\tardisnt.exe
          Normal    LocalSystem         0
Terminal Services   TermService         Running
          Auto      Own Process
          c:\winnt\system32\termsrv.exe Normal
          LocalSystem         0
Telnet    TlntSvr   Stopped   Manual    Own Process
          c:\winnt\system32\tlntsvr.exe Normal
          LocalSystem         0
Distributed Link Tracking Server        TrkSvr
          Stopped   Manual    Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Distributed Link Tracking Client        TrkWks
          Running   Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Uninterruptible Power Supply  UPS       Stopped
          Manual    Own Process
          c:\winnt\system32\ups.exe     Normal
          LocalSystem         0
Utility Manager     UtilMan   Stopped   Manual    Own
Process   c:\winnt\system32\utilman.exe Normal
          LocalSystem         0
Windows Time        W32Time   Stopped   Manual
          Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Windows Management Instrumentation      WinMgmt
          Running   Auto      Own Process
          c:\winnt\system32\wbem\winmgmt.exe
          Ignore    LocalSystem         0
Windows Management Instrumentation Driver Extensions
          Wmi       Running   Manual    Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0

[Program Groups]

Group Name          Name      User Name
Accessories         Default User:Accessories
          Default User
Accessories\Accessibility     Default
User:Accessories\Accessibility          Default User
Accessories\Entertainment     Default
User:Accessories\Entertainment          Default User
Accessories\System Tools      Default
User:Accessories\System Tools Default User
Startup   Default User:Startup          Default User
Accessories         All Users:Accessories         All
Users
Accessories\Communications    All
Users:Accessories\Communications        All Users
Accessories\Entertainment     All
Users:Accessories\Entertainment         All Users
Accessories\System Tools      All
Users:Accessories\System Tools          All Users
Administrative Tools          All
Users:Administrative Tools    All Users
Adobe Acrobat 4.0   All Users:Adobe Acrobat 4.0   All
Users
GigaNet   All Users:GigaNet   All Users
```

```
Microsoft SQL Server          All Users:Microsoft SQL
Server    All Users
Microsoft SQL Server - Switch All Users:Microsoft SQL
Server - Switch     All Users
Startup   All Users:Startup   All Users
Accessories         ART\Administrator:Accessories
          ART\Administrator
Accessories\Accessibility
          ART\Administrator:Accessories\Accessibility
          ART\Administrator
Accessories\Entertainment
          ART\Administrator:Accessories\Entertainment
          ART\Administrator
Accessories\System Tools
          ART\Administrator:Accessories\System Tools
          ART\Administrator
Administrative Tools
          ART\Administrator:Administrative Tools
          ART\Administrator
Startup   ART\Administrator:Startup
          ART\Administrator

[Startup Programs]

Program   Command   User Name Location
Service Manager
          c:\progra~1\micros~2\80\tools\binn\sqlmangr
.exe  /n  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
Image Document      "C:\Program Files\Windows
NT\Accessories\ImageVue\KodakImg.exe"
WordPad Document    "%ProgramFiles%\Windows
NT\Accessories\WORDPAD.EXE"
Windows Media Services DRM Storage object         Not
Available
Bitmap Image        mspaint.exe

[Internet Explorer 5]

[ Following are sub-categories of this main category
]

[Summary]

Item      Value
Version   5.00.3315.1000
Build     53315.1000
Product ID          51879-000-0000007-05434
Application Path    C:\Program Files\Internet
Explorer
Language  English (United States)
Active Printer      Not Available

Cipher Strength     168-bit
Content Advisor     Disabled
IEAK Install        No

[File Versions]

File      Version   Size      Date      Path
          Company
advapi32.dll        5.0.2195.2867       352 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
advpack.dll         5.0.3103.1000       87 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
browselc.dll        5.0.3315.2846       35 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
browseui.dll        5.0.3315.2846       789 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
ckcnv.exe 5.0.2189.1          9 KB      12/7/1999
7:00:00 AM          C:\WINNT\system32   Microsoft
Corporation
comctl32.dll        5.81.3103.1000      538 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
crypt32.dll         5.131.2195.2833     451 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
enhsig.dll          <File Missing>      Not Available
          Not Available       Not Available       Not
Available
iemigrat.dll        <File Missing>      Not Available
          Not Available       Not Available       Not
Available
iesetup.dll         5.0.3103.1000       57 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
iexplore.exe        5.0.2920.0          59 KB
          12/7/1999 7:00:00 AM          C:\Program
Files\Internet Explorer       Microsoft Corporation
imagehlp.dll        5.0.2195.2778       126 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
imghelp.dll         <File Missing>      Not Available
          Not Available       Not Available       Not
Available
inseng.dll          5.0.3103.1000       72 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
jobexec.dll         5.0.0.1   47 KB     12/7/1999
7:00:00 AM          C:\WINNT\system32   Microsoft
Corporation
jscript.dll         5.1.0.5907          476 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
jsproxy.dll         5.0.2920.0          13 KB
          12/7/1999 7:00:00 AM
          C:\WINNT\system32   Microsoft Corporation
msaahtml.dll        <File Missing>      Not Available
          Not Available       Not Available       Not
Available
mshtml.dll          5.0.3315.2870       2290 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
msjava.dll          5.0.3802.0          923 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
msoss.dll <File Missing>      Not Available       Not
Available Not Available       Not Available
msxml.dll 8.0.5718.1          493 KB    5/4/2001
12:05:02 PM         C:\WINNT\system32   Microsoft
Corporation
occache.dll         5.0.3103.1000       86 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
ole32.dll 5.0.2195.2887       970 KB    5/4/2001
12:05:02 PM         C:\WINNT\system32   Microsoft
Corporation
oleaut32.dll        2.40.4517.0         612 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
olepro32.dll        5.0.4517.0          160 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
rsabase.dll         5.0.2195.2228       128 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
rsaenh.dll          5.0.2195.2228       131 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
rsapi32.dll         <File Missing>      Not Available
          Not Available       Not Available       Not
Available
rsasig.dll          <File Missing>      Not Available
          Not Available       Not Available       Not
Available
schannel.dll        5.1.2195.0          138 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
shdoc401.dll        <File Missing>      Not Available
          Not Available       Not Available       Not
Available
shdocvw.dll         5.0.3315.2879       1078 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
shell32.dll         5.0.3315.2902       2304 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
shlwapi.dll         5.0.3315.1000       283 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
url.dll   5.0.2920.0          82 KB     12/7/1999
7:00:00 AM          C:\WINNT\system32   Microsoft
Corporation
urlmon.dll          5.0.3315.1000       441 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
vbscript.dll        5.1.0.5907          428 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
webcheck.dll        5.0.3315.1000       252 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
```

```
win.com   5.0.2134.1          24 KB     12/7/1999
7:00:00 AM          C:\WINNT\system32   Microsoft
Corporation
wininet.dll         5.0.3315.1000       457 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
winsock.dll         3.10.0.103          3 KB
          12/7/1999 7:00:00 AM
          C:\WINNT\system32   Microsoft Corporation
wintrust.dll        5.131.2195.2779     162 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
wsock.vxd <File Missing>      Not Available       Not
Available Not Available       Not Available
wsock32.dll         5.0.2195.2871       21 KB
          5/4/2001 12:05:02 PM
          C:\WINNT\system32   Microsoft Corporation
wsock32n.dll        <File Missing>      Not Available
          Not Available       Not Available       Not
Available

[Connectivity]

Item      Value
Connection Preference         Never dial
EnableHttp1.1       1
ProxyHttp1.1        0

LAN Settings

AutoConfigProxy     wininet.dll
AutoProxyDetectMode Disabled
AutoConfigURL
Proxy     Disabled
ProxyServer
ProxyOverride

[Cache]

[ Following are sub-categories of this main category
]

[Summary]

Item      Value
Page Refresh Type   Automatic
Temporary Internet Files Folder         C:\Documents
and Settings\Administrator\Local Settings\Temporary
Internet Files
Total Disk Space    8630 MB
Available Disk Space          4873 MB
Maximum Cache Size  269 MB
Available Cache Size          270 MB

[List of Objects]

Program File        Status    CodeBase
{15589FA1-C456-11CE-BF01-00AA0055595A}  Not Available
          file://D:\install\pfw\cLANdoc.exe

[Content]

[ Following are sub-categories of this main category
]

[Summary]

Item      Value
Content Advisor     Disabled

[Personal Certificates]

Issued To Issued By Validity  Signature Algorithm
Administrator       Administrator       6/14/2001 to
5/21/2101 sha1RSA

[Other People Certificates]

Issued To Issued By Validity  Signature Algorithm
No other people certificate information available


[Publishers]

Name
No publisher information available

[Security]

Zone      Security Level
Local intranet      Medium-low
Trusted sites       Low
Internet  Medium
Restricted sites    High
```

Client System Configuration

```
Date . . . . . .  09/20/2001
Time . . . . . .  17:24:33

Product  . . . . . .  ProLiant DL360

Machine ID
  From System Board  . . . . . .  CPQ0685

Processor  . . . . . .  Pentium III(R) at
933 MHz
  Slot . . . . . .  2
  Secondary Cache  . . . . . .  256K
  CPU ID . . . . . .  0686

Processor  . . . . . .  Pentium III(R) at
933 MHz
  Slot . . . . . .  1
  Secondary Cache  . . . . . .  256K
  CPU ID . . . . . .  0686

Processor(s) Mapped Out  . . . .  None

Numeric Coprocessor  . . . . . .  Integrated 387-
Compatible

Expansion Bus  . . . . . .  ISA, PCI

System Identification Number . .  6J14FXS1V007

CPU Mode . . . . . .  Real Mode

System ROM
    Revision . . . . . .  01/11/2001
      Family . . . . . .  P21
    Flashable  . . . . . .  Yes
    Supports F10 partition . . .  Yes

Video Controller ROM
    Revision . . . . . .  3.96

Option ROMs
  Address Range  . . . . . .  C0000 - C7FFF
    Data Dump  . . . . . .  (1999/03/24 23:56)

  Address Range  . . . . . .  C8000 - CBFFF
    Data Dump  . . . . . .  (04/22/98 ROC
Smart Array Option ROM/BIOS (C)Co...)

  Address Range  . . . . . .  E8000 - EDFFF
    Data Dump  . . . . . .  ( CPQSCSI d)

Bootblock ROM  . . . . . .  01/25/2000

Standby Recovery Server
  Status . . . . . .  Disabled
  COM Port . . . . . .  COM1
  Server Configuration . . . . .  Recovery
  Timeout Value  . . . . . .  1 minutes



Memory Boards Identified:
  System Board
    DIMM Slot  1 (SDRAM) . . . .   128 Megabytes
    DIMM Slot  2 (SDRAM) . . . .   128 Megabytes
    DIMM Slot  3 (SDRAM) . . . .   128 Megabytes
    DIMM Slot  4 (SDRAM) . . . .   128 Megabytes
Total Compaq Memory  . . . . . .   512 Megabytes

Keyboard . . . . . .  Enhanced

LPT Ports  . . . . . .  Not Installed

COM Ports  . . . . . .  COM1 (Address 3F8)
Compaq NC3163 Fast Ethernet NIC
  Device Type  . . . . . .  Ethernet Controller
  PCI Bus Number . . . . . .  3
  Device Number  . . . . . .  4
  Function Number  . . . . . .  00h
  Slot Number  . . . . . .  0
  Vendor ID  . . . . . .  0E11h
  Device ID  . . . . . .  1229h
  Subsystem Vendor ID  . . . . .  0E11h
  Subsystem ID . . . . . .  B134h
  Revision ID  . . . . . .  08h
```

```
  Programming Interface  . . . .  00h
  Expansion ROM Base Address . .  FFF00000h
  IRQ Line . . . . . .  5
  IRQ Pin  . . . . . .  INTA#
  Memory Address Base  . . . . .  C6FFF000h
  Memory Address Length  . . . .  1000h
  IO Address Base  . . . . . .  3000h
  IO Address Length  . . . . . .  40h
  Memory Address Base  . . . . .  C6E00000h
  Memory Address Length  . . . .  100000h


Compaq NC3163 Fast Ethernet NIC
  Device Type  . . . . . .  Ethernet Controller
  PCI Bus Number . . . . . .  3
  Device Number  . . . . . .  5
  Function Number  . . . . . .  00h
  Slot Number  . . . . . .  0
  Vendor ID  . . . . . .  0E11h
  Device ID  . . . . . .  1229h
  Subsystem Vendor ID  . . . . .  0E11h
  Subsystem ID . . . . . .  B134h
  Revision ID  . . . . . .  08h
  Programming Interface  . . . .  00h
  Expansion ROM Base Address . .  FFF00000h
  IRQ Line . . . . . .  7
  IRQ Pin  . . . . . .  INTA#
  Memory Address Base  . . . . .  C6DFF000h
  Memory Address Length  . . . .  1000h
  IO Address Base  . . . . . .  3040h
  IO Address Length  . . . . . .  40h
  Memory Address Base  . . . . .  C6C00000h
  Memory Address Length  . . . .  100000h


ATM Controller
  PCI Bus Number . . . . . .  3
  Device Number  . . . . . .  6
  Function Number  . . . . . .  00h
  Slot Number  . . . . . .  2
  Vendor ID  . . . . . .  135Bh
  Device ID  . . . . . .  0001h
  Revision ID  . . . . . .  00h
  Programming Interface  . . . .  00h
  Expansion ROM Base Address . .  0h
  IRQ Line . . . . . .  10
  IRQ Pin  . . . . . .  INTA#
  Memory Address Base  . . . . .  C6BE0000h
  Memory Address Length  . . . .  20000h
  Memory Address Base  . . . . .  C6800000h
  Memory Address Length  . . . .  200000h
  Memory Address Base  . . . . .  C5000000h
  Memory Address Length  . . . .  1000000h
  Memory Address Base  . . . . .  C4FF0000h
  Memory Address Length  . . . .  10000h



Diskette Drive A . . . . . .  1.44 Megabyte (3.5
inch)

Drive Controller 1, Compaq Integrated Smart Array
Controller
  IDA Firmware Revision  . . . .  1.42
  Array Accelerator Memory . . .  8188 Kbytes
  Accelerator Status . . . . . .  Not Configured
    Battery count  . . . . . .  0
    Batteries charged  . . . . .  0
    Batteries failed . . . . . .  0
  Internal ProLiant  . . . . . .  Bus 2, Rev. JB21

  Logical Drive  1 . . . . . .  9095 Megabyte
  Fault Tolerance  . . . . . .  Mirroring
  OS Format  . . . . . .  Multi-Sector
Distribution
  Drive geometry (Cyl, Hds, Sec)  2177, 255, 32
  Array Accelerator  . . . . . .  Disabled
  Logical drive in interim recovery mode.

