Hewlett-Packard Company

TPC Benchmark™ C
Full Disclosure Report
for
ProLiant DL380 G3
using
Microsoft SQL Server 2000 Standard Edition
and
Windows Server 2003 Standard Edition

Third Edition
September 2003

Third Edition – September 2003

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

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Preface

The TPC Benchmark C was developed by the Transaction Processing Performance Council (TPC). The TPC was founded to define transaction processing benchmarks and to disseminate objective, verifiable performance data to the industry. This full disclosure report is based on the TPC Benchmark C Standard Specifications Version 5.1, released February 11, 2003.

TPC Benchmark C Overview

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

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

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

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

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

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

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

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

Abstract

Overview

This report documents the methodology and results of the TPC Benchmark C test conducted on the HP ProLiant DL380G3. The operating system used for the benchmark was Windows Server 2003 Standard Edition. The DBMS used was Microsoft SQL Server 2000 Standard 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:

18,818.46 tpmC
$2.32 per tpmC

The availability date is May 27, 2003.

Standard and Executive Summary Statements

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

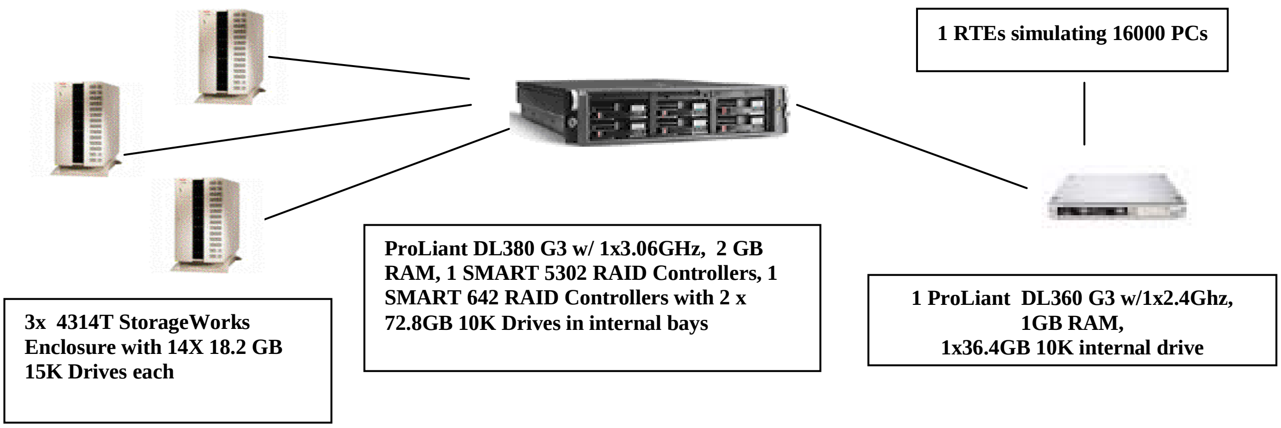
Auditor

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

Hewlett-Packard Company	ProLiant DL380 G3 1P c/s with 1 ProLiant DL360 G3	TPC-C Rev. 5.1 Report Date: May 29, 2003

Total System Cost	TPC-C Throughput	Price/Performance	Availability Date
$43,502	**18,818.46**	**$2.32**	**May 27, 2003**

Processors	Database Manager	Operating System	Other Software	Number of Users
1 Intel Xeon 3.06GHz – Server 1 Intel Xeon 2.4GHz – Client	Microsoft SQL Server 2000 Standard Edition (SP3)	Microsoft Windows Server 2003, Standard Edition	Microsoft Visual C++ Microsoft COM+	**16000**


1 RTEs simulating 16000 PCs
ProLiant DL380 G3 w/ 1x3.06GHz, 2 GB RAM, 1 SMART 5302 RAID Controllers, 1 SMART 642 RAID Controllers with 2 x 72.8GB 10K Drives in internal bays
1 ProLiant DL360 G3 w/1x2.4Ghz, 1GB RAM, 1x36.4GB 10K internal drive
3x 4314T StorageWorks Enclosure with 14X 18.2 GB 15K Drives each

	Server		Each Client	
System Components	Quantity	Description	Quantity	Description
Processor	1	3.06 GHz Intel Xeon w/ 512K Cache	1	2.4GHz Intel Xeon w/ 512K cache
Memory	2	1024 MB (2x512MB)	2	512MB (2x256MB)
Disk Controllers	1	Integrated SMART Array Controller	1	Integrated SMART Array Controller
	1	SMART 5302 Array Controller		
	1	SMART 642 Array Controller		
Disk Drives	42	18.2 GB SCSI Drive	1	36.4 GB SCSI Drive
	2	72.8 GB SCSI Drive		
Total Storage		205.8 GB		36.4 GB
Tape Drives	1	12/24 GB DAT		

Hewlett-Packard Company	HP ProLiant DL380 G3 1P	TPC-C Rev. 5.1	
	Client/Server	Report Date:	29-May-03

Description	Part Number	Third Party		Unit Price	Qty	Extended Price	3 yr. Maint. Price
Server Hardware		Brand	Pricing				
ProLiant DL380 G3 1x3.06GHz/533MHz FSB (512KB L2) , 512MB (2x256MB), Two integrated Gigabit NIC, Integrated Smart Array Controller	310587-001		1	3,299	1	3,299	
1GB PC2100 DDR (2x512MB)	300679-B21		1	550	2	1,100	
StorageWorks Enclosure Model 4314T- Tower	190210-001		1	3,182	3	9,546	
Smart Array 5302/128 Controller	283552-B21		1	1,299	1	1,299	
Smart Array 642 Controller	291967-B21		1	699	1	699	
S5500 15 carbon / silver monitor	261602-001		1	129	1	129	
3-Button Mouse-Carbon	231947-B21		1	5	1	5	
PS/2 Easy Access Internet Keyboard	265977-001		1	12	1	12	
TR5 10/20-Gigabyte Tape Drive - Carbon	294243-B22		1	299	1	299	
Pro UPS 500 (500VA/300 Watts; 110-127 VAC, 60Hz)	136386-001		1	146	1	146	
18.2GB 15Krpm U320 UNI HDD	286775-B22		1	299	42	12,558	
18.2GB 15Krpm U320 UNI HDD (10% spares)	286775-B22		1	299	5		1,495
72.8GB 10Krpm U320 UNI HDD (internal log)	286714-B22		1	489	2	978	
HP CP 3Y 4H 24x7 HW 300 Srs 4-Hour 24 Hour x 7 Day Coverage 3 Yea	162657-002		1	949	1		949
FM-4E724-36 3YR 24X7/4HR EMPTY DISK ENCL	171242-002		1	157	3		471
					Subtotal	**30,070**	**2,915**
Server Software							
Database Server Support Package	-PRORS-16U-01	Microsoft	2	1,950	3		5,850
SQL Server 2000 Standard Edition 32-bit	228-01079	Microsoft	2	4,999	1	4,999	Incl Above
Visual C++ .Net Standard	254-00170	Microsoft	2	109	1	109	Incl Above
Windows Server 2003 Standard Edition	P73-00295	Microsoft	2	738	1	738	Incl Above
					Subtotal	**5,846**	**5,850**
Client Hardware							
ProLiant DL360 G3 1x2.4GHz, 512MB (2x256MB) , Two integrated Gigabit NIC, Integrated Smart Array Controller	292887-001		1	2,199	1	2,199	
36.4GB 10Krpm U320 UNI HDD (internal OS drive)	286713-B22		1	339	1	339	
FM-EL724-36 3YR 24X7/4HR ENTRY 300 SVR	162675-002		1	599	1		599
					Subtotal	**2,538**	**599**
Client Software							
Windows 2000 Server 32-bit	C11-00821	Microsoft	2	738	1	738	Incl. Above
					Subtotal	**738**	**0**
User Connectivity							
7 ft. CAT5e Patch cable	CBLC57	LanAdapter	3	1	3	3	
					Subtotal	**3**	**0**
Large Purchase and Net 30 discount (See Note 1)	14.0%		1			**($4,565)**	**($492)**
					Total	**$34,630**	**$8,872**

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:	**$43,502**
tpmC Rating:	**18818.46**
$ / tpmC:	**$2.32**

Pricing: 1=HP 2= Microsoft 3=LanAdapters.com

Note 1 = Discount based on HP Direct guidence with large purchase and Net 30 discount.

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

Numerical Quantities Summary

MQTH, Computed Maximum Qualified Throughput **18,818.46 tpmC**

Response Times (in seconds)	**Average**	**90%**	**Maximum**
New-Order	0.65	0.99	6.19
Payment	0.38	0.68	6.54
Order-Status	0.49	0.81	5.53
Delivery (interactive portion)	0.10	0.11	0.53
Delivery (deferred portion)	1.14	1.58	3.47
Stock-Level	3.84	4.79	11.64
Menu	0.10	0.11	0.93

Transaction Mix, in percent of total transaction	
New-Order	44.90%
Payment	43.03%
Order-Status	4.02%
Delivery	4.02%
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	18.02/13.24	18.04/132.50
Payment	3.00/0.00	3.02/13.24	3.04/132.50
Order-Status	2.00/0.00	2.02/11.04	2.04/110.50
Delivery (interactive)	2.00/0.00	2.02/5.57	2.04/55.50
Stock-Level	2.00/0.00	2.02/5.56	2.04/55.50

Test Duration	
Ramp-up time	12 min 39 sec
Measurement interval	120 minutes
Transactions (all types) completed during measurement interval	5,231,518
Ramp down time	31 seconds

Checkpointing	
Number of checkpoints	9
Checkpoint interval	Ave 14 min 58 sec

General Items

Test Sponsor

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

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

Application Code and Definition Statements

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

Appendix A contains all source code implemented in this benchmark.

Parameter Settings

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

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

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

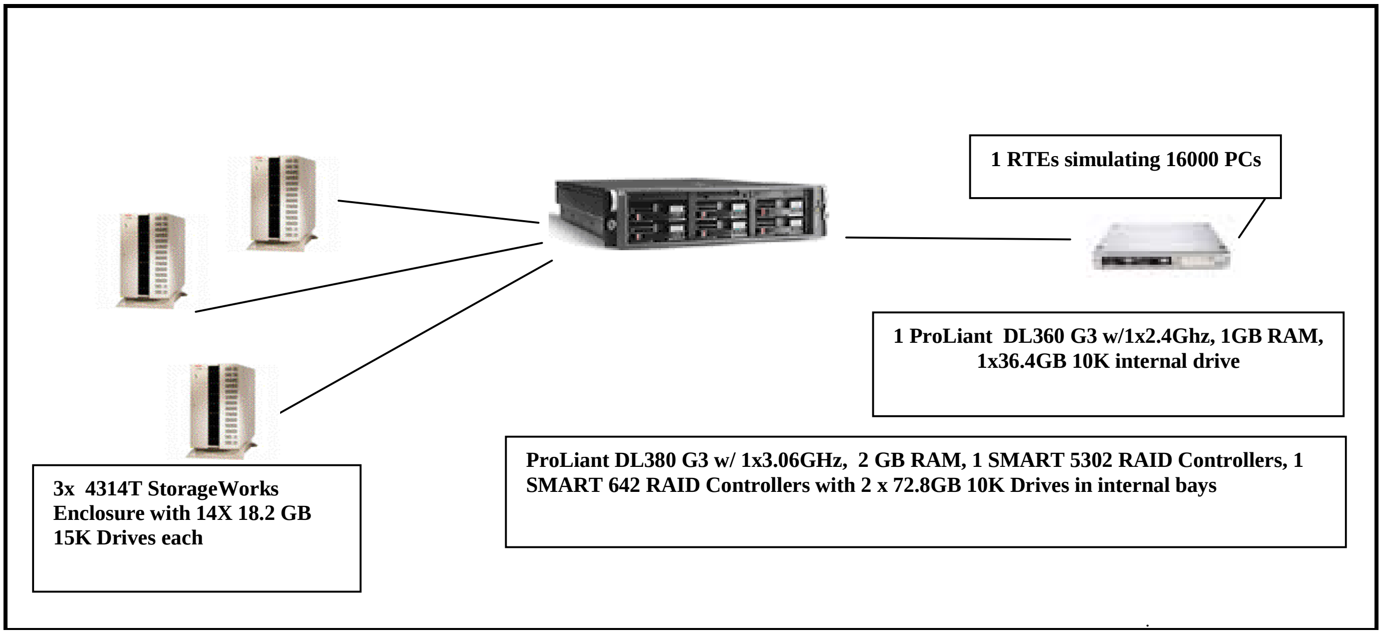
Appendix C contains the tunable parameters to for the database, the operating system, and the transaction monitor.

Configuration Items

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

The configuration diagrams for both the tested and priced systems are included on the following pages.

Figure 1. Benchmarked Configuration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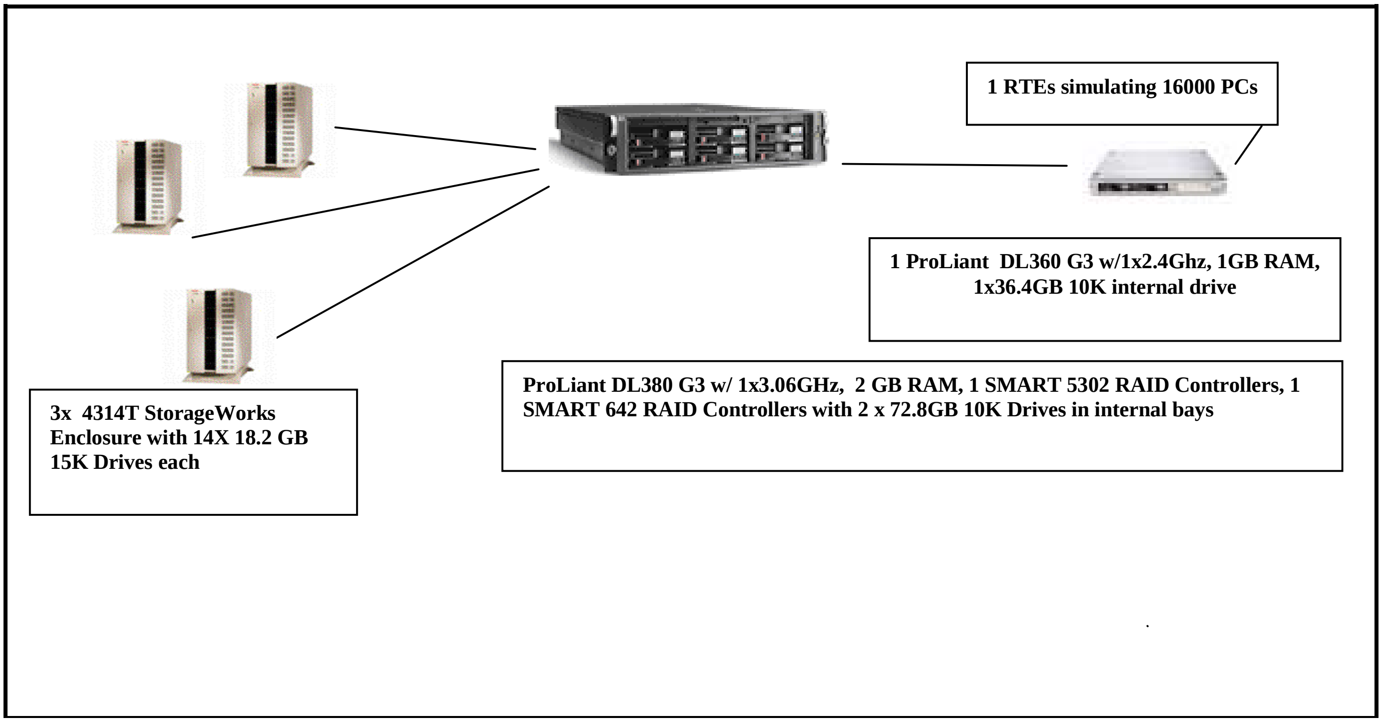
3x 4314T StorageWorks Enclosure with 14X 18.2 GB 15K Drives each

Figure 2. Priced Configuration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Clause 1 Related Items

Table Definitions

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

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

Physical Organization of Database

The physical organization of tables and indices within the database must be disclosed.
The tested configuration consisted of: 42 18.2GB 15K drives for the database data and 2 72.8GB 10K drives for the transaction log and operating system Fourteen drives (18.2GB 15K) were connected to the each external port of the controllers in slots 1 and 2. The two drives (72.8GB 10K) were connected to the integrated controller.

Benchmarked Configuration:

Integrated SMART Controller, Port 1, Array A

LOGICAL DRIVE C:	Total Capacity = 33.91 GB	RAID 0+1
Microsoft Server 2003 Standard Edition, MSSQL_tpcc_root.mdf		
LOGICAL DRIVE E:	Total Capacity = 51.59 GB	RAID 0+1
MSSQL_tpcc_log		

SMART-642 Controller, Slot 1, Array A

LOGICAL DRIVE F:	Total Capacity = 31.44 GB	RAID 0
MSSQL_cs0		
LOGICAL DRIVE G:	Total Capacity = 15.40 GB	RAID 0
MSSQL_misc0		
LOGICAL DRIVE X:	Total Capacity = 80.00 GB	RAID 0+1
Tpccbackup0		
Unused space:	Total Capacity = 36.59 GB	
Free space		

SMART-5302 Controller, Slot 2, Port 1, Array A

LOGICAL DRIVE H:	Total Capacity = 31.44 GB	RAID 0
MSSQL_cs1		
LOGICAL DRIVE I:	Total Capacity = 15.40 GB	RAID 0
MSSQL_misc1		
LOGICAL DRIVE Y:	Total Capacity = 80.00 GB	RAID 0+1
Tpccback1		
Unused space:	Total Capacity = 36.59 GB	
Free space		

SMART-5302 Controller, Slot 2, Port 2, Array B

LOGICAL DRIVE J:	Total Capacity = 31.44 GB	RAID 0
MSSQL_ cs2		
LOGICAL DRIVE K:	Total Capacity = 15.40 GB	RAID 0
MSSQL_misc2		
LOGICAL DRIVE Z:	Total Capacity = 80.00 GB	RAID 0+1
Tpccbackup2		
Unused space:	Total Capacity = 36.59 GB	
Free space		

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.

Insert and Delete Operations

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

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

Partitioning

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

No partitioning was used in this benchmark.

Replication, Duplication or Additions

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

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

Clause 2 Related Items

Random Number Generation

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

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

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

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

Input/Output Screen Layout

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

All screen layouts followed the specifications exactly.

Priced Terminal Feature Verification

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

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

Presentation Manager or Intelligent Terminal

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

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

Transaction Statistics

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

Table 2.1 Transaction Statistics

Statistic		Value
New Order	Home warehouse order lines	99.00%
	Remote warehouse order lines	1.00%
	Rolled back transactions	1.01%
	Average items per order	10.00
Payment	Home warehouse payments	85.02%
	Remote warehouse payments	14.98%

Statistic		Value
	Accessed by last name	59.98%
Order Status	Accessed by last name	60.09%
Transaction Mix	New Order	44.90%
	Payment	43.03%
	Order status	4.02%
	Delivery	4.02%
	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 that 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 160 warehouses (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 1600 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 13 and 14 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 1600 warehouses under a full load of 16000 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 16000 users.
- The test was allowed to run for a minimum of 10 minutes.
- A checkpoint was performed.
- The 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

Table2	Cardinality as built
Warehouse	1,600
District	16,000
Customer	98,400,000
History	98,400,000
Orders	98,400,000
New Order	29,520,000
Order Line	983,995,558
Stock	160,000,000
Item	100,000
Deleted Warehouses	0

Database Layout

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

The benchmarked configuration used 1 SMART 5302 Array controller with 2 SCSI channels, 1 SMART-642 Array controller with 2 SCSI channels and 1 integrated SMART Array controller with 2 SCSI channels. Each controller is capable of accessing up to 14 disk drives per channel, and supports RAID 0, RAID 0+1,and RAID 5 per each logical volume configured. The data tables were stored on 3 RAID arrays of (14) 18.2GB 15K drives each. Each of these controllers also housed a RAID 0+1 volume used for backup of the database. The integrated SMART Array controller had one array consisting of (2) 72.8GB 10K drives with a RAID 0+1 logical volume for the operating system and the database log. The Array Accelerators on the data controllers were disabled for all logical drives on these controllers. The Array Accelerator on the integrated 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 Standard 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	18,818.46 tpmC
Price per tpmC	$2.32 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	0.65	0.99	6.19
Payment	0.38	0.68	6.54
Order-Status	0.49	0.81	5.53
Interactive Delivery	0.10	0.11	0.53
Deferred Delivery	1.14	1.58	3.47
Stock-Level	3.84	4.79	11.64
Menu	0.10	0.11	0.93

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	3.04
Order-Status	2.00	2.02	2.04
Interactive Delivery	2.00	2.02	2.04
Stock-Level	2.00	2.02	2.04

Table 5.4: Think Times

Type	Minimum	Average	Maximum
New-Order	0.00	13.24	132.50
Payment	0.00	13.24	132.50
Order-Status	0.00	11.04	110.50
Interactive Delivery	0.00	5.57	55.50
Stock-Level	0.00	5.56	55.50