    Hard Drive  1
    SCSI Bus . . . . . .  2
    SCSI ID  . . . . . .  0
    Serial Number  . . . . . .
LS811187000070211G43
    Firmware Revision 1  . . . .  3B07
    Model Number . . . . . .  COMPAQ  BD009122BA
    Initialized for Monitoring .  Yes
      Reference time . . . . . .  359596
      Sectors read . . . . . .  *56641919
      Hard read errors . . . . .  0
      Read errors retry  . . . .  0
      ECC read errors  . . . . .  0
      Sectors written  . . . . .  21991332
      Hard write errors  . . . .  0
      Write errors retry . . . .  0
      Seek count . . . . . .  54384
      Seek errors  . . . . . .  0
      Spin cycles  . . . . . .  3
      Spin up time . . . . . .  0
      Seek time track  . . . . .  47%
      Seek time third  . . . . .  69%
      Seek time full . . . . . .  71%
      Reallocated sectors  . . .  442
      Recovers read failed . . .  0
      Bus faults . . . . . .  0

    Hard Drive  2
    SCSI Bus . . . . . .  2
    SCSI ID  . . . . . .  1
    Serial Number  . . . . . .  Undetermined
    Model Number . . . . . .  Undetermined
    Initialized for Monitoring .  No

Graphics Mode  . . . . . .  03 (80-Column Text)


Primary Monitor attached to  . .  ATI RAGE IIC PCI
Graphics Controller
with Video Graphics Color Monitor

Base Memory
  System Total . . . . . .  638 Kbytes
  Amount Free  . . . . . .  555 Kbytes
(568384 Bytes)

Extended Memory
  System Total . . . . . .  523264 Kbytes

Expanded Memory
  LIM Driver Support . . . . . .  LIM driver not
loaded

Operating System . . . . . .  MS-DOS version 7.10
(from diskette)

Environment variables
  PATH=
  PROMPT=$P$G
  COMSPEC=A:\COMMAND.COM
  CMDLINE=inspect /u
End of environment

Revisions Table

Previous Revisions

Current Revisions

System serial number . . . . . .  6J14FXS1V007

Memory Allocation (including INSPECT)
  PSP   SIZE    NAME          TRAPPED INTERRUPTS
  ----  ------  ------------  ----------------------
--------------
  12F7  007200  COMMAND.COM   2Fh  2Eh  24h  23h  22h
  14C2  218144  INSPECT.EXE   F9h  F4h  F3h  F2h  E5h
3Fh  00h

System Configuration Memory
  00 - 0F :    40 00 24 00    17 00 04 20    09 01 26
82    50 80 00 00
  10 - 1F :    40 00 00 00    03 80 02 00    3C 00 00
00    00 00 00 02
  20 - 2F :    00 00 00 00    7F 20 20 40    00 7A 00
00    00 18 02 94
  30 - 3F :    00 3C 20 80    00 00 XX XX    XX XX XX
XX    XX XX XX XX

BIOS Data Area
  40:0000 :    F8 03 00 00    00 00 00 00    00 00 00
00    00 00 80 9F
  40:0010 :    27 02 00 7E    02 00 00 00    00 00 1E
00    1E 00 00 00
  40:0020 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:0030 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 01 01
  40:0040 :    25 00 00 00    00 2A 00 11    02 03 50
00    00 10 00 00
  40:0050 :    00 18 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:0060 :    0E 0D 00 D4    03 29 30 A4    17 FD 74
00    40 69 11 00
  40:0070 :    00 00 00 12    00 01 00 00    14 14 14
14    01 01 01 01
  40:0080 :    1E 00 3E 00    18 10 00 60    F9 11 0B
01    00 00 00 05
  40:0090 :    17 00 00 00    2A 00 10 00    00 00 00
00    00 00 00 00
```

```
  40:00A0 :    00 00 00 00    00 00 00 00    7C 14 00
C0    00 00 00 00
  40:00B0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00C0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00D0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00E0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00F0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00


Interrupt Vector Table (including INSPECT)
  00 - 03 :    14D2:0555      0070:0465
122E:0016      0070:0465
  04 - 07 :    0070:0465      F000:FF54
F000:93CC      F000:9BD0
  08 - 0B :    122E:001F      122E:0028
F000:9BD0      122E:0052
  0C - 0F :    F000:9BD0      F000:9BD0
122E:009A      0070:0465
  10 - 13 :    C000:13FE      F000:F84D
F000:F841      0070:03EE
  14 - 17 :    F000:D0E5      0207:0240
0070:042D      F000:EFD2
  18 - 1B :    F000:F06D      12EF:002F
F000:FE6E      0070:045F
  1C - 1F :    F000:FF53      F000:0000
0000:0522      C000:2143
  20 - 23 :    00C9:0FA8      00C9:0FB2
12F7:0314      12F7:016D
  24 - 27 :    12F7:0178      00C9:0FBC
00C9:0FC6      00C9:0FD0
  28 - 2B :    00C9:106C      0070:0466
00C9:106C      00C9:106C
  2C - 2F :    00C9:106C      00C9:106C
12F7:0162      12F8:01CC
  30 - 33 :    C90F:E4EA      F000:9B00
00C9:106C      00C9:106C
  34 - 37 :    00C9:106C      00C9:106C
00C9:106C      00C9:106C
  38 - 3B :    00C9:106C      00C9:106C
00C9:106C      00C9:106C
  3C - 3F :    00C9:106C      00C9:106C
00C9:106C      258E:04F3
  40 - 43 :    F000:EC59      C81F:01C6
F000:F065      C000:2556
  44 - 47 :    F000:9BD0      F000:9BD0
0000:0000      F000:9BD0
  48 - 4B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  4C - 4F :    F000:9BD0      F000:9BD0
F000:9BD0      0070:04FC
  50 - 53 :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  54 - 57 :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  58 - 5B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  5C - 5F :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  60 - 63 :    0000:0000      0000:0000
0000:0000      0000:0000
  64 - 67 :    0000:0000      0000:0000
0000:0000      0000:0000
  68 - 6B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  6C - 6F :    F000:9BD0      C000:13FE
F000:9BD0      F000:9BD0
  70 - 73 :    122E:0035      F000:9C1F
F000:9BD0      F000:9BD0
  74 - 77 :    122E:00E2      F000:9C28
F000:9BD0      122E:0112
  78 - 7B :    0000:0000      0000:0000
0000:0000      0000:0000
  7C - 7F :    0000:0000      0000:0000
0000:0000      0000:0000
  80 - 83 :    0000:0000      0000:0000
0000:0000      0000:0000
  84 - 87 :    0000:0000      0000:0000
0000:0000      0000:0000
  88 - 8B :    0000:0000      0000:0000
0000:0000      0000:0000
  8C - 8F :    0000:0000      0000:0000
0000:0000      0000:0000
  90 - 93 :    0000:0000      0000:0000
0000:0000      0000:0000
  94 - 97 :    0000:0000      0000:0000
0000:0000      0000:0000
  98 - 9B :    0000:0000      0000:0000
0000:0000      0000:0000
  9C - 9F :    0000:0000      0000:0000
0000:0000      0000:0000
  A0 - A3 :    0000:0000      0000:0000
0000:0000      0000:0000
  A4 - A7 :    0000:0000      0000:0000
0000:0000      0000:0000
  A8 - AB :    0000:0000      0000:0000
0000:0000      0000:0000
  AC - AF :    0000:0000      0000:0000
0000:0000      0000:0000
  B0 - B3 :    0000:0000      0000:0000
0000:0000      0000:0000
  B4 - B7 :    0000:0000      0000:0000
0000:0000      0000:0000
  B8 - BB :    0000:0000      0000:0000
0000:0000      0000:0000
  BC - BF :    0000:0000      0000:0000
0000:0000      0000:0000
  C0 - C3 :    0000:0000      0000:0000
0000:0000      0000:0000
  C4 - C7 :    0000:0000      0000:0000
0000:0000      0000:0000
  C8 - CB :    0000:0000      0000:0000
0000:0000      0000:0000
  CC - CF :    0000:0000      0000:0000
0000:0000      0000:0000
  D0 - D3 :    0057:0057      0006:0000
7757:0000      0087:0000
  D4 - D7 :    5777:0000      0057:0000
0000:0000      0000:0002
  D8 - DB :    0179:0000      0000:0000
0000:200B      0000:0BD6
  DC - DF :    0179:0000      0000:0000
0000:200B      0000:0100
  E0 - E3 :    0000:0BF0      0000:200A
0000:0000      0000:031E
  E4 - E7 :    0000:0178      2000:00D0
0001:A610      0000:0051
  E8 - EB :    0000:00E8      0000:0000
0083:0020      0006:1EA2
  EC - EF :    0006:1EA0      0046:B000
B000:1F76      0046:0087
  F0 - F3 :    0010:13C1      DC38:1DB7
1DB7:13C1      1400:DA95
  F4 - F7 :    1CDA:0246      0101:7387
0000:0000      0000:613D
  F8 - FB :    613D:0020      15B7:6443
00F2:0003      0000:09F6
  FC - FF :    0246:0900      0900:0000
E15F:0049      0003:09F6

PCI Devices Information
  Signature  . . . . . .  PCI
  Config Mechanism #1  . . . . .  Supported
  Config Mechanism #2  . . . . .  Not Supported
  Spec Cycle for Config #1 . . .  Supported
  Spec Cycle for Config #2 . . .  Not Supported
  BIOS Interface Version . . . .  2.10
  Last PCI Bus Number  . . . . .  3
  Number of PCI Devices  . . . .  5

  PCI Bus Number . . . . . .  0
  Device Number  . . . . . .  1
  Function Number  . . . . . .  00h
  Slot Number  . . . . . .  0
  Vendor ID  . . . . . .  0E11h
  Device ID  . . . . . .  0010h
  Revision ID  . . . . . .  02h
  Device Type  . . . . . .  RAID Controller
  Programming Interface  . . . .  00h
  Expansion ROM Base Address . .  FFF80000h
  IRQ Line . . . . . .  3
  IRQ Pin  . . . . . .  INTA#
  IO Address Base  . . . . . .  2000h
  IO Address Length  . . . . . .  100h
  Memory Address Base  . . . . .  C3000000h
  Memory Address Length  . . . .  1000000h
  Memory Address Base  . . . . .  C2000000h
  Memory Address Length  . . . .  1000000h

  PCI Bus Number . . . . . .  0
  Device Number  . . . . . .  3
  Function Number  . . . . . .  00h
  Slot Number  . . . . . .  0
  Vendor ID  . . . . . .  1002h
  Device ID  . . . . . .  4756h
  Revision ID  . . . . . .  7Ah
  Device Type  . . . . . .  VGA Compatible
Controller
  Programming Interface  . . . .  00h
  Expansion ROM Base Address . .  FFFE0000h
  IRQ Line . . . . . .  255
  IRQ Pin  . . . . . .  Not Used
  Memory Address Base  . . . . .  C0000000h
  Memory Address Length  . . . .  1000000h
```

```
IO Address Base . . . . . 2400h
IO Address Length . . . . . 100h
Memory Address Base . . . . . C1FFF000h
Memory Address Length . . . . 1000h

PCI Bus Number . . . . . 3
Device Number . . . . . 4
Function Number . . . . . 00h
Slot Number . . . . . 0
Vendor ID . . . . . 0E11h
Device ID . . . . . 1229h
Revision ID . . . . . 08h
Device Type . . . . . Ethernet Controller
Programming Interface . . . . 00h
Expansion ROM Base Address . . FFF00000h
IRQ Line . . . . . 5
IRQ Pin . . . . . INTA#
Memory Address Base . . . . . C6FFF000h
Memory Address Length . . . . 1000h
IO Address Base . . . . . 3000h
IO Address Length . . . . . 40h
Memory Address Base . . . . . C6E00000h
Memory Address Length . . . . 100000h

PCI Bus Number . . . . . 3
Device Number . . . . . 5
Function Number . . . . . 00h
Slot Number . . . . . 0
Vendor ID . . . . . 0E11h
Device ID . . . . . 1229h
Revision ID . . . . . 08h
Device Type . . . . . Ethernet Controller
Programming Interface . . . . 00h
Expansion ROM Base Address . . FFF00000h
IRQ Line . . . . . 7
IRQ Pin . . . . . INTA#
Memory Address Base . . . . . C6DFF000h
Memory Address Length . . . . 1000h
IO Address Base . . . . . 3040h
IO Address Length . . . . . 40h
Memory Address Base . . . . . C6C00000h
Memory Address Length . . . . 100000h

PCI Bus Number . . . . . 3
Device Number . . . . . 6
Function Number . . . . . 00h
Slot Number . . . . . 2
Vendor ID . . . . . 135Bh
Device ID . . . . . 0001h
Revision ID . . . . . 00h
Device Type . . . . . ATM Controller
Programming Interface . . . . 00h
Expansion ROM Base Address . . 0h
IRQ Line . . . . . 10
IRQ Pin . . . . . INTA#
Memory Address Base . . . . . C6BE0000h
Memory Address Length . . . . 20000h
Memory Address Base . . . . . C6800000h
Memory Address Length . . . . 200000h
Memory Address Base . . . . . C5000000h
Memory Address Length . . . . 1000000h
Memory Address Base . . . . . C4FF0000h
Memory Address Length . . . . 10000h
```

```
ProLiant DL360 is a trademark of Compaq Computer
Corporation.

Date . . . . . 09/20/2001
Time . . . . . 17:36:55

Product . . . . . ProLiant DL360

Machine ID
  From System Board . . . . . CPQ0685

Processor . . . . . Pentium III(R) at
933 MHz
  Slot . . . . . 2
  Secondary Cache . . . . . 256K
  CPU ID . . . . . 0686

Processor . . . . . Pentium III(R) at
933 MHz
  Slot . . . . . 1
  Secondary Cache . . . . . 256K
  CPU ID . . . . . 0686

Processor(s) Mapped Out . . . . None

Numeric Coprocessor . . . . . Integrated 387-
Compatible

Expansion Bus . . . . . ISA, PCI

System Identification Number . . 6J14FXS1V01K

CPU Mode . . . . . Real Mode

System ROM
    Revision . . . . . 01/11/2001
      Family . . . . . P21
    Flashable . . . . . Yes
    Supports F10 partition . . . Yes

Video Controller ROM
    Revision . . . . . 3.96

Option ROMs
  Address Range . . . . . C0000 - C7FFF
    Data Dump . . . . . (1999/03/24 23:56)

  Address Range . . . . . C8000 - CBFFF
    Data Dump . . . . . (04/22/98 ROC
Smart Array Option ROM/BIOS (C)Co...)