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

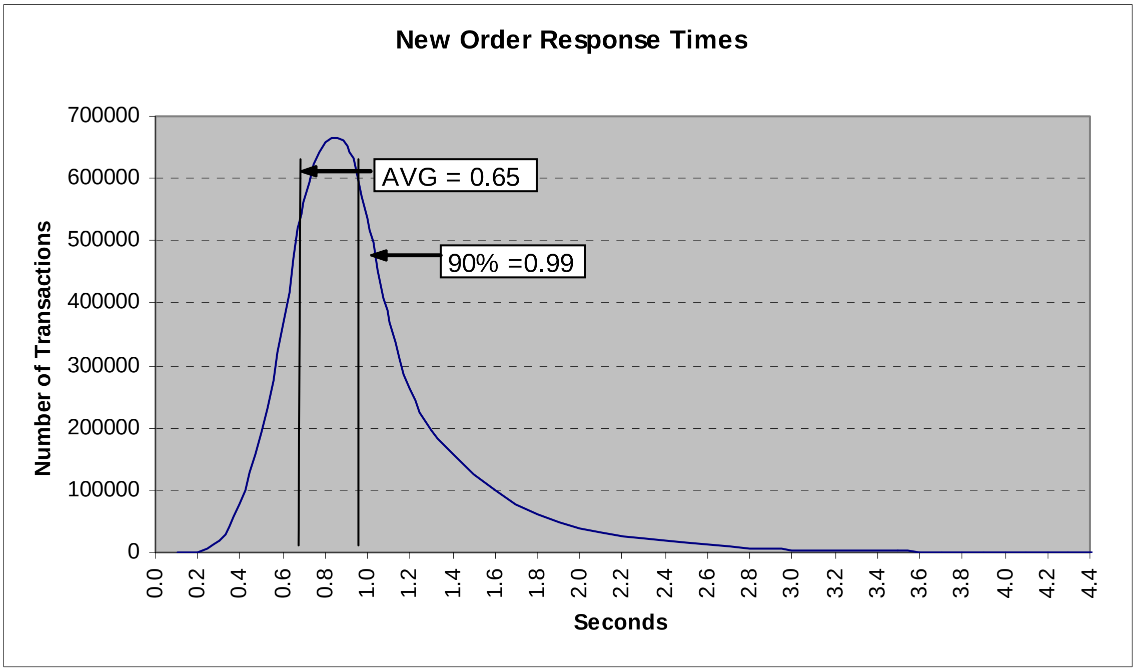


Figure 4. Payment Response Time Distribution

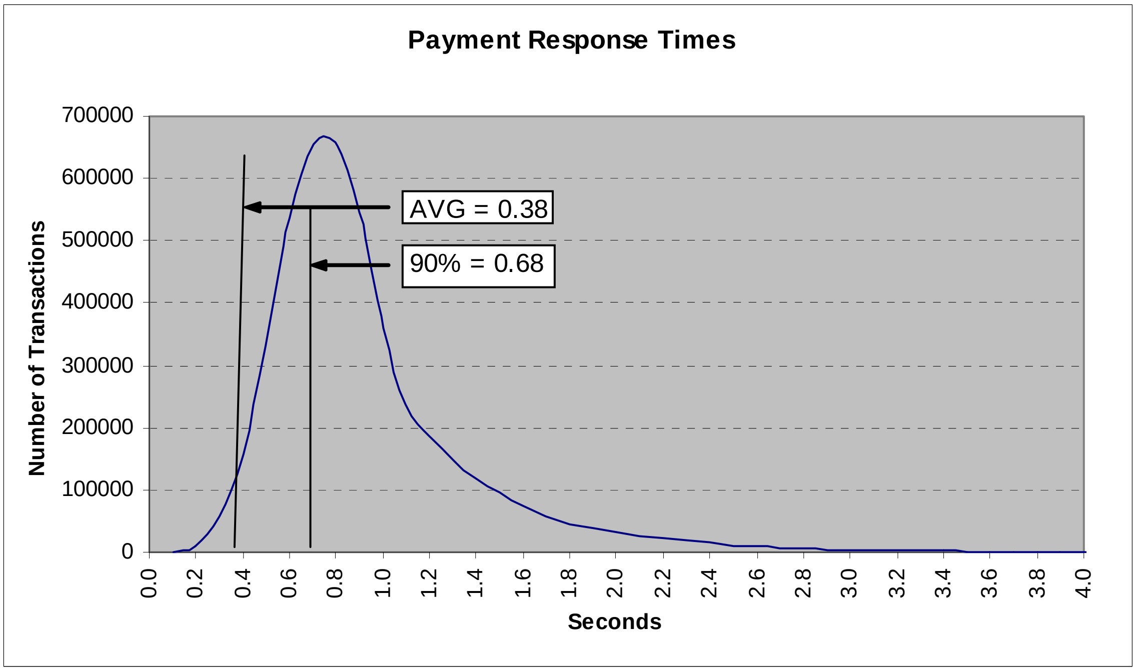


Figure 5. Order Status Response Time Distribution

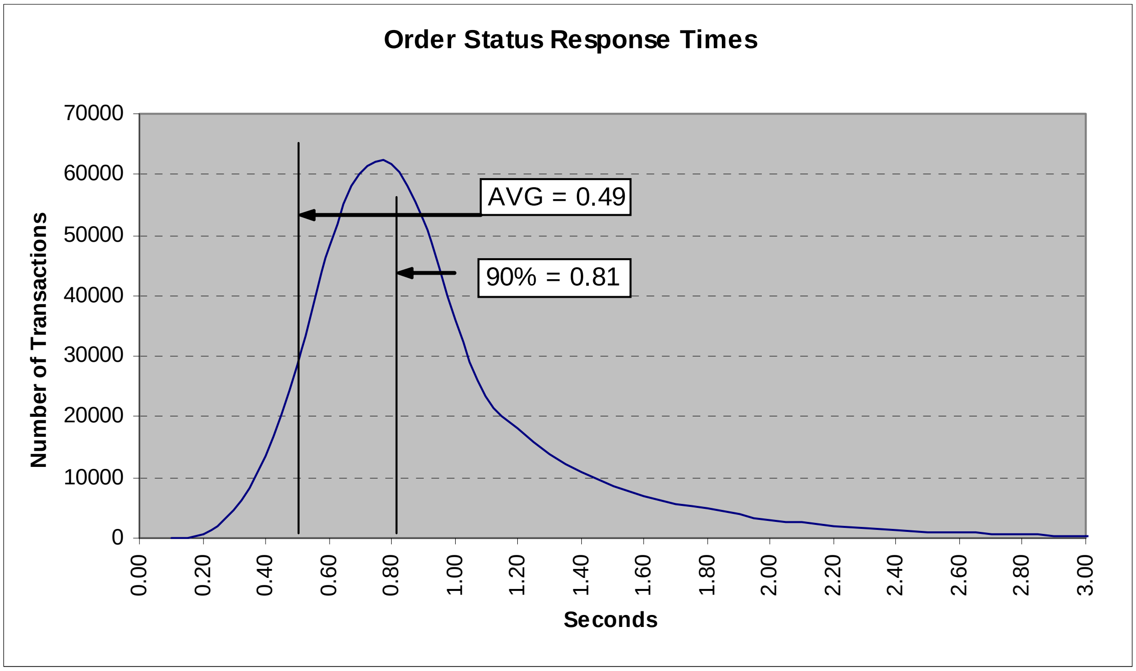


Figure 6. Delivery Response Time Distribution

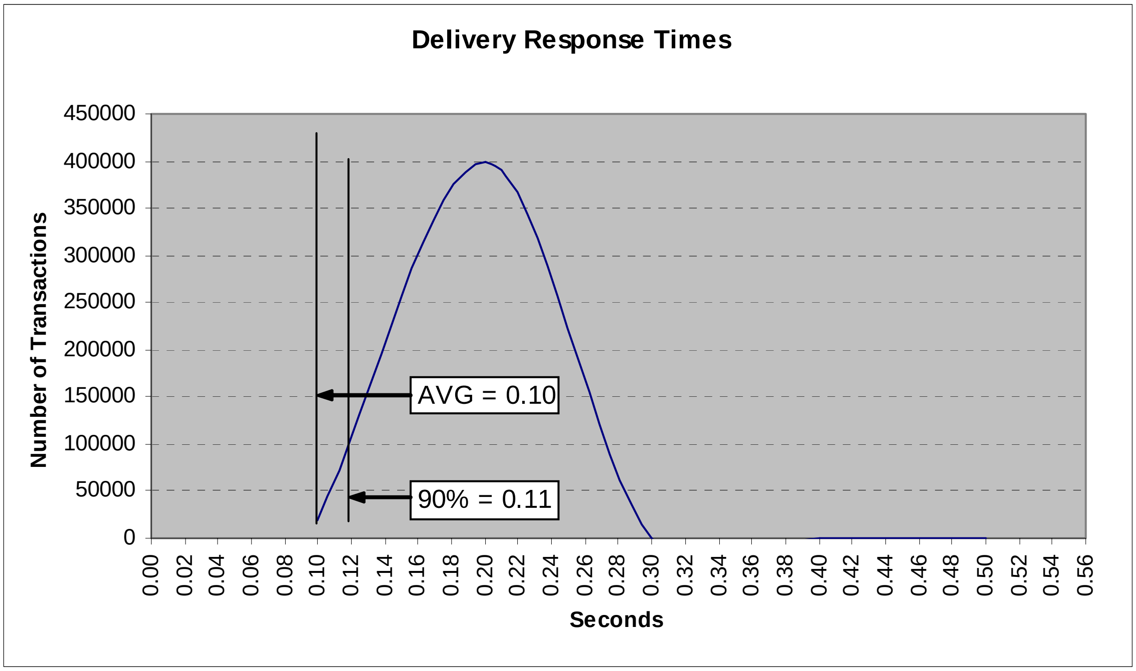


Figure 7. Stock Level Response Time Distribution

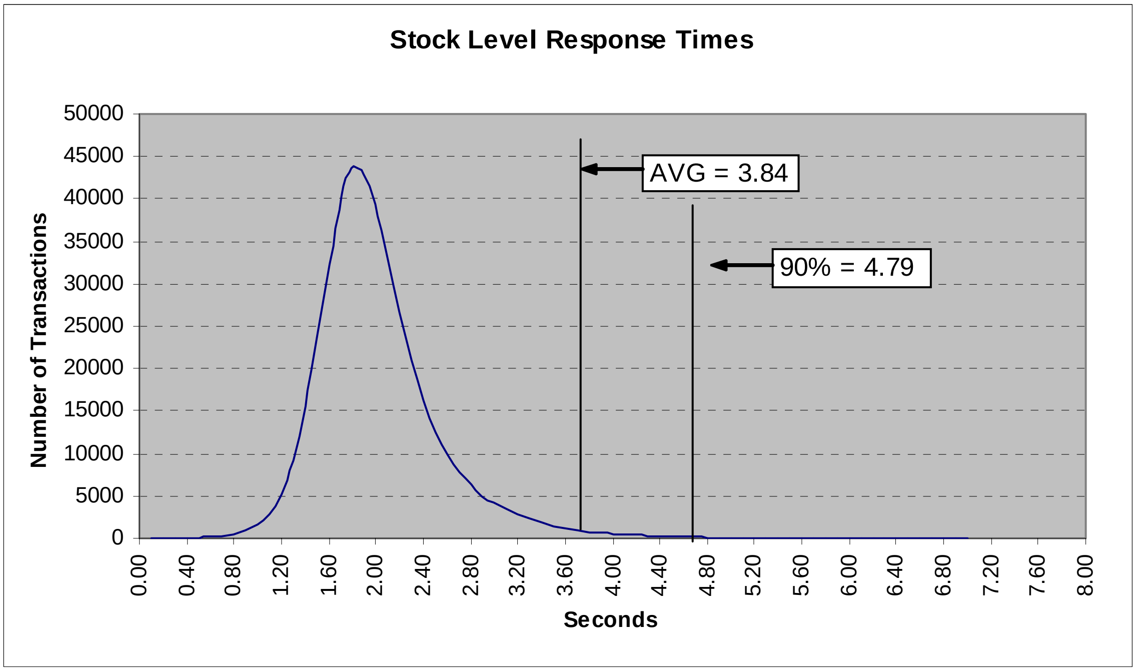


Figure 8. Response Time vs. Throughput

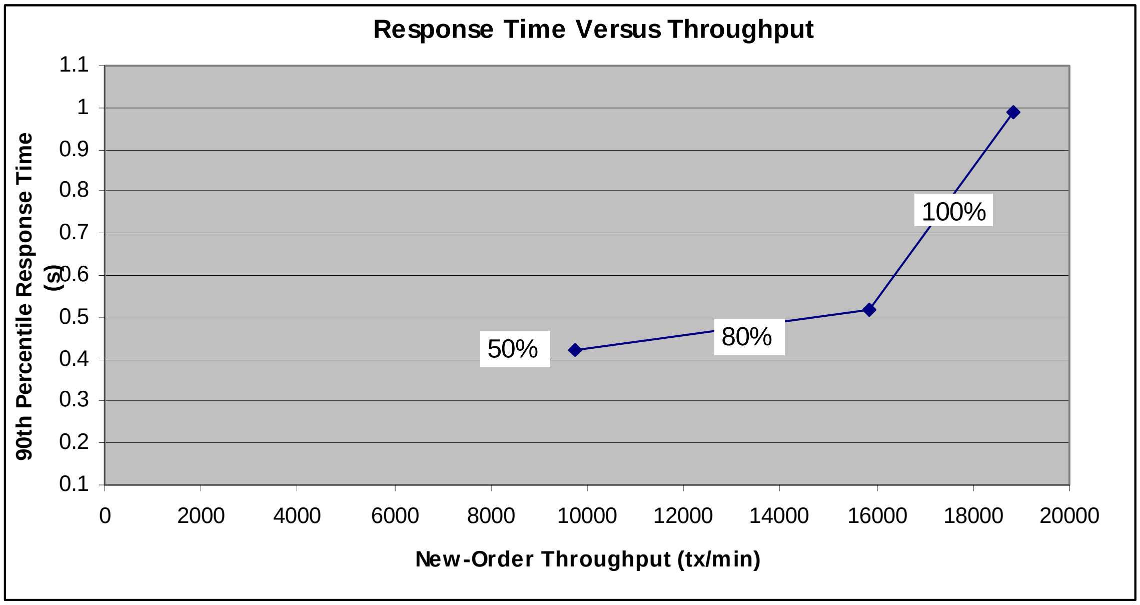


Figure 9. New Order Think Time Distribution

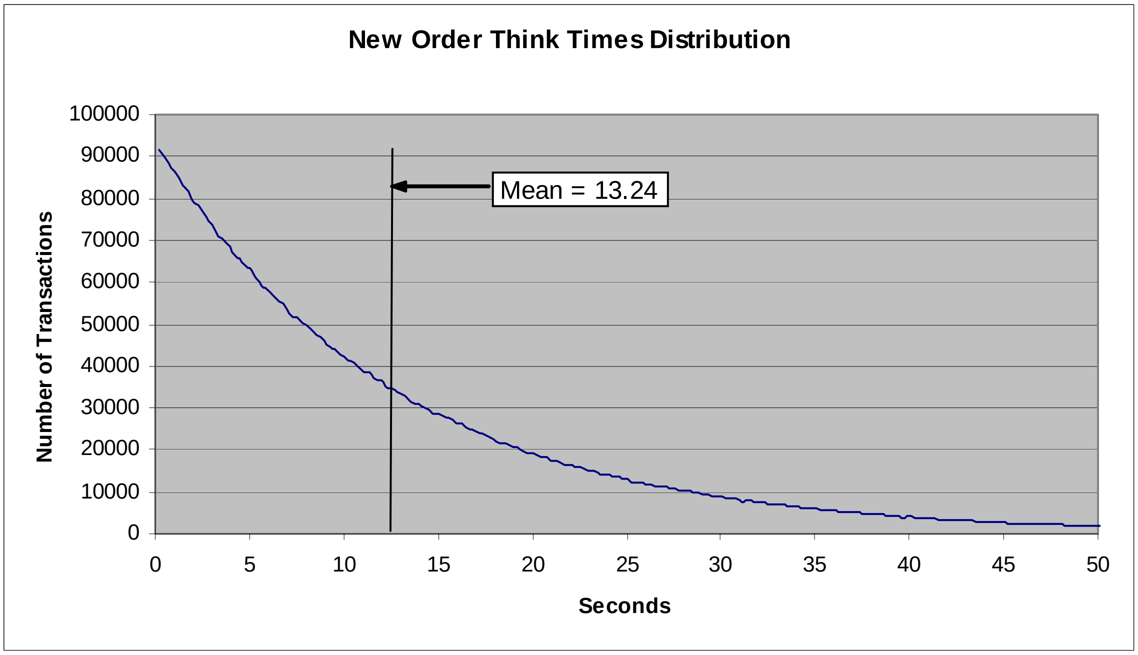
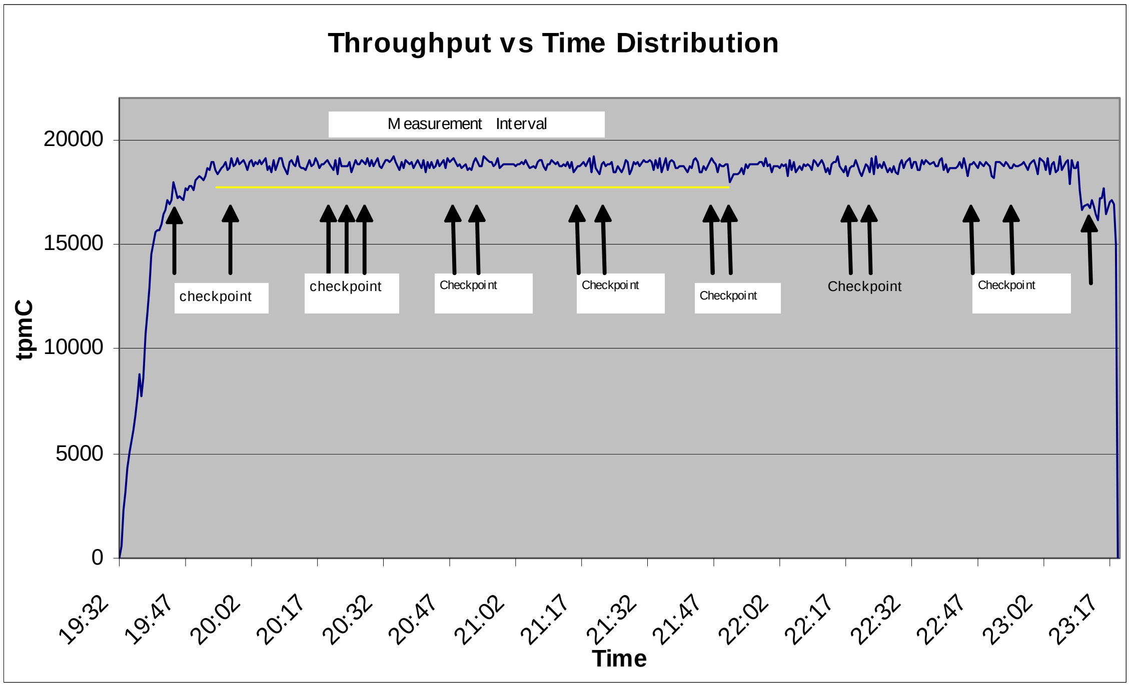


Figure 10. Throughput vs. Time Distribution



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 Ethernet LANs using ODBC and RPC calls.

To perform checkpoints at specific intervals, the SQL Server *recovery interval* was set to 20 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	1.01%
	Average items per order	10.00
Payment	Home warehouse payments	85.02%
	Remote warehouse payments	14.98%
	Accessed by last name	59.98%
Delivery	Skipped transactions (interactive)	0
	Skipped transactions (deferred)	0
Order Status	Accessed by last name	60.09%
Transaction Mix	New Order	44.90%
	Payment	43.03%
	Order status	4.02%
	Delivery	4.02%
	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 3 minutes, 47 seconds after the start of the ramp-up. Subsequent checkpoints occurred on average of every 14 minutes, 58 seconds. The measurement interval contains nine 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
7:55:48 pm	5 minutes, 0 seconds
8:25:46 pm	5 minutes, 0 seconds
8:55:42 pm	5 minutes, 0 seconds
9:25:31 pm	5 minutes, 1 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 1 HP ProLiant server. 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, 1 driver (RTE) machine was connected through a 10/100/1000 switch to the client machine at 1000Mbps, thus providing the path from the RTE to the client. The server (SUT) was connected to the client via a CAT5e cable at 1000Mbps.

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

Operator Intervention

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

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

Clause 7 Related Items

System Pricing

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

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

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

Availability, Throughput, and Price Performance

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

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

• **Maximum Qualified Throughput**	**18,818.46 tpmC**
• **Price per tpmC**	**$2.32 per tpmC**
• **Availability**	**May 27, 2003**

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:

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

Clause 9 Related Items

Auditor's Report

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

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

Performance Metrics, Inc.
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

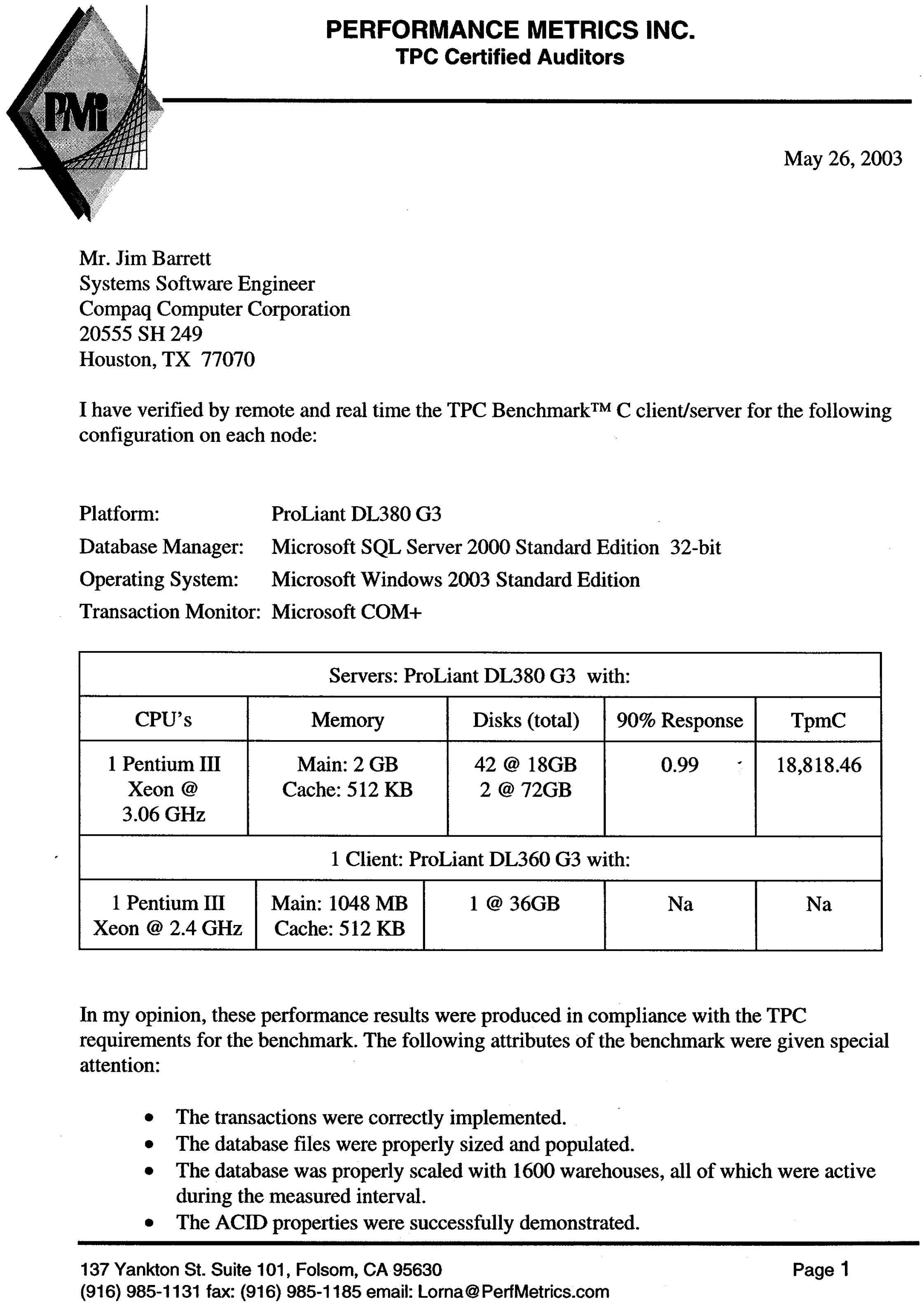
The Full Disclosure Report must be readily available to the public at a reasonable charge, similar to the charges for similar documents by the test sponsor. The report must be made available when results are made public. In order to use the phrase "TPC Benchmark™ C", the Full Disclosure Report must have 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

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



PERFORMANCE METRICS INC.
TPC Certified Auditors

May 26, 2003

Mr. Jim Barrett
Systems Software Engineer
Compaq Computer Corporation
20555 SH 249
Houston, TX 77070

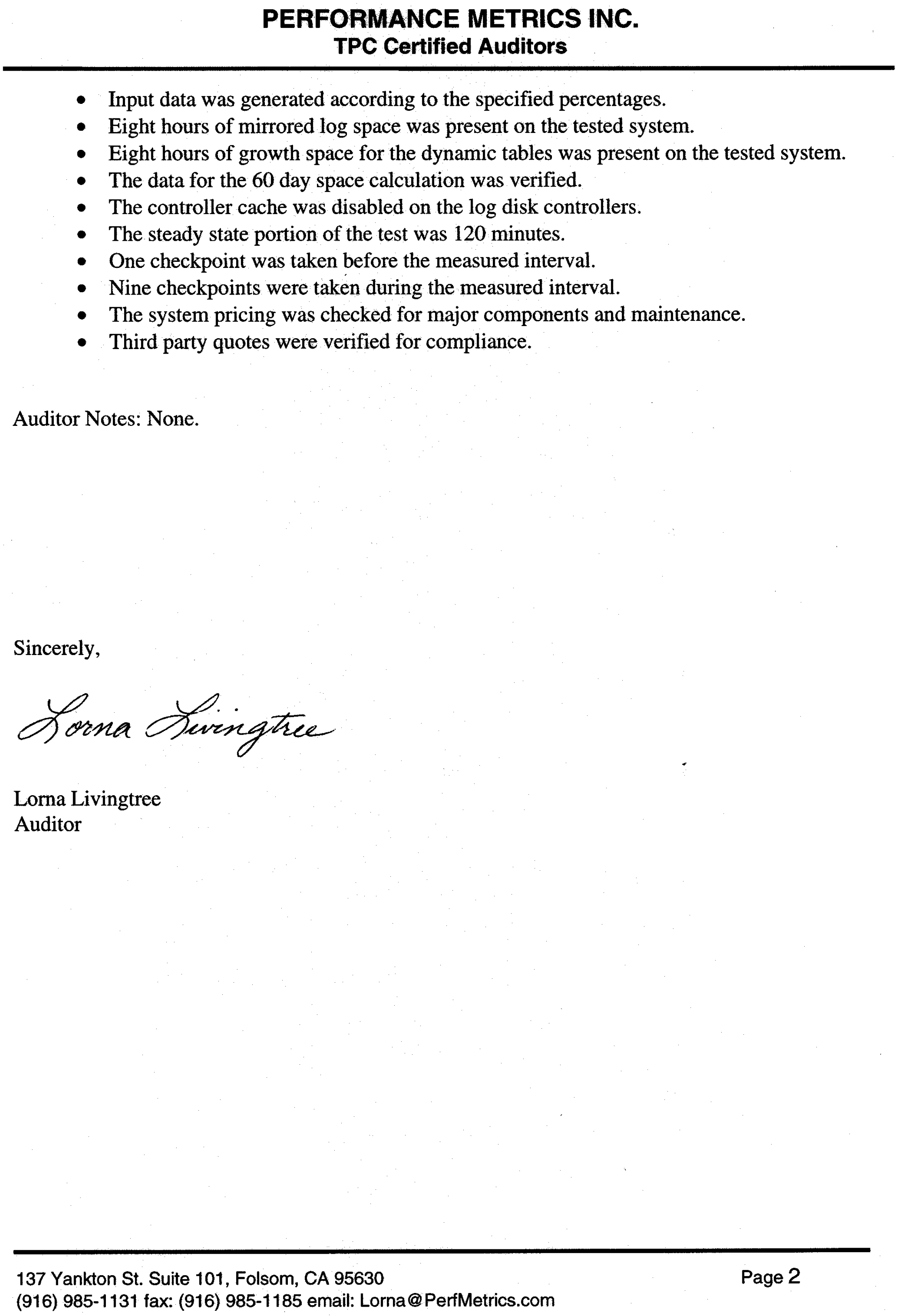
I have verified by remote and real time the TPC Benchmark™ C client/server for the following configuration on each node:

Platform:	ProLiant DL380 G3
Database Manager:	Microsoft SQL Server 2000 Standard Edition 32-bit
Operating System:	Microsoft Windows 2003 Standard Edition
Transaction Monitor:	Microsoft COM+

Servers: ProLiant DL380 G3 with:				
CPU's	Memory	Disks (total)	90% Response	TpmC
1 Pentium III Xeon @ 3.06 GHz	Main: 2 GB Cache: 512 KB	42 @ 18GB 2 @ 72GB	0.99	18,818.46
1 Client: ProLiant DL360 G3 with:				
1 Pentium III Xeon @ 2.4 GHz	Main: 1048 MB Cache: 512 KB	1 @ 36GB	Na	Na

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

- The transactions were correctly implemented.
- The database files were properly sized and populated.
- The database was properly scaled with 1600 warehouses, all of which were active during the measured interval.
- The ACID properties were successfully demonstrated.



- Input data was generated according to the specified percentages.
- Eight hours of mirrored log space was present on the tested system.
- Eight hours of growth space for the dynamic tables was present on the tested system.
- The data for the 60 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.
- Nine 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

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_BUF_OVERFLOW                                                   25
                    //Buffer overflow during receive
// TPC-W error types
#define ERR_TYPE_TPCW_CONN                                                   50
                    //Benchcraft connection class
#define ERR_TYPE_TPCW_HTML                                                   51
                    //error from TpcwHtml dll
#define ERR_TYPE_TPCW_USER                                                   52
                    //error from TPC-W user class
#define ERR_TYPE_TPCW_ENG_BASE                                               53
#define ERR_TYPE_TPCW_ENG_OS                                       54
#define ERR_TYPE_HTML_RESP                                                   55
#define ERR_TYPE_TPCW_ODBC                                                   56
#define ERR_TYPE_SCHANNEL                                                    57

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



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;

          //short   m_errType;
};
```

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

          CSocketErr(Action eAction, LPCTSTR szLocation = NULL);

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

          Action    m_eAction;
          char      *m_szErrorText;

          int ErrorType() { return ERR_TYPE_SOCKET;};
          char *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,
                    eRegisterClassEx,
                    eCreateWindow,
                    eCreateSemaphore,
                    eFSeek,
                    eFRead,
                    eFWrite,
                    eTmpFile,
                    eSetFilePointer,
                    eNew,
          };

                              CSystemErr(Action eAction, LPCTSTR szLocation);
                              CSystemErr(int iError, 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;}
};


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

          int ErrorType() {return ERR_BUF_OVERFLOW;}

          char *ErrorText() {return ERR_INS_BUF_OVERFLOW;}
};
```

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, 16));
                    SendDlgItemMessage(hwnd, IDC_PROGRESS1, PBM_SETSTEP, (WPARAM)1,
0);
                    return TRUE;
          }
          return FALSE;
}

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

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

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

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

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

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

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

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

          CloseHandle(hFile);

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

```
static int CopyFiles(HWND hDlg, char *szDllPath)
{
          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_all.tlb
          strcpy( szLastFileName, "tpcc_com_all.tlb" );
          if (!FileFromResource( "COM_TYPLIB", IDR_COMTYPLIB_DLL, szDllPath,
szLastFileName ))
                    return 0;
          SendDlgItemMessage(hDlg, IDC_PROGRESS1, PBM_STEPIT, 0, 0);
          UpdateDialog(hDlg);

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

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

          //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;
          int                 iRc;


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

          szDllPath[0] =  0;
          bRc = TRUE;
          if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE, "SOFTWARE\\Microsoft\\InetStp", 0,
KEY_ALL_ACCESS, &hKey) == ERROR_SUCCESS )
```

```
          {
                    sv = sizeof(szData);
                    iRc = RegQueryValueEx( hKey, "PathWWWRoot", NULL, NULL, szData,
&sv );  // used by IIS 5.0 & 6.0
                    if (iRc == ERROR_SUCCESS)
                    {
                              bRc = FALSE;
                              strcpy(szDllPath, szData);
                              len = strlen(szDllPath);
                              if ( szDllPath[len-1] != '\\' )
                              {
                                        szDllPath[len] = '\\';
                                        szDllPath[len+1] = 0;
                              }
                    }

                    RegCloseKey(hKey);
          }

          return bRc;
}

static 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"

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

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

#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 =         bstrDllPath + "tpcc_com_all.tlb";                 //
type library (TLB)
          bstrTemp4 =         bstrDllPath + "tpcc_com_ps.dll";                  //
proxy/stub dll

          hr = pCOMAdminCat->InstallComponent(bstrTemp,

                              bstrTemp2,

                              bstrTemp3,

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


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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

                              // save key to get the MethodsForInterface collection
                              hr = pCatalogObjectItf->get_Key(&vKey);
                              if (!SUCCEEDED(hr)) goto Error;
                              bstrTemp = "MethodsForInterface";
                              hr = pCatalogCollectionItf->GetCollection(bstrTemp,
vKey, (IDispatch**) &pCatalogCollectionMethod);
                              if (!SUCCEEDED(hr)) goto Error;

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

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

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

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

                                        pCatalogObjectMethod->Release();
                                        pCatalogObjectMethod = NULL;

                                        lCountMethod--;
                              }

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

                              pCatalogObjectItf->Release();
                              pCatalogObjectItf = NULL;

                              lCountItf--;

                    }


                    pCatalogObjectCo->Release();
                    pCatalogObjectCo = NULL;

                    lCountCo--;
          }


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

          pCatalogCollectionApp->Release();
          pCatalogCollectionApp = NULL;

          pCatalogCollectionCo->Release();
          pCatalogCollectionCo = NULL;

          pCatalogCollectionItf->Release();
          pCatalogCollectionItf = NULL;
```

```

          pCatalogCollectionMethod->Release();
          pCatalogCollectionMethod = NULL;


Error:
          CoUninitialize();

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

          NULL,

          hr,

          MAKELANGID(LANG_NEUTRAL, SUBLANG_DEFAULT),

          (LPTSTR) &lpBuf,

          0,

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

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];

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

          try
          {
                    switch( ul_reason_for_call )
                    {
                              case DLL_PROCESS_ATTACH:
                                        {
                                                  DWORD dwSize =
MAX_COMPUTERNAME_LENGTH+1;
                                                  GetComputerName(szMyComputerName,
&dwSize);
                                                  szMyComputerName[dwSize] = 0;
                                        }

                                        DisableThreadLibraryCalls((HMODULE)hModule);
          InitializeCriticalSection(&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

          assert(txnDelilog != NULL);

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

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

                                        ZeroMemory(&txnDeliRec, sizeof(txnDeliRec));
                                        txnDeliRec.TxnType =
TXN_REC_TYPE_TPCC_DELIV_DEF;

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

          EnterCriticalSection(&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> <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 Thu Dec 13 23:13:14 2001
 */
/* 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 Thu Dec 13 23:13:14 2001
 */
/* 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 Thu Dec 13 23:13:14 2001
 */
/* 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 Thu Dec 13 23:13:08 2001
 */
/* 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 Thu Dec 13 23:13:08 2001
 */
/* 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 Thu Dec 13 23:13:08 2001
 */
/* 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 Thu Dec 13 23:13:08 2001
 */
/* 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 */
```