  Address Range . . . . . E8000 - EDFFF
    Data Dump . . . . . ( CPQSCSI d)

Bootblock ROM . . . . . 01/25/2000

Standby Recovery Server
  Status . . . . . Disabled
  COM Port . . . . . COM1
  Server Configuration . . . . . Recovery
  Timeout Value . . . . . 1 minutes

Memory Boards Identified:
  System Board
    DIMM Slot  1 (SDRAM) . . . .  128 Megabytes
    DIMM Slot  2 (SDRAM) . . . .  128 Megabytes
    DIMM Slot  3 (SDRAM) . . . .  128 Megabytes
    DIMM Slot  4 (SDRAM) . . . .  128 Megabytes
Total Compaq Memory . . . . . 512 Megabytes

Keyboard . . . . . Enhanced

LPT Ports . . . . . Not Installed

COM Ports . . . . . COM1 (Address 3F8)
Compaq NC3163 Fast Ethernet NIC
  Device Type . . . . . Ethernet Controller
  PCI Bus Number . . . . . 3
  Device Number . . . . . 4
  Function Number . . . . . 00h
  Slot Number . . . . . 0
  Vendor ID . . . . . 0E11h
  Device ID . . . . . 1229h
  Subsystem Vendor ID . . . . . 0E11h
  Subsystem ID . . . . . B134h
  Revision ID . . . . . 08h
  Programming Interface . . . . 00h
  Expansion ROM Base Address . . FFF00000h
  IRQ Line . . . . . 5
  IRQ Pin . . . . . INTA#
  Memory Address Base . . . . . C6FFF000h
  Memory Address Length . . . . 1000h
  IO Address Base . . . . . 3000h
  IO Address Length . . . . . 40h
  Memory Address Base . . . . . C6E00000h
  Memory Address Length . . . . 100000h


Compaq NC3163 Fast Ethernet NIC
  Device Type . . . . . Ethernet Controller
  PCI Bus Number . . . . . 3
  Device Number . . . . . 5
  Function Number . . . . . 00h
  Slot Number . . . . . 0
  Vendor ID . . . . . 0E11h
  Device ID . . . . . 1229h
  Subsystem Vendor ID . . . . . 0E11h
  Subsystem ID . . . . . B134h
  Revision ID . . . . . 08h
  Programming Interface . . . . 00h
  Expansion ROM Base Address . . FFF00000h
  IRQ Line . . . . . 7
  IRQ Pin . . . . . INTA#
  Memory Address Base . . . . . C6DFF000h
  Memory Address Length . . . . 1000h
  IO Address Base . . . . . 3040h
  IO Address Length . . . . . 40h
  Memory Address Base . . . . . C6C00000h
  Memory Address Length . . . . 100000h
```

```
ATM Controller
  PCI Bus Number . . . . . .  3
  Device Number  . . . . . .  6
  Function Number  . . . . .  00h
  Slot Number  . . . . . .  2
  Vendor ID  . . . . . .  135Bh
  Device ID  . . . . . .  0001h
  Revision ID  . . . . . .  00h
  Programming Interface  . . . .  00h
  Expansion ROM Base Address . .  0h
  IRQ Line . . . . . .  10
  IRQ Pin  . . . . . .  INTA#
  Memory Address Base  . . . . .  C6BE0000h
  Memory Address Length  . . . .  20000h
  Memory Address Base  . . . . .  C6800000h
  Memory Address Length  . . . .  200000h
  Memory Address Base  . . . . .  C5000000h
  Memory Address Length  . . . .  1000000h
  Memory Address Base  . . . . .  C4FF0000h
  Memory Address Length  . . . .  10000h



Diskette Drive A . . . . . .  1.44 Megabyte (3.5
inch)

Drive Controller 1, Compaq Integrated Smart Array
Controller
  IDA Firmware Revision  . . . .  1.42
  Array Accelerator Memory . . .  8188 Kbytes
  Accelerator Status . . . . . .  Not Configured
    Battery count  . . . . . .  0
    Batteries charged  . . . . .  0
    Batteries failed . . . . . .  0
  Internal ProLiant  . . . . . .  Bus 2, Rev. JB21

  Logical Drive  1 . . . . . .  9095 Megabyte
  Fault Tolerance  . . . . . .  Mirroring
  OS Format  . . . . . .  Multi-Sector
Distribution
  Drive geometry (Cyl, Hds, Sec)  2177, 255, 32
  Array Accelerator  . . . . . .  Disabled
  Logical drive in interim recovery mode.

    Hard Drive  1
    SCSI Bus . . . . . .  2
    SCSI ID  . . . . . .  0
    Serial Number  . . . . . .
LS75691400001020H4B1
    Firmware Revision 1  . . . .  3B07
    Model Number . . . . . .  COMPAQ  BD009122BA
    Initialized for Monitoring .  Yes
      Reference time . . . . . .  618302
      Sectors read . . . . . .  *3569374148
      Hard read errors . . . . .  0
      Read errors retry  . . . .  0
      ECC read errors  . . . . .  0
      Sectors written  . . . . .  1158056060
      Hard write errors  . . . .  0
      Write errors retry . . . .  0
      Seek count . . . . . .  2137696
      Seek errors  . . . . . .  0
      Spin cycles  . . . . . .  5
      Spin up time . . . . . .  0
      Seek time track  . . . . .  47%
      Seek time third  . . . . .  70%
      Seek time full . . . . . .  72%
      Reallocated sectors  . . .  726
      Recovers read failed . . .  0
      Bus faults . . . . . .  0

    Hard Drive  2
    SCSI Bus . . . . . .  2
    SCSI ID  . . . . . .  1
    Serial Number  . . . . . .  Undetermined
    Model Number . . . . . .  Undetermined
    Initialized for Monitoring .  No

Graphics Mode  . . . . . .  03 (80-Column Text)


Primary Monitor attached to  . .  ATI RAGE IIC PCI
Graphics Controller
with Video Graphics Color Monitor

Base Memory
  System Total . . . . . .    638 Kbytes
  Amount Free  . . . . . .    555 Kbytes
(568384 Bytes)

Extended Memory
  System Total . . . . . .  523264 Kbytes

Expanded Memory
  LIM Driver Support . . . . . .  LIM driver not
loaded

Operating System . . . . . .  MS-DOS version 7.10
(from diskette)

Environment variables
  PATH=
  PROMPT=$P$G
  COMSPEC=A:\COMMAND.COM
  CMDLINE=inspect /u
End of environment

Revisions Table

Previous Revisions

Current Revisions

System serial number . . . . . .  6J14FXS1V01K

Memory Allocation (including INSPECT)
  PSP   SIZE    NAME          TRAPPED INTERRUPTS
  ----  ------  ------------  ----------------------
---------------
  12F7  007200  COMMAND.COM   2Fh  2Eh  24h  23h  22h
  14C2  218144  INSPECT.EXE   F9h  F4h  F3h  F2h  E5h
D4h  3Fh  00h

System Configuration Memory
  00 - 0F :    01 00 37 00    17 00 04 20    09 01 26
82    50 80 00 00
  10 - 1F :    40 00 00 00    03 80 02 00    3C 00 00
00    00 00 00 02
  20 - 2F :    00 00 00 00    7F 20 20 40    00 7A 00
00    00 18 02 94
  30 - 3F :    00 3C 20 80    00 00 XX XX    XX XX XX
XX    XX XX XX XX

BIOS Data Area
  40:0000 :    F8 03 00 00    00 00 00 00    00 00 00
00    00 00 80 9F
  40:0010 :    27 02 00 7E    02 00 00 00    00 00 1E
00    1E 00 00 00
  40:0020 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:0030 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 01 01
  40:0040 :    25 00 00 00    00 2A 00 11    02 03 50
00    00 10 00 00
  40:0050 :    00 18 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:0060 :    0E 0D 00 D4    03 29 30 A4    17 FD 74
00    05 9E 11 00
  40:0070 :    00 00 00 12    00 01 00 00    14 14 14
14    01 01 01 01
  40:0080 :    1E 00 3E 00    18 10 00 60    F9 11 0B
01    00 00 00 05
  40:0090 :    17 00 00 00    2A 00 10 00    00 00 00
00    00 00 00 00
  40:00A0 :    00 00 00 00    00 00 00 00    7C 14 00
C0    00 00 00 00
  40:00B0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00C0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00D0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00E0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00F0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00


Interrupt Vector Table (including INSPECT)
  00 - 03 :    14D2:0555      0070:0465
122E:0016      0070:0465
  04 - 07 :    0070:0465      F000:FF54
F000:93CC      F000:9BD0
  08 - 0B :    122E:001F      122E:0028
F000:9BD0      122E:0052
  0C - 0F :    F000:9BD0      F000:9BD0
122E:009A      0070:0465
  10 - 13 :    C000:13FE      F000:F84D
F000:F841      0070:03EE
  14 - 17 :    F000:D0E5      0207:0240
0070:042D      F000:EFD2
  18 - 1B :    F000:F06D      12EF:002F
F000:FE6E      0070:045F
  1C - 1F :    F000:FF53      F000:0000
0000:0522      C000:2143
  20 - 23 :    00C9:0FA8      00C9:0FB2
12F7:0314      12F7:016D
```

```
  24 - 27 :    12F7:0178      00C9:0FBC
00C9:0FC6      00C9:0FD0
  28 - 2B :    00C9:106C      0070:0466
00C9:106C      00C9:106C
  2C - 2F :    00C9:106C      00C9:106C
12F7:0162      12F8:01CC
  30 - 33 :    C90F:E4EA      F000:9B00
00C9:106C      00C9:106C
  34 - 37 :    00C9:106C      00C9:106C
00C9:106C      00C9:106C
  38 - 3B :    00C9:106C      00C9:106C
00C9:106C      00C9:106C
  3C - 3F :    00C9:106C      00C9:106C
00C9:106C      258E:04F3
  40 - 43 :    F000:EC59      C81F:01C6
F000:F065      C000:2556
  44 - 47 :    F000:9BD0      F000:9BD0
0000:0000      F000:9BD0
  48 - 4B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  4C - 4F :    F000:9BD0      F000:9BD0
F000:9BD0      0070:04FC
  50 - 53 :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  54 - 57 :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  58 - 5B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  5C - 5F :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  60 - 63 :    0000:0000      0000:0000
0000:0000      0000:0000
  64 - 67 :    0000:0000      0000:0000
0000:0000      0000:0000
  68 - 6B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  6C - 6F :    F000:9BD0      C000:13FE
F000:9BD0      F000:9BD0
  70 - 73 :    122E:0035      F000:9C1F
F000:9BD0      F000:9BD0
  74 - 77 :    122E:00E2      F000:9C28
F000:9BD0      122E:0112
  78 - 7B :    0000:0000      0000:0000
0000:0000      0000:0000
  7C - 7F :    0000:0000      0000:0000
0000:0000      0000:0000
  80 - 83 :    0000:0000      0000:0000
0000:0000      0000:0000
  84 - 87 :    0000:0000      0000:0000
0000:0000      0000:0000
  88 - 8B :    0000:0000      0000:0000
0000:0000      0000:0000
  8C - 8F :    0000:0000      0000:0000
0000:0000      0000:0000
  90 - 93 :    0000:0000      0000:0000
0000:0000      0000:0000
  94 - 97 :    0000:0000      0000:0000
0000:0000      0000:0000
  98 - 9B :    0000:0000      0000:0000
0000:0000      0000:0000
  9C - 9F :    0000:0000      0000:0000
0000:0000      0000:0000
```

```
  A0 - A3 :    0000:0000      0000:0000
0000:0000      0000:0000
  A4 - A7 :    0000:0000      0000:0000
0000:0000      0000:0000
  A8 - AB :    0000:0000      0000:0000
0000:0000      0000:0000
  AC - AF :    0000:0000      0000:0000
0000:0000      0000:0000
  B0 - B3 :    0000:0000      0000:0000
0000:0000      0000:0000
  B4 - B7 :    0000:0000      0000:0000
0000:0000      0000:0000
  B8 - BB :    0000:0000      0000:0000
0000:0000      0000:0000
  BC - BF :    0000:0000      0000:0000
0000:0000      0000:0000
  C0 - C3 :    0000:0000      0000:0000
0000:0000      0000:0000
  C4 - C7 :    0000:0000      0000:0000
0000:0000      0000:0000
  C8 - CB :    0000:0000      0000:0000
0000:0000      0000:0000
  CC - CF :    0000:0000      0000:0000
0000:0000      0000:0000
  D0 - D3 :    0029:0029      0007:0000
E729:0000      0087:0000
  D4 - D7 :    29E7:0000      0029:0000
0000:0000      0000:0002
  D8 - DB :    00E9:0000      0000:0000
0000:200B      0000:0BD6
  DC - DF :    00E9:0000      0000:0000
0000:200B      0000:0100
  E0 - E3 :    0000:0BF0      0000:200A
0000:0000      0000:031E
  E4 - E7 :    0000:00E8      2000:00D0
0001:A610      0000:0051
  E8 - EB :    0000:00E8      0000:0000
0083:0020      0006:1EA2
  EC - EF :    0006:1EA0      0046:9B00
9B00:1F76      0046:0087
  F0 - F3 :    0010:13C1      DC38:1DB7
1DB7:13C1      1400:DA95
  F4 - F7 :    1CDA:0246      0101:7387
0000:0000      0000:613D
  F8 - FB :    613D:0020      15B7:6443
00D8:0003      0000:09F6
  FC - FF :    0246:0900      0900:0000
E15F:0049      0003:09F6

PCI Devices Information
  Signature  . . . . . .  PCI
  Config Mechanism #1  . . . . .  Supported
  Config Mechanism #2  . . . . .  Not Supported
  Spec Cycle for Config #1 . . .  Supported
  Spec Cycle for Config #2 . . .  Not Supported
  BIOS Interface Version . . . .  2.10
  Last PCI Bus Number  . . . . .  3
  Number of PCI Devices  . . . .  5

  PCI Bus Number . . . . . .  0
  Device Number  . . . . . .  1
  Function Number  . . . . . .  00h
  Slot Number  . . . . . .  0
    Vendor ID  . . . . . .  0E11h
    Device ID  . . . . . .  0010h
    Revision ID  . . . . . .  02h
    Device Type  . . . . . .  RAID Controller
    Programming Interface  . . . .  00h
    Expansion ROM Base Address . .  FFF80000h
    IRQ Line . . . . . .  3
    IRQ Pin  . . . . . .  INTA#
    IO Address Base  . . . . . .  2000h
    IO Address Length  . . . . . .  100h
    Memory Address Base  . . . . .  C3000000h
    Memory Address Length  . . . .  1000000h
    Memory Address Base  . . . . .  C2000000h
    Memory Address Length  . . . .  1000000h

    PCI Bus Number . . . . . .  0
    Device Number  . . . . . .  3
    Function Number  . . . . . .  00h
    Slot Number  . . . . . .  0
    Vendor ID  . . . . . .  1002h
    Device ID  . . . . . .  4756h
    Revision ID  . . . . . .  7Ah
    Device Type  . . . . . .  VGA Compatible
  Controller
    Programming Interface  . . . .  00h
    Expansion ROM Base Address . .  FFFE0000h
    IRQ Line . . . . . .  255
    IRQ Pin  . . . . . .  Not Used
    Memory Address Base  . . . . .  C0000000h
    Memory Address Length  . . . .  1000000h
    IO Address Base  . . . . . .  2400h
    IO Address Length  . . . . . .  100h
    Memory Address Base  . . . . .  C1FFF000h
    Memory Address Length  . . . .  1000h

    PCI Bus Number . . . . . .  3
    Device Number  . . . . . .  4
    Function Number  . . . . . .  00h
    Slot Number  . . . . . .  0
    Vendor ID  . . . . . .  0E11h
    Device ID  . . . . . .  1229h
    Revision ID  . . . . . .  08h
    Device Type  . . . . . .  Ethernet Controller
    Programming Interface  . . . .  00h
    Expansion ROM Base Address . .  FFF00000h
    IRQ Line . . . . . .  5
    IRQ Pin  . . . . . .  INTA#
    Memory Address Base  . . . . .  C6FFF000h
    Memory Address Length  . . . .  1000h
    IO Address Base  . . . . . .  3000h
    IO Address Length  . . . . . .  40h
    Memory Address Base  . . . . .  C6E00000h
    Memory Address Length  . . . .  100000h

    PCI Bus Number . . . . . .  3
    Device Number  . . . . . .  5
    Function Number  . . . . . .  00h
    Slot Number  . . . . . .  0
    Vendor ID  . . . . . .  0E11h
    Device ID  . . . . . .  1229h
    Revision ID  . . . . . .  08h
    Device Type  . . . . . .  Ethernet Controller
    Programming Interface  . . . .  00h
```

```
  Expansion ROM Base Address . .  FFF00000h
  IRQ Line . . . . . .  7
  IRQ Pin  . . . . . .  INTA#
  Memory Address Base  . . . . .  C6DFF000h
  Memory Address Length  . . . .  1000h
  IO Address Base  . . . . . .  3040h
  IO Address Length  . . . . . .  40h
  Memory Address Base  . . . . .  C6C00000h
  Memory Address Length  . . . .  100000h

  PCI Bus Number . . . . . .  3
  Device Number  . . . . . .  6
  Function Number  . . . . . .  00h
  Slot Number  . . . . . .  2
  Vendor ID  . . . . . .  135Bh
  Device ID  . . . . . .  0001h
  Revision ID  . . . . . .  00h
  Device Type  . . . . . .  ATM Controller
  Programming Interface  . . . .  00h
  Expansion ROM Base Address . .  0h
  IRQ Line . . . . . .  10
  IRQ Pin  . . . . . .  INTA#
  Memory Address Base  . . . . .  C6BE0000h
  Memory Address Length  . . . .  20000h
  Memory Address Base  . . . . .  C6800000h
  Memory Address Length  . . . .  200000h
  Memory Address Base  . . . . .  C5000000h
  Memory Address Length  . . . .  1000000h
  Memory Address Base  . . . . .  C4FF0000h
  Memory Address Length  . . . .  10000h



ProLiant DL360 is a trademark of Compaq Computer
Corporation.

Date . . . . . .  09/20/2001
Time . . . . . .  17:41:47

Product  . . . . . .  ProLiant DL360

Machine ID
  From System Board  . . . . . .  CPQ0685

Processor  . . . . . .  Pentium III(R) at
933 MHz
  Slot . . . . . .  2
  Secondary Cache  . . . . . .  256K
  CPU ID . . . . . .  0686

Processor  . . . . . .  Pentium III(R) at
933 MHz
  Slot . . . . . .  1
  Secondary Cache  . . . . . .  256K
  CPU ID . . . . . .  0686

Processor(s) Mapped Out  . . . .  None

Numeric Coprocessor  . . . . . .  Integrated 387-
Compatible

Expansion Bus  . . . . . .  ISA, PCI

System Identification Number . .  6J14FXS1V01T

CPU Mode . . . . . .  Real Mode

System ROM
    Revision . . . . . .  01/11/2001
      Family . . . . . .  P21
    Flashable  . . . . . .  Yes
    Supports F10 partition . . .  Yes

Video Controller ROM
    Revision . . . . . .  3.96

Option ROMs
  Address Range  . . . . . .  C0000 - C7FFF
    Data Dump  . . . . . .  (1999/03/24 23:56)

  Address Range  . . . . . .  C8000 - CBFFF
    Data Dump  . . . . . .  (04/22/98 ROC
Smart Array Option ROM/BIOS (C)Co...)

  Address Range  . . . . . .  E8000 - EDFFF
    Data Dump  . . . . . .  ( CPQSCSI d)

Bootblock ROM  . . . . . .  01/25/2000

Standby Recovery Server
  Status . . . . . .  Disabled
  COM Port . . . . . .  COM1
  Server Configuration . . . . .  Recovery
  Timeout Value  . . . . . .  1 minutes



Memory Boards Identified:
  System Board
    DIMM Slot  1 (SDRAM) . . . .   128 Megabytes
    DIMM Slot  2 (SDRAM) . . . .   128 Megabytes
    DIMM Slot  3 (SDRAM) . . . .   128 Megabytes
    DIMM Slot  4 (SDRAM) . . . .   128 Megabytes
Total Compaq Memory  . . . . . .   512 Megabytes

Keyboard . . . . . .  Enhanced

LPT Ports  . . . . . .  Not Installed

COM Ports  . . . . . .  COM1 (Address 3F8)
Compaq NC3163 Fast Ethernet NIC
  Device Type  . . . . . .  Ethernet Controller
  PCI Bus Number . . . . . .  3
  Device Number  . . . . . .  4
  Function Number  . . . . . .  00h
  Slot Number  . . . . . .  0
  Vendor ID  . . . . . .  0E11h
  Device ID  . . . . . .  1229h
  Subsystem Vendor ID  . . . . .  0E11h
  Subsystem ID . . . . . .  B134h
  Revision ID  . . . . . .  08h
  Programming Interface  . . . .  00h
  Expansion ROM Base Address . .  FFF00000h
  IRQ Line . . . . . .  5
  IRQ Pin  . . . . . .  INTA#
  Memory Address Base  . . . . .  C6FFF000h
  Memory Address Length  . . . .  1000h
  IO Address Base  . . . . . .  3000h
  IO Address Length  . . . . . .  40h
  Memory Address Base  . . . . .  C6E00000h
  Memory Address Length  . . . .  100000h


Compaq NC3163 Fast Ethernet NIC
  Device Type  . . . . . .  Ethernet Controller
  PCI Bus Number . . . . . .  3
  Device Number  . . . . . .  5
  Function Number  . . . . . .  00h
  Slot Number  . . . . . .  0
  Vendor ID  . . . . . .  0E11h
  Device ID  . . . . . .  1229h
  Subsystem Vendor ID  . . . . .  0E11h
  Subsystem ID . . . . . .  B134h
  Revision ID  . . . . . .  08h
  Programming Interface  . . . .  00h
  Expansion ROM Base Address . .  FFF00000h
  IRQ Line . . . . . .  7
  IRQ Pin  . . . . . .  INTA#
  Memory Address Base  . . . . .  C6DFF000h
  Memory Address Length  . . . .  1000h
  IO Address Base  . . . . . .  3040h
  IO Address Length  . . . . . .  40h
  Memory Address Base  . . . . .  C6C00000h
  Memory Address Length  . . . .  100000h


ATM Controller
  PCI Bus Number . . . . . .  3
  Device Number  . . . . . .  6
  Function Number  . . . . . .  00h
  Slot Number  . . . . . .  2
  Vendor ID  . . . . . .  135Bh
  Device ID  . . . . . .  0001h
  Revision ID  . . . . . .  00h
  Programming Interface  . . . .  00h
  Expansion ROM Base Address . .  0h
  IRQ Line . . . . . .  10
  IRQ Pin  . . . . . .  INTA#
  Memory Address Base  . . . . .  C6BE0000h
  Memory Address Length  . . . .  20000h
  Memory Address Base  . . . . .  C6800000h
  Memory Address Length  . . . .  200000h
  Memory Address Base  . . . . .  C5000000h
  Memory Address Length  . . . .  1000000h
  Memory Address Base  . . . . .  C4FF0000h
  Memory Address Length  . . . .  10000h



Diskette Drive A . . . . . .  1.44 Megabyte (3.5
inch)

Drive Controller 1, Compaq Integrated Smart Array
Controller
  IDA Firmware Revision  . . . .  1.42
  Array Accelerator Memory . . .  8188 Kbytes
  Accelerator Status . . . . . .  Not Configured
    Battery count  . . . . . .  0
```

```
    Batteries charged  . . . . .  0
    Batteries failed . . . . . .  0
  Internal ProLiant  . . . . . .  Bus 2, Rev. JB21

  Logical Drive  1 . . . . . .  9095 Megabyte
  Fault Tolerance  . . . . . .  Mirroring
  OS Format  . . . . . .  Multi-Sector
Distribution
  Drive geometry (Cyl, Hds, Sec)  2177, 255, 32
  Array Accelerator  . . . . . .  Disabled
  Logical drive in interim recovery mode.

    Hard Drive  1
    SCSI Bus . . . . . .  2
    SCSI ID  . . . . . .  0
    Serial Number  . . . . . .
LS81772000001020349R
    Firmware Revision 1  . . . .  3B07
    Model Number . . . . . .  COMPAQ  BD009122BA
    Initialized for Monitoring .  Yes
      Reference time . . . . . .  403023
      Sectors read . . . . . .  *2541390627
      Hard read errors . . . . .  0
      Read errors retry  . . . .  0
      ECC read errors  . . . . .  0
      Sectors written  . . . . .  368754255
      Hard write errors  . . . .  0
      Write errors retry . . . .  0
      Seek count . . . . . .  1466628
      Seek errors  . . . . . .  0
      Spin cycles  . . . . . .  2
      Spin up time . . . . . .  0
      Seek time track  . . . . .  47%
      Seek time third  . . . . .  70%
      Seek time full . . . . . .  71%
      Reallocated sectors  . . .  354
      Recovers read failed . . .  0
      Bus faults . . . . . .  0

    Hard Drive  2
    SCSI Bus . . . . . .  2
    SCSI ID  . . . . . .  1
    Serial Number  . . . . . .  Undetermined
    Model Number . . . . . .  Undetermined
    Initialized for Monitoring .  No

Graphics Mode  . . . . . .  03 (80-Column Text)


Primary Monitor attached to  . .  ATI RAGE IIC PCI
Graphics Controller
with Video Graphics Color Monitor

Base Memory
  System Total . . . . . .    638 Kbytes
  Amount Free  . . . . . .    555 Kbytes
(568384 Bytes)

Extended Memory
  System Total . . . . . .  523264 Kbytes

Expanded Memory
  LIM Driver Support . . . . . .  LIM driver not
loaded

Operating System . . . . . .  MS-DOS version 7.10
(from diskette)

Environment variables
  PATH=
  PROMPT=$P$G
  COMSPEC=A:\COMMAND.COM
  CMDLINE=inspect /u
End of environment

Revisions Table

Previous Revisions

Current Revisions

System serial number . . . . . .  6J14FXS1V01T

Memory Allocation (including INSPECT)
  PSP   SIZE    NAME          TRAPPED INTERRUPTS
  ----  ------  ------------  ----------------------
--------------
  12F7  007200  COMMAND.COM   2Fh  2Eh  24h  23h  22h
  14C2  218144  INSPECT.EXE   EEh  F9h  F4h  F3h  F2h
E5h  D2h  3Fh
                              00h

System Configuration Memory
  00 - 0F :    54 00 41 00    17 00 04 20    09 01 26
82    50 80 00 00
  10 - 1F :    40 00 00 00    03 80 02 00    3C 00 00
00    00 00 00 02
  20 - 2F :    00 00 00 00    7F 20 20 40    00 7A 00
00    00 18 02 94
  30 - 3F :    00 3C 20 80    00 00 XX XX    XX XX XX
XX    XX XX XX XX

BIOS Data Area
  40:0000 :    F8 03 00 00    00 00 00 00    00 00 00
00    00 00 80 9F
  40:0010 :    27 02 00 7E    02 00 00 00    00 00 1E
00    1E 00 00 00
  40:0020 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:0030 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 01 01
  40:0040 :    25 00 00 00    00 2A 00 11    02 03 50
00    00 10 00 00
  40:0050 :    00 18 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:0060 :    0E 0D 00 D4    03 29 30 A4    17 FD 74
00    C8 B2 11 00
  40:0070 :    00 00 00 12    00 01 00 00    14 14 14
14    01 01 01 01
  40:0080 :    1E 00 3E 00    18 10 00 60    F9 11 0B
01    00 00 00 05
  40:0090 :    17 00 00 00    2A 00 10 00    00 00 00
00    00 00 00 00
  40:00A0 :    00 00 00 00    00 00 00 00    7C 14 00
C0    00 00 00 00
  40:00B0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00C0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00D0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00E0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00F0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00