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/* 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( 0xffffffe4 ),     /* 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 */ 0x1,                /* FC_BYTE */
                              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( 0xffffffe8 ),     /* 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( 0xffffffe8 ),     /* 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( 0xffffffe8 ),     /* 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 */
```

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/* 796 */ NdrFcShort( 0x4 ),  /* 4 */
/* 798 */ 0x12, 0x0,          /* FC_UP */
/* 800 */ NdrFcShort( 0xffffffe8 ),     /* 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( 0xffffffe8 ),     /* 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 Thu Dec 13 23:13:08 2001
 */
/* 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( 0xffffffdc ),     /* 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( 0xffffffdc ),     /* 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( 0xffffffdc ),     /* 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( 0xffffffd6 ),     /* Offset= -42 (576) */
/* 620 */ 0x39,               /* FC_ALIGNM8 */
                              0x36,               /* FC_POINTER */
/* 622 */ 0x5c,               /* FC_PAD */
                              0x5b,               /* FC_END */
/* 624 */
                              0x12, 0x0,          /* FC_UP */
/* 626 */ NdrFcShort( 0xffffffe0 ),     /* 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( 0xffffffd8 ),     /* 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 */ 0x1,                /* FC_BYTE */
                              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( 0xffffffe7 ),     /* 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( 0xffffffe6 ),     /* 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( 0xffffffe6 ),     /* 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( 0xffffffe6 ),     /* 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( 0xffffffe6 ),     /* 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( 0xffffffdc ),     /* 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);

          dbcmd(m_dbproc, "set nocount on ");                         // do not
return row counts
          dbcmd(m_dbproc, "set XACT_ABORT ON");             // rollback transaction
on abort

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

          DiscardNextResults(2);

          // verify that version of stored procs on server is correct
          dbrpcinit(m_dbproc, "tpcc_version", 0);

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

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

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

          char szSrvVersion[16];
          pData=dbdata(m_dbproc, 1);
          if (pData)
                    UtilStrCpy(szSrvVersion, pData, dbdatlen(m_dbproc, 1));
          else
                    szSrvVersion[0]=0;
          if (strcmp(szSrvVersion,sVersion))
                    throw new CTPCC_DBLIB_ERR( CTPCC_DBLIB_ERR::ERR_WRONG_SP_VERSION
);


          DiscardNextRows(0);
          DiscardNextResults(0);
}
```

```

CTPCC_DBLIB::~CTPCC_DBLIB( void )
{
          // close db connection and deallocate resources
          dbclose(m_dbproc);
          InterlockedDecrement( &iConnectionCount );
          if (m_DbLibErr != NULL)
                    delete m_DbLibErr;
          if (m_SqlErr != NULL)
                    delete m_SqlErr;
}

void CTPCC_DBLIB::SetDbLibError(int severity, int dberr, int oserr, LPCSTR dberrstr,
LPCSTR oserrstr)
{
          delete m_DbLibErr;
          m_DbLibErr = new CDBLIBERR(CDBLIBERR::eUnknown, severity, dberr, oserr);

          if (dberrstr != NULL)
          {
                    m_DbLibErr->m_dberrstr = new char[ strlen(dberrstr)+1 ];
                    strcpy( m_DbLibErr->m_dberrstr, dberrstr );
          }

          if (oserrstr != NULL)
          {
                    m_DbLibErr->m_oserrstr = new char[ strlen(oserrstr)+1 ];
                    strcpy( m_DbLibErr->m_oserrstr, oserrstr );
          }

}

void CTPCC_DBLIB::SetSqlError( int /*DBINT*/ msgno, int msgstate, int severity,
LPCSTR msgtext )
{
          if (m_SqlErr == NULL)
                    m_SqlErr = new CSQLERR();

          m_SqlErr->m_msgno = msgno;
          m_SqlErr->m_msgstate = msgstate;
          m_SqlErr->m_severity = severity;

          delete [] m_SqlErr->m_msgtext;
          if (msgtext != NULL)
          {
                    m_SqlErr->m_msgtext = new char[ strlen(msgtext)+1 ];
                    strcpy( m_SqlErr->m_msgtext, msgtext );
          }
}

void CTPCC_DBLIB::ThrowError( CDBLIBERR::ACTION eAction )
{
          // discard anything still in return buffer
          DiscardNextRows(-1);
          DiscardNextResults(-1);

          // check for SQL Server error first;  if yes, throw it and ignore any
DBLib error.
          if (m_SqlErr != NULL)
          {
                    CSQLERR             *pSqlErr;
                    pSqlErr = m_SqlErr;
                    m_SqlErr = NULL;    // clear our pointer to instance; catch
handler will delete
                    throw pSqlErr;
          }

          CDBLIBERR *pDbLibErr;
          if (m_DbLibErr == NULL)
                    // this case isn't expected to happen, since it means that an
error was returned
                    // but the error handlers were not called.
                    pDbLibErr = new CDBLIBERR(eAction);
          else
          {
                    pDbLibErr = m_DbLibErr;
                    pDbLibErr->m_eAction = eAction;
                    m_DbLibErr = NULL;            // clear our pointer to instance;
catch handler will delete
          }

          throw pDbLibErr;
}

// Read and discard rows until no more.  Throw an exception if number of rows read
doesn't
// match number of rows expected.  The row count will be ignored if the expected
count value
// passed in is negative.  A typical use of this routine is to verify that there are
no more
// rows to be read.
void CTPCC_DBLIB::DiscardNextRows(int iExpectedCount)
{
          int                 iRowsRead = 0;
          RETCODE   rc;

          while (TRUE)
          {
                    rc = dbnextrow(m_dbproc);
                    if (rc == NO_MORE_ROWS)
                              break;
                    if (rc == FAIL)
                    {
                              if (iExpectedCount >= 0)
                                        ThrowError(CDBLIBERR::eDbNextRow);
                              else
                                        break;
                    }
                    iRowsRead++;
          }

          if ((iExpectedCount >= 0) &&
                    (iExpectedCount != iRowsRead))
                    ThrowError(CDBLIBERR::eWrongRowCount);
}

// Read and discard results until no more.  Throw an exception if number of result
sets read doesn't
// match number expected.  The result set count will be ignored if the expected
count value
// passed in is negative.  A typical use of this routine is to verify that there are
no more
// result sets to be read.
void CTPCC_DBLIB::DiscardNextResults(int iExpectedCount)
{
```

```
          int                 iResultsRead = 0;
          RETCODE   rc;

          while (TRUE)
          {
                    rc = dbresults(m_dbproc);
                    if (rc == NO_MORE_RESULTS)
                              break;
                    if (rc == FAIL)
                    {
                              if (iExpectedCount >= 0)
                                        ThrowError(CDBLIBERR::eDbResults);
                              else
                                        break;
                    }

                    DiscardNextRows(-1);
                    iResultsRead++;
          }

          if ((iExpectedCount >= 0) &&
                    (iExpectedCount != iResultsRead))
                    ThrowError(CDBLIBERR::eWrongRowCount);
}

void CTPCC_DBLIB::StockLevel()
{
          int                           iTryCount = 0;
          const BYTE          *pData;

          ResetError();

          while (TRUE)
          {
                    try
                    {
                              dbrpcinit(m_dbproc, "tpcc_stocklevel", 0);

                              dbrpcparam(m_dbproc, NULL, 0, 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) != SUCCEED)
                                        ThrowError(CDBLIBERR::eDbResults);

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

                              if (dbnumcols(m_dbproc) != 8)
                                        ThrowError(CDBLIBERR::eWrongNumCols);

                              if (pData=dbdata(m_dbproc, 1))


                                        dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,1), SQLFLT8, (BYTE *)&m_txn.NewOrder.w_tax, 8);
                              if (pData=dbdata(m_dbproc, 2))

                                        dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,2), SQLFLT8, (BYTE *)&m_txn.NewOrder.d_tax, 8);
                              if (pData=dbdata(m_dbproc, 3))
                                        m_txn.NewOrder.o_id = (*(DBINT *) pData);
                              if (pData=dbdata(m_dbproc, 4))
                                        UtilStrCpy(m_txn.NewOrder.c_last, pData,
dbdatlen(m_dbproc, 4));
                              if (pData=dbdata(m_dbproc, 5))
                                        dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,5), SQLFLT8, (BYTE *)&m_txn.NewOrder.c_discount,
8);
                              if (pData=dbdata(m_dbproc, 6))
                                        UtilStrCpy(m_txn.NewOrder.c_credit, pData,
dbdatlen(m_dbproc, 6));
                              if (pData=dbdata(m_dbproc, 7))
                              {
                                        datetime = *((DBDATETIME *) pData);
                                        dbdatecrack(m_dbproc, &daterec, &datetime);
                                        m_txn.NewOrder.o_entry_d.year   =
daterec.year;
                                        m_txn.NewOrder.o_entry_d.month  =
daterec.month;
                                        m_txn.NewOrder.o_entry_d.day    =
daterec.day;
                                        m_txn.NewOrder.o_entry_d.hour   =
daterec.hour;
                                        m_txn.NewOrder.o_entry_d.minute =
daterec.minute;
                                        m_txn.NewOrder.o_entry_d.second =
daterec.second;
                              }
                              if (pData=dbdata(m_dbproc, 8))
                                        commit_flag = (*(DBTINYINT *) pData);

                              DiscardNextRows(0);
                              DiscardNextResults(0);


                              if (commit_flag == 1)
                              {
                                        m_txn.NewOrder.total_amount *= ((1 +
m_txn.NewOrder.w_tax + m_txn.NewOrder.d_tax) * (1 - m_txn.NewOrder.c_discount));
                                        m_txn.NewOrder.exec_status_code = eOK;
                              }
                              else
```

```
                                        m_txn.NewOrder.exec_status_code =
eInvalidItem;

                              return;
                    }
                    catch (CSQLERR *e)
                    {
                              if ((e->m_msgno == 1205 ||
                                        (e->m_msgno == iErrOleDbProvider &&
                                        strstr(e->m_msgtext, sErrTimeoutExpired) !=
NULL)) &&
                                        (++iTryCount <= iMaxRetries))
                              {
                                        // hit deadlock; backoff for increasingly
longer period
                                        delete e;
                                        Sleep(10 * iTryCount);
                              }
                              else
                                        throw;
                    }
          }         // while (TRUE)

//        if (iTryCount)
//                  throw new CTPCC_DBLIB_ERR(CTPCC_DBLIB_ERR::ERR_RETRIED_TRANS,
iTryCount);
}


void CTPCC_DBLIB::Payment()
{
          DBDATETIME          datetime;
          DBDATEREC daterec;

          int                           iTryCount = 0;
          const BYTE          *pData;

          ResetError();

          while (TRUE)
          {
                    try
                    {
                              dbrpcinit(m_dbproc, "tpcc_payment", 0);

                              dbrpcparam(m_dbproc, NULL, 0, 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 set XACT_ABORT ON");
                    rc = SQLExecDirect(m_hstmt, (unsigned char *)buffer, SQL_NTS);
                    if (rc != SQL_SUCCESS && rc != SQL_SUCCESS_WITH_INFO)
                              ThrowError(CODBCERR::eExecDirect);

                    // verify that version of stored procs on server is correct
                    char db_sp_version[10];
                    strcpy(buffer, "{call tpcc_version}");
                    rc = SQLExecDirect(m_hstmt, (unsigned char *)buffer, SQL_NTS);
                    if (rc != SQL_SUCCESS && rc != SQL_SUCCESS_WITH_INFO)
                              ThrowError(CODBCERR::eExecDirect);
                    if ( SQLBindCol(m_hstmt, 1, SQL_C_CHAR, &db_sp_version,
sizeof(db_sp_version), NULL) != SQL_SUCCESS )
                              ThrowError(CODBCERR::eBindCol);
                    if ( SQLFetch(m_hstmt) == SQL_ERROR )
                              ThrowError(CODBCERR::eFetch);
                    if (strcmp(db_sp_version,sVersion))
                              throw new CTPCC_ODBC_ERR(
CTPCC_ODBC_ERR::ERR_WRONG_SP_VERSION );

                    SQLFreeHandle(SQL_HANDLE_STMT, m_hstmt);
          }

          // Bind parameters for each of the transactions
          InitNewOrderParams();
          InitPaymentParams();
          InitOrderStatusParams();
          InitDeliveryParams();
          InitStockLevelParams();
}

CTPCC_ODBC::~CTPCC_ODBC( void )
{
          // note: descriptors are automatically released when the connection is
dropped
          SQLFreeHandle(SQL_HANDLE_STMT, m_hstmtNewOrder);
          SQLFreeHandle(SQL_HANDLE_STMT, m_hstmtPayment);
          SQLFreeHandle(SQL_HANDLE_STMT, m_hstmtDelivery);
          SQLFreeHandle(SQL_HANDLE_STMT, m_hstmtOrderStatus);
          SQLFreeHandle(SQL_HANDLE_STMT, m_hstmtStockLevel);

          SQLDisconnect(m_hdbc);
          SQLFreeHandle(SQL_HANDLE_DBC, m_hdbc);
}

void CTPCC_ODBC::ThrowError( CODBCERR::ACTION eAction )
{
          RETCODE             rc;
          SDWORD              lNativeError;
          char                szState[6];
          char                szMsg[SQL_MAX_MESSAGE_LENGTH];
          char                szTmp[6*SQL_MAX_MESSAGE_LENGTH];
          CODBCERR   *pODBCErr;                             // not allocated until
needed (maybe never)

          pODBCErr = new CODBCERR();

          pODBCErr->m_NativeError = 0;
          pODBCErr->m_eAction = eAction;
          pODBCErr->m_bDeadLock = FALSE;

          szTmp[0] = 0;
          while (TRUE)
          {
                    rc = SQLError(henv, m_hdbc, m_hstmt, (BYTE *)&szState,
&lNativeError,
                                                    (BYTE *)&szMsg, sizeof(szMsg),
NULL);
                    if (rc == SQL_NO_DATA)
                              break;

                    // check for deadlock
                    if (lNativeError == 1205 || (lNativeError == iErrOleDbProvider
&&
                              strstr(szMsg, sErrTimeoutExpired) != NULL))
                              pODBCErr->m_bDeadLock = TRUE;

                    // capture the (first) database error
                    if (pODBCErr->m_NativeError == 0 && lNativeError != 0)
                              pODBCErr->m_NativeError = lNativeError;

                    // quit if there isn't enough room to concatenate error text
                    if ( (strlen(szMsg) + 2) > (sizeof(szTmp) - strlen(szTmp)) )
                              break;

                    // include line break after first error msg
                    if (szTmp[0] != 0)
                              strcat( szTmp, "\n");
                    strcat( szTmp, szMsg );
          }

          if (pODBCErr->m_odbcerrstr != NULL)
          {
                    delete [] pODBCErr->m_odbcerrstr;
                    pODBCErr->m_odbcerrstr = NULL;
          }

          if (strlen(szTmp) > 0)
          {
                    pODBCErr->m_odbcerrstr = new char[ strlen(szTmp)+1 ];
                    strcpy( pODBCErr->m_odbcerrstr, szTmp );
          }

          SQLFreeStmt(m_hstmt, SQL_CLOSE);
          throw pODBCErr;
}

void CTPCC_ODBC::InitStockLevelParams()
{
          if (   SQLAllocHandle(SQL_HANDLE_STMT, m_hdbc, &m_hstmtStockLevel) !=
SQL_SUCCESS )
                    ThrowError(CODBCERR::eAllocHandle);

          m_hstmt = m_hstmtStockLevel;

          int i = 0;
          if (   SQLBindParameter(m_hstmt, ++i, SQL_PARAM_INPUT, SQL_C_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);
          }

          // set the bind offset pointer
          if ( SQLSetStmtAttrW( m_hstmt, SQL_ATTR_ROW_BIND_OFFSET_PTR,
&m_BindOffset, SQL_IS_POINTER ) != SQL_SUCCESS )
                    ThrowError(CODBCERR::eSetStmtAttr);

          i = 0;
          if (   SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.NewOrder.OL[0].ol_i_name, sizeof(m_txn.NewOrder.OL[0].ol_i_name), NULL) !=
SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_SSHORT,
&m_txn.NewOrder.OL[0].ol_stock, 0, NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.NewOrder.OL[0].ol_brand_generic,
sizeof(m_txn.NewOrder.OL[0].ol_brand_generic), NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_DOUBLE,
&m_txn.NewOrder.OL[0].ol_i_price, 0, NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_DOUBLE,
&m_txn.NewOrder.OL[0].ol_amount, 0, NULL) != SQL_SUCCESS
                    )
                    ThrowError(CODBCERR::eBindCol);

          // associate the column bindings for the second result set
          if ( SQLSetStmtAttrW( m_hstmt, SQL_ATTR_APP_ROW_DESC, m_descNewOrderCols2,
SQL_IS_POINTER ) != SQL_SUCCESS )
                    ThrowError(CODBCERR::eSetStmtAttr);

          i = 0;
          if (   SQLBindCol(m_hstmt, ++i, SQL_C_DOUBLE,    &m_txn.NewOrder.w_tax, 0,
NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_DOUBLE,
&m_txn.NewOrder.d_tax, 0, NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_SLONG,
&m_txn.NewOrder.o_id, 0, NULL) != SQL_SUCCESS
```

```
                    || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.NewOrder.c_last, sizeof(m_txn.NewOrder.c_last), NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_DOUBLE,
&m_txn.NewOrder.c_discount, 0, NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.NewOrder.c_credit, sizeof(m_txn.NewOrder.c_credit), NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_TYPE_TIMESTAMP,
&m_txn.NewOrder.o_entry_d, 0, NULL) != SQL_SUCCESS
                    || SQLBindCol(m_hstmt, ++i, SQL_C_SLONG,     &m_no_commit_flag,
0, NULL) != SQL_SUCCESS
             )
                    ThrowError(CODBCERR::eBindCol);
}

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++)
                              {
                                        // set the bind offset value...
                                        m_BindOffset = i *
sizeof(m_txn.NewOrder.OL[0]);

                                        if ( SQLFetch(m_hstmt) == SQL_ERROR)
                                                  ThrowError(CODBCERR::eFetch);

                                        // move to the next resultset
                                        if ( SQLMoreResults(m_hstmt) == SQL_ERROR )

          ThrowError(CODBCERR::eMoreResults);

                                        m_txn.NewOrder.total_amount +=
m_txn.NewOrder.OL[i].ol_amount;
                              }

                              // associate the column bindings for the second result
set
                              if ( SQLSetStmtAttrW( m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descNewOrderCols2, SQL_IS_POINTER ) != SQL_SUCCESS )
                                        ThrowError(CODBCERR::eSetStmtAttr);

                              if ( SQLFetch(m_hstmt) == SQL_ERROR)
                                        ThrowError(CODBCERR::eFetch);

                              SQLFreeStmt(m_hstmt, SQL_CLOSE);

                              if (m_no_commit_flag == 1)
                              {
                                        m_txn.NewOrder.total_amount *= ((1 +
m_txn.NewOrder.w_tax + m_txn.NewOrder.d_tax) * (1 - m_txn.NewOrder.c_discount));
                                        m_txn.NewOrder.exec_status_code = eOK;
                              }
                              else
                                        m_txn.NewOrder.exec_status_code =
eInvalidItem;

                              break;
                    }
                    catch (CODBCERR *e)
                    {
                              if ((!e->m_bDeadLock) || (++iTryCount > iMaxRetries))
                                        throw;

                              // hit deadlock; backoff for increasingly longer
period
                              delete e;
                              Sleep(10 * iTryCount);
                    }
          }

//        if (iTryCount)
//                  throw new CTPCC_ODBC_ERR(CTPCC_ODBC_ERR::ERR_RETRIED_TRANS,
iTryCount);
}
```

```
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;

                    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;
```

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
                    int                 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)
                    int                 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               2
#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;

          /* Header of the sorted pointers blocks in Temp file (in merging). */
          typedef struct BLOCK_HEADER {
                    long      BlockPos;
                    __int64 CurPos;
                    DWORD     BytesRead;
                    int                 nRecords;
                    BYTE      *offset;  /* offset of pointers to records in the log
file */
          } BLOCK_HEADER, *PBLOCK_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_CRASHOPEN     0x08                // if set, invalid headers will be
tolerated; used for recovery

#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.
                    LARGE_INTEGER       lFilePointer;                 //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;
                    LARGE_INTEGER       lSavePtFilePointer;
                    int                                     iSavePtNextRec;

                    JULIAN_TIME         lastTS;
          //when writing sorted output, used to verify records are sorted
                    BOOL                bWrite;
          //writing log file
                    BOOL                bCrashOpen;
          // tolerate bad headers and consistency checks

                    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

                    FILE                                    *tmpFile;
          //temp file for merging sorted pieces
                    PBLOCK_HEADER                 tmpHeaders;
          //sorted pointers block header
                    BYTE                                    **recPointers;
          //record pointer buffers for each sorted block
                    PTXN_RECORD_HEADER  *recBuffers;        //record buffers for
each sorted block
                    int                 *PointersRead;
          //# of pointers processed in each block
                    BOOL      *BlockAvailable;                        //whether to
check a particular block for jmin

                    int                 nBlocks;
                    int                 jmin;
                    //index (block-wise) of the lowest timestamp record
                    int                 iAvgRecordLen;
          //average record length

                    int                 iSortedReturnedCount;
          //keeps track of the # of sorted records returned through
GetSortedRecord()


                    int Write(BYTE *ptr, DWORD Size);
                    static void LogFileIO(CTxnLog *);

                    void LoadBuffers(int j);                          //used in
sort/merge to load record buffers

          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();

                    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:

RunSQLCfg.sql

```
--  File:     RUNSQLCFG.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.41
--            Copyright Microsoft, 2001
--  Purpose:  This script file is used to set runtime server configuration
parameters
--

exec sp_configure "show advanced option", 1
go

reconfigure with override
go

/* change this value to approximately the number of connected users */
exec sp_configure "max worker threads",255

/* increase priority of user threads */
exec sp_configure "priority boost",1

/* disable automatic checkpointing */
exec sp_configure "recovery interval",32767

/* change to a mask appropriate for the number of processors on the server */
exec sp_configure "affinity mask",0xf

/* enable fibers */
exec sp_configure "lightweight pooling",1

go

reconfigure with override
go
```

VerifyTpccLoad.sql

```
--  File:     VERIFYTPCCLOAD.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.41
--            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. 4.41
--            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 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. 4.41
--            Copyright Microsoft, 2001
--  Purpose:  Creates tpcc database Backup Devices


use master
go

--  create backup devices

exec sp_addumpdevice 'disk','tpccback1','X:\tpccback1.dmp'
go
exec sp_addumpdevice 'disk','tpccback2','Y:\tpccback2.dmp'
go
exec sp_addumpdevice 'disk','tpccback3','Z:\tpccback3.dmp'
go
```

config.sql

```
--  File:     CONFIG.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.41
--            Copyright Microsoft, 2001
--  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
sp_configure
go
```

createdb.sql

```
--  File:     CREATEDB.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.41
--            Copyright Microsoft, 2001
--  Purpose:  Creates tpcc database and backup files


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_misc_fg
(         NAME                = MSSQL_misc0,
          FILENAME  = "G:",
          SIZE                = 15716MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc1,
          FILENAME  = "I:",
          SIZE                = 15716MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc2,
          FILENAME  = "K:",
          SIZE                = 15716MB,
          FILEGROWTH          = 0),

FILEGROUP MSSQL_cs_fg
(         NAME                = MSSQL_cs0,
          FILENAME  = "F:",
          SIZE                = 32150MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs1,
          FILENAME  = "H:",
          SIZE                = 32150MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs2,
          FILENAME  = "J:",
          SIZE                = 32150MB,
          FILEGROWTH          = 0)

LOG ON
(         NAME                = MSSQL_tpcc_log,
          FILENAME  = "E:",
          SIZE                = 53022MB,
          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
```

dbopt1.sql

```
--  File:     DBOPT1.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.41
--            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
exec sp_dboption tpcc,'torn page detection',false
go

use tpcc
go

checkpoint
go
```

dbopt2.sql

```
--  File:     DBOPT2.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.41
--            Copyright Microsoft, 2001
--  Purpose:  Resets database options after data load

exec sp_dboption tpcc,'select into/bulkcopy',false
exec sp_dboption tpcc,'trunc. log on chkpt.',false
exec sp_dboption tpcc,'torn page detection',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 2000         --
-- Set option values for user-defined indexes --
--                                            --

SET       @msg      = ' '
PRINT     @msg
SET       @msg      = 'Setting SQL Server indexoptions'
PRINT     @msg
SET       @msg      = ' '
PRINT     @msg

EXEC sp_indexoption 'customer',         'DisAllowPageLocks',          TRUE
EXEC sp_indexoption 'district',         'DisAllowPageLocks',          TRUE
EXEC sp_indexoption 'warehouse',        'DisAllowPageLocks',          TRUE
EXEC sp_indexoption 'stock',  'DisAllowPageLocks',          TRUE
EXEC sp_indexoption 'order_line',       'DisAllowRowLocks', TRUE
EXEC sp_indexoption 'orders', 'DisAllowRowLocks', TRUE
EXEC sp_indexoption 'new_order',        'DisAllowRowLocks', TRUE
EXEC sp_indexoption 'item',             'DisAllowRowLocks', TRUE
EXEC sp_indexoption 'item',             'DisAllowPageLocks',          TRUE
GO

Print ' '
Print '*******************'
Print 'Pre-specified Locking Hierarchy:'
Print '     Lockflag = 0 ==> No pre-specified hierarchy'
Print '   Lockflag = 1 ==> Lock at Page-level then Table-level'
Print '   Lockflag = 2 ==> Lock at Row-level then Table-level'
Print '   Lockflag = 3 ==> Lock at Table-level'
Print ' '

SELECT    name,lockflags
FROM      sysindexes
WHERE     object_id('warehouse')        = id OR
          object_id('district')         = id OR
          object_id('customer')         = id OR
          object_id('stock')  = id OR
          object_id('orders') = id OR
          object_id('order_line')       = id OR
          object_id('history')          = id OR
          object_id('new_order')        = id OR
          object_id('item')   = id
ORDER     BY lockflags asc
GO

sp_configure 'allow updates',0
GO

RECONFIGURE WITH OVERRIDE
GO

EXEC sp_dboption tpcc,        'auto update statistics',     FALSE
EXEC sp_dboption tpcc,        'auto create statistics',     FALSE
GO
```

```
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. 4.41
--            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. 4.41
//                                      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->log_path                                   =  LOG_PATH;
          pargs->pack_size                        =  DEFLDPACKSIZE;
          pargs->starting_warehouse     =  DEF_STARTING_WAREHOUSE;
          pargs->build_index                      =  BUILD_INDEX;
          pargs->index_order                      =  INDEX_ORDER;
          pargs->index_script_path      =  INDEX_SCRIPT_PATH;
          pargs->scale_down                       =  SCALE_DOWN;

    /* check for zero command line args */
    if ( argc == 1 )
                    GetArgsLoaderUsage();

    for (i = 1; i < argc; ++i)
    {
                    if (argv[i][0] != '-' && argv[i][0] != '/')
                    {
```

```
                    printf("\nUnrecognized command");
                    GetArgsLoaderUsage();
                    exit(1);
                    }

                    ptr = argv[i];

                    switch (ptr[1])
                    {
                    case '?':     /* Fall throught */
                                        GetArgsLoaderUsage();
                                        break;

                    case 'D':
                                        pargs->database = ptr+2;
                                        break;

                    case 'P':
                                        pargs->password = ptr+2;
                                        break;

                    case 'S':
                                        pargs->server = ptr+2;
                                        break;

                    case 'U':
                                        pargs->user = ptr+2;
                                        break;

                    case 'b':
                                        pargs->batch = atol(ptr+2);
                                        break;

                    case 'W':
                                        pargs->num_warehouses = atol(ptr+2);
                                        break;

                    case 's':
                                        pargs->starting_warehouse = atol(ptr+2);
                                        break;

                    case 't':
                                        {
                                                  pargs->tables_all = FALSE;
                                                  if (strcmp(ptr+2,"item") == 0)
                                                            pargs->table_item =
TRUE;
                                                  else if (strcmp(ptr+2,"warehouse")
== 0)
                                                            pargs->table_warehouse =
TRUE;
                                                  else if (strcmp(ptr+2,"customer")
== 0)
                                                            pargs->table_customer =
TRUE;
                                                  else if (strcmp(ptr+2,"orders") ==
0)
                                                            pargs->table_orders =
TRUE;
                                                  else
                                                  {
                                                  printf("\nUnrecognized command");
                                                  GetArgsLoaderUsage();
```

```
                                                  exit(1);
                                                  }

                                                  break;
                                        }

                              case 'f':
                                        pargs->loader_res_file = ptr+2;
                                        break;

                              case 'L':
                                        pargs->log_path = ptr+2;
                                        break;

                              case 'p':
                                        pargs->pack_size = atol(ptr+2);
                                        break;

                              case 'i':
                                        pargs->build_index = atol(ptr+2);
                                        break;

                              case 'o':
                                        pargs->index_order = atol(ptr+2);
                                        break;

                              case 'c':
                                        pargs->scale_down = atol(ptr+2);
                                        break;

                    case 'd':
                                        pargs->index_script_path = ptr+2;
                                        break;

                              default:
                              GetArgsLoaderUsage();
                              exit(-1);
                              break;
                    }
    }

    /* check for required args */
    if (pargs->num_warehouses == UNDEF )
    {
                    printf("Number of Warehouses is required\n");
                    exit(-2);
    }

    return;
}


//=======================================================================
//
// Function name: GetArgsLoaderUsage
//
//=======================================================================

void GetArgsLoaderUsage()
{

#ifdef DEBUG
    printf("[%ld]DBG: Entering GetArgsLoaderUsage()\n", (int) GetCurrentThreadId());
```

```
#endif


    printf("TPCCLDR:\n\n");
          printf("Parameter                                             Default\n");
          printf("------------------------------------------------------------
\n");
    printf("-W Number of Warehouses to Load                      Required \n");
    printf("-S Server                                            %s\n", SERVER);
    printf("-U Username                                          %s\n", USER);
    printf("-P Password                                          %s\n", PASSWORD);
    printf("-D Database                                          %s\n", DATABASE);
          printf("-b Batch Size                                      %ld\n",
(long) BATCH);
          printf("-p TDS packet size                                 %ld\n",
(long) DEFLDPACKSIZE);
          printf("-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. 4.41
--            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. 4.41
--            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. 4.41
--            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. 4.41
--            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. 4.41
--            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. 4.41
--            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. 4.41
--            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. 4.41
--            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. 4.41
--            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. 4.41
--            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. 4.41
--            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,
                                                  @o_ol_cnt       tinyint,
                                                  @o_all_local    tinyint,
                                                  @i_id1  int = 0, @s_w_id1
smallint = 0, @ol_qty1  smallint = 0,
                                                  @i_id2  int = 0, @s_w_id2
smallint = 0, @ol_qty2  smallint = 0,
                                                  @i_id3  int = 0, @s_w_id3
smallint = 0, @ol_qty3  smallint = 0,
                                                  @i_id4  int = 0, @s_w_id4
smallint = 0, @ol_qty4  smallint = 0,
                                                  @i_id5  int = 0, @s_w_id5
smallint = 0, @ol_qty5  smallint = 0,
                                                  @i_id6  int = 0, @s_w_id6
smallint = 0, @ol_qty6  smallint = 0,
                                                  @i_id7  int = 0, @s_w_id7
smallint = 0, @ol_qty7  smallint = 0,
                                                  @i_id8  int = 0, @s_w_id8
smallint = 0, @ol_qty8  smallint = 0,
                                                  @i_id9  int = 0, @s_w_id9
smallint = 0, @ol_qty9  smallint = 0,
                                                  @i_id10 int = 0, @s_w_id10
smallint = 0, @ol_qty10 smallint = 0,
                                                  @i_id11 int = 0, @s_w_id11
smallint = 0, @ol_qty11 smallint = 0,
                                                  @i_id12 int = 0, @s_w_id12
smallint = 0, @ol_qty12 smallint = 0,
                                                  @i_id13 int = 0, @s_w_id13
smallint = 0, @ol_qty13 smallint = 0,
                                                  @i_id14 int = 0, @s_w_id14
smallint = 0, @ol_qty14 smallint = 0,
                                                  @i_id15 int = 0, @s_w_id15
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

          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
```

null-txns.sql

```
--  File:     NULL-TXNS.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.41
--            Copyright Microsoft, 2001
--
--  Purpose:  This script will create stored procs which accept the same parameters
and
--            return correctly formed results sets to match the standard TPC-C
stored
--            procs.  Of course, the advantage is that these stored procs place
almost
--            no load on SQL Server and do not require a database.
--
--              The purpose of these stored procs is to size and test the web client
without
--            the need of a fully scaled database.
--

drop proc tpcc_delivery
drop proc tpcc_neworder
drop proc tpcc_orderstatus
drop proc tpcc_payment
drop proc tpcc_stocklevel
drop proc tpcc_version
drop table order_line_null
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

declare @delaytime varchar(30)

-- uniform random delay of 0 - 1 second; avg = 0.50
select @delaytime = '00:00:0' + cast(cast((rand()*1.00) as decimal(4,3)) as char(5))
waitfor delay @delaytime

select 3001, 3001, 3001, 3001, 3001, 3001, 3001, 3001, 3001, 3001


GO

create proc tpcc_neworder
                                                  @w_id           smallint,
                                                  @d_id           tinyint,
                                                  @c_id           int,
                                                  @o_ol_cnt       tinyint,
                                                  @o_all_local    tinyint,
                                                  @i_id1  int = 0, @s_w_id1 smallint
= 0, @ol_qty1 smallint = 0,
                                                  @i_id2  int = 0, @s_w_id2 smallint
= 0, @ol_qty2 smallint = 0,
                                                  @i_id3  int = 0, @s_w_id3 smallint
= 0, @ol_qty3 smallint = 0,
                                                  @i_id4  int = 0, @s_w_id4 smallint
= 0, @ol_qty4 smallint = 0,
                                                  @i_id5  int = 0, @s_w_id5 smallint
= 0, @ol_qty5 smallint = 0,
                                                  @i_id6  int = 0, @s_w_id6 smallint
= 0, @ol_qty6 smallint = 0,
                                                  @i_id7  int = 0, @s_w_id7 smallint
= 0, @ol_qty7 smallint = 0,
                                                  @i_id8  int = 0, @s_w_id8 smallint
= 0, @ol_qty8 smallint = 0,
                                                  @i_id9  int = 0, @s_w_id9 smallint
= 0, @ol_qty9 smallint = 0,
                                                  @i_id10 int = 0, @s_w_id10
smallint = 0, @ol_qty10 smallint = 0,
                                                  @i_id11 int = 0, @s_w_id11
smallint = 0, @ol_qty11 smallint = 0,
                                                  @i_id12 int = 0, @s_w_id12
smallint = 0, @ol_qty12 smallint = 0,
                                                  @i_id13 int = 0, @s_w_id13
smallint = 0, @ol_qty13 smallint = 0,
                                                  @i_id14 int = 0, @s_w_id14
smallint = 0, @ol_qty14 smallint = 0,
                                                  @i_id15 int = 0, @s_w_id15
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),
        @o_entry_d      datetime,
          @li_no          int,
          @o_id               int,
          @commit_flag    tinyint,
        @li_id          int,
        @li_qty         smallint

declare @delaytime varchar(30)

begin
    -- uniform random delay of 0 - 0.6 second; avg = 0.3
    select @delaytime = '00:00:0' + cast(cast((rand()*0.60) as decimal(4,3)) as
char(5))
    waitfor delay @delaytime

    --  process orderlines

          select @commit_flag = 1, @li_no = 0

    while (@li_no < @o_ol_cnt)
          begin

          select @li_id = case @li_no
                              when 1 then @i_id1
                                  when 2 then @i_id2
                                  when 3 then @i_id3
                                  when 4 then @i_id4
                                  when 5 then @i_id5
                                  when 6 then @i_id6
                                  when 7 then @i_id7
                                  when 8 then @i_id8
                                  when 9 then @i_id9
                                  when 10 then @i_id10
                                  when 11 then @i_id11
                                  when 12 then @i_id12
                                  when 13 then @i_id13
                                  when 14 then @i_id14
                                  when 15 then @i_id15
                                  end


        select @li_no = @li_no + 1
          select @i_price = 23.45, @li_qty = @li_no

          if (@li_id = 999999)
                    begin
                    select '',0,'',0,0
                    select @commit_flag = 0
                    end
          else
                    begin
                    select 'Item Name blah',17,'G', @i_price, @i_price * @li_qty
                    end

          end

--  return order data to client

          select    @w_tax = 0.1234,
                    @d_tax = 0.0987,
                    @o_id = 3001,
                    @c_last = 'BAROUGHTABLE',
                    @c_discount = 0.2198,
                    @c_credit = 'GC',
                    @o_entry_d = getdate()
```

```
          select    @w_tax,
                    @d_tax,
                    @o_id,
                    @c_last,
                    @c_discount,
                    @c_credit,
                    @o_entry_d,
                    @commit_flag

end

GO

create 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,
          @ol_cnt                       smallint

declare @delaytime varchar(30)


    -- uniform random delay of 0 - 0.2 second; avg = 0.1
    select @delaytime = '00:00:0' + cast(cast((rand()*0.20) as decimal(4,3)) as
char(5))
    waitfor delay @delaytime

          select
                 @c_id      = 113,
                 @c_balance = -10.00,
                 @c_first   = '8YCodgytqCj8',
                 @c_middle  = 'OE',
                 @c_last    = 'OUGHTOUGHTABLE',
                 @o_id          = 3456,
                 @o_entry_d = getdate(),
                 @o_carrier_id = 1

          select @ol_cnt = (rand() * 11) + 5
          SET ROWCOUNT @ol_cnt

          select
                    ol_supply_w_id,
                    ol_i_id,
                 ol_quantity,
                 ol_amount,
                 ol_delivery_d
          from order_line_null

          select @c_id,
             @c_last,
             @c_first,
             @c_middle,
             @o_entry_d,
             @o_carrier_id,
             @c_balance,
             @o_id


GO

create 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

declare @delaytime varchar(30)

    -- uniform random delay of 0 - 0.3 second; avg = 0.15
```

```
    select @delaytime = '00:00:0' + cast(cast((rand()*0.30) as decimal(4,3)) as
char(5))
    waitfor delay @delaytime

    select @screen_data = ''


--  get customer info and update balances

          select
                    @d_street_1 = 'rqSHHakqyV',
                    @d_street_2 = 'zZ98nW3BR2s',
                    @d_city     = 'ArNr4GNFV9',
                    @d_state    = 'aV',
                    @d_zip      = '453511111'

--  get warehouse data and update year-to-date

          select
                    @w_street_1 = 'rqSHHakqyV',
                    @w_street_2 = 'zZ98nW3BR2s',
                    @w_city     = 'ArNr4GNFV9',
                    @w_state    = 'aV',
                    @w_zip      = '453511111'

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



--  return data to client

select  @c_id,
                    @c_last,
                    @datetime,
                    @w_street_1,
                    @w_street_2,
                    @w_city,
                    @w_state,
                    @w_zip,
                    @d_street_1,
                    @d_street_2,
                    @d_city,
                    @d_state,
                    @d_zip,
                    @c_first,
                    @c_middle,
                    @c_street_1,
                    @c_street_2,
                    @c_city,
                    @c_state,
                    @c_zip,
                    @c_phone,
                    @c_since,
                    @c_credit,
                    @c_credit_lim,
                    @c_discount,
                    @c_balance,
                    @screen_data


GO

create proc tpcc_stocklevel   @w_id               smallint,
                                                        @d_id
          tinyint,
                                                        @threshhold
          smallint
as

declare @delaytime varchar(30)

    -- uniform random delay of 0 - 3.6 second; avg = 1.8
    select @delaytime = '00:00:0' + cast(cast((rand()*3.60) as decimal(4,3)) as
char(5))
    waitfor delay @delaytime

    select 49

GO

create proc tpcc_version
as
declare @version    char(8)

begin
          select @version = '4.10.000'
          select @version as 'Version'
end

GO

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

insert into order_line_null values ( 101, 1, getdate(), 1, 123.45 )
insert into order_line_null values ( 102, 1, getdate(), 2, 123.45 )
insert into order_line_null values ( 103, 1, getdate(), 3, 123.45 )
insert into order_line_null values ( 104, 1, getdate(), 4, 123.45 )
insert into order_line_null values ( 105, 1, getdate(), 5, 123.45 )
insert into order_line_null values ( 106, 1, getdate(), 1, 123.45 )
insert into order_line_null values ( 107, 1, getdate(), 2, 123.45 )
insert into order_line_null values ( 108, 1, getdate(), 3, 123.45 )
insert into order_line_null values ( 109, 1, getdate(), 4, 123.45 )
insert into order_line_null values ( 110, 1, getdate(), 5, 123.45 )
insert into order_line_null values ( 111, 1, getdate(), 1, 123.45 )
insert into order_line_null values ( 112, 1, getdate(), 2, 123.45 )
insert into order_line_null values ( 113, 1, getdate(), 3, 123.45 )
insert into order_line_null values ( 114, 1, getdate(), 4, 123.45 )
insert into order_line_null values ( 115, 1, getdate(), 5, 123.45 )

GO
```

ordstat.sql

```
--  File:      ORDSTAT.SQL
--             Microsoft TPC-C Benchmark Kit Ver. 4.41
--             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. 4.41
--            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. 4.41
//                                      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. 4.41
--            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'
go
```

restore.sql

```
--  File:     RESTORE.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.41
--            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 with stats = 1

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

sqlshutdown.sql