Interrupt Vector Table (including INSPECT)
  00 - 03 :    14D2:0555      0070:0465
122E:0016      0070:0465
  04 - 07 :    0070:0465      F000:FF54
F000:93CC      F000:9BD0
  08 - 0B :    122E:001F      122E:0028
F000:9BD0      122E:0052
  0C - 0F :    F000:9BD0      F000:9BD0
122E:009A      0070:0465
  10 - 13 :    C000:13FE      F000:F84D
F000:F841      0070:03EE
  14 - 17 :    F000:D0E5      0207:0240
0070:042D      F000:EFD2
  18 - 1B :    F000:F06D      12EF:002F
F000:FE6E      0070:045F
  1C - 1F :    F000:FF53      F000:0000
0000:0522      C000:2143
  20 - 23 :    00C9:0FA8      00C9:0FB2
12F7:0314      12F7:016D
  24 - 27 :    12F7:0178      00C9:0FBC
00C9:0FC6      00C9:0FD0
  28 - 2B :    00C9:106C      0070:0466
00C9:106C      00C9:106C
  2C - 2F :    00C9:106C      00C9:106C
12F7:0162      12F8:01CC
  30 - 33 :    C90F:E4EA      F000:9B00
00C9:106C      00C9:106C
  34 - 37 :    00C9:106C      00C9:106C
00C9:106C      00C9:106C
  38 - 3B :    00C9:106C      00C9:106C
00C9:106C      00C9:106C
  3C - 3F :    00C9:106C      00C9:106C
00C9:106C      258E:04F3
  40 - 43 :    F000:EC59      C81F:01C6
F000:F065      C000:2556
  44 - 47 :    F000:9BD0      F000:9BD0
0000:0000      F000:9BD0
  48 - 4B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  4C - 4F :    F000:9BD0      F000:9BD0
F000:9BD0      0070:04FC
  50 - 53 :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  54 - 57 :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  58 - 5B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  5C - 5F :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  60 - 63 :    0000:0000      0000:0000
0000:0000      0000:0000
```

```
  64 - 67 :    0000:0000      0000:0000
0000:0000      0000:0000
  68 - 6B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  6C - 6F :    F000:9BD0      C000:13FE
F000:9BD0      F000:9BD0
  70 - 73 :    122E:0035      F000:9C1F
F000:9BD0      F000:9BD0
  74 - 77 :    122E:00E2      F000:9C28
F000:9BD0      122E:0112
  78 - 7B :    0000:0000      0000:0000
0000:0000      0000:0000
  7C - 7F :    0000:0000      0000:0000
0000:0000      0000:0000
  80 - 83 :    0000:0000      0000:0000
0000:0000      0000:0000
  84 - 87 :    0000:0000      0000:0000
0000:0000      0000:0000
  88 - 8B :    0000:0000      0000:0000
0000:0000      0000:0000
  8C - 8F :    0000:0000      0000:0000
0000:0000      0000:0000
  90 - 93 :    0000:0000      0000:0000
0000:0000      0000:0000
  94 - 97 :    0000:0000      0000:0000
0000:0000      0000:0000
  98 - 9B :    0000:0000      0000:0000
0000:0000      0000:0000
  9C - 9F :    0000:0000      0000:0000
0000:0000      0000:0000
  A0 - A3 :    0000:0000      0000:0000
0000:0000      0000:0000
  A4 - A7 :    0000:0000      0000:0000
0000:0000      0000:0000
  A8 - AB :    0000:0000      0000:0000
0000:0000      0000:0000
  AC - AF :    0000:0000      0000:0000
0000:0000      0000:0000
  B0 - B3 :    0000:0000      0000:0000
0000:0000      0000:0000
  B4 - B7 :    0000:0000      0000:0000
0000:0000      0000:0000
  B8 - BB :    0000:0000      0000:0000
0000:0000      0000:0000
  BC - BF :    0000:0000      0000:0000
0000:0000      0000:0000
  C0 - C3 :    0000:0000      0000:0000
0000:0000      0000:0000
  C4 - C7 :    0000:0000      0000:0000
0000:0000      0000:0000
  C8 - CB :    0000:0000      0000:0000
0000:0000      0000:0000
  CC - CF :    0000:0000      0000:0000
0000:0000      0000:0000
  D0 - D3 :    0057:0057      0006:0000
2657:0000      0087:0000
  D4 - D7 :    5726:0000      0057:0000
0000:0000      0000:0002
  D8 - DB :    0178:0000      0000:0000
0000:200B      0000:0BD6
  DC - DF :    0178:0000      0000:0000
0000:200B      0000:0100
```

```
  E0 - E3 :    0000:0BF0      0000:200A
0000:0000      0000:031E
  E4 - E7 :    0000:0177      2000:00D0
0001:A610      0000:0051
  E8 - EB :    0000:00E8      0000:0000
0083:0020      0006:1EA2
  EC - EF :    0006:1EA0      0046:9200
9200:1F76      0046:0087
  F0 - F3 :    0010:13C1      DC38:1DB7
1DB7:13C1      1400:DA95
  F4 - F7 :    1CDA:0246      0101:7387
0000:0000      0000:613D
  F8 - FB :    613D:0020      15B7:6443
0010:0003      0000:09F6
  FC - FF :    0246:0900      0900:0000
E15F:0049      0003:09F6

PCI Devices Information
  Signature . . . . . .  PCI
  Config Mechanism #1 . . . . .  Supported
  Config Mechanism #2 . . . . .  Not Supported
  Spec Cycle for Config #1 . . .  Supported
  Spec Cycle for Config #2 . . .  Not Supported
  BIOS Interface Version . . . .  2.10
  Last PCI Bus Number . . . . .  3
  Number of PCI Devices . . . .  5

  PCI Bus Number . . . . . .  0
  Device Number . . . . . .  1
  Function Number . . . . . .  00h
  Slot Number . . . . . .  0
  Vendor ID . . . . . .  0E11h
  Device ID . . . . . .  0010h
  Revision ID . . . . . .  02h
  Device Type . . . . . .  RAID Controller
  Programming Interface . . . .  00h
  Expansion ROM Base Address . .  FFF80000h
  IRQ Line . . . . . .  3
  IRQ Pin . . . . . .  INTA#
  IO Address Base . . . . . .  2000h
  IO Address Length . . . . . .  100h
  Memory Address Base . . . . .  C3000000h
  Memory Address Length . . . .  1000000h
  Memory Address Base . . . . .  C2000000h
  Memory Address Length . . . .  1000000h

  PCI Bus Number . . . . . .  0
  Device Number . . . . . .  3
  Function Number . . . . . .  00h
  Slot Number . . . . . .  0
  Vendor ID . . . . . .  1002h
  Device ID . . . . . .  4756h
  Revision ID . . . . . .  7Ah
  Device Type . . . . . .  VGA Compatible
Controller
  Programming Interface . . . .  00h
  Expansion ROM Base Address . .  FFFE0000h
  IRQ Line . . . . . .  255
  IRQ Pin . . . . . .  Not Used
  Memory Address Base . . . . .  C0000000h
  Memory Address Length . . . .  1000000h
  IO Address Base . . . . . .  2400h
  IO Address Length . . . . . .  100h
```

```
  Memory Address Base . . . . .  C1FFF000h
  Memory Address Length . . . .  1000h

  PCI Bus Number . . . . . .  3
  Device Number . . . . . .  4
  Function Number . . . . . .  00h
  Slot Number . . . . . .  0
  Vendor ID . . . . . .  0E11h
  Device ID . . . . . .  1229h
  Revision ID . . . . . .  08h
  Device Type . . . . . .  Ethernet Controller
  Programming Interface . . . .  00h
  Expansion ROM Base Address . .  FFF00000h
  IRQ Line . . . . . .  5
  IRQ Pin . . . . . .  INTA#
  Memory Address Base . . . . .  C6FFF000h
  Memory Address Length . . . .  1000h
  IO Address Base . . . . . .  3000h
  IO Address Length . . . . . .  40h
  Memory Address Base . . . . .  C6E00000h
  Memory Address Length . . . .  100000h

  PCI Bus Number . . . . . .  3
  Device Number . . . . . .  5
  Function Number . . . . . .  00h
  Slot Number . . . . . .  0
  Vendor ID . . . . . .  0E11h
  Device ID . . . . . .  1229h
  Revision ID . . . . . .  08h
  Device Type . . . . . .  Ethernet Controller
  Programming Interface . . . .  00h
  Expansion ROM Base Address . .  FFF00000h
  IRQ Line . . . . . .  7
  IRQ Pin . . . . . .  INTA#
  Memory Address Base . . . . .  C6DFF000h
  Memory Address Length . . . .  1000h
  IO Address Base . . . . . .  3040h
  IO Address Length . . . . . .  40h
  Memory Address Base . . . . .  C6C00000h
  Memory Address Length . . . .  100000h

  PCI Bus Number . . . . . .  3
  Device Number . . . . . .  6
  Function Number . . . . . .  00h
  Slot Number . . . . . .  2
  Vendor ID . . . . . .  135Bh
  Device ID . . . . . .  0001h
  Revision ID . . . . . .  00h
  Device Type . . . . . .  ATM Controller
  Programming Interface . . . .  00h
  Expansion ROM Base Address . .  0h
  IRQ Line . . . . . .  10
  IRQ Pin . . . . . .  INTA#
  Memory Address Base . . . . .  C6BE0000h
  Memory Address Length . . . .  20000h
  Memory Address Base . . . . .  C6800000h
  Memory Address Length . . . .  200000h
  Memory Address Base . . . . .  C5000000h
  Memory Address Length . . . .  1000000h
  Memory Address Base . . . . .  C4FF0000h
  Memory Address Length . . . .  10000h
```

```
ProLiant DL360 is a trademark of Compaq Computer
Corporation.

Date . . . . . 09/20/2001
Time . . . . . 17:45:28

Product . . . . . ProLiant DL360

Machine ID
  From System Board . . . . . CPQ0685

Processor . . . . . Pentium III(R) at
933 MHz
  Slot . . . . . 2
  Secondary Cache . . . . . 256K
  CPU ID . . . . . 0686

Processor . . . . . Pentium III(R) at
933 MHz
  Slot . . . . . 1
  Secondary Cache . . . . . 256K
  CPU ID . . . . . 0686

Processor(s) Mapped Out . . . . None

Numeric Coprocessor . . . . . Integrated 387-
Compatible

Expansion Bus . . . . . ISA, PCI

System Identification Number . . 6J14FXS1V008

CPU Mode . . . . . Real Mode

System ROM
    Revision . . . . . 01/11/2001
      Family . . . . . P21
    Flashable . . . . . Yes
    Supports F10 partition . . . Yes

Video Controller ROM
    Revision . . . . . 3.96

Option ROMs
  Address Range . . . . . C0000 - C7FFF
    Data Dump . . . . . (1999/03/24 23:56)

  Address Range . . . . . C8000 - CBFFF
    Data Dump . . . . . (04/22/98 ROC
Smart Array Option ROM/BIOS (C)Co...)

  Address Range . . . . . E8000 - EDFFF
    Data Dump . . . . . ( CPQSCSI d)

Bootblock ROM . . . . . 01/25/2000

Standby Recovery Server
  Status . . . . . Disabled
  COM Port . . . . . COM1
  Server Configuration . . . . . Recovery
  Timeout Value . . . . . 1 minutes

Memory Boards Identified:
  System Board
    DIMM Slot  1 (SDRAM) . . . .  128 Megabytes
    DIMM Slot  2 (SDRAM) . . . .  128 Megabytes
    DIMM Slot  3 (SDRAM) . . . .  128 Megabytes
    DIMM Slot  4 (SDRAM) . . . .  128 Megabytes
Total Compaq Memory . . . . . .  512 Megabytes

Keyboard . . . . . Enhanced

LPT Ports . . . . . Not Installed

COM Ports . . . . . COM1 (Address 3F8)
Compaq NC3163 Fast Ethernet NIC
  Device Type . . . . . Ethernet Controller
  PCI Bus Number . . . . . 3
  Device Number . . . . . 4
  Function Number . . . . . 00h
  Slot Number . . . . . 0
  Vendor ID . . . . . 0E11h
  Device ID . . . . . 1229h
  Subsystem Vendor ID . . . . . 0E11h
  Subsystem ID . . . . . B134h
  Revision ID . . . . . 08h
  Programming Interface . . . . 00h
  Expansion ROM Base Address . . FFF00000h
  IRQ Line . . . . . 5
  IRQ Pin . . . . . INTA#
  Memory Address Base . . . . . C6FFF000h
  Memory Address Length . . . . 1000h
  IO Address Base . . . . . 3000h
  IO Address Length . . . . . 40h
  Memory Address Base . . . . . C6E00000h
  Memory Address Length . . . . 100000h


Compaq NC3163 Fast Ethernet NIC
  Device Type . . . . . Ethernet Controller
  PCI Bus Number . . . . . 3
  Device Number . . . . . 5
  Function Number . . . . . 00h
  Slot Number . . . . . 0
  Vendor ID . . . . . 0E11h
  Device ID . . . . . 1229h
  Subsystem Vendor ID . . . . . 0E11h
  Subsystem ID . . . . . B134h
  Revision ID . . . . . 08h
  Programming Interface . . . . 00h
  Expansion ROM Base Address . . FFF00000h
  IRQ Line . . . . . 7
  IRQ Pin . . . . . INTA#
  Memory Address Base . . . . . C6DFF000h
  Memory Address Length . . . . 1000h
  IO Address Base . . . . . 3040h
  IO Address Length . . . . . 40h
  Memory Address Base . . . . . C6C00000h
  Memory Address Length . . . . 100000h


ATM Controller
  PCI Bus Number . . . . . 3
  Device Number . . . . . 6
  Function Number . . . . . 00h
  Slot Number . . . . . 2
  Vendor ID . . . . . 135Bh
  Device ID . . . . . 0001h
  Revision ID . . . . . 00h
  Programming Interface . . . . 00h
  Expansion ROM Base Address . . 0h
  IRQ Line . . . . . 10
  IRQ Pin . . . . . INTA#
  Memory Address Base . . . . . C6BE0000h
  Memory Address Length . . . . 20000h
  Memory Address Base . . . . . C6800000h
  Memory Address Length . . . . 200000h
  Memory Address Base . . . . . C5000000h
  Memory Address Length . . . . 1000000h
  Memory Address Base . . . . . C4FF0000h
  Memory Address Length . . . . 10000h


Diskette Drive A . . . . . 1.44 Megabyte (3.5
inch)

Drive Controller 1, Compaq Integrated Smart Array
Controller
  IDA Firmware Revision . . . . 1.42
  Array Accelerator Memory . . . 8188 Kbytes
  Accelerator Status . . . . . Not Configured
    Battery count . . . . . 0
    Batteries charged . . . . . 0
    Batteries failed . . . . . 0
  Internal ProLiant . . . . . Bus 2, Rev. JB21

  Logical Drive  1 . . . . . 9095 Megabyte
  Fault Tolerance . . . . . Mirroring
  OS Format . . . . . Multi-Sector
Distribution
  Drive geometry (Cyl, Hds, Sec) 2177, 255, 32
  Array Accelerator . . . . . Disabled
  Logical drive in interim recovery mode.