```
--  File:     SQLSHUTDOWN.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.41

--            Copyright Microsoft, 2001
--  Purpose:  Checkpoints tpcc database and issues a shutdown
--

use tpcc
go
checkpoint
go
shutdown
go
```

stocklev.sql

```
--  File:     STOCKLEV.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.41
--            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. 4.41
//                                      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. 4.41
--            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. 4.41
//                                      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. 4.41
//                                      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  "4.41"

// 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                   "C:\\MSTPCC.440\\SETUP\\logs\\load.out"
#define LOG_PATH                    "C:\\MSTPCC.440\\SETUP\\LOGS\\";
#define LOADER_NURAND_C                             123
```

```
#define DEF_STARTING_WAREHOUSE                    1
#define BUILD_INDEX                                         1         // build both
data and indexes
#define INDEX_ORDER                                         1         // build
indexes before load
#define SCALE_DOWN                                          0   // build a normal
scale database
#define INDEX_SCRIPT_PATH     "scripts"

typedef struct
{
    char                                          *server;
    char                                          *database;
    char                                          *user;
    char                                          *password;
          BOOL                                    tables_all;
          // set if loading all tables
          BOOL                                    table_item;
          // set if loading ITEM table specifically
          BOOL                                    table_warehouse;    // set if
loading WAREHOUSE, DISTRICT, and STOCK
          BOOL                                    table_customer;               //
set if loading CUSTOMER and HISTORY
          BOOL                                    table_orders;                 //
set if loading NEW-ORDER, ORDERS, ORDER-LINE
    long                                          num_warehouses;
    long                                          batch;
    long                                          verbose;
          long                                    pack_size;
          char                                    *loader_res_file;
          char                                    *log_path;
          char                                    *synch_servername;
          long                                    case_sensitivity;
          long                                    starting_warehouse;
          long                                    build_index;
          long                                    index_order;
          long                                    scale_down;
          char                                    *index_script_path;
} TPCCLDR_ARGS;

// String length constants
          #define SERVER_NAME_LEN           20
          #define DATABASE_NAME_LEN         20
          #define USER_NAME_LEN             20
          #define PASSWORD_LEN              20
          #define TABLE_NAME_LEN            20
          #define I_DATA_LEN                50
          #define I_NAME_LEN                24
          #define BRAND_LEN                  1
          #define LAST_NAME_LEN             16
          #define W_NAME_LEN                10
          #define ADDRESS_LEN               20
          #define STATE_LEN                  2
          #define ZIP_LEN                    9
          #define S_DIST_LEN                24
          #define S_DATA_LEN                50
          #define D_NAME_LEN                10
          #define FIRST_NAME_LEN            16
          #define MIDDLE_NAME_LEN            2
          #define PHONE_LEN                 16
          #define CREDIT_LEN                 2
          #define C_DATA_LEN               500
          #define H_DATA_LEN                24
          #define DIST_INFO_LEN              24
          #define MAX_OL_NEW_ORDER_ITEMS     15
          #define MAX_OL_ORDER_STATUS_ITEMS  15
          #define STATUS_LEN                 25
          #define OL_DIST_INFO_LEN                   24
          #define C_SINCE_LEN                                  23
          #define H_DATE_LEN                                   23
          #define OL_DELIVERY_D_LEN                  23
          #define O_ENTRY_D_LEN              23


// Functions in random.c
void      seed();
long      irand();
double    drand();
void      WUCreate();
short     WURand();
long      RandomNumber(long lower, long upper);

// Functions in getargs.c;
void      GetArgsLoader();
void      GetArgsLoaderUsage();

// Functions in time.c
long      TimeNow();

// Functions in strings.c
void      MakeAddress();
void      LastName();
int       MakeAlphaString();
int       MakeOriginalAlphaString();
int       MakeNumberString();
int       MakeZipNumberString();
void      InitString();
void      InitAddress();
void      PaddString();
```

tpccldr.c

```
//        File:               TPCCLDR.C
//                                      Microsoft TPC-C Kit Ver. 4.41
//                                      Copyright Microsoft, 1996, 1997, 1998, 1999,
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 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
          //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];
          char                err_log_path[256];
```

```
          // 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);
          strcpy(err_log_path,aptr->log_path);
          strcat(err_log_path,"item.err");
          rc = bcp_init(i_hdbc1, name, NULL, err_log_path , DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(i_hdbc1);

          if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                    sprintf(bcphint, "tablock, order (i_id), ROWS_PER_BATCH =
100000");
                    rc = bcp_control(i_hdbc1, BCPHINTS, (void*) bcphint);
                    if (rc != SUCCEED)
                              HandleErrorDBC(i_hdbc1);
          }

          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];
          char      err_log_path[256];

          // Seed with unique number
          seed(2);

          printf("Loading warehouse table...\n");

          // if build index before load...
          if ((aptr->build_index == 1) && (aptr->index_order == 1))
                    BuildIndex("idxwarcl");

          InitString(w_name, W_NAME_LEN+1);
          InitAddress(w_street_1, w_street_2, w_city, w_state, w_zip);

          sprintf(name, "%s..%s", aptr->database, "warehouse");

          //rc = bcp_init(w_hdbc1, name, NULL, "logs\\whouse.err", DB_IN);
          strcpy(err_log_path,aptr->log_path);
          strcat(err_log_path,"whouse.err");
          rc = bcp_init(w_hdbc1, name, NULL, err_log_path, DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                    sprintf(bcphint, "tablock, order (w_id), ROWS_PER_BATCH = %d",
aptr->num_warehouses);
                    rc = bcp_control(w_hdbc1, BCPHINTS, (void*) bcphint);
                    if (rc != SUCCEED)
                              HandleErrorDBC(w_hdbc1);
          }

          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];
          char      err_log_path[256];

          // Seed with unique number
          seed(4);

          printf("Loading district table...\n");

          // build index before load
          if ((aptr->build_index == 1) && (aptr->index_order == 1))
                    BuildIndex("idxdiscl");

          InitString(d_name, D_NAME_LEN+1);
          InitAddress(d_street_1, d_street_2, d_city, d_state, d_zip);
          sprintf(name, "%s..%s", aptr->database, "district");

          //rc = bcp_init(w_hdbc1, name, NULL, "logs\\district.err", DB_IN);
          strcpy(err_log_path,aptr->log_path);
          strcat(err_log_path,"district.err");
          rc = bcp_init(w_hdbc1, name, NULL, err_log_path, DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                    sprintf(bcphint, "tablock, order (d_w_id, d_id), ROWS_PER_BATCH
= %u", (aptr->num_warehouses * 10));
                    rc = bcp_control(w_hdbc1, BCPHINTS, (void*) bcphint);
                    if (rc != SUCCEED)
                              HandleErrorDBC(w_hdbc1);
          }

          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];
          char      err_log_path[256];

          // Seed with unique number
          seed(3);

          // if build index before load...
          if ((aptr->build_index == 1) && (aptr->index_order == 1))
                    BuildIndex("idxstkcl");

          sprintf(name, "%s..%s", aptr->database, "stock");

          //rc = bcp_init(w_hdbc1, name, NULL, "logs\\stock.err", DB_IN);
          strcpy(err_log_path,aptr->log_path);
          strcat(err_log_path,"stock.err");
          rc = bcp_init(w_hdbc1, name, NULL, err_log_path, DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

          if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                    sprintf(bcphint, "tablock, order (s_i_id, s_w_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 100000));
                    rc = bcp_control(w_hdbc1, BCPHINTS, (void*) bcphint);
                    if (rc != SUCCEED)
                              HandleErrorDBC(w_hdbc1);
          }
          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];
          int                                                             num_procs;
          char                                                  err_log_path_cust[256];
          char                                                  err_log_path_hist[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");
                    // check the number of processors on this system
                    // if 8 or more processors, then build index on History.
                    // if less than 8 processors, do not build the index
                    num_procs = atoi(getenv( "NUMBER_OF_PROCESSORS" ));
                    if ( num_procs >= 8 )
                              BuildIndex("idxhiscl");
          }

          // Initialize bulk copy
          sprintf(name, "%s..%s", aptr->database, "customer");

          //rc = bcp_init(c_hdbc1, name, NULL, "logs\\customer.err", DB_IN);
          strcpy(err_log_path_cust,aptr->log_path);
          strcat(err_log_path_cust,"customer.err");
          rc = bcp_init(c_hdbc1, name, NULL, err_log_path_cust, DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc1);

          if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
```

```
                    sprintf(bcphint, "tablock, order (c_w_id, c_d_id, c_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 30000));
                    rc = bcp_control(c_hdbc1, BCPHINTS, (void*) bcphint);
                    if (rc != SUCCEED)
                              HandleErrorDBC(c_hdbc1);
          }

          sprintf(name, "%s..%s", aptr->database, "history");

          rc = bcp_init(c_hdbc2, name, NULL, "logs\\history.err", DB_IN);
          strcpy(err_log_path_hist,aptr->log_path);
          strcat(err_log_path_hist,"history.err");
          rc = bcp_init(c_hdbc2, name, NULL, err_log_path_hist, DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);

          sprintf(bcphint, "tablock");
          rc = bcp_control(c_hdbc2, BCPHINTS, (void*) bcphint);
          if (rc != SUCCEED)
                    HandleErrorDBC(c_hdbc2);

          customer_rows_loaded    = 0;
          history_rows_loaded     = 0;

          CustomerBufInit();

          customer_time_start.time_start = (TimeNow() / MILLI);
          history_time_start.time_start = (TimeNow() / MILLI);

          for (w_id = (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");
                    // check the number of processors on this system
                    // if 8 or more processors, then build index on History.
                    // if less than 8 processors, do not build the index
                    num_procs = atoi(getenv( "NUMBER_OF_PROCESSORS" ));
```

```
                    if (num_procs >= 8)
                              BuildIndex("idxhiscl");
          }

          // build non-clustered index
          if (aptr->build_index == 1)
                    BuildIndex("idxcusnc");

          // Output the NURAND used for the loader into C_FIRST for C_ID = 1,
          // C_W_ID = 1, and C_D_ID = 1
          //sprintf(cmd, "osql -S%s -U%s -P%s -d%s -e -Q\"update customer set
c_first = 'C_LOAD = %d' where c_id = 1 and c_w_id = 1 and c_d_id = 1\" >
logs\\nurand_load.log",
          sprintf(cmd, "osql -S%s -U%s -P%s -d%s -e -Q\"update customer set c_first
= 'C_LOAD = %d' where c_id = 1 and c_w_id = 1 and c_d_id = 1\" > %snurand_load.log",
                                        aptr->server,
                                        aptr->user,
                                        aptr->password,
                                        aptr->database,
                                        LOADER_NURAND_C,
                                        aptr->log_path);

          system(cmd);

          SQLFreeStmt(c_hstmt1, SQL_DROP);
          SQLDisconnect(c_hdbc1);
          SQLFreeConnect(c_hdbc1);

          SQLFreeStmt(c_hstmt2, SQL_DROP);
          SQLDisconnect(c_hdbc2);
          SQLFreeConnect(c_hdbc2);


    return;

}


//=======================================================================
//
// Function   : CustomerBufInit
//
//=======================================================================

void CustomerBufInit()
{
          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];
          char                                              err_log_path_ord[256];
          char                                              err_log_path_nord[256];
          char                                              err_log_path_ordl[256];

          // seed with unique number
          seed(6);

          printf("Loading orders...\n");

          // if build index before load...
          if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                              BuildIndex("idxordcl");
                              BuildIndex("idxnodcl");
                              BuildIndex("idxodlcl");
          }

          // initialize bulk copy
          sprintf(name, "%s..%s", aptr->database, "orders");

          rc = bcp_init(o_hdbc1, name, NULL, "logs\\orders.err", DB_IN);
          strcpy(err_log_path_ord,aptr->log_path);
          strcat(err_log_path_ord,"orders.err");
          rc = bcp_init(o_hdbc1, name, NULL, err_log_path_ord, DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc1);

          if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                    sprintf(bcphint, "tablock, order (o_w_id, o_d_id, o_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 30000));
                    rc = bcp_control(o_hdbc1, BCPHINTS, (void*) bcphint);
                    if (rc != SUCCEED)
                              HandleErrorDBC(o_hdbc1);
          }

          sprintf(name, "%s..%s", aptr->database, "new_order");

          rc = bcp_init(o_hdbc2, name, NULL, "logs\\neword.err", DB_IN);
          strcpy(err_log_path_nord,aptr->log_path);
          strcat(err_log_path_nord,"neword.err");
          rc = bcp_init(o_hdbc2, name, NULL, err_log_path_nord, DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc2);

          if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                    sprintf(bcphint, "tablock, order (no_w_id, no_d_id, no_o_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 9000));
                    rc = bcp_control(o_hdbc2, BCPHINTS, (void*) bcphint);
                    if (rc != SUCCEED)
                              HandleErrorDBC(o_hdbc2);
          }
```

```
          sprintf(name, "%s..%s", aptr->database, "order_line");

          rc = bcp_init(o_hdbc3, name, NULL, "logs\\ordline.err", DB_IN);
          strcpy(err_log_path_ordl,aptr->log_path);
          strcat(err_log_path_ordl,"ordline.err");
          rc = bcp_init(o_hdbc3, name, NULL, err_log_path_ordl, DB_IN);
          if (rc != SUCCEED)
                    HandleErrorDBC(o_hdbc3);

    if ((aptr->build_index == 1) && (aptr->index_order == 1))
          {
                    sprintf(bcphint, "tablock, order (ol_w_id, ol_d_id, ol_o_id,
ol_number), ROWS_PER_BATCH = %u", (aptr->num_warehouses * 300000));
                    rc = bcp_control(o_hdbc3, BCPHINTS, (void*) bcphint);
                    if (rc != SUCCEED)
                              HandleErrorDBC(o_hdbc3);
          }

          orders_rows_loaded      = 0;
          new_order_rows_loaded   = 0;
          order_line_rows_loaded  = 0;

          OrdersBufInit();

          orders_time_start.time_start = (TimeNow() / MILLI);
          new_order_time_start.time_start = (TimeNow() / MILLI);
          order_line_time_start.time_start = (TimeNow() / MILLI);

          for (w_id = (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, "osql -S%s -U%s -P%s -e -i%s\\%s.sql > %s%s.log",
                                        aptr->server,
                                        aptr->user,
                                        aptr->password,
                                        aptr->index_script_path,
                                        index_script,
                                        aptr->log_path,
                                        index_script);

          system(cmd);

          printf("Finished index creation:  %s\n",index_script);
}


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];
          char                err_log_path[256];
          FILE                *fp1;

          i = 1;
          while (( rc2 = SQLGetDiagRec(SQL_HANDLE_DBC , hdbc1, i, SqlState ,
&NativeError,
                                           Msg, sizeof(Msg) , &MsgLen )) !=
SQL_NO_DATA )
          {

                    sprintf( szLastError , "%s" ,  Msg );

                    _strtime(timebuf);
                    _strdate(datebuf);

                    printf( "[%s : %s] %s\n" , datebuf, timebuf, szLastError);

                    strcpy(err_log_path,aptr->log_path);
                    strcat(err_log_path,"tpccldr.err");
                    fp1 = fopen(err_log_path,"w");
                    //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];
          char                err_log_path[256];
          FILE                *fp1;

          i = 1;
          while (( rc2 = SQLGetDiagRec(SQL_HANDLE_STMT , hstmt1, i, SqlState ,
&NativeError,
                                           Msg, sizeof(Msg) , &MsgLen )) !=
SQL_NO_DATA )
          {

                    sprintf( szLastError , "%s" ,  Msg );

                    _strtime(timebuf);
                    _strdate(datebuf);

                    printf( "[%s : %s] %s\n" , datebuf, timebuf, szLastError);

                    strcpy(err_log_path,aptr->log_path);
                    strcat(err_log_path,"tpccldr.err");
                    fp1 = fopen(err_log_path,"w");
                    //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   : 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. 4.41
--            Copyright Microsoft, 2001
--  Purpose:  Returns version level of TPC-C stored procs
--  Note:     Always update the return value of this proc for
--            any interface changes or 'must have' bug fixes.
--
--  The value returned by this SP defines the 'interface level',
--  which must match between the stored procs and the client code.
--  The interface level may be down rev from the current kit.  This
--  indicates that the interface hasn't changed since that version.

use tpcc
go

if exists ( select name from sysobjects where name = 'tpcc_version' )
        drop procedure tpcc_version
go

create proc tpcc_version
as
declare   @version  char(8)

begin
        select @version = '4.10.000'
        select @version as 'Version'
end

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

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
```

Boot.ini Parameters

```
[boot loader]
timeout=10
default=multi(0)disk(0)rdisk(0)partition(1)\WINDOWS
[operating systems]
multi(0)disk(0)rdisk(0)partition(1)\WINDOWS="Windows
Server 2003, Standard" /fastdetect
multi(0)disk(0)rdisk(0)partition(1)\WINDOWS="Windows
Server 2003, Standard" /fastdetect
```

Microsoft SQL Server 2000 Configuration Parameters

```
1> 2> 3> 4> 5> 6> 7> 8> --  File:     VERSION.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.41
--            Copyright Microsoft, 2001
--  Purpose:  Extracts current version of SQL Server


use master
1> 2> 3>
SELECT    CONVERT(char(20),
SERVERPROPERTY('ProductVersion'))

 --------------------
 8.00.761

(1 row affected)
1> 2> 3>
SELECT    CONVERT(char(20),
SERVERPROPERTY('ProductLevel'))

 --------------------
 SP3

(1 row affected)
1> 2> 3>
SELECT    CONVERT(char(30), getdate(),9)

 ------------------------------
 May 25 2003 11:39:43:870PM

(1 row affected)
1> 2> 3> 4> 5>



1> 2> 3> 4> 5> 6> 7> 8> 9> 10>
--  File:     CONFIG.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.41
--            Copyright Microsoft, 2001
--  Purpose:  Collects SQL Server configuration
parameters


PRINT     " "
SELECT    convert(char(30), getdate(),9)
PRINT     " "

 ------------------------------
 May 25 2003 11:39:44:197PM

(1 row affected)

1> 2> 3> DBCC execution completed. If DBCC printed
error messages, contact your system administrator.
Configuration option 'show advanced options' changed
from 1 to 1. Run the RECONFIGURE statement to
install.

sp_configure "show advanced",1
1> 2> reconfigure with override
1> 2> sp_configure
 name                                minimum
maximum     config_value run_value
 ----------------------------------- ----------- ----
------- ------------ -----------
 affinity mask                       -2147483648
2147483647            3           3
 allow updates                                 0
1            0           0
 awe enabled                                   0
1            0           0
 c2 audit mode                                 0
1            0           0
 cost threshold for parallelism                0
32767            5           5
 Cross DB Ownership Chaining                   0
1            0           0
 cursor threshold                             -1
2147483647           -1          -1
 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            0           0
 lightweight pooling                           0
1            1           1
 locks                                      5000
2147483647            0           0
 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          300         300
 media retention                               0
365            0           0
 min memory per query (KB)                   512
2147483647         1024        1024
 min server memory (MB)                        0
2147483647            0           0
 nested triggers                               0
1            1           1
 network packet size (B)                     512
65536         4096        4096
 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           20          20
 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>
1>
```

Benchcraft Profile

```
Profile:  Apark_1600
File Path:
          C:\benchcraft\Profiles\Apark_1600.pro
Version:  3

          Number of Engines: 4

                    Name: cl73a
                    Description:
                    Directory: c:\blog\cl73a.log
                    Machine: N15
                    Parameter Set: 1.1
                    Index: 50000000
                    Seed: 18546
                    Configured Users: 4000
                    Pipe Name: DRIVER286005718
                    Connect Rate: 4000
                    Start Rate: 4000
                    Max. Concurrency: 4000
                    Concurrency Rate: 0
                    CLIENT_NURAND: 233
                    CPU: 0

                    Name: cl73b
                    Description:
                    Directory: c:\blog\cl73b.log
                    Machine: N15
                    Parameter Set: 1.1
                    Index: 100000000
                    Seed: 18546
                    Configured Users: 4000
                    Pipe Name: DRIVER2149515765
                    Connect Rate: 4000
                    Start Rate: 4000
                    Max. Concurrency: 4000
                    Concurrency Rate: 0
                    CLIENT_NURAND: 233
                    CPU: 1

                    Name: cl73c
                    Description:
                    Directory: c:\blog\cl73c.log
                    Machine: N15
                    Parameter Set: 1.1
                    Index: 200000000
                    Seed: 18546
                    Configured Users: 4000
                    Pipe Name: DRIVER34355890
                    Connect Rate: 4000
                    Start Rate: 4000
                    Max. Concurrency: 4000
                    Concurrency Rate: 0
                    CLIENT_NURAND: 233
                    CPU: 2

                    Name: cl73d
                    Description:
                    Directory: c:\blog\cl73d.log
                    Machine: N15
                    Parameter Set: 1.1
                    Index: 300000000
                    Seed: 18546
                    Configured Users: 4000
                    Pipe Name: DRIVER44400187
                    Connect Rate: 4000
                    Start Rate: 4000
                    Max. Concurrency: 4000
                    Concurrency Rate: 0
                    CLIENT_NURAND: 233
                    CPU: 3

          Number of User groups: 4

                    Driver Engine: cl73a
                    IIS Server: cr73
                    SQL Server: venom
                    Database: tpcc
                    User: sa
                    Protocol: HTML
                    w_id Range: 1 - 400
                    w_id Min Warehouse: 1
                    w_id Max Warehouse: 1600
                    Scale: Normal
                    User Count: 4000
                    District id: 1
                    Scale Down: No

                    Driver Engine: cl73b
                    IIS Server: cr73
                    SQL Server: venom
                    Database: tpcc
                    User: sa
                    Protocol: HTML
                    w_id Range: 401 - 800
                    w_id Min Warehouse: 1
                    w_id Max Warehouse: 1600
                    Scale: Normal
                    User Count: 4000
                    District id: 1
                    Scale Down: No

                    Driver Engine: cl73c
                    IIS Server: cr73
                    SQL Server: venom
                    Database: tpcc
                    User: sa
                    Protocol: HTML
                    w_id Range: 801 - 1200
                    w_id Min Warehouse: 1
                    w_id Max Warehouse: 1600
                    Scale: Normal
                    User Count: 4000
                    District id: 1
                    Scale Down: No

                    Driver Engine: cl73d
                    IIS Server: cr73
                    SQL Server: venom
                    Database: tpcc
                    User: sa
                    Protocol: HTML
                    w_id Range: 1201 - 1600
                    w_id Min Warehouse: 1
                    w_id Max Warehouse: 1600
                    Scale: Normal
                    User Count: 4000
                    District id: 1
                    Scale Down: No

          Number of Parameter Sets: 55


                    ~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       18.01      0.10      5.00      0.10
                    Payment           43.03
24.10        3.01      0.10      5.00      0.10
                    Delivery           4.03
10.10        2.01      0.10      5.00      0.10
                    Stock Level        4.03
10.10        2.01      0.10     20.00      0.10
                    Order Status       4.03
20.10        2.01      0.10      5.00      0.10

                    2.6
                    2.6 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.75
31.33       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
                    1.05 tt
                                    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
                    1.01 tt
                                    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
                    1.02 tt
                                    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
                    1.06 tt
                                    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
                    1.07 tt
                                    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
                    1.03 tt
                                    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
                    1.04 tt
                                    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 tt
                                    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

                    1.8
                    1.8 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.86
21.69       18.01      0.10      5.00      0.10
                    Payment           43.05
21.69        3.01      0.10      5.00      0.10
                    Delivery           4.03
9.09         2.01      0.10      5.00      0.10
                    Stock Level        4.03
9.09         2.01      0.10     20.00      0.10
                    Order Status       4.03
18.09        2.01      0.10      5.00      0.10

                    1.9
                    1.9 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.86
22.90       18.01      0.10      5.00      0.10
                    Payment           43.05
22.90        3.01      0.10      5.00      0.10
                    Delivery           4.03
9.60         2.01      0.10      5.00      0.10
                    Stock Level        4.03
9.60         2.01      0.10     20.00      0.10
                    Order Status       4.03
19.10        2.01      0.10      5.00      0.10

                    1.4
                    1.4 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.86
16.87       18.01      0.10      5.00      0.10
                    Payment           43.05
16.87        3.01      0.10      5.00      0.10
                    Delivery           4.03
7.07         2.01      0.10      5.00      0.10
                    Stock Level        4.03
7.07         2.01      0.10     20.00      0.10
                    Order Status       4.03
14.07        2.01      0.10      5.00      0.10

                    1.5
                    1.5 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.86
18.07       18.01      0.10      5.00      0.10
                    Payment           43.05
18.07        3.01      0.10      5.00      0.10
                    Delivery           4.03
7.58         2.01      0.10      5.00      0.10
                    Stock Level        4.03
7.58         2.01      0.10     20.00      0.10
                    Order Status       4.03
15.07        2.01      0.10      5.00      0.10

                    1.3
                    1.3 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.86
15.66       18.01      0.10      5.00      0.10
                    Payment           43.05
15.66        3.01      0.10      5.00      0.10
                    Delivery           4.03
6.57         2.01      0.10      5.00      0.10
                    Stock Level        4.03
6.57         2.01      0.10     20.00      0.10
                    Order Status       4.03
13.07        2.01      0.10      5.00      0.10

                    1.49
                    1.49 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.86
17.95       18.01      0.10      5.00      0.10
                    Payment           43.05
17.95        3.01      0.10      5.00      0.10
                    Delivery           4.03
7.52         2.01      0.10      5.00      0.10
                    Stock Level        4.03
7.52         2.01      0.10     20.00      0.10
                    Order Status       4.03
14.97        2.01      0.10      5.00      0.10

                    1.48
                    1.48 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.86
17.83       18.01      0.10      5.00      0.10
                    Payment           43.05
17.83        3.01      0.10      5.00      0.10
                    Delivery           4.03
7.47         2.01      0.10      5.00      0.10
                    Stock Level        4.03
7.47         2.01      0.10     20.00      0.10
                    Order Status       4.03
14.87        2.01      0.10      5.00      0.10

                    1.47
                    1.47 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order        44.86
17.71       18.01      0.10      5.00      0.10
                    Payment          43.05
17.71        3.01      0.10      5.00      0.10
                    Delivery          4.03
7.42         2.01      0.10      5.00      0.10
                    Stock Level       4.03
7.42         2.01      0.10     20.00      0.10
                    Order Status      4.03
14.77        2.01      0.10      5.00      0.10

                    1.46
                    1.46 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order        44.86
17.59       18.01      0.10      5.00      0.10
                    Payment          43.05
17.59        3.01      0.10      5.00      0.10
                    Delivery          4.03
7.37         2.01      0.10      5.00      0.10
                    Stock Level       4.03
7.37         2.01      0.10     20.00      0.10
                    Order Status      4.03
14.67        2.01      0.10      5.00      0.10

                    1.45
                    1.45 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order        44.86
17.47       18.01      0.10      5.00      0.10
                    Payment          43.05
17.47        3.01      0.10      5.00      0.10
                    Delivery          4.03
7.32         2.01      0.10      5.00      0.10
                    Stock Level       4.03
7.32         2.01      0.10     20.00      0.10
                    Order Status      4.03
14.57        2.01      0.10      5.00      0.10

                    1.44
                    1.44 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order        44.86
17.35       18.01      0.10      5.00      0.10
                    Payment          43.05
17.35        3.01      0.10      5.00      0.10
                    Delivery          4.03
7.27         2.01      0.10      5.00      0.10
```

```
                    Stock Level       4.03
7.27         2.01      0.10     20.00      0.10
                    Order Status      4.03
14.47        2.01      0.10      5.00      0.10

                    1.43
                    1.43 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order        44.86
17.23       18.01      0.10      5.00      0.10
                    Payment          43.05
17.23        3.01      0.10      5.00      0.10
                    Delivery          4.03
7.22         2.01      0.10      5.00      0.10
                    Stock Level       4.03
7.22         2.01      0.10     20.00      0.10
                    Order Status      4.03
14.37        2.01      0.10      5.00      0.10

                    1.42
                    1.42 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order        44.86
17.11       18.01      0.10      5.00      0.10
                    Payment          43.05
17.11        3.01      0.10      5.00      0.10
                    Delivery          4.03
7.17         2.01      0.10      5.00      0.10
                    Stock Level       4.03
7.17         2.01      0.10     20.00      0.10
                    Order Status      4.03
14.27        2.01      0.10      5.00      0.10

                    1.41
                    1.41 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order        44.86
16.99       18.01      0.10      5.00      0.10
                    Payment          43.05
16.99        3.01      0.10      5.00      0.10
                    Delivery          4.03
7.12         2.01      0.10      5.00      0.10
                    Stock Level       4.03
7.12         2.01      0.10     20.00      0.10
                    Order Status      4.03
14.17        2.01      0.10      5.00      0.10

                    1.25
                    1.25 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
```