    Hard Drive  1
    SCSI Bus . . . . . 2
    SCSI ID . . . . . 0
    Serial Number . . . . . .
LJF8512500001931HDC0
    Firmware Revision 1 . . . . 3208
    Model Number . . . . . COMPAQ  HD0093172C
    Initialized for Monitoring . Yes

    Hard Drive  2
    SCSI Bus . . . . . 2
    SCSI ID . . . . . 1
    Serial Number . . . . . Undetermined
    Model Number . . . . . Undetermined
    Initialized for Monitoring . No

Graphics Mode . . . . . 03 (80-Column Text)
```

```
Primary Monitor attached to  . .  ATI RAGE IIC PCI
Graphics Controller
with Video Graphics Color Monitor

Base Memory
  System Total . . . . . .    638 Kbytes
  Amount Free  . . . . . .    555 Kbytes
(568384 Bytes)

Extended Memory
  System Total . . . . . .  523264 Kbytes

Expanded Memory
  LIM Driver Support . . . . . .  LIM driver not
loaded

Operating System . . . . . .  MS-DOS version 7.10
(from diskette)

Environment variables
  PATH=
  PROMPT=$P$G
  COMSPEC=A:\COMMAND.COM
  CMDLINE=inspect /u
End of environment

Revisions Table

Previous Revisions

Current Revisions

System serial number . . . . . .  6J14FXS1V008

Memory Allocation (including INSPECT)
  PSP   SIZE    NAME          TRAPPED INTERRUPTS
  ----  ------  ------------  ----------------------
---------------
  12F7  007200  COMMAND.COM   2Fh  2Eh  24h  23h  22h
  14C2  218144  INSPECT.EXE   F9h  F4h  F3h  F2h  E5h
3Fh  00h

System Configuration Memory
  00 - 0F :    35 00 45 00    17 00 04 20    09 01 26
82    50 80 00 00
  10 - 1F :    40 00 00 00    03 80 02 00    3C 00 00
00    00 00 00 02
  20 - 2F :    00 00 00 00    7F 20 20 40    00 7A 00
00    00 18 02 94
  30 - 3F :    00 3C 20 80    00 00 XX XX    XX XX XX
XX    XX XX XX XX

BIOS Data Area
  40:0000 :    F8 03 00 00    00 00 00 00    00 00 00
00    00 00 80 9F
  40:0010 :    27 02 00 7E    02 00 00 00    00 00 1E
00    1E 00 00 00
  40:0020 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:0030 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 01 01
  40:0040 :    25 00 00 00    00 2A 00 11    02 03 50
00    00 10 00 00
  40:0050 :    00 18 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:0060 :    0E 0D 00 D4    03 29 30 A4    17 FD 74
00    82 C2 11 00
  40:0070 :    00 00 00 12    00 01 00 00    14 14 14
14    01 01 01 01
  40:0080 :    1E 00 3E 00    18 10 00 60    F9 11 0B
01    00 00 00 05
  40:0090 :    17 00 00 00    2A 00 10 00    00 00 00
00    00 00 00 00
  40:00A0 :    00 00 00 00    00 00 00 00    7C 14 00
C0    00 00 00 00
  40:00B0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00C0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00D0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00E0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00F0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00


Interrupt Vector Table (including INSPECT)
  00 - 03 :    14D2:0555      0070:0465
122E:0016      0070:0465
  04 - 07 :    0070:0465      F000:FF54
F000:93CC      F000:9BD0
  08 - 0B :    122E:001F      122E:0028
F000:9BD0      122E:0052
  0C - 0F :    F000:9BD0      F000:9BD0
122E:009A      0070:0465
  10 - 13 :    C000:13FE      F000:F84D
F000:F841      0070:03EE
  14 - 17 :    F000:D0E5      0207:0240
0070:042D      F000:EFD2
  18 - 1B :    F000:F06D      12EF:002F
F000:FE6E      0070:045F
  1C - 1F :    F000:FF53      F000:0000
0000:0522      C000:2143
  20 - 23 :    00C9:0FA8      00C9:0FB2
12F7:0314      12F7:016D
  24 - 27 :    12F7:0178      00C9:0FBC
00C9:0FC6      00C9:0FD0
  28 - 2B :    00C9:106C      0070:0466
00C9:106C      00C9:106C
  2C - 2F :    00C9:106C      00C9:106C
12F7:0162      12F8:01CC
  30 - 33 :    C90F:E4EA      F000:9B00
00C9:106C      00C9:106C
  34 - 37 :    00C9:106C      00C9:106C
00C9:106C      00C9:106C
  38 - 3B :    00C9:106C      00C9:106C
00C9:106C      00C9:106C
  3C - 3F :    00C9:106C      00C9:106C
00C9:106C      258E:04F3
  40 - 43 :    F000:EC59      C81F:01C6
F000:F065      C000:2556
  44 - 47 :    F000:9BD0      F000:9BD0
0000:0000      F000:9BD0
  48 - 4B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  4C - 4F :    F000:9BD0      F000:9BD0
F000:9BD0      0070:04FC
  50 - 53 :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  54 - 57 :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  58 - 5B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  5C - 5F :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  60 - 63 :    0000:0000      0000:0000
0000:0000      0000:0000
  64 - 67 :    0000:0000      0000:0000
0000:0000      0000:0000
  68 - 6B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  6C - 6F :    F000:9BD0      C000:13FE
F000:9BD0      F000:9BD0
  70 - 73 :    122E:0035      F000:9C1F
F000:9BD0      F000:9BD0
  74 - 77 :    122E:00E2      F000:9C28
F000:9BD0      122E:0112
  78 - 7B :    0000:0000      0000:0000
0000:0000      0000:0000
  7C - 7F :    0000:0000      0000:0000
0000:0000      0000:0000
  80 - 83 :    0000:0000      0000:0000
0000:0000      0000:0000
  84 - 87 :    0000:0000      0000:0000
0000:0000      0000:0000
  88 - 8B :    0000:0000      0000:0000
0000:0000      0000:0000
  8C - 8F :    0000:0000      0000:0000
0000:0000      0000:0000
  90 - 93 :    0000:0000      0000:0000
0000:0000      0000:0000
  94 - 97 :    0000:0000      0000:0000
0000:0000      0000:0000
  98 - 9B :    0000:0000      0000:0000
0000:0000      0000:0000
  9C - 9F :    0000:0000      0000:0000
0000:0000      0000:0000
  A0 - A3 :    0000:0000      0000:0000
0000:0000      0000:0000
  A4 - A7 :    0000:0000      0000:0000
0000:0000      0000:0000
  A8 - AB :    0000:0000      0000:0000
0000:0000      0000:0000
  AC - AF :    0000:0000      0000:0000
0000:0000      0000:0000
  B0 - B3 :    0000:0000      0000:0000
0000:0000      0000:0000
  B4 - B7 :    0000:0000      0000:0000
0000:0000      0000:0000
  B8 - BB :    0000:0000      0000:0000
0000:0000      0000:0000
  BC - BF :    0000:0000      0000:0000
0000:0000      0000:0000
  C0 - C3 :    0000:0000      0000:0000
0000:0000      0000:0000
  C4 - C7 :    0000:0000      0000:0000
0000:0000      0000:0000
```

```
  C8 - CB :    0000:0000      0000:0000
0000:0000      0000:0000
  CC - CF :    0000:0000      0000:0000
0000:0000      0000:0000
  D0 - D3 :    0054:0054      0006:0000
4D54:0000      0087:0000
  D4 - D7 :    544D:0000      0054:0000
0000:0000      0000:0002
  D8 - DB :    016F:0000      0000:0000
0000:200B      0000:0BD6
  DC - DF :    016F:0000      0000:0000
0000:200B      0000:0100
  E0 - E3 :    0000:0BF0      0000:200A
0000:0000      0000:031E
  E4 - E7 :    0000:016E      2000:00D0
0001:A610      0000:0051
  E8 - EB :    0000:00E8      0000:0000
0083:0020      0006:1EA2
  EC - EF :    0006:1EA0      0046:AF00
AF00:1F76      0046:0087
  F0 - F3 :    0010:13C1      DC38:1DB7
1DB7:13C1      1400:DA95
  F4 - F7 :    1CDA:0246      0101:7387
0000:0000      0000:613D
  F8 - FB :    613D:0020      15B7:6443
00F4:0003      0000:09F6
  FC - FF :    0246:0900      0900:0000
E15F:0049      0003:09F6

PCI Devices Information
  Signature . . . . . .  PCI
  Config Mechanism #1 . . . . .  Supported
  Config Mechanism #2 . . . . .  Not Supported
  Spec Cycle for Config #1 . . .  Supported
  Spec Cycle for Config #2 . . .  Not Supported
  BIOS Interface Version . . . .  2.10
  Last PCI Bus Number . . . . .  3
  Number of PCI Devices . . . .  5

  PCI Bus Number . . . . . .  0
  Device Number . . . . . .  1
  Function Number . . . . . .  00h
  Slot Number . . . . . .  0
  Vendor ID . . . . . .  0E11h
  Device ID . . . . . .  0010h
  Revision ID . . . . . .  02h
  Device Type . . . . . .  RAID Controller
  Programming Interface . . . .  00h
  Expansion ROM Base Address . .  FFF80000h
  IRQ Line . . . . . .  3
  IRQ Pin . . . . . .  INTA#
  IO Address Base . . . . . .  2000h
  IO Address Length . . . . . .  100h
  Memory Address Base . . . . .  C3000000h
  Memory Address Length . . . .  1000000h
  Memory Address Base . . . . .  C2000000h
  Memory Address Length . . . .  1000000h

  PCI Bus Number . . . . . .  0
  Device Number . . . . . .  3
  Function Number . . . . . .  00h
  Slot Number . . . . . .  0
  Vendor ID . . . . . .  1002h
  Device ID . . . . . .  4756h
  Revision ID . . . . . .  7Ah
  Device Type . . . . . .  VGA Compatible
Controller
  Programming Interface . . . .  00h
  Expansion ROM Base Address . .  FFFE0000h
  IRQ Line . . . . . .  255
  IRQ Pin . . . . . .  Not Used
  Memory Address Base . . . . .  C0000000h
  Memory Address Length . . . .  1000000h
  IO Address Base . . . . . .  2400h
  IO Address Length . . . . . .  100h
  Memory Address Base . . . . .  C1FFF000h
  Memory Address Length . . . .  1000h

  PCI Bus Number . . . . . .  3
  Device Number . . . . . .  4
  Function Number . . . . . .  00h
  Slot Number . . . . . .  0
  Vendor ID . . . . . .  0E11h
  Device ID . . . . . .  1229h
  Revision ID . . . . . .  08h
  Device Type . . . . . .  Ethernet Controller
  Programming Interface . . . .  00h
  Expansion ROM Base Address . .  FFF00000h
  IRQ Line . . . . . .  5
  IRQ Pin . . . . . .  INTA#
  Memory Address Base . . . . .  C6FFF000h
  Memory Address Length . . . .  1000h
  IO Address Base . . . . . .  3000h
  IO Address Length . . . . . .  40h
  Memory Address Base . . . . .  C6E00000h
  Memory Address Length . . . .  100000h

  PCI Bus Number . . . . . .  3
  Device Number . . . . . .  5
  Function Number . . . . . .  00h
  Slot Number . . . . . .  0
  Vendor ID . . . . . .  0E11h
  Device ID . . . . . .  1229h
  Revision ID . . . . . .  08h
  Device Type . . . . . .  Ethernet Controller
  Programming Interface . . . .  00h
  Expansion ROM Base Address . .  FFF00000h
  IRQ Line . . . . . .  7
  IRQ Pin . . . . . .  INTA#
  Memory Address Base . . . . .  C6DFF000h
  Memory Address Length . . . .  1000h
  IO Address Base . . . . . .  3040h
  IO Address Length . . . . . .  40h
  Memory Address Base . . . . .  C6C00000h
  Memory Address Length . . . .  100000h

  PCI Bus Number . . . . . .  3
  Device Number . . . . . .  6
  Function Number . . . . . .  00h
  Slot Number . . . . . .  2
  Vendor ID . . . . . .  135Bh
  Device ID . . . . . .  0001h
  Revision ID . . . . . .  00h
  Device Type . . . . . .  ATM Controller
  Programming Interface . . . .  00h
  Expansion ROM Base Address . .  0h
  IRQ Line . . . . . .  10
  IRQ Pin . . . . . .  INTA#
  Memory Address Base . . . . .  C6BE0000h
  Memory Address Length . . . .  20000h
  Memory Address Base . . . . .  C6800000h
  Memory Address Length . . . .  200000h
  Memory Address Base . . . . .  C5000000h
  Memory Address Length . . . .  1000000h
  Memory Address Base . . . . .  C4FF0000h
  Memory Address Length . . . .  10000h
```


SUT System Configuration

```
Date . . . . . .  09/24/2001
Time . . . . . .  16:30:26

Product . . . . . .  ProLiant DL580

Machine ID
  From System Board . . . . . .  CPQ0715

Processor . . . . . .  Pentium III(R) Xeon
at 900 MHz
  Slot . . . . . .  4
  Secondary Cache . . . . . .  2048K
  CPU ID . . . . . .  06A4

Processor . . . . . .  Pentium III(R) Xeon
at 900 MHz
  Slot . . . . . .  3
  Secondary Cache . . . . . .  2048K
  CPU ID . . . . . .  06A4

Processor . . . . . .  Pentium III(R) Xeon
at 900 MHz
  Slot . . . . . .  2
  Secondary Cache . . . . . .  2048K
  CPU ID . . . . . .  06A4

Processor . . . . . .  Pentium III(R) Xeon
at 900 MHz
  Slot . . . . . .  1
  Secondary Cache . . . . . .  2048K
  CPU ID . . . . . .  06A4

Processor(s) Mapped Out . . . .  None

Numeric Coprocessor . . . . . .  Integrated 387-
Compatible

Expansion Bus . . . . . .  ISA, PCI
```

```
System Identification Number . .  D041DYV1K599

CPU Mode . . . . . .  Real Mode

System ROM
    Revision . . . . . .  01/05/2001
      Family . . . . . .  P20
    Flashable  . . . . . .  Yes
    Supports F10 partition . . .  Yes

Video Controller ROM
    Revision . . . . . .  3.96

Option ROMs
  Address Range  . . . . . .  C0000 - C7FFF
    Data Dump  . . . . . .  (1999/03/24 23:56)

  Address Range  . . . . . .  C8000 - CBFFF
    Data Dump  . . . . . .  (04/22/98 ROC
Smart Array Option ROM/BIOS (C)Co...)