```
                    New Order        44.86
15.06       18.01      0.10      5.00      0.10
                    Payment          43.05
15.06        3.01      0.10      5.00      0.10
                    Delivery          4.03
6.32         2.01      0.10      5.00      0.10
                    Stock Level       4.03
6.32         2.01      0.10     20.00      0.10
                    Order Status      4.03
12.57        2.01      0.10      5.00      0.10

                    1.24
                    1.24 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order        44.86
14.94       18.01      0.10      5.00      0.10
                    Payment          43.05
14.94        3.01      0.10      5.00      0.10
                    Delivery          4.03
6.26         2.01      0.10      5.00      0.10
                    Stock Level       4.03
6.26         2.01      0.10     20.00      0.10
                    Order Status      4.03
12.46        2.01      0.10      5.00      0.10

                    1.23
                    1.23 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order        44.86
14.82       18.01      0.10      5.00      0.10
                    Payment          43.05
14.82        3.01      0.10      5.00      0.10
                    Delivery          4.03
6.21         2.01      0.10      5.00      0.10
                    Stock Level       4.03
6.21         2.01      0.10     20.00      0.10
                    Order Status      4.03
12.36        2.01      0.10      5.00      0.10

                    1.22
                    1.22 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order        44.86
14.70       18.01      0.10      5.00      0.10
                    Payment          43.05
14.70        3.01      0.10      5.00      0.10
                    Delivery          4.03
6.16         2.01      0.10      5.00      0.10
                    Stock Level       4.03
6.16         2.01      0.10     20.00      0.10
                    Order Status      4.03
12.26        2.01      0.10      5.00      0.10

                    1.21
                    1.21 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.86
14.58       18.01      0.10      5.00      0.10
                    Payment           43.05
14.58        3.01      0.10      5.00      0.10
                    Delivery           4.03
6.11         2.01      0.10      5.00      0.10
                    Stock Level        4.03
6.11         2.01      0.10     20.00      0.10
                    Order Status       4.03
12.16        2.01      0.10      5.00      0.10

                    1.19
                    1.19 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.86
14.34       18.01      0.10      5.00      0.10
                    Payment           43.05
14.34        3.01      0.10      5.00      0.10
                    Delivery           4.03
6.01         2.01      0.10      5.00      0.10
                    Stock Level        4.03
6.01         2.01      0.10     20.00      0.10
                    Order Status       4.03
11.96        2.01      0.10      5.00      0.10

                    1.18
                    1.18 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.86
14.22       18.01      0.10      5.00      0.10
                    Payment           43.05
14.22        3.01      0.10      5.00      0.10
                    Delivery           4.03
5.96         2.01      0.10      5.00      0.10
                    Stock Level        4.03
5.96         2.01      0.10     20.00      0.10
                    Order Status       4.03
11.86        2.01      0.10      5.00      0.10

                    1.17
                    1.17 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.86
14.10       18.01      0.10      5.00      0.10
                    Payment           43.05
14.10        3.01      0.10      5.00      0.10
                    Delivery           4.03
5.91         2.01      0.10      5.00      0.10
                    Stock Level        4.03
5.91         2.01      0.10     20.00      0.10
                    Order Status       4.03
11.76        2.01      0.10      5.00      0.10

                    1.16
                    1.16 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.86
13.98       18.01      0.10      5.00      0.10
                    Payment           43.05
13.98        3.01      0.10      5.00      0.10
                    Delivery           4.03
5.86         2.01      0.10      5.00      0.10
                    Stock Level        4.03
5.86         2.01      0.10     20.00      0.10
                    Order Status       4.03
11.66        2.01      0.10      5.00      0.10

                    1.15
                    1.15 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.86
13.86       18.01      0.10      5.00      0.10
                    Payment           43.05
13.86        3.01      0.10      5.00      0.10
                    Delivery           4.03
5.80         2.01      0.10      5.00      0.10
                    Stock Level        4.03
5.80         2.01      0.10     20.00      0.10
                    Order Status       4.03
11.56        2.01      0.10      5.00      0.10

                    1.7
                    1.7 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.86
20.48       18.01      0.10      5.00      0.10
                    Payment           43.05
20.48        3.01      0.10      5.00      0.10
                    Delivery           4.03
8.59         2.01      0.10      5.00      0.10
                    Stock Level        4.03
8.59         2.01      0.10     20.00      0.10
                    Order Status       4.03
17.09        2.01      0.10      5.00      0.10

                    3.5
                    3.5 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.74
42.10       18.01      0.10      5.00      0.10
                    Payment           43.10
42.10        3.01      0.10      5.00      0.10
                    Delivery           4.05
17.60        2.01      0.10      5.00      0.10
                    Stock Level        4.05
17.60        2.01      0.10     20.00      0.10
                    Order Status       4.05
35.10        2.01      0.10      5.00      0.10

                    3.5
                    3.5 tt
                                    Txn     Think
Key     RT      RT      Menu
                                    Weight  Time
Time    Delay   Fence   Delay
                    New Order         44.75
42.10       18.01      0.10      5.00      0.10
                    Payment           43.10
42.10        3.01      0.10      5.00      0.10
                    Delivery           4.05
17.60        2.01      0.10      5.00      0.10
                    Stock Level        4.05
17.60        2.01      0.10     20.00      0.10
                    Order Status       4.05
35.10        2.01      0.10      5.00      0.10
```

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:00000019
"DispatchEntries"=hex(7):4c,00,44,00,41,00,50,00,53,0
0,56,00,43,00,00,00,00,00
"PoolThreadLimit"=dword:000003fe
"ThreadTimeout"=dword:00015180

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\InetInfo\Performance]
"Library"="infoctrs.dll"
"Open"="OpenINFOPerformanceData"
"Close"="CloseINFOPerformanceData"
"Collect"="CollectINFOPerformanceData"
"Last Counter"=dword:00000842
"Last Help"=dword:00000843
"First Counter"=dword:00000802
"First Help"=dword:00000803
```

```
"Library Validation
Code"=hex:30,bb,ee,43,77,5b,c2,01,10,25,00,00,00,00,0
0,00
"WbemAdapFileTime"=hex:00,73,79,5b,bc,d4,c0,01
"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."
"FailureActions"=hex:ff,ff,ff,ff,00,00,00,00,00,00,00
,00,03,00,00,00,50,a8,0d,\

00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00
,00,00,00,00,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\ASP]
"NOTE"="This is for backward compatibility only."

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\ASP\Parameters]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters]
"MajorVersion"=dword:00000005
"MinorVersion"=dword:00000000
"InstallPath"="C:\\WINNT\\System32\\inetsrv"
"CertMapList"="C:\\WINNT\\System32\\inetsrv\\iiscrmap
.dll"
"AccessDeniedMessage"="Error: Access is Denied."
"Filter DLLs"=""
"LogFileDirectory"="C:\\WINNT\\System32\\LogFiles"
"AcceptExOutstanding"=dword:00000028

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\ADCLaunch]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\ADCLaunch\AdvancedDataFactory]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\ADCLaunch\RDSServer.DataFactory]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\Script Map]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Parameters\Virtual Roots]
"/"="c:\\inetpub\\wwwroot,,207"
"/Scripts"="c:\\inetpub\\scripts,,1"
"/IISHelp"="c:\\winnt\\help\\iishelp,,1"
"/IISAdmin"="C:\\WINNT\\System32\\inetsrv\\iisadmin,,
1"
"/IISSamples"="c:\\inetpub\\iissamples,,1"
"/MSADC"="c:\\program files\\common
files\\system\\msadc,,1"
"/_vti_bin"="C:\\Program Files\\Common
Files\\Microsoft Shared\\Web Server
Extensions\\40\\isapi,,1"
"/Printers"="C:\\WINNT\\web\\printers,,201"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Performance]
"Library"="w3ctrs.dll"
"Open"="OpenW3PerformanceData"
"Close"="CloseW3PerformanceData"
"Collect"="CollectW3PerformanceData"
"Last Counter"=dword:000008e6
"Last Help"=dword:000008e7
"First Counter"=dword:00000844
"First Help"=dword:00000845
"Library Validation
Code"=hex:de,61,7e,46,77,5b,c2,01,10,3d,00,00,00,00,0
0,00
"WbemAdapFileTime"=hex:00,73,79,5b,bc,d4,c0,01
"WbemAdapFileSize"=dword:00001d10
"WbemAdapStatus"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Security]
"Security"=hex:01,00,14,80,a0,00,00,00,ac,00,00,00,14
,00,00,00,30,00,00,00,02,\

00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00
,00,00,00,00,01,00,00,\

00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,74,00,6f,00,00,00,1c,00,ff,01,0f,00,01
,02,00,00,00,00,00,05,\

20,00,00,00,20,02,00,00,72,00,73,00,00,00,18,00,8d,01
,02,00,01,01,00,00,00,\

00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02
,00,01,02,00,00,00,00,\

00,05,20,00,00,00,23,02,00,00,72,00,73,00,01,01,00,00
,00,00,00,05,12,00,00,\
  00,01,01,00,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\W3SVC\Enum]
"0"="Root\\LEGACY_W3SVC\\0000"
"Count"=dword:00000001
"NextInstance"=dword:00000001
```

TPCC Application Registry Parameters

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\TPCC]
"Path"="C:\\Inetpub\\wwwroot\\"
"NumberOfDeliveryThreads"=dword:00000040
"MaxConnections"=dword:00004e20
"MaxPendingDeliveries"=dword:00000bb8
"DB_Protocol"="ODBC"
"TxnMonitor"="COM"
"DbServer"="apark"
"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
\hpqcissb]
"Type"=dword:00000001
"Start"=dword:00000000
"ErrorControl"=dword:00000001
"Tag"=dword:00000102
"ImagePath"=hex(2):73,00,79,00,73,00,74,00,65,00,6d,0
0,33,00,32,00,5c,00,44,00,\

52,00,49,00,56,00,45,00,52,00,53,00,5c,00,68,00,70,00
,71,00,63,00,69,00,73,\
  00,73,00,62,00,2e,00,73,00,79,00,73,00,00,00
"DisplayName"="Smart Array Controllers Non-Miniport
Bus Driver"
"Group"="port"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissb\Parameters]
"CompletionMode"=dword:00000002
"CosTimerRate"=dword:00000004

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissb\Parameters\Controller2]
"CompletionMode"=dword:00000001

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissb\Security]
"Security"=hex:01,00,14,80,90,00,00,00,9c,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,\

00,00,02,00,60,00,04,00,00,00,00,00,14,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,00,00,18,00,ff,01,0f,00,01,02,00,00,00
,00,00,05,20,00,00,00,\

20,02,00,00,00,00,14,00,8d,01,02,00,01,01,00,00,00,00
,00,05,0b,00,00,00,00,\

00,18,00,fd,01,02,00,01,02,00,00,00,00,00,05,20,00,00
,00,23,02,00,00,01,01,\

00,00,00,00,00,05,12,00,00,00,01,01,00,00,00,00,00,05
,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissb\Enum]
"0"="PCI\\VEN_0E11&DEV_0046&SUBSYS_409B0E11&REV_01\\3
&29e81982&0&08"
"Count"=dword:00000002
"NextInstance"=dword:00000002
"1"="PCI\\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_02\\3
&172e68dd&0&08"
```

Server Disk Device

Performance Driver Registry Parameters

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissd]
"Type"=dword:00000001
"Start"=dword:00000000
"ErrorControl"=dword:00000001
"Tag"=dword:00000102
"ImagePath"=hex(2):73,00,79,00,73,00,74,00,65,00,6d,0
0,33,00,32,00,5c,00,44,00,\

52,00,49,00,56,00,45,00,52,00,53,00,5c,00,68,00,70,00
,71,00,63,00,69,00,73,\
  00,73,00,64,00,2e,00,73,00,79,00,73,00,00,00
"DisplayName"="Smart Array Controllers Non-Miniport
Disk Driver"
"Group"="Primary Disk"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissd\Security]
"Security"=hex:01,00,14,80,90,00,00,00,9c,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,\

00,00,02,00,60,00,04,00,00,00,00,00,14,00,fd,01,02,00
,01,01,00,00,00,00,00,\

05,12,00,00,00,00,00,18,00,ff,01,0f,00,01,02,00,00,00
,00,00,05,20,00,00,00,\

20,02,00,00,00,00,14,00,8d,01,02,00,01,01,00,00,00,00
,00,05,0b,00,00,00,00,\

00,18,00,fd,01,02,00,01,02,00,00,00,00,00,05,20,00,00
,00,23,02,00,00,01,01,\

00,00,00,00,00,05,12,00,00,00,01,01,00,00,00,00,00,05
,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
\hpqcissd\Enum]
"0"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\4&24ab
e6e9&0&0600004000000000"
"Count"=dword:00000009
"NextInstance"=dword:00000009
"1"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\4&24ab
e6e9&0&0700004000000000"
"2"="HPQCISS\\Disk&VEN_HP&PROD_LOGICAL_VOLUME\\4&24ab
e6e9&0&0800004000000000"
"3"="HPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
1f72f2bd&0&0000004000000000"
"4"="HPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
1f72f2bd&0&0100004000000000"
"5"="HPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
1f72f2bd&0&0200004000000000"
"6"="HPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
1f72f2bd&0&0300004000000000"
"7"="HPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
1f72f2bd&0&0400004000000000"
"8"="HPQCISS\\Disk&VEN_COMPAQ&PROD_LOGICAL_VOLUME\\4&
1f72f2bd&0&0500004000000000"
```

System Summary

```
System Information report written at: 05/25/03
17:40:37
System Name: APARK
[System Summary]

Item      Value
OS Name   Microsoft(R) Windows(R) Server 2003,
Standard Edition
Version   5.2.3790  Build 3790
OS Manufacturer     Microsoft Corporation
System Name         APARK
System Manufacturer HP
System Model        ProLiant DL380 G3
System Type         X86-based PC
Processor x86 Family 15 Model 2 Stepping 7
GenuineIntel ~3060 Mhz
Processor x86 Family 15 Model 2 Stepping 7
GenuineIntel ~3060 Mhz
BIOS Version/Date   HP P29, 3/25/2003
SMBIOS Version      2.3
Windows Directory   C:\WINDOWS
System Directory    C:\WINDOWS\system32
Boot Device         \Device\HarddiskVolume10
Locale    United States
Hardware Abstraction Layer    Version = "5.2.3790.0
(srv03_rtm.030324-2048)"
User Name APARK\Administrator
Time Zone Central Daylight Time
Total Physical Memory        2,048.00 MB
Available Physical Memory    112.72 MB
Total Virtual Memory         5.85 GB
Available Virtual Memory     2.23 GB
Page File Space     3.86 GB
Page File C:\pagefile.sys

[Hardware Resources]



[Conflicts/Sharing]

Resource  Device
I/O Port 0x00000000-0x00000CFF          PCI bus
I/O Port 0x00000000-0x00000CFF          PCI bus
I/O Port 0x00000000-0x00000CFF          Direct memory
access controller
```

```
I/O Port 0x000003C0-0x000003DF          PCI bus
I/O Port 0x000003C0-0x000003DF          RAGE XL PCI
Family (Microsoft Corporation)

I/O Port 0x00003000-0x000030FF          PCI bus
I/O Port 0x00003000-0x000030FF          Smart Array
5i

I/O Port 0x00005000-0x000050FF          PCI bus
I/O Port 0x00005000-0x000050FF          Smart Array
5300 Controller (Non-Miniport)

Memory Address 0xA0000-0xBFFFF          PCI bus
Memory Address 0xA0000-0xBFFFF          RAGE XL PCI
Family (Microsoft Corporation)

Memory Address 0xF5F00000-0xF6FFFFFF    PCI bus
Memory Address 0xF5F00000-0xF6FFFFFF    HP iLO
Management Interface Driver

I/O Port 0x000003B0-0x000003BB          PCI bus
I/O Port 0x000003B0-0x000003BB          RAGE XL PCI
Family (Microsoft Corporation)

I/O Port 0x00004000-0x000040FF          PCI bus
I/O Port 0x00004000-0x000040FF          Smart Array
642 Controller (Non-Miniport)


[DMA]

Resource  Device    Status
Channel 7 Direct memory access controller         OK

Channel 2 Standard floppy disk controller         OK


[Forced Hardware]

Device    PNP Device ID

[I/O]

Resource  Device    Status
0x00000000-0x00000CFF         PCI bus   OK
0x00000000-0x00000CFF         PCI bus   OK
0x00000000-0x00000CFF         Direct memory access
controller          OK
0x000003B0-0x000003BB         PCI bus   OK
0x000003B0-0x000003BB         RAGE XL PCI Family
(Microsoft Corporation)       OK
0x000003C0-0x000003DF         PCI bus   OK
0x000003C0-0x000003DF         RAGE XL PCI Family
(Microsoft Corporation)       OK
0x00002400-0x000024FF         RAGE XL PCI Family
(Microsoft Corporation)       OK
0x00001800-0x000018FF         HP ProLiant iLO
Advanced System Management Controller   OK
0x00002800-0x000028FF         HP iLO Management
Interface Driver    OK
0x00000A79-0x00000A79         ISAPNP Read Data Port
          OK
```

```
0x00000279-0x00000279         ISAPNP Read Data Port
          OK
0x00000274-0x00000277         ISAPNP Read Data Port
          OK
0x00000F50-0x00000F58         Motherboard resources
          OK
0x00000408-0x0000040F         Motherboard resources
          OK
0x00000092-0x00000092         Motherboard resources
          OK
0x00000900-0x00000903         Motherboard resources
          OK
0x00000910-0x00000911         Motherboard resources
          OK
0x00000920-0x00000923         Motherboard resources
          OK
0x00000930-0x00000937         Motherboard resources
          OK
0x00000940-0x00000947         Motherboard resources
          OK
0x00000950-0x00000957         Motherboard resources
          OK
0x00000C06-0x00000C08         Motherboard resources
          OK
0x00000C14-0x00000C14         Motherboard resources
          OK
0x00000C49-0x00000C4A         Motherboard resources
          OK
0x00000C50-0x00000C52         Motherboard resources
          OK
0x00000C6C-0x00000C6F         Motherboard resources
          OK
0x00000010-0x0000001F         Motherboard resources
          OK
0x00000230-0x00000233         Motherboard resources
          OK
0x00000260-0x00000267         Motherboard resources
          OK
0x000004D0-0x000004D1         Motherboard resources
          OK
0x00000700-0x0000070F         Motherboard resources
          OK
0x00000800-0x0000081F         Motherboard resources
          OK
0x00000C80-0x00000C83         Motherboard resources
          OK
0x00000CD4-0x00000CD7         Motherboard resources
          OK
0x00000CF9-0x00000CF9         Motherboard resources
          OK
0x00000020-0x00000021         Programmable interrupt
controller          OK
0x000000A0-0x000000A1         Programmable interrupt
controller          OK
0x00000C00-0x00000C01         Programmable interrupt
controller          OK
0x00000040-0x00000043         System timer        OK

0x00000080-0x0000008F         Direct memory access
controller          OK
0x000000C0-0x000000DF         Direct memory access
controller          OK
```

```
0x0000040B-0x0000040B         Direct memory access
controller          OK
0x000004D6-0x000004D6         Direct memory access
controller          OK
0x00000061-0x00000061         System speaker      OK

0x00000060-0x00000060         Standard 101/102-Key or
Microsoft Natural PS/2 Keyboard         OK
0x00000064-0x00000064         Standard 101/102-Key or
Microsoft Natural PS/2 Keyboard         OK
0x0000002E-0x0000002F         Extended IO Bus     OK

0x00000220-0x00000223         Extended IO Bus     OK

0x00000240-0x0000025F         Extended IO Bus     OK

0x00000070-0x00000073         Extended IO Bus     OK

0x000003F8-0x000003FF         Communications Port
(COM1)    OK
0x000003F2-0x000003F5         Standard floppy disk
controller          OK
0x000003F7-0x000003F7         Standard floppy disk
controller          OK
0x00002000-0x0000200F         CSB5 IDE Controller OK

0x000001F0-0x000001F7         Primary IDE Channel OK

0x000003F6-0x000003F6         Primary IDE Channel OK

0x00000170-0x00000177         Secondary IDE Channel
          OK
0x00000376-0x00000376         Secondary IDE Channel
          OK
0x00003000-0x000030FF         PCI bus   OK
0x00003000-0x000030FF         Smart Array 5i      OK

0x00004000-0x000040FF         PCI bus   OK
0x00004000-0x000040FF         Smart Array 642
Controller (Non-Miniport)     OK
0x00005000-0x000050FF         PCI bus   OK
0x00005000-0x000050FF         Smart Array 5300
Controller (Non-Miniport)     OK

[IRQs]

Resource  Device    Status
IRQ 9     Microsoft ACPI-Compliant System         OK

IRQ 16    HP ProLiant iLO Advanced System Management
Controller          OK
IRQ 17    HP iLO Management Interface Driver      OK

IRQ 0     System timer        OK
IRQ 1     Standard 101/102-Key or Microsoft Natural
PS/2 Keyboard       OK
IRQ 12    PS/2 Compatible Mouse         OK
IRQ 4     Communications Port (COM1)    OK
IRQ 6     Standard floppy disk controller         OK

IRQ 14    Primary IDE Channel OK
IRQ 30    Smart Array 5i      OK
IRQ 29    Compaq NC7781 Gigabit Server Adapter    OK

IRQ 31    Compaq NC7781 Gigabit Server Adapter #2 OK

IRQ 20    Smart Array 642 Controller (Non-Miniport)
          OK
IRQ 24    Smart Array 5300 Controller (Non-Miniport)
          OK
IRQ 18    hp ProLiant PCI Hot Plug Controller (CPQPHP
installed)          OK

[Memory]

Resource  Device    Status
0xA0000-0xBFFFF     PCI bus   OK
0xA0000-0xBFFFF     RAGE XL PCI Family (Microsoft
Corporation)        OK
0xF5F00000-0xF6FFFFFF         PCI bus   OK
0xF5F00000-0xF6FFFFFF         HP iLO Management
Interface Driver    OK
0xF6000000-0xF6FFFFFF         RAGE XL PCI Family
(Microsoft Corporation)       OK
0xF5FF0000-0xF5FF0FFF         RAGE XL PCI Family
(Microsoft Corporation)       OK
0xF5FE0000-0xF5FE01FF         HP ProLiant iLO
Advanced System Management Controller   OK
0xF5FD0000-0xF5FD07FF         HP iLO Management
Interface Driver    OK
0xF5FC0000-0xF5FC1FFF         HP iLO Management
Interface Driver    OK
0xF7900000-0xF7AFFFFF         PCI bus   OK
0xF7AC0000-0xF7AFFFFF         Smart Array 5i      OK

0xF79F0000-0xF79F3FFF         Smart Array 5i      OK

0xF7B00000-0xF7BFFFFF         PCI bus   OK
0xF7BF0000-0xF7BFFFFF         Compaq NC7781 Gigabit
Server Adapter      OK
0xF7BE0000-0xF7BEFFFF         Compaq NC7781 Gigabit
Server Adapter #2   OK
0xF7C00000-0xF7CFFFFF         PCI bus   OK
0xF7CF0000-0xF7CF1FFF         Smart Array 642
Controller (Non-Miniport)     OK
0xF7C80000-0xF7CBFFFF         Smart Array 642
Controller (Non-Miniport)     OK
0xF7D00000-0xF7FFFFFF         PCI bus   OK
0xF7FC0000-0xF7FFFFFF         Smart Array 5300
Controller (Non-Miniport)     OK
0xF7E00000-0xF7EFFFFF         Smart Array 5300
Controller (Non-Miniport)     OK
0xF7DF0000-0xF7DF0FFF         hp ProLiant PCI Hot
Plug Controller (CPQPHP installed)      OK

[Components]



[Multimedia]



[Audio Codecs]
```

```
CODEC     Manufacturer        Description
          Status    File      Version   Size
          Creation Date
c:\windows\system32\sl_anet.acm         Sipro Lab
Telecom Inc.        Sipro Lab Telecom Audio Codec OK
          C:\WINDOWS\system32\SL_ANET.ACM
          3.02      84.00 KB (86,016 bytes)
          3/25/2003 12:00 AM
c:\windows\system32\msaud32.acm         Microsoft
Corporation         Windows Media Audio Codec     OK
          C:\WINDOWS\system32\MSAUD32.ACM
          8.00.00.4487        288.00 KB (294,912
bytes)    3/25/2003 12:00 AM
c:\windows\system32\msadp32.acm         Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSADP32.ACM
          5.2.3790.0 (srv03_rtm.030324-2048)
          14.50 KB (14,848 bytes)       3/25/2003
12:00 AM
c:\windows\system32\msgsm32.acm         Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSGSM32.ACM
          5.2.3790.0 (srv03_rtm.030324-2048)
          20.50 KB (20,992 bytes)       3/25/2003
12:00 AM
c:\windows\system32\imaadp32.acm        Microsoft
Corporation                   OK
          C:\WINDOWS\system32\IMAADP32.ACM
          5.2.3790.0 (srv03_rtm.030324-2048)
          15.50 KB (15,872 bytes)       3/25/2003
12:00 AM
c:\windows\system32\msg711.acm          Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSG711.ACM
          5.2.3790.0 (srv03_rtm.030324-2048)
          10.00 KB (10,240 bytes)       3/25/2003
12:00 AM
c:\windows\system32\msg723.acm          Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSG723.ACM
          4.4.4000  116.00 KB (118,784 bytes)
          5/13/2003 4:41 PM
c:\windows\system32\l3codeca.acm        Fraunhofer
Institut Integrierte Schaltungen IIS    Fraunhofer
IIS MPEG Layer-3 Codec        OK
          C:\WINDOWS\system32\L3CODECA.ACM        1,
9, 0, 0305          284.00 KB (290,816 bytes)
          3/25/2003 12:00 AM
c:\windows\system32\tssoft32.acm        DSP GROUP,
INC.                OK
          C:\WINDOWS\system32\TSSOFT32.ACM
          1.01      9.50 KB (9,728 bytes)
          3/25/2003 12:00 AM

[Video Codecs]

CODEC     Manufacturer        Description
          Status    File      Version   Size
          Creation Date
c:\windows\system32\tsbyuv.dll          Microsoft
Corporation                   OK
          C:\WINDOWS\system32\TSBYUV.DLL
          5.2.3790.0 (srv03_rtm.030324-2048)
```

```
          8.00 KB (8,192 bytes)         3/24/2003
7:50 PM
c:\windows\system32\msrle32.dll         Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSRLE32.DLL
          5.2.3790.0 (srv03_rtm.030324-2048)
          10.50 KB (10,752 bytes)       3/25/2003
12:00 AM
c:\windows\system32\msh261.drv          Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSH261.DRV
          4.4.4000  180.00 KB (184,320 bytes)
          5/13/2003 4:41 PM
c:\windows\system32\msvidc32.dll        Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSVIDC32.DLL
          5.2.3790.0 (srv03_rtm.030324-2048)
          26.50 KB (27,136 bytes)       3/25/2003
12:00 AM
c:\windows\system32\iyuv_32.dll         Microsoft
Corporation                   OK
          C:\WINDOWS\system32\IYUV_32.DLL
          5.2.3790.0 (srv03_rtm.030324-2048)
          45.00 KB (46,080 bytes)       3/24/2003
7:49 PM
c:\windows\system32\msyuv.dll Microsoft Corporation
                    OK
          C:\WINDOWS\system32\MSYUV.DLL 5.2.3790.0
(srv03_rtm.030324-2048)       16.50 KB (16,896 bytes)
          3/24/2003 7:49 PM
c:\windows\system32\msh263.drv          Microsoft
Corporation                   OK
          C:\WINDOWS\system32\MSH263.DRV
          4.4.4000  284.00 KB (290,816 bytes)
          3/24/2003 7:46 PM

[CD-ROM]

Item      Value
Drive     D:
Description         CD-ROM Drive
Media Loaded        No
Media Type          CD-ROM
Name      COMPAQ CD-ROM SN-124
Manufacturer        (Standard CD-ROM drives)
Status    OK
Transfer Rate       Not Available
SCSI Target ID      0
PNP Device ID       IDE\CDROMCOMPAQ_CD-ROM_SN-
124____________________N104____\5&FB0C83D&0&0.0.0
Driver    c:\windows\system32\drivers\cdrom.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 49.50 KB (50,688
bytes), 3/25/2003 12:00 AM)

[Sound Device]

Item      Value

[Display]

Item      Value
Name      RAGE XL PCI Family (Microsoft Corporation)
```

```
PNP Device ID
          PCI\VEN_1002&DEV_4752&SUBSYS_001E0E11&REV_2
7\3&267A616A&0&18
Adapter Type        ATI RAGE XL PCI (B41), ATI
Technologies Inc. compatible
Adapter Description RAGE XL PCI Family (Microsoft
Corporation)
Adapter RAM         8.00 MB (8,388,608 bytes)
Installed Drivers   ati2drad.dll
Driver Version      5.10.3663.6013
INF File  atiixpad.inf (ati2mpad section)
Color Planes        1
Color Table Entries 65536
Resolution          800 x 600 x 60 hertz
Bits/Pixel          16
Memory Address      0xF6000000-0xF6FFFFFF
I/O Port  0x00002400-0x000024FF
Memory Address      0xF5FF0000-0xF5FF0FFF
I/O Port  0x000003B0-0x000003BB
I/O Port  0x000003C0-0x000003DF
Memory Address      0xA0000-0xBFFFF
Driver    c:\windows\system32\drivers\ati2mpad.sys
(5.10.3663.6013, 335.38 KB (343,424 bytes), 6/15/2003
7:32 AM)

[Infrared]

Item      Value

[Input]



[Keyboard]

Item      Value
Description         Standard 101/102-Key or Microsoft
Natural PS/2 Keyboard
Name      Enhanced (101- or 102-key)
Layout    00000409
PNP Device ID       ACPI\PNP0303\4&35118DFF&0
Number of Function Keys       12
I/O Port  0x00000060-0x00000060
I/O Port  0x00000064-0x00000064
IRQ Channel         IRQ 1
Driver    c:\windows\system32\drivers\i8042prt.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 68.50 KB (70,144
bytes), 3/25/2003 12:00 AM)

[Pointing Device]

Item      Value
Hardware Type       PS/2 Compatible Mouse
Number of Buttons   5
Status    OK
PNP Device ID       ACPI\PNP0F13\4&35118DFF&0
Power Management Supported    No
Double Click Threshold        6
Handedness          Right Handed Operation
IRQ Channel         IRQ 12
Driver    c:\windows\system32\drivers\i8042prt.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 68.50 KB (70,144
bytes), 3/25/2003 12:00 AM)
```

```

[Modem]

Item      Value

[Network]



[Adapter]

Item      Value
Name      [00000001] Compaq NC7781 Gigabit Server
Adapter
Adapter Type        Ethernet 802.3
Product Type        Compaq NC7781 Gigabit Server
Adapter
Installed Yes
PNP Device ID
          PCI\VEN_14E4&DEV_16A7&SUBSYS_00CB0E11&REV_0
2\3&1070020&0&08
Last Reset          5/25/2003 5:08 AM
Index     1
Service Name        q57w2k
IP Address          130.168.202.6
IP Subnet 255.255.0.0
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         00:02:A5:EF:51:D7
Memory Address      0xF7BF0000-0xF7BFFFFF
IRQ Channel         IRQ 29
Driver    c:\windows\system32\drivers\q57xp32.sys
(2.90.0.0 built by: WinDDK, 137.00 KB (140,288
bytes), 5/13/2003 6:28 PM)

Name      [00000002] Compaq NC7781 Gigabit Server
Adapter
Adapter Type        Ethernet 802.3
Product Type        Compaq NC7781 Gigabit Server
Adapter
Installed Yes
PNP Device ID
          PCI\VEN_14E4&DEV_16A7&SUBSYS_00CB0E11&REV_0
2\3&1070020&0&10
Last Reset          5/25/2003 5:08 AM
Index     2
Service Name        q57w2k
IP Address          0.0.0.0
IP Subnet 0.0.0.0
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         00:02:A5:EF:51:D6
Memory Address      0xF7BE0000-0xF7BEFFFF
IRQ Channel         IRQ 31
Driver    c:\windows\system32\drivers\q57xp32.sys
(2.90.0.0 built by: WinDDK, 137.00 KB (140,288
bytes), 5/13/2003 6:28 PM)
```

```

Name      [00000003] RAS Async Adapter
Adapter Type        Not Available
Product Type        RAS Async Adapter
Installed Yes
PNP Device ID       Not Available
Last Reset          5/25/2003 5:08 AM
Index     3
Service Name        AsyncMac
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available

Name      [00000004] WAN Miniport (L2TP)
Adapter Type        Not Available
Product Type        WAN Miniport (L2TP)
Installed Yes
PNP Device ID       ROOT\MS_L2TPMINIPORT\0000
Last Reset          5/25/2003 5:08 AM
Index     4
Service Name        Rasl2tp
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Driver    c:\windows\system32\drivers\rasl2tp.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 77.00 KB (78,848
bytes), 3/25/2003 12:00 AM)

Name      [00000005] WAN Miniport (PPTP)
Adapter Type        Wide Area Network (WAN)
Product Type        WAN Miniport (PPTP)
Installed Yes
PNP Device ID       ROOT\MS_PPTPMINIPORT\0000
Last Reset          5/25/2003 5:08 AM
Index     5
Service Name        PptpMiniport
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         50:50:54:50:30:30
Driver    c:\windows\system32\drivers\raspptp.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 70.50 KB (72,192
bytes), 3/25/2003 12:00 AM)

Name      [00000006] WAN Miniport (PPPOE)
Adapter Type        Wide Area Network (WAN)
Product Type        WAN Miniport (PPPOE)
Installed Yes
PNP Device ID       ROOT\MS_PPPOEMINIPORT\0000
```

```
Last Reset          5/25/2003 5:08 AM
Index     6
Service Name        RasPppoe
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         33:50:6F:45:30:30
Driver    c:\windows\system32\drivers\raspppoe.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 38.00 KB (38,912
bytes), 3/25/2003 12:00 AM)

Name      [00000007] Direct Parallel
Adapter Type        Not Available
Product Type        Direct Parallel
Installed Yes
PNP Device ID       ROOT\MS_PTIMINIPORT\0000
Last Reset          5/25/2003 5:08 AM
Index     7
Service Name        Raspti
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Driver    c:\windows\system32\drivers\raspti.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 18.50 KB (18,944
bytes), 3/25/2003 12:00 AM)

Name      [00000008] WAN Miniport (IP)
Adapter Type        Not Available
Product Type        WAN Miniport (IP)
Installed Yes
PNP Device ID       ROOT\MS_NDISWANIP\0000
Last Reset          5/25/2003 5:08 AM
Index     8
Service Name        NdisWan
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Driver    c:\windows\system32\drivers\ndiswan.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 96.50 KB (98,816
bytes), 3/25/2003 12:00 AM)

[Protocol]

Item      Value
Name      MSAFD Tcpip [TCP/IP]
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          16 bytes
```

```
Maximum Message Size          0 bytes
Message Oriented    No
Minimum Address Size          16 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       Yes
Supports Graceful Closing     Yes
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD Tcpip [UDP/IP]
Connectionless Service        Yes
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          16 bytes
Maximum Message Size          63.93 KB (65,467 bytes)

Message Oriented    Yes
Minimum Address Size          16 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         Yes

Name      RSVP UDP Service Provider
Connectionless Service        Yes
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          16 bytes
Maximum Message Size          63.93 KB (65,467 bytes)

Message Oriented    Yes
Minimum Address Size          16 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption Yes
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         Yes

Name      RSVP TCP Service Provider
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          16 bytes
Maximum Message Size          0 bytes
Message Oriented    No
Minimum Address Size          16 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
```

```
Supports Encryption Yes
Supports Expedited Data       Yes
Supports Graceful Closing     Yes
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{C3E772CD-FA29-4CBA-BB45-
53319FF2ABF4}] SEQPACKET 0
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{C3E772CD-FA29-4CBA-BB45-
53319FF2ABF4}] DATAGRAM 0
Connectionless Service        Yes
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{E48E3C52-1FC8-4B15-B5F1-
3FE5591B4B52}] SEQPACKET 1
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{E48E3C52-1FC8-4B15-B5F1-
3FE5591B4B52}] DATAGRAM 1
Connectionless Service        Yes
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{8A6D5B49-37B2-4050-9548-
A3CCD3A91793}] SEQPACKET 2
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{8A6D5B49-37B2-4050-9548-
A3CCD3A91793}] DATAGRAM 2
Connectionless Service        Yes
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
```

```
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{EB514B65-FE0F-45F7-9A9C-
DC858F8B6169}] SEQPACKET 3
Connectionless Service        No
Guarantees Delivery Yes
Guarantees Sequencing         Yes
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         No
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{EB514B65-FE0F-45F7-9A9C-
DC858F8B6169}] DATAGRAM 3
Connectionless Service        Yes
Guarantees Delivery No
Guarantees Sequencing         No
Maximum Address Size          20 bytes
Maximum Message Size          62.50 KB (64,000 bytes)

Message Oriented    Yes
Minimum Address Size          20 bytes
Pseudo Stream Oriented        No
Supports Broadcasting         Yes
Supports Connect Data         No
Supports Disconnect Data      No
Supports Encryption No
Supports Expedited Data       No
Supports Graceful Closing     No
Supports Guaranteed Bandwidth No
Supports Multicasting         No

[WinSock]

Item      Value
File      c:\windows\system32\winsock.dll
Size      2.80 KB (2,864 bytes)
Version   3.10

File      c:\windows\system32\wsock32.dll
Size      22.00 KB (22,528 bytes)
Version   5.2.3790.0 (srv03_rtm.030324-2048)

[Ports]
```

```
[Serial]

Item      Value
Name      Communications Port (COM1)
Status    OK
PNP Device ID       ACPI\PNP0501\0
Maximum Input Buffer Size     0
Maximum Output Buffer Size    No
Settable Baud Rate  Yes
Settable Data Bits  Yes
Settable Flow Control         Yes
Settable Parity     Yes
Settable Parity Check         Yes
Settable Stop Bits  Yes
Settable RLSD       Yes
Supports RLSD       Yes
Supports 16 Bit Mode          No
Supports Special Characters   No
Baud Rate 9600
Bits/Byte 8
Stop Bits 1
Parity    None
Busy      No
Abort Read/Write on Error     No
Binary Mode Enabled Yes
Continue XMit on XOff         No
CTS Outflow Control No
Discard NULL Bytes  No
DSR Outflow Control 0
DSR Sensitivity     0
DTR Flow Control Type         Enable
EOF Character       0
Error Replace Character       0
Error Replacement Enabled     No
Event Character     0
Parity Check Enabled          No
RTS Flow Control Type         Enable
XOff Character      19
XOffXMit Threshold  512
XOn Character       17
XOnXMit Threshold   2048
XOnXOff InFlow Control        0
XOnXOff OutFlow Control       0
IRQ Channel         IRQ 4
I/O Port  0x000003F8-0x000003FF
Driver    c:\windows\system32\drivers\serial.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 76.00 KB (77,824
bytes), 3/25/2003 12:00 AM)

[Parallel]

Item      Value

[Storage]



[Drives]

Item      Value
Drive     A:
Description         3 1/2 Inch Floppy Drive
```

```
Drive     C:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size      16.00 GB (17,179,590,656 bytes)
Free Space          12.05 GB (12,933,713,920 bytes)

Volume Name
Volume Serial Number          541B82FD

Drive     D:
Description         CD-ROM Disc

Drive     E:
Description         Local Fixed Disk
Compressed          Not Available
File System         Not Available
Size      Not Available
Free Space          Not Available
Volume Name         Not Available
Volume Serial Number          Not Available

Drive     F:
Description         Local Fixed Disk
Compressed          Not Available
File System         Not Available
Size      Not Available
Free Space          Not Available
Volume Name         Not Available
Volume Serial Number          Not Available

Drive     G:
Description         Local Fixed Disk
Compressed          Not Available
File System         Not Available
Size      Not Available
Free Space          Not Available
Volume Name         Not Available
Volume Serial Number          Not Available

Drive     H:
Description         Local Fixed Disk
Compressed          Not Available
File System         Not Available
Size      Not Available
Free Space          Not Available
Volume Name         Not Available
Volume Serial Number          Not Available

Drive     I:
Description         Local Fixed Disk
Compressed          Not Available
File System         Not Available
Size      Not Available
Free Space          Not Available
Volume Name         Not Available
Volume Serial Number          Not Available

Drive     J:
Description         Local Fixed Disk
Compressed          Not Available
File System         Not Available
Size      Not Available
Free Space          Not Available
Volume Name         Not Available
Volume Serial Number          Not Available

Drive     K:
Description         Local Fixed Disk
Compressed          Not Available
File System         Not Available
Size      Not Available
Free Space          Not Available
Volume Name         Not Available
Volume Serial Number          Not Available

Drive     X:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size      80.00 GB (85,896,564,736 bytes)
Free Space          36.59 GB (39,288,156,160 bytes)

Volume Name         backup0
Volume Serial Number          DCCD2CDC

Drive     Y:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size      80.00 GB (85,896,564,736 bytes)
Free Space          36.59 GB (39,288,156,160 bytes)

Volume Name         backup1
Volume Serial Number          88E6F8F5

Drive     Z:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size      80.00 GB (85,896,564,736 bytes)
Free Space          40.36 GB (43,339,857,920 bytes)

Volume Name         backup2
Volume Serial Number          6CFEACE1

[Disks]

Item      Value
Description         \\.\PHYSICALDRIVE3
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      31.44 GB (33,756,549,120 bytes)
Total Cylinders     4,104
Total Sectors       65,930,760
Total Tracks        1,046,520
Tracks/Cylinder     255
Partition Disk #3, Partition #0
Partition Size      31.44 GB (33,756,516,864 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE4
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      15.39 GB (16,524,587,520 bytes)
Total Cylinders     2,009
Total Sectors       32,274,585
Total Tracks        512,295
Tracks/Cylinder     255
Partition Disk #4, Partition #0
Partition Size      15.39 GB (16,524,555,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE5
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      80.00 GB (85,896,599,040 bytes)
Total Cylinders     10,443
Total Sectors       167,766,795
Total Tracks        2,662,965
Tracks/Cylinder     255
Partition Disk #5, Partition #0
Partition Size      80.00 GB (85,896,566,784 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE6
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      31.44 GB (33,756,549,120 bytes)
Total Cylinders     4,104
Total Sectors       65,930,760
Total Tracks        1,046,520
Tracks/Cylinder     255
Partition Disk #6, Partition #0
Partition Size      31.44 GB (33,756,516,864 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE7
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      15.39 GB (16,524,587,520 bytes)
Total Cylinders     2,009
Total Sectors       32,274,585
Total Tracks        512,295
Tracks/Cylinder     255
Partition Disk #7, Partition #0
Partition Size      15.39 GB (16,524,555,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE8
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      80.00 GB (85,896,599,040 bytes)
Total Cylinders     10,443
Total Sectors       167,766,795
Total Tracks        2,662,965
Tracks/Cylinder     255
Partition Disk #8, Partition #0
Partition Size      80.00 GB (85,896,566,784 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE0
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      31.44 GB (33,756,549,120 bytes)
Total Cylinders     4,104
Total Sectors       65,930,760
Total Tracks        1,046,520
Tracks/Cylinder     255
Partition Disk #0, Partition #0
Partition Size      31.44 GB (33,756,516,864 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE1
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      15.39 GB (16,524,587,520 bytes)
Total Cylinders     2,009
Total Sectors       32,274,585
Total Tracks        512,295
Tracks/Cylinder     255
Partition Disk #1, Partition #0
Partition Size      15.39 GB (16,524,555,264 bytes)

Partition Starting Offset     32,256 bytes

Description         \\.\PHYSICALDRIVE2
Manufacturer        Not Available
Model     Not Available
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  Not Available
SCSI Logical Unit   Not Available
SCSI Port Not Available
SCSI Target ID      Not Available
Sectors/Track       63
Size      80.00 GB (85,896,599,040 bytes)
Total Cylinders     10,443
Total Sectors       167,766,795
Total Tracks        2,662,965
Tracks/Cylinder     255
Partition Disk #2, Partition #0
Partition Size      80.00 GB (85,896,566,784 bytes)

Partition Starting Offset     32,256 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     COMPAQ LOGICAL VOLUME SCSI Disk Device
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  0
SCSI Logical Unit   0
SCSI Port 2
SCSI Target ID      4
Sectors/Track       32
Size      16.00 GB (17,179,607,040 bytes)
Total Cylinders     4,112
Total Sectors       33,553,920
Total Tracks        1,048,560
Tracks/Cylinder     255
Partition Disk #9, Partition #0
Partition Size      16.00 GB (17,179,590,656 bytes)

Partition Starting Offset     16,384 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model     COMPAQ LOGICAL VOLUME SCSI Disk Device
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions          1
SCSI Bus  0
SCSI Logical Unit   0
SCSI Port 2
SCSI Target ID      5
Sectors/Track       32
Size      51.83 GB (55,654,072,320 bytes)
Total Cylinders     13,321
Total Sectors       108,699,360
Total Tracks        3,396,855
Tracks/Cylinder     255
Partition Disk #10, Partition #0
Partition Size      51.83 GB (55,649,878,016 bytes)

Partition Starting Offset     16,384 bytes

[SCSI]

Item      Value
Name      Smart Array 5i
Manufacturer        Hewlett-Packard Company
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_B178&SUBSYS_40800E11&REV_0
1\3&13C0B0C5&0&18
Memory Address      0xF7AC0000-0xF7AFFFFF
I/O Port  0x00003000-0x000030FF
Memory Address      0xF79F0000-0xF79F3FFF
IRQ Channel         IRQ 30
Driver    c:\windows\system32\drivers\cpqcissm.sys
(5.44.0.32 Build 1, 15.20 KB (15,568 bytes),
5/13/2003 6:20 PM)

Name      Smart Array 642 Controller (Non-Miniport)

Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_0046&SUBSYS_409B0E11&REV_0
1\3&29E81982&0&08
Memory Address      0xF7CF0000-0xF7CF1FFF
I/O Port  0x00004000-0x000040FF
Memory Address      0xF7C80000-0xF7CBFFFF
```

```
IRQ Channel         IRQ 20
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.6.2.32 built by: WinDDK, 38.00 KB (38,912 bytes),
5/13/2003 6:51 PM)

Name      Smart Array 5300 Controller (Non-Miniport)

Manufacturer        Hewlett-Packard
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_0
2\3&172E68DD&0&08
Memory Address      0xF7FC0000-0xF7FFFFFF
Memory Address      0xF7E00000-0xF7EFFFFF
I/O Port  0x00005000-0x000050FF
IRQ Channel         IRQ 24
Driver    c:\windows\system32\drivers\hpqcissb.sys
(5.6.2.32 built by: WinDDK, 38.00 KB (38,912 bytes),
5/13/2003 6:51 PM)

[IDE]

Item      Value
Name      CSB5 IDE Controller
Manufacturer        ServerWorks
Status    OK
PNP Device ID
          PCI\VEN_1166&DEV_0212&SUBSYS_02121166&REV_9
3\3&267A616A&0&79
I/O Port  0x00002000-0x0000200F
Driver    c:\windows\system32\drivers\pciide.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 5.50 KB (5,632
bytes), 3/25/2003 12:00 AM)

Name      Primary IDE Channel
Manufacturer        (Standard IDE ATA/ATAPI
controllers)
Status    OK
PNP Device ID       PCIIDE\IDECHANNEL\4&1024D5C6&0&0

I/O Port  0x000001F0-0x000001F7
I/O Port  0x000003F6-0x000003F6
IRQ Channel         IRQ 14
Driver    c:\windows\system32\drivers\atapi.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 89.00 KB (91,136
bytes), 3/25/2003 12:00 AM)

Name      Secondary IDE Channel
Manufacturer        (Standard IDE ATA/ATAPI
controllers)
Status    OK
PNP Device ID       PCIIDE\IDECHANNEL\4&1024D5C6&0&1

I/O Port  0x00000170-0x00000177
I/O Port  0x00000376-0x00000376
Driver    c:\windows\system32\drivers\atapi.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 89.00 KB (91,136
bytes), 3/25/2003 12:00 AM)

[Printing]

Name      Driver    Port Name Server Name
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```
[Problem Devices]

Device    PNP Device ID       Error Code

[USB]

Device    PNP Device ID

[Software Environment]



[System Drivers]

Name      Description         File      Type
          Started   Start Mode          State
          Status    Error Control       Accept Pause
          Accept Stop
abiosdsk  Abiosdsk  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Ignore    No        No
acpi      Microsoft ACPI Driver
          c:\windows\system32\drivers\acpi.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

acpiec    ACPIEC
          c:\windows\system32\drivers\acpiec.sys
          Kernel Driver       No        Disabled
          Stopped   OK        Normal    No        No

adpu160m  adpu160m  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
adpu320   adpu320   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
afcnt     afcnt     Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
afd       AFD Networking Support Environment
          c:\windows\system32\drivers\afd.sys
          Kernel Driver       Yes       Auto
          Running   OK        Normal    No        Yes

aha154x   Aha154x   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
aic78u2   aic78u2   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
aic78xx   aic78xx   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
aliide    AliIde    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
alkernel  Altiris Kernel Driver
          c:\windows\system32\drivers\alkernel.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes
```

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asyncmac  RAS Asynchronous Media Driver
          c:\windows\system32\drivers\asyncmac.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

atapi     Standard IDE/ESDI Hard Disk Controller
          c:\windows\system32\drivers\atapi.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

atdisk    Atdisk    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Ignore    No        No
ati2mpad  ati2mpad
          c:\windows\system32\drivers\ati2mpad.sys
          Kernel Driver       Yes       Manual
          Running   OK        Ignore    No        Yes

atmarpc   ATM ARP Client Protocol
          c:\windows\system32\drivers\atmarpc.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

audstub   Audio Stub Driver
          c:\windows\system32\drivers\audstub.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

b57w2k    BCM5703 Gigabit Ethernet
          c:\windows\system32\drivers\b57xp32.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

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

cbidf2k   cbidf2k
          c:\windows\system32\drivers\cbidf2k.sys
          Kernel Driver       No        Disabled
          Stopped   OK        Normal    No        No

cd20xrnt  cd20xrnt  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
cdfs      Cdfs
          c:\windows\system32\drivers\cdfs.sys
          File System Driver  Yes       Disabled
          Running   OK        Normal    No        Yes

cdrom     CD-ROM Driver
          c:\windows\system32\drivers\cdrom.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

changer   Changer   Not Available       Kernel Driver
          No        System    Stopped   OK
          Ignore    No        No
clusdisk  Cluster Disk Driver
          c:\windows\system32\drivers\clusdisk.sys
          Kernel Driver       No        Disabled
          Stopped   OK        Normal    No        No

cmdide    CmdIde    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
cpqarray  Cpqarray  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
cpqarry2  cpqarry2  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
cpqasm2   HP ProLiant iLO Advanced System Management
Controller
          c:\windows\system32\drivers\cpqasm2.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

cpqcidrv  HP Integrated Lights-Out
          c:\windows\system32\drivers\cpqcidrv.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

cpqcisse  CPQCISSE
          c:\windows\system32\drivers\cpqcisse.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

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

cpqfcalm  cpqfcalm  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
cpqphp    hp ProLiant PCI Hot Plug Controller (CPQPHP
installed)
          c:\windows\system32\drivers\cpqphp.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

cpqteam   HP Network Teaming and Configuration
          c:\windows\system32\drivers\cpqteam.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

crcdisk   CRC Disk Filter Driver
          c:\windows\system32\drivers\crcdisk.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

dac960nt  dac960nt  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
dellcerc  dellcerc  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
dfsdriver DfsDriver
          c:\windows\system32\drivers\dfs.sys
          File System Driver  Yes       Boot
          Running   OK        Normal    No        Yes
```

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

dmboot    dmboot
          c:\windows\system32\drivers\dmboot.sys
          Kernel Driver       No        Disabled
          Stopped   OK        Normal    No        No

dmio      Logical Disk Manager Driver
          c:\windows\system32\drivers\dmio.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

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

dpti2o    dpti2o    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
fastfat   Fastfat
          c:\windows\system32\drivers\fastfat.sys
          File System Driver  No        Disabled
          Stopped   OK        Normal    No        No

fdc       Floppy Disk Controller Driver
          c:\windows\system32\drivers\fdc.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

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

flpydisk  Floppy Disk Driver
          c:\windows\system32\drivers\flpydisk.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

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

gpc       Generic Packet Classifier
          c:\windows\system32\drivers\msgpc.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

hpn       hpn       Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
hpqcissb  Smart Array Controllers Non-Miniport Bus
Driver    c:\windows\system32\drivers\hpqcissb.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

hpqcissd  Smart Array Controllers Non-Miniport Disk
Driver    c:\windows\system32\drivers\hpqcissd.sys
```

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          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

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

i2omgmt   i2omgmt   Not Available       Kernel Driver
          No        System    Stopped   OK
          Normal    No        No
i2omp     i2omp     Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
i8042prt  i8042 Keyboard and PS/2 Mouse Port Driver
          c:\windows\system32\drivers\i8042prt.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

iirsp     iirsp     Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
imapi     CD-Burning Filter Driver
          c:\windows\system32\drivers\imapi.sys
          Kernel Driver       No        System
          Stopped   OK        Normal    No        No

intelide  IntelIde  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ipfilterdriver      IP Traffic Filter Driver
          c:\windows\system32\drivers\ipfltdrv.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

ipinip    IP in IP Tunnel Driver
          c:\windows\system32\drivers\ipinip.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

ipnat     IP Network Address Translator
          c:\windows\system32\drivers\ipnat.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

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

ipsraidn  ipsraidn  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
irenum    IR Enumerator Service
          c:\windows\system32\drivers\irenum.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

isapnp    PnP ISA/EISA Bus Driver
          c:\windows\system32\drivers\isapnp.sys
          Kernel Driver       Yes       Boot
          Running   OK        Critical  No        Yes

kbdclass  Keyboard Class Driver
          c:\windows\system32\drivers\kbdclass.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

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

lp6nds35  lp6nds35  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
mnmdd     mnmdd
          c:\windows\system32\drivers\mnmdd.sys
          Kernel Driver       Yes       System
          Running   OK        Ignore    No        Yes

modem     Modem
          c:\windows\system32\drivers\modem.sys
          Kernel Driver       No        Manual
          Stopped   OK        Ignore    No        No

mouclass  Mouse Class Driver
          c:\windows\system32\drivers\mouclass.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

mountmgr  Mount Point Manager
          c:\windows\system32\drivers\mountmgr.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

mraid35x  mraid35x  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
mrxdav    WebDav Client Redirector
          c:\windows\system32\drivers\mrxdav.sys
          File System Driver  No        Manual
          Stopped   OK        Normal    No        No

mrxsmb    MRXSMB
          c:\windows\system32\drivers\mrxsmb.sys
          File System Driver  Yes       System
          Running   OK        Normal    No        Yes

msfs      Msfs
          c:\windows\system32\drivers\msfs.sys
          File System Driver  Yes       System
          Running   OK        Normal    No        Yes

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

ndis      NDIS System Driver
          c:\windows\system32\drivers\ndis.sys
          Kernel Driver       Yes       Boot
```

```
          Running   OK        Normal    No        Yes

ndistapi  Remote Access NDIS TAPI Driver
          c:\windows\system32\drivers\ndistapi.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

ndisuio   NDIS Usermode I/O Protocol
          c:\windows\system32\drivers\ndisuio.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

ndiswan   Remote Access NDIS WAN Driver
          c:\windows\system32\drivers\ndiswan.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

ndproxy   NDIS Proxy
          c:\windows\system32\drivers\ndproxy.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

netbios   NetBIOS Interface
          c:\windows\system32\drivers\netbios.sys
          File System Driver  Yes       System
          Running   OK        Normal    No        Yes

netbt     NetBios over Tcpip
          c:\windows\system32\drivers\netbt.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

nfrd960   nfrd960   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
npfs      Npfs
          c:\windows\system32\drivers\npfs.sys
          File System Driver  Yes       System
          Running   OK        Normal    No        Yes

ntfs      Ntfs
          c:\windows\system32\drivers\ntfs.sys
          File System Driver  Yes       Disabled
          Running   OK        Normal    No        Yes

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

parport   Parport
          c:\windows\system32\drivers\parport.sys
          Kernel Driver       No        Manual
          Stopped   OK        Ignore    No        No

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

pci       PCI Bus Driver
          c:\windows\system32\drivers\pci.sys
          Kernel Driver       Yes       Boot
```

```
          Running   OK        Critical  No        Yes

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

pcmcia    Pcmcia
          c:\windows\system32\drivers\pcmcia.sys
          Kernel Driver       No        Disabled
          Stopped   OK        Normal    No        No

pdcomp    PDCOMP    Not Available       Kernel Driver
          No        Manual    Stopped   OK
          Ignore    No        No
pdframe   PDFRAME   Not Available       Kernel Driver
          No        Manual    Stopped   OK
          Ignore    No        No
pdreli    PDRELI    Not Available       Kernel Driver
          No        Manual    Stopped   OK
          Ignore    No        No
pdrframe  PDRFRAME  Not Available       Kernel Driver
          No        Manual    Stopped   OK
          Ignore    No        No
perc2     perc2     Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
perc2hib  perc2hib  Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
pptpminiport        WAN Miniport (PPTP)
          c:\windows\system32\drivers\raspptp.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

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

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

q57w2k    Compaq NC7781 Gigabit Server Adapter
          c:\windows\system32\drivers\q57xp32.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

ql1080    ql1080    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ql10wnt   Ql10wnt   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ql12160   ql12160   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ql1240    ql1240    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
```

```
ql1280    ql1280    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ql2100    ql2100    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ql2200    ql2200    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
ql2300    ql2300    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
rasacd    Remote Access Auto Connection Driver
          c:\windows\system32\drivers\rasacd.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

rasl2tp   WAN Miniport (L2TP)
          c:\windows\system32\drivers\rasl2tp.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

raspppoe  Remote Access PPPOE Driver
          c:\windows\system32\drivers\raspppoe.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

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

rdbss     Rdbss
          c:\windows\system32\drivers\rdbss.sys
          File System Driver  Yes       System
          Running   OK        Normal    No        Yes

rdpcdd    RDPCDD
          c:\windows\system32\drivers\rdpcdd.sys
          Kernel Driver       Yes       System
          Running   OK        Ignore    No        Yes

rdpdr     Terminal Server Device Redirector Driver
          c:\windows\system32\drivers\rdpdr.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

rdpwd     RDPWD
          c:\windows\system32\drivers\rdpwd.sys
          Kernel Driver       Yes       Manual
          Running   OK        Ignore    No        Yes

redbook   Digital CD Audio Playback Filter Driver
          c:\windows\system32\drivers\redbook.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

secdrv    Secdrv
          c:\windows\system32\drivers\secdrv.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No
```

```
serenum   Serenum Filter Driver
          c:\windows\system32\drivers\serenum.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

serial    Serial port driver
          c:\windows\system32\drivers\serial.sys
          Kernel Driver       Yes       System
          Running   OK        Ignore    No        Yes

sfloppy   Sfloppy
          c:\windows\system32\drivers\sfloppy.sys
          Kernel Driver       No        System
          Stopped   OK        Ignore    No        No

simbad    Simbad    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
sparrow   Sparrow   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
srv       Srv
          c:\windows\system32\drivers\srv.sys
          File System Driver  Yes       Manual
          Running   OK        Normal    No        Yes

swenum    Software Bus Driver
          c:\windows\system32\drivers\swenum.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

symc810   symc810   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
symc8xx   symc8xx   Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
symmpi    symmpi    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
sym_hi    sym_hi    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
sym_u3    sym_u3    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
sysmgmt   HP ProLiant System Management Interface
Driver    c:\windows\system32\drivers\sysmgmt.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

tcpip     TCP/IP Protocol Driver
          c:\windows\system32\drivers\tcpip.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes

tdpipe    TDPIPE
          c:\windows\system32\drivers\tdpipe.sys
          Kernel Driver       No        Manual
          Stopped   OK        Ignore    No        No

tdtcp     TDTCP
          c:\windows\system32\drivers\tdtcp.sys
```

```
          Kernel Driver       Yes       Manual
          Running   OK        Ignore    No        Yes
termdd    Terminal Device Driver
          c:\windows\system32\drivers\termdd.sys
          Kernel Driver       Yes       System
          Running   OK        Normal    No        Yes
toside    TosIde    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
udfs      Udfs
          c:\windows\system32\drivers\udfs.sys
          File System Driver  No        Disabled
          Stopped   OK        Normal    No        No

ultra     ultra     Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
update    Microcode Update Driver
          c:\windows\system32\drivers\update.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

usbhub    USB2 Enabled Hub
          c:\windows\system32\drivers\usbhub.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

usbohci   Microsoft USB Open Host Controller Miniport
Driver    c:\windows\system32\drivers\usbohci.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No

vgasave   VGA Display Controller.
          c:\windows\system32\drivers\vga.sys
          Kernel Driver       Yes       System
          Running   OK        Ignore    No        Yes

viaide    ViaIde    Not Available       Kernel Driver
          No        Disabled  Stopped   OK
          Normal    No        No
volsnap   Storage volumes
          c:\windows\system32\drivers\volsnap.sys
          Kernel Driver       Yes       Boot
          Running   OK        Normal    No        Yes

wanarp    Remote Access IP ARP Driver
          c:\windows\system32\drivers\wanarp.sys
          Kernel Driver       Yes       Manual
          Running   OK        Normal    No        Yes

wdica     WDICA     Not Available       Kernel Driver
          No        Manual    Stopped   OK
          Ignore    No        No
wlbs      Network Load Balancing
          c:\windows\system32\drivers\wlbs.sys
          Kernel Driver       No        Manual
          Stopped   OK        Normal    No        No


[Signed Drivers]
```

```
Device Name         Signed    Device Class
          Driver Version      Driver Date
          Manufacturer        INF Name  Driver Name
          Device ID
Not Available       Not Available       Not Available
          Not Available       Not Available       Not
Available Not Available       Not Available
          HTREE\ROOT\0
ACPI Multiprocessor PC        Yes       COMPUTER
          5.2.3790.0          10/1/2002 (Standard
computers)          hal.inf   Not Available
          ROOT\ACPI_HAL\0000
Microsoft ACPI-Compliant System         Yes
          SYSTEM    5.2.3790.0          10/1/2002
          Microsoft acpi.inf  Not Available
          ACPI_HAL\PNP0C08\0
Processor Yes       PROCESSOR 5.2.3790.0
          10/1/2002 (Standard processor types)
          cpu.inf   Not Available
          ACPI\GENUINEINTEL_-
_X86_FAMILY_15_MODEL_2\_6
Processor Yes       PROCESSOR 5.2.3790.0
          10/1/2002 (Standard processor types)
          cpu.inf   Not Available
          ACPI\GENUINEINTEL_-
_X86_FAMILY_15_MODEL_2\_7
PCI bus   Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0A03\0
ServerWorks (RCC) CMIC_LE Processor to PCI Bridge(*)
          Yes       SYSTEM    5.2.3790.0
          10/1/2002 ServerWorks (RCC)   machine.inf
          Not Available
          PCI\VEN_1166&DEV_0014&SUBSYS_00000000&REV_3
1\3&267A616A&0&00
ServerWorks (RCC) CMIC_LE Processor to PCI Bridge(*)
          Yes       SYSTEM    5.2.3790.0
          10/1/2002 ServerWorks (RCC)   machine.inf
          Not Available
          PCI\VEN_1166&DEV_0014&SUBSYS_00000000&REV_0
0\3&267A616A&0&01
ServerWorks (RCC) CMIC_LE Processor to PCI Bridge(*)
          Yes       SYSTEM    5.2.3790.0
          10/1/2002 ServerWorks (RCC)   machine.inf
          Not Available
          PCI\VEN_1166&DEV_0014&SUBSYS_00000000&REV_0
0\3&267A616A&0&02
RAGE XL PCI Family (Microsoft Corporation)        Yes
          DISPLAY   5.10.2600.6014      8/8/2001  ATI
Technologies Inc.   atiixpad.inf        Not Available
          PCI\VEN_1002&DEV_4752&SUBSYS_001E0E11&REV_2
7\3&267A616A&0&18
Plug and Play Monitor         Yes       MONITOR
          5.1.2001.0          6/6/2001  (Standard
monitor types)      monitor.inf         Not Available
          DISPLAY\AVO0402\4&89B5141&0&80000001&00&03