  Address Range  . . . . . .  CC000 - CFFFF
    Data Dump  . . . . . .  (07/07/00 Maxwell
Smart Array Option ROM/BIOS (C)Co...)

  Address Range  . . . . . .  E8000 - EDFFF
    Data Dump  . . . . . .  ( CPQSCSI d)

Bootblock ROM  . . . . . .  02/28/2000
Memory Boards Identified:
  System Board
    DIMM Slot  1 (SDRAM) . . . .   512 Megabytes
    DIMM Slot  2 (SDRAM) . . . .   512 Megabytes
    DIMM Slot  3 (SDRAM) . . . .   512 Megabytes
    DIMM Slot  4 (SDRAM) . . . .   512 Megabytes
    DIMM Slot  5 (SDRAM) . . . .   512 Megabytes
    DIMM Slot  6 (SDRAM) . . . .   512 Megabytes
    DIMM Slot  7 (SDRAM) . . . .   512 Megabytes
    DIMM Slot  8 (SDRAM) . . . .   512 Megabytes
    DIMM Slot  9 (SDRAM) . . . .   512 Megabytes
    DIMM Slot  10 (SDRAM)  . . .   512 Megabytes
    DIMM Slot  11 (SDRAM)  . . .   512 Megabytes
    DIMM Slot  12 (SDRAM)  . . .   512 Megabytes
    DIMM Slot  13 (SDRAM)  . . .   512 Megabytes
    DIMM Slot  14 (SDRAM)  . . .   512 Megabytes
    DIMM Slot  15 (SDRAM)  . . .   512 Megabytes
    DIMM Slot  16 (SDRAM)  . . .   512 Megabytes
Total Compaq Memory  . . . . . .  8192 Megabytes

Keyboard . . . . . .  Enhanced

LPT Ports  . . . . . .  LPT1 (Address 378)

COM Ports  . . . . . .  COM1 (Address 3F8)
ATM Controller
  PCI Bus Number . . . . . .  0
  Device Number  . . . . . .  7
  Function Number  . . . . . .  00h
  Slot Number  . . . . . .  6
  Vendor ID  . . . . . .  135Bh
  Device ID  . . . . . .  0001h
  Revision ID  . . . . . .  00h
  Programming Interface  . . . .  00h
  Expansion ROM Base Address . .  0h
  IRQ Line . . . . . .  11
  IRQ Pin  . . . . . .  INTA#
  Memory Address Base  . . . . .  F4FC0000h
  Memory Address Length  . . . .  20000h
  Memory Address Base  . . . . .  F4C00000h
  Memory Address Length  . . . .  200000h
  Memory Address Base  . . . . .  F3000000h
  Memory Address Length  . . . .  1000000h
  Memory Address Base  . . . . .  F2FF0000h
  Memory Address Length  . . . .  10000h



Diskette Drive A . . . . . .  1.44 Megabyte (3.5
inch)

Drive Controller 1, Compaq Integrated Smart Array
Controller
  IDA Firmware Revision  . . . .  1.42
  Array Accelerator Memory . . .  8188 Kbytes
    Reserved for reads . . . . .  8188 Kbytes
  Accelerator Status . . . . . .  Enabled
    Battery count  . . . . . .  0
    Batteries charged  . . . . .  0
    Batteries failed . . . . . .  0
  Internal ProLiant  . . . . . .  Bus 1, Rev. JB21

  Logical Drive  1 . . . . . .  9091 Megabyte
  Fault Tolerance  . . . . . .  None
  OS Format  . . . . . .  Multi-Sector
Distribution
  Drive geometry (Cyl, Hds, Sec)  2176, 255, 32
  Array Accelerator  . . . . . .  Enabled

    Hard Drive  1
    SCSI Bus . . . . . .  1
    SCSI ID  . . . . . .  0
    Serial Number  . . . . . .  B3012646
    Firmware Revision 1  . . . .  B016
    Model Number . . . . . .  COMPAQ  BD009122C6
    Initialized for Monitoring .  Yes
      Reference time . . . . . .  604418
      Sectors read . . . . . .  *1721107802
      Hard read errors . . . . .  0
      Read errors retry  . . . .  0
      ECC read errors  . . . . .  0
      Sectors written  . . . . .  692657516
      Hard write errors  . . . .  0
      Write errors retry . . . .  0
      Seek count . . . . . .  1936978
      Seek errors  . . . . . .  0
      Spin cycles  . . . . . .  3
      Spin up time . . . . . .  0
      Seek time track  . . . . .  36%
      Seek time third  . . . . .  68%
      Seek time full . . . . . .  71%
      Reallocated sectors  . . .  14
      Recovers read failed . . .  0
      Bus faults . . . . . .  0

Graphics Mode  . . . . . .  03 (80-Column Text)


Primary Monitor attached to  . .  ATI RAGE IIC PCI
Graphics Controller
with Video Graphics Color Monitor

Base Memory
  System Total . . . . . .    636 Kbytes
  Amount Free  . . . . . .    553 Kbytes
(566336 Bytes)

Extended Memory
  System Total . . . . . .  8387584 Kbytes

Expanded Memory
  LIM Driver Support . . . . . .  LIM driver not
loaded

Operating System . . . . . .  MS-DOS version 7.10
(from diskette)

Environment variables
  PATH=
  PROMPT=$P$G
  COMSPEC=A:\COMMAND.COM
  CMDLINE=inspect /u
End of environment

System serial number . . . . . .  D041DYV1K599

Memory Allocation (including INSPECT)
  PSP   SIZE    NAME          TRAPPED INTERRUPTS
  ----  ------  ------------  ------------------------
---------------
  12F7  007200  COMMAND.COM   EFh  2Fh  2Eh  24h  23h
22h
  14C2  218144  INSPECT.EXE   F1h  F9h  F4h  F3h  F2h
EDh  3Fh  00h

System Configuration Memory
  00 - 0F :    33 00 30 00    16 00 01 24    09 01 26
82    50 80 00 00
  10 - 1F :    40 00 00 00    03 80 02 00    3C 00 00
00    00 00 00 02
  20 - 2F :    00 00 00 00    7F 20 20 40    00 9A 00
00    00 10 02 AC
  30 - 3F :    00 3C 20 80    00 00 XX XX    XX XX XX
XX    XX XX XX XX

BIOS Data Area
  40:0000 :    F8 03 00 00    00 00 00 00    78 03 00
00    00 00 00 9F
  40:0010 :    27 42 00 7C    02 00 00 00    00 00 1E
00    1E 00 00 00
  40:0020 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:0030 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 01 01
  40:0040 :    25 00 00 00    00 2A 00 11    02 03 50
00    00 10 00 00
  40:0050 :    00 18 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:0060 :    0E 0D 00 D4    03 29 30 A4    17 7D 74
00    50 82 10 00
```

```
  40:0070 :    00 00 00 12    00 01 00 00    14 14 14
14    01 01 01 01
  40:0080 :    1E 00 3E 00    18 10 00 60    F9 11 0B
01    00 00 00 05
  40:0090 :    17 00 00 00    2A 00 10 00    00 00 00
00    00 00 00 00
  40:00A0 :    00 00 00 00    00 00 00 00    7C 14 00
C0    00 00 00 00
  40:00B0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00C0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00D0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00E0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00
  40:00F0 :    00 00 00 00    00 00 00 00    00 00 00
00    00 00 00 00


Interrupt Vector Table (including INSPECT)
  00 - 03 :    14D2:0555      0070:0465
122E:0016      0070:0465
  04 - 07 :    0070:0465      F000:FF54
F000:93CC      F000:9BD0
  08 - 0B :    122E:001F      122E:0028
F000:9BD0      122E:0052
  0C - 0F :    F000:9BD0      F000:9BD0
122E:009A      0070:0465
  10 - 13 :    C000:13FE      F000:F84D
F000:F841      0070:03EE
  14 - 17 :    F000:F66C      0207:0240
0070:042D      F000:EFD2
  18 - 1B :    F000:25FA      12EF:002F
F000:FE6E      0070:045F
  1C - 1F :    F000:FF53      F000:0000
0000:0522      C000:2143
  20 - 23 :    00C9:0FA8      00C9:0FB2
12F7:0314      12F7:016D
  24 - 27 :    12F7:0178      00C9:0FBC
00C9:0FC6      00C9:0FD0
  28 - 2B :    00C9:106C      0070:0466
00C9:106C      00C9:106C
  2C - 2F :    00C9:106C      00C9:106C
12F7:0162      12F8:01CC
  30 - 33 :    C90F:E4EA      F000:9B00
00C9:106C      00C9:106C
  34 - 37 :    00C9:106C      00C9:106C
00C9:106C      00C9:106C
  38 - 3B :    00C9:106C      00C9:106C
00C9:106C      00C9:106C
  3C - 3F :    00C9:106C      00C9:106C
00C9:106C      258E:04F3
  40 - 43 :    F000:EC59      C81F:01C6
F000:F065      C000:2556
  44 - 47 :    F000:9BD0      F000:9BD0
0000:0000      F000:9BD0
  48 - 4B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  4C - 4F :    F000:9BD0      F000:9BD0
F000:9BD0      0070:04FC
  50 - 53 :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  54 - 57 :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  58 - 5B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  5C - 5F :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  60 - 63 :    0000:0000      0000:0000
0000:0000      0000:0000
  64 - 67 :    0000:0000      0000:0000
0000:0000      0000:0000
  68 - 6B :    F000:9BD0      F000:9BD0
F000:9BD0      F000:9BD0
  6C - 6F :    F000:9BD0      C000:13FE
F000:9BD0      F000:9BD0
  70 - 73 :    122E:0035      F000:9C1F
F000:9BD0      F000:9BD0
  74 - 77 :    122E:00E2      F000:9C28
122E:00FA      F000:9BD0
  78 - 7B :    0000:0000      0000:0000
0000:0000      0000:0000
  7C - 7F :    0000:0000      0000:0000
0000:0000      0000:0000
  80 - 83 :    0000:0000      0000:0000
0000:0000      0000:0000
  84 - 87 :    0000:0000      0000:0000
0000:0000      0000:0000
  88 - 8B :    0000:0000      0000:0000
0000:0000      0000:0000
  8C - 8F :    0000:0000      0000:0000
0000:0000      0000:0000
  90 - 93 :    0000:0000      0000:0000
0000:0000      0000:0000
  94 - 97 :    0000:0000      0000:0000
0000:0000      0000:0000
  98 - 9B :    0000:0000      0000:0000
0000:0000      0000:0000
  9C - 9F :    0000:0000      0000:0000
0000:0000      0000:0000
  A0 - A3 :    0000:0000      0000:0000
0000:0000      0000:0000
  A4 - A7 :    0000:0000      0000:0000
0000:0000      0000:0000
  A8 - AB :    0000:0000      0000:0000
0000:0000      0000:0000
  AC - AF :    0000:0000      0000:0000
0000:0000      0000:0000
  B0 - B3 :    0000:0000      0000:0000
0000:0000      0000:0000
  B4 - B7 :    0000:0000      0000:0000
0000:0000      0000:0000
  B8 - BB :    0000:0000      0000:0000
0000:0000      0000:0000
  BC - BF :    0000:0000      0000:0000
0000:0000      0000:0000
  C0 - C3 :    0000:0000      0001:0000
0000:0000      0000:0000
  C4 - C7 :    0000:0000      0000:0000
0000:0000      0000:0000
  C8 - CB :    0000:0000      0000:0000
0000:0000      0000:0000
  CC - CF :    0000:0000      0000:0000
0000:0000      0000:0000
  D0 - D3 :    0000:0000      0000:0000
0000:0000      0000:0000
  D4 - D7 :    0000:0000      0000:0000
0000:0000      0000:0000
  D8 - DB :    0000:0000      0000:0000
0000:0000      0000:0000
  DC - DF :    0000:0000      0000:0000
0000:0000      0000:0000
  E0 - E3 :    0000:0000      0000:0000
0000:0000      0000:0000
  E4 - E7 :    0000:0000      0000:0000
0000:0000      0083:0000
  E8 - EB :    0002:00D0      0083:0018
0006:00D8      0006:00D8
  EC - EF :    0046:7F00      1FA5:00F6
0046:0087      13C1:00F4
  F0 - F3 :    7C00:0001      8B0C:1D83
1D83:13C1      1400:8969
  F4 - F7 :    1CDA:0246      0101:7387
0000:0000      0000:613D
  F8 - FB :    613D:0020      15B7:6443
0000:0003      0246:0900
  FC - FF :    0000:00F4      0000:0900
EC38:0049      0003:09C2

PCI Devices Information
  Signature  . . . . . .  PCI
  Config Mechanism #1  . . . . .  Supported
  Config Mechanism #2  . . . . .  Not Supported
  Spec Cycle for Config #1 . . .  Supported
  Spec Cycle for Config #2 . . .  Not Supported
  BIOS Interface Version . . . .  2.10
  Last PCI Bus Number  . . . . .  10
  Number of PCI Devices  . . . .  8

  PCI Bus Number . . . . . .  0
  Device Number  . . . . . .  4
  Function Number  . . . . . .  00h
  Slot Number  . . . . . .  0
  Vendor ID  . . . . . .  0E11h
  Device ID  . . . . . .  0010h
  Revision ID  . . . . . .  02h
  Device Type  . . . . . .  RAID Controller
  Programming Interface  . . . .  00h
  Expansion ROM Base Address . .  FFF80000h
  IRQ Line . . . . . .  3
  IRQ Pin  . . . . . .  INTA#
  IO Address Base  . . . . . .  2000h
  IO Address Length  . . . . . .  100h
  Memory Address Base  . . . . .  F6000000h
  Memory Address Length  . . . .  1000000h
  Memory Address Base  . . . . .  F5000000h
  Memory Address Length  . . . .  1000000h

  PCI Bus Number . . . . . .  0
  Device Number  . . . . . .  5
  Function Number  . . . . . .  00h
  Slot Number  . . . . . .  0
  Vendor ID  . . . . . .  1002h
  Device ID  . . . . . .  4756h
  Revision ID  . . . . . .  7Ah
  Device Type  . . . . . .  VGA Compatible
Controller
```

```
Programming Interface  . . . .  00h
Expansion ROM Base Address . .  FFFE0000h
IRQ Line . . . . . .  255
IRQ Pin  . . . . . .  Not Used
Memory Address Base  . . . . .  F1000000h
Memory Address Length  . . . .  1000000h
IO Address Base  . . . . . .  2400h
IO Address Length  . . . . . .  100h
Memory Address Base  . . . . .  F4FF0000h
Memory Address Length  . . . .  1000h