HP ProLiant iLO Advanced System Management Controller
          Yes       SYSTEM    5.30.3718.0
          3/20/2003 Compaq    oem2.inf  Not Available
          PCI\VEN_0E11&DEV_B203&SUBSYS_B2060E11&REV_0
1\3&267A616A&0&20
```

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HP iLO Management Interface Driver      Yes
          MULTIFUNCTION       1.4.0.0   9/4/2002
          Hewlett-Packard Company       oem4.inf  Not
Available
          PCI\VEN_0E11&DEV_B204&SUBSYS_B2060E11&REV_0
1\3&267A616A&0&22
PCI standard ISA bridge       Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          PCI\VEN_1166&DEV_0201&SUBSYS_00000000&REV_9
3\3&267A616A&0&78
ISAPNP Read Data Port         Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ISAPNP\READDATAPORT\0
Motherboard resources         Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ACPI\PNP0C02\0
Programmable interrupt controller       Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          ACPI\PNP0000\4&35118DFF&0
System timer        Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0100\4&35118DFF&0
Direct memory access controller         Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available
          ACPI\PNP0200\4&35118DFF&0
System speaker      Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0800\4&35118DFF&0
Standard 101/102-Key or Microsoft Natural PS/2
Keyboard  Yes       KEYBOARD  5.2.3790.0
          10/1/2002 (Standard keyboards)
          keyboard.inf        Not Available
          ACPI\PNP0303\4&35118DFF&0
PS/2 Compatible Mouse         Yes       MOUSE
          5.2.3790.0          10/1/2002 Microsoft
          msmouse.inf         Not Available
          ACPI\PNP0F13\4&35118DFF&0
Extended IO Bus     Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0A06\4&35118DFF&0
Communications Port Yes       PORTS     5.2.3790.0
          10/1/2002 (Standard port types)
          msports.inf         Not Available
          ACPI\PNP0501\0
Standard floppy disk controller         Yes       FDC
          5.2.3790.0          10/1/2002 (Standard
floppy disk controllers)      fdc.inf   Not Available
          ACPI\PNP0700\5&13237358&0
Floppy disk drive   Yes       FLOPPYDISK
          5.2.3790.0          10/1/2002 (Standard
floppy disk drives) flpydisk.inf        Not Available
          FDC\GENERIC_FLOPPY_DRIVE\6&1C650E5D&0&0
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CSB5 IDE Controller Yes       HDC       5.2.3790.0
          10/1/2002 ServerWorks         mshdc.inf Not
Available
          PCI\VEN_1166&DEV_0212&SUBSYS_02121166&REV_9
3\3&267A616A&0&79
Primary IDE Channel Yes       HDC       5.2.3790.0
          10/1/2002 (Standard IDE ATA/ATAPI
controllers)        mshdc.inf Not Available
          PCIIDE\IDECHANNEL\4&1024D5C6&0&0
CD-ROM Drive        Yes       CDROM     5.2.3790.0
          10/1/2002 (Standard CD-ROM drives)
          cdrom.inf Not Available
          IDE\CDROMCOMPAQ_CD-ROM_SN-
124____________________N104____\5&FB0C83D&0&0.0.0
Secondary IDE Channel         Yes       HDC
          5.2.3790.0          10/1/2002 (Standard IDE
ATA/ATAPI controllers)        mshdc.inf Not Available
          PCIIDE\IDECHANNEL\4&1024D5C6&0&1
Serverworks Champion CSB5 - SouthBridge 5 LPC     Yes
          SYSTEM    5.2.3790.0          10/1/2002
          ServerWorks (RCC)   machine.inf         Not
Available
          PCI\VEN_1166&DEV_0225&SUBSYS_00000000&REV_0
0\3&267A616A&0&7B
ServerWorks Grand Champion CIOB_X2 - I/O Bridge 133
Mhz       Yes       SYSTEM    5.2.3790.0
          10/1/2002 ServerWorks (RCC)   machine.inf
          Not Available
          PCI\VEN_1166&DEV_0101&SUBSYS_00000000&REV_0
5\3&267A616A&0&80
ServerWorks Grand Champion CIOB_X2 - I/O Bridge 133
Mhz       Yes       SYSTEM    5.2.3790.0
          10/1/2002 ServerWorks (RCC)   machine.inf
          Not Available
          PCI\VEN_1166&DEV_0101&SUBSYS_00000000&REV_0
5\3&267A616A&0&82
ServerWorks Grand Champion CIOB_X2 - I/O Bridge 133
Mhz       Yes       SYSTEM    5.2.3790.0
          10/1/2002 ServerWorks (RCC)   machine.inf
          Not Available
          PCI\VEN_1166&DEV_0101&SUBSYS_00000000&REV_0
5\3&267A616A&0&88
ServerWorks Grand Champion CIOB_X2 - I/O Bridge 133
Mhz       Yes       SYSTEM    5.2.3790.0
          10/1/2002 ServerWorks (RCC)   machine.inf
          Not Available
          PCI\VEN_1166&DEV_0101&SUBSYS_00000000&REV_0
5\3&267A616A&0&8A
PCI bus   Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0A03\1
Smart Array 5i      Yes       SCSIADAPTER
          5.44.0.32 1/31/2003 Hewlett-Packard Company
          oem0.inf  Not Available
          PCI\VEN_0E11&DEV_B178&SUBSYS_40800E11&REV_0
1\3&13C0B0C5&0&18
Smart Array 5x and 6x Notification Driver         Yes
          SYSTEM    5.44.0.32 2/12/2003 Hewlett-
Packard Company     oem1.inf  Not Available
          SCSI\OTHER&VEN_COMPAQ&PROD_SCSI_COMMUNICATE
&REV_CISS\4&73DC70A&0&000
```

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Disk drive          Yes       DISKDRIVE 5.2.3790.0
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&RE
V_2.38\4&73DC70A&0&040
Disk drive          Yes       DISKDRIVE 5.2.3790.0
          10/1/2002 (Standard disk drives)
          disk.inf  Not Available
          SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&RE
V_2.38\4&73DC70A&0&050
PCI bus   Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0A03\2
Compaq NC7781 Gigabit Server Adapter    Yes       NET
          2.90.0.0  12/12/2002          Compaq
          oem5.inf  Not Available
          PCI\VEN_14E4&DEV_16A7&SUBSYS_00CB0E11&REV_0
2\3&1070020&0&08
Compaq NC7781 Gigabit Server Adapter    Yes       NET
          2.90.0.0  12/12/2002          Compaq
          oem5.inf  Not Available
          PCI\VEN_14E4&DEV_16A7&SUBSYS_00CB0E11&REV_0
2\3&1070020&0&10
PCI bus   Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0A03\3
Smart Array 642 Controller (Non-Miniport)         No
          SCSIADAPTER         5.6.59.32 4/8/2003
          Hewlett-Packard     oem8.inf  Not Available
          PCI\VEN_0E11&DEV_0046&SUBSYS_409B0E11&REV_0
1\3&29E81982&0&08
Smart Array Logical Volume    No        DISKDRIVE
          5.6.56.32 4/8/2003  Hewlett-Packard
          oem9.inf  Not Available
          HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\4&2
4ABE6E9&0&0600004000000000
Smart Array Logical Volume    No        DISKDRIVE
          5.6.56.32 4/8/2003  Hewlett-Packard
          oem9.inf  Not Available
          HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\4&2
4ABE6E9&0&0700004000000000
Smart Array Logical Volume    No        DISKDRIVE
          5.6.56.32 4/8/2003  Hewlett-Packard
          oem9.inf  Not Available
          HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\4&2
4ABE6E9&0&0800004000000000
PCI bus   Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\PNP0A03\4
Smart Array 5300 Controller (Non-Miniport)        No
          SCSIADAPTER         5.6.59.32 4/8/2003
          Hewlett-Packard     oem8.inf  Not Available
          PCI\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_0
2\3&172E68DD&0&08
Smart Array Logical Volume    No        DISKDRIVE
          5.6.56.32 4/8/2003  Hewlett-Packard
          oem9.inf  Not Available
          HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME
\4&1F72F2BD&0&0000004000000000
```

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Smart Array Logical Volume    No        DISKDRIVE
          5.6.56.32 4/8/2003  Hewlett-Packard
          oem9.inf  Not Available
          HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME
\4&1F72F2BD&0&0100004000000000
Smart Array Logical Volume    No        DISKDRIVE
          5.6.56.32 4/8/2003  Hewlett-Packard
          oem9.inf  Not Available
          HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME
\4&1F72F2BD&0&0200004000000000
Smart Array Logical Volume    No        DISKDRIVE
          5.6.56.32 4/8/2003  Hewlett-Packard
          oem9.inf  Not Available
          HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME
\4&1F72F2BD&0&0300004000000000
Smart Array Logical Volume    No        DISKDRIVE
          5.6.56.32 4/8/2003  Hewlett-Packard
          oem9.inf  Not Available
          HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME
\4&1F72F2BD&0&0400004000000000
Smart Array Logical Volume    No        DISKDRIVE
          5.6.56.32 4/8/2003  Hewlett-Packard
          oem9.inf  Not Available
          HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME
\4&1F72F2BD&0&0500004000000000
hp ProLiant PCI Hot Plug Controller (CPQPHP
installed)          Yes       SYSTEM    6.1.2.5
          1/6/2003  HP        oem3.inf  Not Available
          PCI\VEN_0E11&DEV_A0F7&SUBSYS_A2FE0E11&REV_1
4\3&172E68DD&0&F0
ACPI Thermal Zone   Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ACPI\THERMALZONE\THM0
ACPI Fixed Feature Button     Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ACPI\FIXEDBUTTON\2&DABA3FF&0
Logical Disk Manager          Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ROOT\DMIO\0000
Volume Manager      Yes       SYSTEM    5.2.3790.0
          10/1/2002 (Standard system devices)
          machine.inf         Not Available
          ROOT\FTDISK\0000
Generic volume      Yes       VOLUME    5.2.3790.0
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE65337A
C7OFFSET7E00LENGTH7DC0B9200
Generic volume      Yes       VOLUME    5.2.3790.0
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE65337A
C1OFFSET7E00LENGTH3D8F0B400
Generic volume      Yes       VOLUME    5.2.3790.0
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE65337A
C3OFFSET7E00LENGTH13FFD59800
Generic volume      Yes       VOLUME    5.2.3790.0
          10/1/2002 Microsoft volume.inf          Not
```

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Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE65337A
C8OFFSET7E00LENGTH7DC0B9200
Generic volume      Yes       VOLUME    5.2.3790.0
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE65337A
C9OFFSET7E00LENGTH3D8F0B400
Generic volume      Yes       VOLUME    5.2.3790.0
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE65337A
CAOFFSET7E00LENGTH13FFD59800
Generic volume      Yes       VOLUME    5.2.3790.0
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE65337A
CCOFFSET7E00LENGTH7DC0B9200
Generic volume      Yes       VOLUME    5.2.3790.0
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE65337A
CDOFFSET7E00LENGTH3D8F0B400
Generic volume      Yes       VOLUME    5.2.3790.0
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE65337A
CFOFFSET7E00LENGTH13FFD59800
Generic volume      Yes       VOLUME    5.2.3790.0
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE478347
83OFFSET4000LENGTH3FFFBC000
Generic volume      Yes       VOLUME    5.2.3790.0
          10/1/2002 Microsoft volume.inf          Not
Available
          STORAGE\VOLUME\1&30A96598&0&SIGNATURE4503ED
6DOFFSET4000LENGTHCF4FDC000
AFD Networking Support Environment      Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_AFD\0000
Altiris Kernel Driver         Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_ALKERNEL\0000
Beep      Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_BEEP\0000

CRC Disk Filter Driver        Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_CRCDISK\0000
dmboot    Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_DMBOOT\0000

dmload    Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_DMLOAD\0000
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Fips      Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_FIPS\0000

Generic Packet Classifier     Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_GPC\0000
IPSEC driver        Not Available       LEGACYDRIVER
          Not Available       Not Available       Not
Available Not Available       Not Available
          ROOT\LEGACY_IPSEC\0000
ksecdd    Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_KSECDD\0000

mnmdd     Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_MNMDD\0000

mountmgr  Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available
          ROOT\LEGACY_MOUNTMGR\0000
NDIS System Driver  Not Available       LEGACYDRIVER
          Not Available       Not Available       Not
Available Not Available       Not Available
          ROOT\LEGACY_NDIS\0000
Remote Access NDIS TAPI Driver          Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_NDISTAPI\0000
NDIS Usermode I/O Protocol    Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_NDISUIO\0000
NDProxy   Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available
          ROOT\LEGACY_NDPROXY\0000
NetBios over Tcpip  Not Available       LEGACYDRIVER
          Not Available       Not Available       Not
Available Not Available       Not Available
          ROOT\LEGACY_NETBT\0000
Null      Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_NULL\0000

Partition Manager   Not Available       LEGACYDRIVER
          Not Available       Not Available       Not
Available Not Available       Not Available
          ROOT\LEGACY_PARTMGR\0000
Remote Access Auto Connection Driver    Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_RASACD\0000
RDPCDD    Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_RDPCDD\0000

RDPWD     Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
```

```
Available Not Available       ROOT\LEGACY_RDPWD\0000

HP ProLiant System Management Interface Driver    Not
Available LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_SYSMGMT\0000
TCP/IP Protocol Driver        Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_TCPIP\0000
TDTCP     Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available       ROOT\LEGACY_TDTCP\0000

VGA Display Controller.       Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_VGASAVE\0000
volsnap   Not Available       LEGACYDRIVER        Not
Available Not Available       Not Available       Not
Available Not Available
          ROOT\LEGACY_VOLSNAP\0000
Remote Access IP ARP Driver   Not Available
          LEGACYDRIVER        Not Available       Not
Available Not Available       Not Available       Not
Available ROOT\LEGACY_WANARP\0000
Audio Codecs        Yes       MEDIA     5.2.3790.0
          10/1/2002 (Standard system devices)
          wave.inf  Not Available
          ROOT\MEDIA\MS_MMACM
Legacy Audio Drivers          Yes       MEDIA
          5.2.3790.0          10/1/2002 (Standard
system devices)     wave.inf  Not Available
          ROOT\MEDIA\MS_MMDRV
Media Control Devices         Yes       MEDIA
          5.2.3790.0          10/1/2002 (Standard
system devices)     wave.inf  Not Available
          ROOT\MEDIA\MS_MMMCI
Legacy Video Capture Devices  Yes       MEDIA
          5.2.3790.0          10/1/2002 (Standard
system devices)     wave.inf  Not Available
          ROOT\MEDIA\MS_MMVCD
Video Codecs        Yes       MEDIA     5.2.3790.0
          10/1/2002 (Standard system devices)
          wave.inf  Not Available
          ROOT\MEDIA\MS_MMVID
WAN Miniport (L2TP) Yes       NET       5.2.3790.0
          10/1/2002 Microsoft netrasa.inf         Not
Available ROOT\MS_L2TPMINIPORT\0000
WAN Miniport (IP)   Yes       NET       5.2.3790.0
          10/1/2002 Microsoft netrasa.inf         Not
Available ROOT\MS_NDISWANIP\0000
WAN Miniport (PPPOE)          Yes       NET
          5.2.3790.0          10/1/2002 Microsoft
          netrasa.inf         Not Available
          ROOT\MS_PPPOEMINIPORT\0000
WAN Miniport (PPTP) Yes       NET       5.2.3790.0
          10/1/2002 Microsoft netrasa.inf         Not
Available ROOT\MS_PPTPMINIPORT\0000
Direct Parallel     Yes       NET       5.2.3790.0
          10/1/2002 Microsoft netrasa.inf         Not
Available ROOT\MS_PTIMINIPORT\0000
```

```
Terminal Server Device Redirector       Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available       ROOT\RDPDR\0000
Terminal Server Keyboard Driver         Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available       ROOT\RDP_KBD\0000
Terminal Server Mouse Driver  Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ROOT\RDP_MOU\0000
Plug and Play Software Device Enumerator          Yes
          SYSTEM    5.2.3790.0          10/1/2002
          (Standard system devices)     machine.inf
          Not Available       ROOT\SYSTEM\0000
Microcode Update Device       Yes       SYSTEM
          5.2.3790.0          10/1/2002 (Standard
system devices)     machine.inf         Not Available
          ROOT\SYSTEM\0001

[Environment Variables]

Variable  Value     User Name
ClusterLog          C:\WINDOWS\Cluster\cluster.log
          <SYSTEM>
ComSpec   %SystemRoot%\system32\cmd.exe <SYSTEM>
NUMBER_OF_PROCESSORS          2         <SYSTEM>
OS        Windows_NT          <SYSTEM>
Path
          %SystemRoot%\system32;%SystemRoot%;%SystemR
oot%\System32\Wbem;C:\Program Files\Microsoft SQL
Server\80\Tools\BINN;C:\Program Files\Microsoft SQL
Server\MSSQL\Binn;. <SYSTEM>
PATHEXT
          .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF
;.WSH     <SYSTEM>
PROCESSOR_ARCHITECTURE        x86       <SYSTEM>
PROCESSOR_IDENTIFIER          x86 Family 15 Model 2
Stepping 7, GenuineIntel      <SYSTEM>
PROCESSOR_LEVEL     15        <SYSTEM>
PROCESSOR_REVISION  0207      <SYSTEM>
TEMP      %SystemRoot%\TEMP   <SYSTEM>
TMP       %SystemRoot%\TEMP   <SYSTEM>
windir    %SystemRoot%        <SYSTEM>
TEMP      %USERPROFILE%\Local Settings\Temp       NT
AUTHORITY\SYSTEM
TMP       %USERPROFILE%\Local Settings\Temp       NT
AUTHORITY\SYSTEM
TEMP      %USERPROFILE%\Local Settings\Temp       NT
AUTHORITY\LOCAL SERVICE
TMP       %USERPROFILE%\Local Settings\Temp       NT
AUTHORITY\LOCAL SERVICE
TEMP      %USERPROFILE%\Local Settings\Temp       NT
AUTHORITY\NETWORK SERVICE
TMP       %USERPROFILE%\Local Settings\Temp       NT
AUTHORITY\NETWORK SERVICE
TEMP      %USERPROFILE%\Local Settings\Temp
          APARK\Administrator
TMP       %USERPROFILE%\Local Settings\Temp
          APARK\Administrator

[Print Jobs]
```

```
Document  Size      Owner     Notify    Status
          Time Submitted      Start Time
          Until Time          Elapsed Time
          Pages Printed       Job ID    Priority
          Parameters          Driver    Print
Processor Host Print Queue    Data Type Name

[Network Connections]

Local Name          Remote Name         Type
          Status    User Name
W:        \\inforb\mount      Disk      Persistent
Connection

[Running Tasks]

Name      Path      Process ID          Priority  Min
Working Set         Max Working Set     Start Time
          Version   Size      File Date
system idle process Not Available       0         0
          Not Available       Not Available       Not
Available Not Available       Not Available       Not
Available
system    Not Available       4         8         0
          1413120   Not Available       Not Available
          Not Available       Not Available
smss.exe  Not Available       368       11
          204800    1413120   5/25/2003 5:09 AM   Not
Available Not Available       Not Available
csrss.exe Not Available       576       13        Not
Available Not Available       5/25/2003 5:09 AM   Not
Available Not Available       Not Available
winlogon.exe        c:\windows\system32\winlogon.exe
          600       13        204800    1413120
          5/25/2003 5:09 AM   5.2.3790.0
(srv03_rtm.030324-2048)       536.50 KB (549,376
bytes)    3/25/2003 12:00 AM
services.exe        c:\windows\system32\services.exe
          644       9         204800    1413120
          5/25/2003 5:09 AM   5.2.3790.0
(srv03_rtm.030324-2048)       102.00 KB (104,448
bytes)    3/25/2003 12:00 AM
lsass.exe c:\windows\system32\lsass.exe 656       9
          204800    1413120   5/25/2003 5:09 AM
          5.2.3790.0 (srv03_rtm.030324-2048)
          13.00 KB (13,312 bytes)       3/25/2003
12:00 AM
svchost.exe         c:\windows\system32\svchost.exe
          820       8         204800    1413120
          5/25/2003 5:09 AM   5.2.3790.0
(srv03_rtm.030324-2048)       13.00 KB (13,312 bytes)
          3/25/2003 12:00 AM
svchost.exe         c:\windows\system32\svchost.exe
          860       8         204800    1413120
          5/25/2003 5:09 AM   5.2.3790.0
(srv03_rtm.030324-2048)       13.00 KB (13,312 bytes)
          3/25/2003 12:00 AM
svchost.exe         Not Available       1036      8
          Not Available       Not Available
          5/25/2003 5:09 AM   Not Available       Not
Available Not Available
svchost.exe         Not Available       1084      8
          Not Available       Not Available
          5/25/2003 5:09 AM   Not Available       Not
Available Not Available
svchost.exe         c:\windows\system32\svchost.exe
          1096      8         204800    1413120
          5/25/2003 5:09 AM   5.2.3790.0
(srv03_rtm.030324-2048)       13.00 KB (13,312 bytes)
          3/25/2003 12:00 AM
spoolsv.exe         c:\windows\system32\spoolsv.exe
          1292      8         204800    1413120
          5/25/2003 5:09 AM   5.2.3790.0
(srv03_rtm.030324-2048)       55.00 KB (56,320 bytes)
          3/25/2003 12:00 AM
msdtc.exe Not Available       1328      8         Not
Available Not Available       5/25/2003 5:09 AM   Not
Available Not Available       Not Available
aclient.exe         c:\program
files\altiris\aclient\aclient.exe       1480      8
          204800    1413120   5/25/2003 5:09 AM
          5.6.72    3.83 MB (4,014,156 bytes)
          5/24/2003 4:47 PM
svchost.exe         c:\windows\system32\svchost.exe
          1540      8         204800    1413120
          5/25/2003 5:09 AM   5.2.3790.0
(srv03_rtm.030324-2048)       13.00 KB (13,312 bytes)
          3/25/2003 12:00 AM
svchost.exe         Not Available       1572      8
          Not Available       Not Available
          5/25/2003 5:09 AM   Not Available       Not
Available Not Available
sysdown.exe         c:\windows\system32\sysdown.exe
          1636      8         204800    1413120
          5/25/2003 5:09 AM   5.30.3718.0 built by:
          29.00 KB (29,696 bytes)       5/13/2003
6:24 PM
dfssvc.exe          c:\windows\system32\dfssvc.exe
          1928      8         204800    1413120
          5/25/2003 5:09 AM   5.2.3790.0
(srv03_rtm.030324-2048)       130.50 KB (133,632
bytes)    3/25/2003 12:00 AM
explorer.exe        c:\windows\explorer.exe       488
          8         204800    1413120   5/25/2003
5:10 AM   6.00.3790.0 (srv03_rtm.030324-2048)
          1,008.50 KB (1,032,704 bytes) 3/25/2003
12:00 AM
aclntusr.exe        c:\program
files\altiris\aclient\aclntusr.exe      544       8
          204800    1413120   5/25/2003 5:10 AM   5,
6, 0, 50  176.00 KB (180,224 bytes)     5/24/2003
4:47 PM
wmiprvse.exe        Not Available       808       8
          Not Available       Not Available
          5/25/2003 5:10 AM   Not Available       Not
Available Not Available
cmd.exe   c:\windows\system32\cmd.exe   568       8
          204800    1413120   5/25/2003 5:19 AM
          5.2.3790.0 (srv03_rtm.030324-2048)
          374.00 KB (382,976 bytes)     3/25/2003
12:00 AM
sqlservr.exe        c:\program files\microsoft sql
server\mssql\binn\sqlservr.exe          824       13
          204800    1413120   5/25/2003 5:19 AM
          2000.080.0761.00    7.11 MB (7,450,664
bytes)    5/14/2003 10:00 AM
helpctr.exe
          c:\windows\pchealth\helpctr\binaries\helpct
r.exe     1848      8         204800    1413120
          5/25/2003 5:39 PM   5.2.3790.0
(srv03_rtm.030324-2048)       764.00 KB (782,336
bytes)    5/13/2003 4:41 PM
helpsvc.exe
          c:\windows\pchealth\helpctr\binaries\helpsv
c.exe     1216      8         204800    1413120
          5/25/2003 5:39 PM   5.2.3790.0
(srv03_rtm.030324-2048)       720.00 KB (737,280
bytes)    5/13/2003 4:41 PM
wmiprvse.exe        Not Available       1844      8
          Not Available       Not Available
          5/25/2003 5:39 PM   Not Available       Not
Available Not Available

[Loaded Modules]

Name      Version   Size      File Date Manufacturer
          Path
winlogon  5.2.3790.0 (srv03_rtm.030324-2048)
          536.50 KB (549,376 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\winlogon.exe
ntdll     5.2.3790.0 (srv03_rtm.030324-2048)
          722.50 KB (739,840 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\ntdll.dll
kernel32  5.2.3790.0 (srv03_rtm.030324-2048)
          965.00 KB (988,160 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\kernel32.dll
msvcrt    7.0.3790.0 (srv03_rtm.030324-2048)
          319.50 KB (327,168 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\msvcrt.dll
advapi32  5.2.3790.0 (srv03_rtm.030324-2048)
          559.50 KB (572,928 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\advapi32.dll
rpcrt4    5.2.3790.0 (srv03_rtm.030324-2048)
          643.50 KB (658,944 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\rpcrt4.dll
user32    5.2.3790.0 (srv03_rtm.030324-2048)
          562.00 KB (575,488 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\user32.dll
gdi32     5.2.3790.0 (srv03_rtm.030324-2048)
          263.00 KB (269,312 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\gdi32.dll
userenv   5.2.3790.0 (srv03_rtm.030324-2048)
          732.50 KB (750,080 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\userenv.dll
nddeapi   5.2.3790.0 (srv03_rtm.030324-2048)
          16.00 KB (16,384 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\nddeapi.dll
```

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crypt32   5.131.3790.0 (srv03_rtm.030324-2048)
          598.00 KB (612,352 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\crypt32.dll
msasn1    5.2.3790.0 (srv03_rtm.030324-2048)
          58.00 KB (59,392 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\msasn1.dll
secur32   5.2.3790.0 (srv03_rtm.030324-2048)
          63.00 KB (64,512 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\secur32.dll
winsta    5.2.3790.0 (srv03_rtm.030324-2048)
          51.00 KB (52,224 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\winsta.dll
netapi32  5.2.3790.0 (srv03_rtm.030324-2048)
          317.00 KB (324,608 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\netapi32.dll
profmap   5.2.3790.0 (srv03_rtm.030324-2048)
          22.00 KB (22,528 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\profmap.dll
regapi    5.2.3790.0 (srv03_rtm.030324-2048)
          48.50 KB (49,664 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\regapi.dll
ws2_32    5.2.3790.0 (srv03_rtm.030324-2048)
          87.50 KB (89,600 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\ws2_32.dll
ws2help   5.2.3790.0 (srv03_rtm.030324-2048)
          19.50 KB (19,968 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\ws2help.dll
psapi     5.2.3790.0 (srv03_rtm.030324-2048)
          21.50 KB (22,016 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\psapi.dll
version   5.2.3790.0 (srv03_rtm.030324-2048)
          17.00 KB (17,408 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\version.dll
setupapi  5.2.3790.0 (srv03_rtm.030324-2048)
          1,014.50 KB (1,038,848 bytes) 3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\setupapi.dll
msgina    5.2.3790.0 (srv03_rtm.030324-2048)
          1.14 MB (1,191,936 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\msgina.dll
shsvcs    6.00.3790.0 (srv03_rtm.030324-2048)
          121.50 KB (124,416 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\shsvcs.dll
shlwapi   6.00.3790.0 (srv03_rtm.030324-2048)
          281.00 KB (287,744 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\shlwapi.dll
sfc       5.2.3790.0 (srv03_rtm.030324-2048)
          4.50 KB (4,608 bytes)         3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\sfc.dll
sfc_os    5.2.3790.0 (srv03_rtm.030324-2048)
          133.00 KB (136,192 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\sfc_os.dll
wintrust  5.131.3790.0 (srv03_rtm.030324-2048)
          161.50 KB (165,376 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\wintrust.dll
ole32     5.2.3790.0 (srv03_rtm.030324-2048)
          1.13 MB (1,187,328 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\ole32.dll
imagehlp  5.2.3790.0 (srv03_rtm.030324-2048)
          142.50 KB (145,920 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\imagehlp.dll
comctl32  6.0 (srv03_rtm.030324-2048)   907.00 KB
(928,768 bytes)     6/15/2003 7:28 AM   Microsoft
Corporation
          c:\windows\winsxs\x86_microsoft.windows.com
mon-controls_6595b64144ccf1df_6.0.100.0_x-
ww_8417450b\comctl32.dll
winscard  5.2.3790.0 (srv03_rtm.030324-2048)
          98.50 KB (100,864 bytes)      3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\winscard.dll
wtsapi32  5.2.3790.0 (srv03_rtm.030324-2048)
          17.50 KB (17,920 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\wtsapi32.dll
winmm     5.2.3790.0 (srv03_rtm.030324-2048)
          166.00 KB (169,984 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\winmm.dll
sxs       5.2.3790.0 (srv03_rtm.030324-2048)
          733.00 KB (750,592 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\sxs.dll
shell32   6.00.3790.0 (srv03_rtm.030324-2048)
          7.79 MB (8,166,400 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\shell32.dll
wldap32   5.2.3790.0 (srv03_rtm.030324-2048)
          158.00 KB (161,792 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\wldap32.dll
cscdll    5.2.3790.0 (srv03_rtm.030324-2048)
          99.00 KB (101,376 bytes)      3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\cscdll.dll
rsaenh    5.2.3790.0 (srv03_rtm.030324-2048)
          176.83 KB (181,072 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\rsaenh.dll
wlnotify  5.2.3790.0 (srv03_rtm.030324-2048)
          87.50 KB (89,600 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\wlnotify.dll
winspool  5.2.3790.0 (srv03_rtm.030324-2048)
          140.00 KB (143,360 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\winspool.drv
mpr       5.2.3790.0 (srv03_rtm.030324-2048)
          56.00 KB (57,344 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\mpr.dll
comctl32  5.82 (srv03_rtm.030324-2048)  561.00 KB
(574,464 bytes)     6/15/2003 7:28 AM   Microsoft
Corporation
          c:\windows\winsxs\x86_microsoft.windows.com
mon-controls_6595b64144ccf1df_5.82.0.0_x-
ww_8a69ba05\comctl32.dll
uxtheme   6.00.3790.0 (srv03_rtm.030324-2048)
          196.00 KB (200,704 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\uxtheme.dll
samlib    5.2.3790.0 (srv03_rtm.030324-2048)
          49.00 KB (50,176 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\samlib.dll
cscui     5.2.3790.0 (srv03_rtm.030324-2048)
          305.00 KB (312,320 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\cscui.dll
drprov    5.2.3790.0 (srv03_rtm.030324-2048)
          12.50 KB (12,800 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\drprov.dll
ntlanman  5.2.3790.0 (srv03_rtm.030324-2048)
          41.00 KB (41,984 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\ntlanman.dll
netui0    5.2.3790.0 (srv03_rtm.030324-2048)
          75.50 KB (77,312 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\netui0.dll
netui1    5.2.3790.0 (srv03_rtm.030324-2048)
          184.00 KB (188,416 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\netui1.dll
davclnt   5.2.3790.0 (srv03_rtm.030324-2048)
          23.50 KB (24,064 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\davclnt.dll
mprui     5.2.3790.0 (srv03_rtm.030324-2048)
          49.00 KB (50,176 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\mprui.dll
netui2    5.2.3790.0 (srv03_rtm.030324-2048)
          309.50 KB (316,928 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\netui2.dll
comdlg32  6.00.3790.0 (srv03_rtm.030324-2048)
          261.00 KB (267,264 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\comdlg32.dll
netmsg    5.2.3790.0 (srv03_rtm.030324-2048)
          178.00 KB (182,272 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\netmsg.dll
oleaut32  5.2.3790.0          486.00 KB (497,664
bytes)    3/25/2003 12:00 AM  Microsoft Corporation
          c:\windows\system32\oleaut32.dll
```

```
clbcatq   2001.12.4720.0 (srv03_rtm.030324-2048)
          481.00 KB (492,544 bytes)     5/13/2003
4:38 PM   Microsoft Corporation
          c:\windows\system32\clbcatq.dll
comres    2001.12.4720.0 (srv03_rtm.030324-2048)
          778.00 KB (796,672 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\comres.dll
ntmarta   5.2.3790.0 (srv03_rtm.030324-2048)
          114.00 KB (116,736 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\ntmarta.dll
wbemprox  5.2.3790.0 (srv03_rtm.030324-2048)
          17.50 KB (17,920 bytes)       5/13/2003
4:37 PM   Microsoft Corporation
          c:\windows\system32\wbem\wbemprox.dll
wbemcomn  5.2.3790.0 (srv03_rtm.030324-2048)
          211.50 KB (216,576 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\wbem\wbemcomn.dll
wbemsvc   5.2.3790.0 (srv03_rtm.030324-2048)
          42.50 KB (43,520 bytes)       5/13/2003
4:37 PM   Microsoft Corporation
          c:\windows\system32\wbem\wbemsvc.dll
fastprox  5.2.3790.0 (srv03_rtm.030324-2048)
          443.00 KB (453,632 bytes)     5/13/2003
4:37 PM   Microsoft Corporation
          c:\windows\system32\wbem\fastprox.dll
msvcp60   6.05.2144.0         388.00 KB (397,312
bytes)    3/25/2003 12:00 AM  Microsoft Corporation
          c:\windows\system32\msvcp60.dll
ntdsapi   5.2.3790.0 (srv03_rtm.030324-2048)
          76.00 KB (77,824 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\ntdsapi.dll
dnsapi    5.2.3790.0 (srv03_rtm.030324-2048)
          147.50 KB (151,040 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\dnsapi.dll
services  5.2.3790.0 (srv03_rtm.030324-2048)
          102.00 KB (104,448 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\services.exe
scesrv    5.2.3790.0 (srv03_rtm.030324-2048)
          316.50 KB (324,096 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\scesrv.dll
authz     5.2.3790.0 (srv03_rtm.030324-2048)
          67.00 KB (68,608 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\authz.dll
umpnpmgr  5.2.3790.0 (srv03_rtm.030324-2048)
          121.50 KB (124,416 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\umpnpmgr.dll
ncobjapi  5.2.3790.0 (srv03_rtm.030324-2048)
          34.50 KB (35,328 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\ncobjapi.dll
eventlog  5.2.3790.0 (srv03_rtm.030324-2048)
          60.50 KB (61,952 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\eventlog.dll
```