PCI Bus Number . . . . . .  0
Device Number  . . . . . .  7
Function Number  . . . . . .  00h
Slot Number  . . . . . .  6
Vendor ID  . . . . . .  135Bh
Device ID  . . . . . .  0001h
Revision ID  . . . . . .  00h
Device Type  . . . . . .  ATM Controller
Programming Interface  . . . .  00h
Expansion ROM Base Address . .  0h
IRQ Line . . . . . .  11
IRQ Pin  . . . . . .  INTA#
Memory Address Base  . . . . .  F4FC0000h
Memory Address Length  . . . .  20000h
Memory Address Base  . . . . .  F4C00000h
Memory Address Length  . . . .  200000h
Memory Address Base  . . . . .  F3000000h
Memory Address Length  . . . .  1000000h
Memory Address Base  . . . . .  F2FF0000h
Memory Address Length  . . . .  10000h

PCI Bus Number . . . . . .  2
Device Number  . . . . . .  6
Function Number  . . . . . .  00h
Slot Number  . . . . . .  1
Vendor ID  . . . . . .  0E11h
Device ID  . . . . . .  B060h
Revision ID  . . . . . .  02h
Device Type  . . . . . .  RAID Controller
Programming Interface  . . . .  00h
Expansion ROM Base Address . .  FFF00000h
IRQ Line . . . . . .  3
IRQ Pin  . . . . . .  INTA#
Memory Address Base  . . . . .  F7B80000h
Memory Address Length  . . . .  40000h
Memory Address Base  . . . . .  F7A00000h
Memory Address Length  . . . .  100000h
IO Address Base  . . . . . .  3000h
IO Address Length  . . . . . .  100h

PCI Bus Number . . . . . .  2
Device Number  . . . . . .  8
Function Number  . . . . . .  00h
Slot Number  . . . . . .  2
Vendor ID  . . . . . .  0E11h
Device ID  . . . . . .  B060h
Revision ID  . . . . . .  02h
Device Type  . . . . . .  RAID Controller
Programming Interface  . . . .  00h
Expansion ROM Base Address . .  FFF00000h
IRQ Line . . . . . .  5
IRQ Pin  . . . . . .  INTA#
Memory Address Base  . . . . .  F79C0000h
Memory Address Length  . . . .  40000h
Memory Address Base  . . . . .  F7800000h
Memory Address Length  . . . .  100000h
IO Address Base  . . . . . .  3400h
IO Address Length  . . . . . .  100h

PCI Bus Number . . . . . .  2
Device Number  . . . . . .  9
Function Number  . . . . . .  00h
Slot Number  . . . . . .  3
Vendor ID  . . . . . .  0E11h
Device ID  . . . . . .  B060h
Revision ID  . . . . . .  02h
Device Type  . . . . . .  RAID Controller
Programming Interface  . . . .  00h
Expansion ROM Base Address . .  FFF00000h
IRQ Line . . . . . .  10
IRQ Pin  . . . . . .  INTA#
Memory Address Base  . . . . .  F77C0000h
Memory Address Length  . . . .  40000h
Memory Address Base  . . . . .  F7600000h
Memory Address Length  . . . .  100000h
IO Address Base  . . . . . .  3800h
IO Address Length  . . . . . .  100h

PCI Bus Number . . . . . .  7
Device Number  . . . . . .  6
Function Number  . . . . . .  00h
Slot Number  . . . . . .  4
Vendor ID  . . . . . .  0E11h
Device ID  . . . . . .  B060h
Revision ID  . . . . . .  02h
Device Type  . . . . . .  RAID Controller
Programming Interface  . . . .  00h
Expansion ROM Base Address . .  FFF00000h
IRQ Line . . . . . .  3
IRQ Pin  . . . . . .  INTA#
Memory Address Base  . . . . .  F7F80000h
Memory Address Length  . . . .  40000h
Memory Address Base  . . . . .  F7E00000h
Memory Address Length  . . . .  100000h
IO Address Base  . . . . . .  4000h
IO Address Length  . . . . . .  100h

PCI Bus Number . . . . . .  7
Device Number  . . . . . .  7
Function Number  . . . . . .  00h
Slot Number  . . . . . .  5
Vendor ID  . . . . . .  0E11h
Device ID  . . . . . .  B060h
Revision ID  . . . . . .  02h
Device Type  . . . . . .  RAID Controller
Programming Interface  . . . .  00h
Expansion ROM Base Address . .  FFF00000h
IRQ Line . . . . . .  3
IRQ Pin  . . . . . .  INTA#
Memory Address Base  . . . . .  F7DC0000h
Memory Address Length  . . . .  40000h
Memory Address Base  . . . . .  F7C00000h
Memory Address Length  . . . .  100000h
IO Address Base  . . . . . .  4400h
IO Address Length  . . . . . .  100h
```

ProLiant DL580 is a trademark of Compaq Computer Corporation.

Microsoft SQL Server 2000 Installation Procedures

Microsoft SQL Server 2000 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 binary sort order/Latin_1_General

Microsoft COM Component Configuration Parameters

The component services tool in Windows 2000 was used to change the queue settings for the TPCC COM+ single queue component. The single queue component was set to enable object pooling, object construction, just in time activation, and component supports events and statistics. The min and max pool size for the single queue component on each client was 53. Delivery threads were set under the TPCC key in the registry. The construction string was Dummy String

Appendix D: 60-Day Space

TPC-C 180 Day Space Requirements

Warehouses	3248				TpmC	39,158.09
Table	Rows	Data KB	Index KB	Extra 5% KB	8hr Space	Total Space KB
Warehouse	3,248	**352**	**40**	20		412
District	32,480	**3,616**	**40**	183		3839
Customer	97,440,000	**70,865,456**	**4,225,752**	3,754,560		78845768
History	97,440,000	**5,413,344**	**96**		1,057,758	5413440
NewOrder	29,232,000	**462,168**	**1,088**	23,163		486419
Orders	97,440,000	**2,986,672**	**1,358,176**		3,935,045	4344848
OrderLine	974,401,966	**60,900,128**	**128,928**		12,813,728	61029056
Item	100,000	**9,528**	**56**	479		10063
Stock	324,800,000	**103,936,000**	**194,280**	5,206,514		109336794
Total		244,577,264	5,908,456	8,984,919	17,806,530	259,470,639

MB

Dynamic Space	67,676	Sum of Data for Order, Orderline and History
Static Space	185,713	Sum of Data+Index+5%-Dynamic Space
Free Space	na	Total Allocated Spac - (Dynamic + Static Space)
Daily Growth	13,054	(Dynamic Space/(W*62.5))*tpmc
Daily Spread	-	(Free Space -1.5*Daily Growth) Zero Assumed

Misc_fg	CS_fg
412	
3839	
0	78845768
6471198	
486419	
8279893	
73842784	
10063	
0	109336794
89,094,807	188,182,562
4	**4**
3,430,400	**6,912,000**
13,721,600	27,648,000
109,772,800	221,184,000
OK	OK

files=
size=
Total=
8K blocks

60 Day Space MB	968,980							
60 Day Space GB	946.27	GB						
Log Size	121,499.99	MB						
KB Per New Order	5.12	KB						
8 hr log MB	93,952	MB						
8 hr log GB	91.7500	GB						
Space Usage	GB Needed	Disks Measured		GB Priced	Disk Size	Formatted Size		
180 Day Space DB	946.27	168		2839.20	18GB	16.900		
		0		0.00	9GB	8.473		
				0.00	4GB	3.999		
Total DB		168.00		2839.20	9GB			
8-hr log + mirror	183.5000	14		236.60	18GB	8.473		
OS, Swap	3	1		8.473	9GB			
Total Storage	1,132.77	GB		3,084.27	GB			

tpmC	39,158.09

	Data Before KB	Index Before KB	Data After KB	Index After KB	Data Grow KB	Index Grow KB	Total Grow KB	KB/New-Order	8-Hr Growth KB	8-Hr Growth MB
History	5,413,344	96	5,969,088	128	555,744	32	555,776	0.0563	1,057,757.91	1,032.97
Order	2,986,672	1,358,176	3,736,640	2,675,792	749,968	1,317,616	2,067,584	0.2094	3,935,044.58	3,842.82
Order-Line	60,900,128	128,928	67,508,472	253,280	6,608,344	124,352	6,732,696	0.6817	12,813,727.94	12,513.41
										17,389.19

	sum(*) Before
d_next_o_id	97,472,480

	sum(*) After
	107,348,370

	Num New-
	9,875,890

	Before MB	After MB	Grow MB	KB/New-Order	8-Hr Growth MB	8-Hr Growth GB
Log	147.24	50639.39	49365.15	5.1185	93,952.21	91.75

121499.9922	1.213365	41.843124	5,241.3621	bytes
Database tpcc log used (%)				

Appendix E: Third Party Letters

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

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

Microsoft

September 25, 2001

Compaq Computer
Corporation
David Adams
PO Box 692000--
MS150402
Houston, TX 77269

David:

Here is the information you requested regarding pricing for several Microsoft products to be used in conjunction with your TPC-C V5.0 benchmark testing.

All pricing shown is in US Dollars ($).

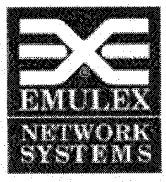
Part Number	Description	Unit Price	Quantity	Price
810-00846	**SQL Server 2000 Enterprise Edition** *Per processor licensing* *Discount schedule: Open Program Level C*	$ 16,541	4	$ 66,164
C11-00821	**Windows 2000 Server** *Server license only - No CALs* *Discount schedule: Open Program - No Level*	$ 738	1	$ 738
C10-00475	**Windows 2000 Advanced Server** *Server license only - No CALs* *Discount schedule: Open Program - No Level*	$ 2,399	1	$ 2,399
048-00317	**Visual C++ Professional 6.0 Win32**	$ 549	1	$ 549
	3-year maintenance for above software	$ 2,095	1	$ 6,285

All products are currently orderable through Microsoft's normal distribution channels.

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: Pjfjj0125092069
Please include this Reference ID in any correspondence regarding this price quote.



Emulex Corporation Network Systems
8201 Corporate Drive Suite 620
Landover, MD. 20785

David Adams
Database Performance Engineering
Compaq Computer Corporation

David;
Thank you for your interest in Emulex products. Per you request, here is a quote for the Emulex products you requested.

1. CLA1000-04 w/(CLS004) Host Bus Adapter – List price = 795.00 each
2. CL5000 Switch – 8 port switch for cLAN VI network – List price = 6,250.00 each
3. CLA0511 5 Meter copper cable – 95.00 each

Please let me know if you have any other inquiries. I have provided you with the associated discounts available to Compaq;

Sincerely,
Walter E. Moore
Emulex Corporation
(301) 918-2532
(301) 918-2533 Fax

Warranty Statement

Hardware: Emulex warrants that each of its products will perform in accordance with its specifications and shall be free from defects in material and workmanship under normal use for a period of time from date of purchase as follows:

Fibre Channel
LPxxxx Host Adapters two years *(1)
LHxxxx Hubs one year **(2)

*(1) The Warranty period will automatically be extended to 3 years for products that are registered within 90 days of purchase. (Applies to product registered after January 1, 1997).
**(2) These models include a one-year complimentary Advanced Replacement Program subscription, when registered within 90 days of purchase (North American Only).

Media: Emulex warrants all media on which software is furnished to be free of defects in material for a period of thirty (30) days from the date of product purchase.

Cable and Kit Accessories: All Emulex provided cables, GLM's, GBIC's, loopbacks, couplers, and kit accessories are warranted for ninety (90) days from date of purchase.

Return to Factory: During the warranty period, if the customer experiences difficulties with an Emulex product and is unable to resolve the problem via the phone with Emulex's Technical Support, a Return Authorization will be issued. Following receipt of a Return Authorization, the customer is responsible for returning the product to Emulex, freight prepaid. Emulex, upon verification of warranty, will, at its option, repair or replace the product in question and return it to the customer, freight prepaid.

Onsite services are not included as a part of these warranties.

General Terms: The above warranties shall not apply to expendable components such as fuses, bulbs, and the like, nor to connectors and other items not a part of the basic product. Nor does the foregoing warranty extend to experimental or developmental products, or to products which have been subject to misuse, neglect, accident, improper media usage or abuse; have been improperly wired, repaired, or altered by anyone other than Emulex or an authorized repair agent; have been used in material violation of Emulex's operating instructions; or have had their serial numbers removed, defaced or altered. Emulex shall have no obligation to make repairs or to cause replacement required through normal wear and tear or necessitated in whole or in part by catastrophe, fault, or negligence of the user, improper or unauthorized use of the product, or use of the product in such a manner for which it was not designed, or by causes external to the product, such as, but not limited to, power failure or air conditioning. Emulex's sole obligation hereunder shall be to repair or replace items covered in the above warranties. Customer shall provide for removal of the defective product, shipping charges for return to Emulex, and installation of its replacement. Above warranties are subject to change without notice.

Product End of Life: For Emulex products that are discontinued, notification and the date of discontinuance may be found on the Emulex web site at 'www.emulex.com/ss/discontinue.html'. Return to Factory qualified repair service shall be available for such products for seven years from such date of discontinuance.

Returned Products: Warranty claims must be received by Emulex within the applicable warranty period. All returned material must be accompanied by a Return Authorization Number assigned by Emulex.

In the event product(s) returned under the provisions of this Warranty are subsequently determined by Emulex to be functionally operational and in accordance with its published specifications, i.e., "No Defect Found" (NDF), Purchaser will be charged an NDF fee and the product shall be returned to the Purchaser freight collect.

THE EXPRESSED WARRANTIES SET FORTH IN THIS AGREEMENT ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND ALL SUCH OTHER WARRANTIES ARE HEREBY DISCLAIMED AND EXCLUDED BY EMULEX. THE STANDARD EXPRESSED WARRANTIES ARE IN LIEU OF ALL OBLIGATIONS OR LIABILITIES ON THE PART OF EMULEX FOR DAMAGES, INCLUDING, BUT NOT LIMITED TO, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THE PRODUCTS.

Customer's sole and exclusive remedy for any breach of this warranty, whether in contract, tort, strict liability, or otherwise, shall be Emulex's obligation to repair or replace as set forth above.

If you have any questions regarding this quote, please contact me at 888-228-3342, ext. 7352. Thank you for your consideration. /RB.