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cryptnet  5.131.3790.0 (srv03_rtm.030324-2048)
          59.50 KB (60,928 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\cryptnet.dll
sensapi   5.2.3790.0 (srv03_rtm.030324-2048)
          6.00 KB (6,144 bytes)         3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\sensapi.dll
cabinet   5.2.3790.0 (srv03_rtm.030324-2048)
          61.00 KB (62,464 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\cabinet.dll
imm32     5.2.3790.0 (srv03_rtm.030324-2048)
          105.50 KB (108,032 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\imm32.dll
apphelp   5.2.3790.0 (srv03_rtm.030324-2048)
          122.00 KB (124,928 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\apphelp.dll
lsass     5.2.3790.0 (srv03_rtm.030324-2048)
          13.00 KB (13,312 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\lsass.exe
lsasrv    5.2.3790.0 (srv03_rtm.030324-2048)
          780.50 KB (799,232 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\lsasrv.dll
samsrv    5.2.3790.0 (srv03_rtm.030324-2048)
          452.00 KB (462,848 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\samsrv.dll
cryptdll  5.2.3790.0 (srv03_rtm.030324-2048)
          34.00 KB (34,816 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\cryptdll.dll
msprivs   5.2.3790.0 (srv03_rtm.030324-2048)
          46.50 KB (47,616 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\msprivs.dll
kerberos  5.2.3790.0 (srv03_rtm.030324-2048)
          332.50 KB (340,480 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\kerberos.dll
msv1_0    5.2.3790.0 (srv03_rtm.030324-2048)
          127.00 KB (130,048 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\msv1_0.dll
netlogon  5.2.3790.0 (srv03_rtm.030324-2048)
          409.00 KB (418,816 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\netlogon.dll
w32time   5.2.3790.0 (srv03_rtm.030324-2048)
          216.00 KB (221,184 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\w32time.dll
iphlpapi  5.2.3790.0 (srv03_rtm.030324-2048)
          82.50 KB (84,480 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\iphlpapi.dll
schannel  5.2.3790.0 (srv03_rtm.030324-2048)
          149.50 KB (153,088 bytes)     3/25/2003
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12:00 AM  Microsoft Corporation
          c:\windows\system32\schannel.dll
wdigest   5.2.3790.0 (srv03_rtm.030324-2048)
          61.00 KB (62,464 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\wdigest.dll
rassfm    5.2.3790.0 (srv03_rtm.030324-2048)
          20.50 KB (20,992 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\rassfm.dll
kdcsvc    5.2.3790.0 (srv03_rtm.030324-2048)
          221.00 KB (226,304 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\kdcsvc.dll
ntdsa     5.2.3790.0 (srv03_rtm.030324-2048)
          1.45 MB (1,520,640 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\ntdsa.dll
ntdsatq   5.2.3790.0 (srv03_rtm.030324-2048)
          32.00 KB (32,768 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\ntdsatq.dll
mswsock   5.2.3790.0 (srv03_rtm.030324-2048)
          254.00 KB (260,096 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\mswsock.dll
esent     5.2.3790.0 (srv03_rtm.030324-2048)
          1.01 MB (1,056,256 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\esent.dll
scecli    5.2.3790.0 (srv03_rtm.030324-2048)
          179.50 KB (183,808 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\scecli.dll
wshtcpip  5.2.3790.0 (srv03_rtm.030324-2048)
          18.00 KB (18,432 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\wshtcpip.dll
ipsecsvc  5.2.3790.0 (srv03_rtm.030324-2048)
          162.50 KB (166,400 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\ipsecsvc.dll
oakley    5.2.3790.0 (srv03_rtm.030324-2048)
          325.50 KB (333,312 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\oakley.dll
winipsec  5.2.3790.0 (srv03_rtm.030324-2048)
          34.50 KB (35,328 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\winipsec.dll
pstorsvc  5.2.3790.0 (srv03_rtm.030324-2048)
          24.00 KB (24,576 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\pstorsvc.dll
psbase    5.2.3790.0 (srv03_rtm.030324-2048)
          81.00 KB (82,944 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\psbase.dll
dssenh    5.2.3790.0 (srv03_rtm.030324-2048)
          131.33 KB (134,480 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\dssenh.dll
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wlbsctrl  5.2.3790.0 (srv03_rtm.030324-2048)
          78.00 KB (79,872 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\wlbsctrl.dll
svchost   5.2.3790.0 (srv03_rtm.030324-2048)
          13.00 KB (13,312 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\svchost.exe
rpcss     5.2.3790.0 (srv03_rtm.030324-2048)
          276.50 KB (283,136 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\rpcss.dll
termsrv   5.2.3790.0 (srv03_rtm.030324-2048)
          216.50 KB (221,696 bytes)     5/13/2003
4:38 PM   Microsoft Corporation
          c:\windows\system32\termsrv.dll
icaapi    5.2.3790.0 (srv03_rtm.030324-2048)
          10.50 KB (10,752 bytes)       5/13/2003
4:38 PM   Microsoft Corporation
          c:\windows\system32\icaapi.dll
mstlsapi  5.2.3790.0 (srv03_rtm.030324-2048)
          104.50 KB (107,008 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\mstlsapi.dll
activeds  5.2.3790.0 (srv03_rtm.030324-2048)
          189.00 KB (193,536 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\activeds.dll
adsldpc   5.2.3790.0 (srv03_rtm.030324-2048)
          142.50 KB (145,920 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\adsldpc.dll
credui    5.2.3790.0 (srv03_rtm.030324-2048)
          159.00 KB (162,816 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\credui.dll
atl       3.05.2283 83.00 KB (84,992 bytes)
          3/25/2003 12:00 AM  Microsoft Corporation
          c:\windows\system32\atl.dll
rdpwsx    5.2.3790.0 (srv03_rtm.030324-2048)
          80.13 KB (82,056 bytes)       5/13/2003
4:38 PM   Microsoft Corporation
          c:\windows\system32\rdpwsx.dll
wzcsvc    5.2.3790.0 (srv03_rtm.030324-2048)
          272.50 KB (279,040 bytes)     3/25/2003
6:15 AM   Microsoft Corporation
          c:\windows\system32\wzcsvc.dll
rtutils   5.2.3790.0 (srv03_rtm.030324-2048)
          32.00 KB (32,768 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\rtutils.dll
wmi       5.2.3790.0 (srv03_rtm.030324-2048)
          6.50 KB (6,656 bytes)         3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\wmi.dll
dhcpcsvc  5.2.3790.0 (srv03_rtm.030324-2048)
          101.50 KB (103,936 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\dhcpcsvc.dll
rastls    5.2.3790.0 (srv03_rtm.030324-2048)
          155.00 KB (158,720 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\rastls.dll
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cryptui   5.131.3790.0 (srv03_rtm.030324-2048)
          473.50 KB (484,864 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\cryptui.dll
mprapi    5.2.3790.0 (srv03_rtm.030324-2048)
          81.00 KB (82,944 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\mprapi.dll
rasapi32  5.2.3790.0 (srv03_rtm.030324-2048)
          227.50 KB (232,960 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\rasapi32.dll
rasman    5.2.3790.0 (srv03_rtm.030324-2048)
          56.50 KB (57,856 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\rasman.dll
tapi32    5.2.3790.0 (srv03_rtm.030324-2048)
          175.00 KB (179,200 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\tapi32.dll
raschap   5.2.3790.0 (srv03_rtm.030324-2048)
          106.00 KB (108,544 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\raschap.dll
schedsvc  5.2.3790.0 (srv03_rtm.030324-2048)
          176.00 KB (180,224 bytes)     5/13/2003
4:41 PM   Microsoft Corporation
          c:\windows\system32\schedsvc.dll
msidle    6.00.3790.0 (srv03_rtm.030324-2048)
          5.50 KB (5,632 bytes)         3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\msidle.dll
audiosrv  5.2.3790.0 (srv03_rtm.030324-2048)
          38.00 KB (38,912 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\audiosrv.dll
wkssvc    5.2.3790.0 (srv03_rtm.030324-2048)
          125.00 KB (128,000 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\wkssvc.dll
wiarpc    5.2.3790.0 (srv03_rtm.030324-2048)
          30.00 KB (30,720 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\wiarpc.dll
cryptsvc  5.2.3790.0 (srv03_rtm.030324-2048)
          51.00 KB (52,224 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\cryptsvc.dll
certcli   5.2.3790.0 (srv03_rtm.030324-2048)
          228.00 KB (233,472 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\certcli.dll
vssapi    5.2.3790.0 (srv03_rtm.030324-2048)
          528.00 KB (540,672 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\vssapi.dll
dmserver  5.2.3790.0 (srv03_rtm.030324-2048)
          24.00 KB (24,576 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\dmserver.dll
es        2001.12.4720.0 (srv03_rtm.030324-2048)
          221.50 KB (226,816 bytes)     3/25/2003
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12:00 AM  Microsoft Corporation
          c:\windows\system32\es.dll
pchsvc    5.2.3790.0 (srv03_rtm.030324-2048)
          31.50 KB (32,256 bytes)       5/13/2003
4:42 PM   Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\pchsvc
.dll
srvsvc    5.2.3790.0 (srv03_rtm.030324-2048)
          89.00 KB (91,136 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\srvsvc.dll
seclogon  5.2.3790.0 (srv03_rtm.030324-2048)
          16.50 KB (16,896 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\seclogon.dll
trkwks    5.2.3790.0 (srv03_rtm.030324-2048)
          85.00 KB (87,040 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\trkwks.dll
wmisvc    5.2.3790.0 (srv03_rtm.030324-2048)
          131.00 KB (134,144 bytes)     5/13/2003
4:37 PM   Microsoft Corporation
          c:\windows\system32\wbem\wmisvc.dll
wuauserv  5.4.3790.0 (srv03_rtm.030324-2048)
          10.50 KB (10,752 bytes)       5/13/2003
4:38 PM   Microsoft Corporation
          c:\windows\system32\wuauserv.dll
wuaueng   5.4.3790.0 (srv03_rtm.030324-2048)
          188.50 KB (193,024 bytes)     5/13/2003
4:38 PM   Microsoft Corporation
          c:\windows\system32\wuaueng.dll
advpack   6.00.3790.0 (srv03_rtm.030324-2048)
          93.50 KB (95,744 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\advpack.dll
wininet   6.00.3790.0 (srv03_rtm.030324-2048)
          609.00 KB (623,616 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\wininet.dll
sens      5.2.3790.0 (srv03_rtm.030324-2048)
          35.50 KB (36,352 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\sens.dll
winrnr    5.2.3790.0 (srv03_rtm.030324-2048)
          15.00 KB (15,360 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\winrnr.dll
comsvcs   2001.12.4720.0 (srv03_rtm.030324-2048)
          1.14 MB (1,199,616 bytes)     5/13/2003
4:38 PM   Microsoft Corporation
          c:\windows\system32\comsvcs.dll
rasadhlp  5.2.3790.0 (srv03_rtm.030324-2048)
          6.50 KB (6,656 bytes)         3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\rasadhlp.dll
browser   5.2.3790.0 (srv03_rtm.030324-2048)
          70.50 KB (72,192 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\browser.dll
netrap    5.2.3790.0 (srv03_rtm.030324-2048)
          11.50 KB (11,776 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\netrap.dll
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netman    5.2.3790.0 (srv03_rtm.030324-2048)
          209.00 KB (214,016 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\netman.dll
wzcsapi   5.2.3790.0 (srv03_rtm.030324-2048)
          24.50 KB (25,088 bytes)       3/25/2003
6:15 AM   Microsoft Corporation
          c:\windows\system32\wzcsapi.dll
netshell  5.2.3790.0 (srv03_rtm.030324-2048)
          1.67 MB (1,747,456 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\netshell.dll
clusapi   5.2.3790.0 (srv03_rtm.030324-2048)
          56.00 KB (57,344 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\clusapi.dll
hnetcfg   5.2.3790.0 (srv03_rtm.030324-2048)
          243.50 KB (249,344 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\hnetcfg.dll
wbemcore  5.2.3790.0 (srv03_rtm.030324-2048)
          457.00 KB (467,968 bytes)     5/13/2003
4:37 PM   Microsoft Corporation
          c:\windows\system32\wbem\wbemcore.dll
esscli    5.2.3790.0 (srv03_rtm.030324-2048)
          235.50 KB (241,152 bytes)     5/13/2003
4:37 PM   Microsoft Corporation
          c:\windows\system32\wbem\esscli.dll
wmiutils  5.2.3790.0 (srv03_rtm.030324-2048)
          90.50 KB (92,672 bytes)       5/13/2003
4:37 PM   Microsoft Corporation
          c:\windows\system32\wbem\wmiutils.dll
repdrvfs  5.2.3790.0 (srv03_rtm.030324-2048)
          165.00 KB (168,960 bytes)     5/13/2003
4:37 PM   Microsoft Corporation
          c:\windows\system32\wbem\repdrvfs.dll
wmiprvsd  5.2.3790.0 (srv03_rtm.030324-2048)
          405.50 KB (415,232 bytes)     5/13/2003
4:37 PM   Microsoft Corporation
          c:\windows\system32\wbem\wmiprvsd.dll
wbemess   5.2.3790.0 (srv03_rtm.030324-2048)
          256.50 KB (262,656 bytes)     5/13/2003
4:37 PM   Microsoft Corporation
          c:\windows\system32\wbem\wbemess.dll
rasdlg    5.2.3790.0 (srv03_rtm.030324-2048)
          642.00 KB (657,408 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\rasdlg.dll
ncprov    5.2.3790.0 (srv03_rtm.030324-2048)
          43.00 KB (44,032 bytes)       5/13/2003
4:37 PM   Microsoft Corporation
          c:\windows\system32\wbem\ncprov.dll
winhttp   5.2.3790.0 (srv03_rtm.030324-2048)
          327.50 KB (335,360 bytes)     6/15/2003
7:28 AM   Microsoft Corporation
          c:\windows\winsxs\x86_microsoft.windows.win
http_6595b64144ccf1df_5.1.0.0_x-
ww_e0651936\winhttp.dll
netcfgx   5.2.3790.0 (srv03_rtm.030324-2048)
          726.00 KB (743,424 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\netcfgx.dll
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spoolsv   5.2.3790.0 (srv03_rtm.030324-2048)
          55.00 KB (56,320 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\spoolsv.exe
spoolss   5.2.3790.0 (srv03_rtm.030324-2048)
          79.00 KB (80,896 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\spoolss.dll
localspl  5.2.3790.0 (srv03_rtm.030324-2048)
          304.50 KB (311,808 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\localspl.dll
cnbjmon   5.2.3680.0 (Lab03_dev(skatari).020509-1043)
          45.50 KB (46,592 bytes)       3/24/2003
7:48 PM   Microsoft Corporation
          c:\windows\system32\cnbjmon.dll
pjlmon    5.2.3790.0 (srv03_rtm.030324-2048)
          15.00 KB (15,360 bytes)       3/24/2003
7:49 PM   Microsoft Corporation
          c:\windows\system32\pjlmon.dll
tcpmon    5.2.3790.0 (srv03_rtm.030324-2048)
          44.00 KB (45,056 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\tcpmon.dll
mgmtapi   5.2.3790.0 (srv03_rtm.030324-2048)
          14.00 KB (14,336 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\mgmtapi.dll
snmpapi   5.2.3790.0 (srv03_rtm.030324-2048)
          17.50 KB (17,920 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\snmpapi.dll
wsnmp32   5.2.3790.0 (srv03_rtm.030324-2048)
          39.50 KB (40,448 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\wsnmp32.dll
usbmon    5.2.3790.0 (srv03_rtm.030324-2048)
          17.00 KB (17,408 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\usbmon.dll
wshqos    5.2.3790.0 (srv03_rtm.030324-2048)
          23.00 KB (23,552 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\wshqos.dll
win32spl  5.2.3790.0 (srv03_rtm.030324-2048)
          94.50 KB (96,768 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\win32spl.dll
inetpp    5.2.3790.0 (srv03_rtm.030324-2048)
          71.50 KB (73,216 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\inetpp.dll
icmp      5.2.3790.0 (srv03_rtm.030324-2048)
          4.50 KB (4,608 bytes)         3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\icmp.dll
aclient   5.6.72    3.83 MB (4,014,156 bytes)
          5/24/2003 4:47 PM   Altiris, Inc.
          c:\program
files\altiris\aclient\aclient.exe
wsock32   5.2.3790.0 (srv03_rtm.030324-2048)
          22.00 KB (22,528 bytes)       3/25/2003
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12:00 AM  Microsoft Corporation
          c:\windows\system32\wsock32.dll
riched32  5.2.3790.0 (srv03_rtm.030324-2048)
          3.50 KB (3,584 bytes)         3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\riched32.dll
riched20  5.31.23.1218        406.00 KB (415,744
bytes)    3/25/2003 12:00 AM  Microsoft Corporation
          c:\windows\system32\riched20.dll
ersvc     5.2.3790.0 (srv03_rtm.030324-2048)
          22.00 KB (22,528 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\ersvc.dll
sysdown   5.30.3718.0 built by:         29.00 KB
(29,696 bytes)      5/13/2003 6:24 PM   Compaq
Computer Corporation
          c:\windows\system32\sysdown.exe
dfssvc    5.2.3790.0 (srv03_rtm.030324-2048)
          130.50 KB (133,632 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\dfssvc.exe
resutils  5.2.3790.0 (srv03_rtm.030324-2048)
          59.00 KB (60,416 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\resutils.dll
mfc42u    6.05.3014.0         960.00 KB (983,040
bytes)    3/25/2003 12:00 AM  Microsoft Corporation
          c:\windows\system32\mfc42u.dll
explorer  6.00.3790.0 (srv03_rtm.030324-2048)
          1,008.50 KB (1,032,704 bytes) 3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\explorer.exe
browseui  6.00.3790.0 (srv03_rtm.030324-2048)
          1.01 MB (1,057,280 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\browseui.dll
shdocvw   6.00.3790.0 (srv03_rtm.030324-2048)
          1.33 MB (1,393,664 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\shdocvw.dll
themeui   6.00.3790.0 (srv03_rtm.030324-2048)
          360.50 KB (369,152 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\themeui.dll
msimg32   5.2.3790.0 (srv03_rtm.030324-2048)
          4.50 KB (4,608 bytes)         3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\msimg32.dll
actxprxy  6.00.3790.0 (srv03_rtm.030324-2048)
          95.00 KB (97,280 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\actxprxy.dll
linkinfo  5.2.3790.0 (srv03_rtm.030324-2048)
          16.50 KB (16,896 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\linkinfo.dll
ntshrui   6.00.3790.0 (srv03_rtm.030324-2048)
          136.00 KB (139,264 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\ntshrui.dll
urlmon    6.00.3790.0 (srv03_rtm.030324-2048)
          501.50 KB (513,536 bytes)     3/25/2003
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12:00 AM  Microsoft Corporation
          c:\windows\system32\urlmon.dll
webcheck  6.00.3790.0 (srv03_rtm.030324-2048)
          261.50 KB (267,776 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\webcheck.dll
stobject  5.2.3790.0 (srv03_rtm.030324-2048)
          117.50 KB (120,320 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\stobject.dll
batmeter  6.00.3790.0 (srv03_rtm.030324-2048)
          28.50 KB (29,184 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\batmeter.dll
powrprof  6.00.3790.0 (srv03_rtm.030324-2048)
          14.50 KB (14,848 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\powrprof.dll
browselc  6.00.3790.0 (srv03_rtm.030324-2048)
          62.00 KB (63,488 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\browselc.dll
shdoclc   6.00.3790.0 (srv03_rtm.030324-2048)
          588.50 KB (602,624 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\shdoclc.dll
printui   5.2.3790.0 (srv03_rtm.030324-2048)
          536.50 KB (549,376 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\printui.dll
cfgmgr32  5.2.3790.0 (srv03_rtm.030324-2048)
          17.50 KB (17,920 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\cfgmgr32.dll
mydocs    6.00.3790.0 (srv03_rtm.030324-2048)
          88.00 KB (90,112 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\mydocs.dll
zipfldr   6.00.3790.0 (srv03_rtm.030324-2048)
          316.00 KB (323,584 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\zipfldr.dll
aclntusr  5, 6, 0, 50           176.00 KB (180,224
bytes)    5/24/2003 4:47 PM             c:\program
files\altiris\aclient\aclntusr.exe
cmd       5.2.3790.0 (srv03_rtm.030324-2048)
          374.00 KB (382,976 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\cmd.exe
sqlservr  2000.080.0761.00    7.11 MB (7,450,664
bytes)    5/14/2003 10:00 AM  Microsoft Corporation
          c:\program files\microsoft sql
server\mssql\binn\sqlservr.exe
opends60  2000.080.0194.00    24.06 KB (24,639 bytes)
          5/13/2003 6:06 PM   Microsoft Corporation
          c:\program files\microsoft sql
server\mssql\binn\opends60.dll
ums       2000.080.0760.00    52.55 KB (53,808 bytes)
          5/13/2003 6:06 PM   Microsoft Corporation
          c:\program files\microsoft sql
server\mssql\binn\ums.dll
sqlsort   2000.080.0760.00    576.56 KB (590,396
bytes)    5/13/2003 6:06 PM   Microsoft Corporation
          c:\program files\microsoft sql
server\mssql\binn\sqlsort.dll
msvcirt   7.0.3790.0 (srv03_rtm.030324-2048)
          50.00 KB (51,200 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\msvcirt.dll
sqlevn70  2000.080.0760.00    28.00 KB (28,672 bytes)
          5/13/2003 6:06 PM   Microsoft Corporation
          c:\program files\microsoft sql
server\mssql\binn\resources\1033\sqlevn70.rll
xolehlp   2001.12.4720.0 (srv03_rtm.030324-2048)
          8.50 KB (8,704 bytes)         5/13/2003
4:38 PM   Microsoft Corporation
          c:\windows\system32\xolehlp.dll
msdtcprx  2001.12.4720.0 (srv03_rtm.030324-2048)
          427.50 KB (437,760 bytes)     5/13/2003
4:38 PM   Microsoft Corporation
          c:\windows\system32\msdtcprx.dll
mtxclu    2001.12.4720.0 (srv03_rtm.030324-2048)
          74.50 KB (76,288 bytes)       3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\mtxclu.dll
ssnetlib  2000.080.0760.00    80.56 KB (82,492 bytes)
          5/13/2003 6:06 PM   Microsoft Corporation
          c:\program files\microsoft sql
server\mssql\binn\ssnetlib.dll
ssnmpn70  2000.080.0534.00    24.56 KB (25,148 bytes)
          5/13/2003 6:06 PM   Microsoft Corporation
          c:\program files\microsoft sql
server\mssql\binn\ssnmpn70.dll
security  5.2.3790.0 (srv03_rtm.030324-2048)
          5.50 KB (5,632 bytes)         3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\security.dll
ssmslpcn  2000.080.0760.00    28.56 KB (29,244 bytes)
          5/13/2003 6:06 PM   Microsoft Corporation
          c:\program files\microsoft sql
server\mssql\binn\ssmslpcn.dll
sqloledb  2000.085.1022.00 (srv03_rtm.030324-2048)
          536.00 KB (548,864 bytes)     5/13/2003
4:41 PM   Microsoft Corporation         c:\program
files\common files\system\ole db\sqloledb.dll
msdart    2.80.1022.0 (srv03_rtm.030324-2048)
          164.00 KB (167,936 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\msdart.dll
msdatl3   2.80.1022.0 (srv03_rtm.030324-2048)
          96.00 KB (98,304 bytes)       5/13/2003
4:41 PM   Microsoft Corporation         c:\program
files\common files\system\ole db\msdatl3.dll
oledb32   2.80.1022.0 (srv03_rtm.030324-2048)
          500.00 KB (512,000 bytes)     5/13/2003
4:41 PM   Microsoft Corporation         c:\program
files\common files\system\ole db\oledb32.dll
oledb32r  2.80.1022.0 (srv03_rtm.030324-2048)
          68.00 KB (69,632 bytes)       5/13/2003
4:41 PM   Microsoft Corporation         c:\program
files\common files\system\ole db\oledb32r.dll
helpctr   5.2.3790.0 (srv03_rtm.030324-2048)
          764.00 KB (782,336 bytes)     5/13/2003
4:41 PM   Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\helpct
r.exe
hcappres  5.2.3790.0 (srv03_rtm.030324-2048)
          6.50 KB (6,656 bytes)         5/13/2003
4:41 PM   Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\hcappr
es.dll
itss      5.2.3790.0 (srv03_rtm.030324-2048)
          119.50 KB (122,368 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\itss.dll
msxml3    8.40.9419.0         1.28 MB (1,337,344
bytes)    3/25/2003 12:00 AM  Microsoft Corporation
          c:\windows\system32\msxml3.dll
pchshell  5.2.3790.0 (srv03_rtm.030324-2048)
          100.50 KB (102,912 bytes)     5/13/2003
4:42 PM   Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\pchshe
ll.dll
mlang     6.00.3790.0 (srv03_rtm.030324-2048)
          570.00 KB (583,680 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\mlang.dll
mshtml    6.00.3790.0 (srv03_rtm.030324-2048)
          2.78 MB (2,916,352 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\mshtml.dll
msimtf    5.2.3790.0 (srv03_rtm.030324-2048)
          149.00 KB (152,576 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\msimtf.dll
msctf     5.2.3790.0 (srv03_rtm.030324-2048)
          287.00 KB (293,888 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\msctf.dll
jscript   5.6.0.8515          436.00 KB (446,464
bytes)    3/25/2003 12:00 AM  Microsoft Corporation
          c:\windows\system32\jscript.dll
msls31    3.10.349.0          147.00 KB (150,528
bytes)    3/25/2003 12:00 AM  Microsoft Corporation
          c:\windows\system32\msls31.dll
mshtmled  6.00.3790.0 (srv03_rtm.030324-2048)
          443.50 KB (454,144 bytes)     3/25/2003
12:00 AM  Microsoft Corporation
          c:\windows\system32\mshtmled.dll
vbscript  5.6.0.8515          404.00 KB (413,696
bytes)    3/25/2003 12:00 AM  Microsoft Corporation
          c:\windows\system32\vbscript.dll
mfc42     6.05.3014.0         960.00 KB (983,040
bytes)    3/25/2003 12:00 AM  Microsoft Corporation
          c:\windows\system32\mfc42.dll
msinfo    5.2.3790.0 (srv03_rtm.030324-2048)
          358.50 KB (367,104 bytes)     5/13/2003
4:41 PM   Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\msinfo
.dll
helpsvc   5.2.3790.0 (srv03_rtm.030324-2048)
          720.00 KB (737,280 bytes)     5/13/2003
4:41 PM   Microsoft Corporation
          c:\windows\pchealth\helpctr\binaries\helpsv
c.exe

[Services]
```

```
Display Name        Name      State     Start Mode
          Service Type        Path      Error Control
          Start Name          Tag ID
Altiris Client Service        AClient   Running
          Auto      Own Process         c:\program
files\altiris\aclient\aclient.exe -service
          Normal    LocalSystem         0
Alerter   Alerter   Stopped   Disabled  Share Process
          c:\windows\system32\svchost.exe -k
localservice        Normal    NT
AUTHORITY\LocalService        0
Application Layer Gateway Service       ALG
          Stopped   Manual    Own Process
          c:\windows\system32\alg.exe   Normal    NT
AUTHORITY\LocalService        0
Application Management        AppMgmt   Stopped
          Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Windows Audio       AudioSrv  Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Background Intelligent Transfer Service BITS
          Stopped   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Computer Browser    Browser   Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Indexing Service    CiSvc     Stopped   Disabled
          Share Process
          c:\windows\system32\cisvc.exe Normal
          LocalSystem         0
ClipBook  ClipSrv   Stopped   Disabled  Own Process
          c:\windows\system32\clipsrv.exe
          Normal    LocalSystem         0
COM+ System Application       COMSysApp Stopped
          Manual    Own Process
          c:\windows\system32\dllhost.exe
/processid:{02d4b3f1-fd88-11d1-960d-00805fc79235}
          Normal    LocalSystem         0
Compaq Remote Monitor Service CpqRcmc   Stopped
          Auto      Own Process
          c:\windows\system32\cpqrcmc.exe
          Normal    LocalSystem         0
Cryptographic Services        CryptSvc  Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Distributed File System       Dfs       Running
          Auto      Own Process
          c:\windows\system32\dfssvc.exe
          Normal    LocalSystem         0
DHCP Client         Dhcp      Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k
networkservice      Normal    NT
AUTHORITY\NetworkService      0
Logical Disk Manager Administrative Service
          dmadmin   Stopped   Manual    Share Process
```

```
          c:\windows\system32\dmadmin.exe /com
          Normal    LocalSystem         0
Logical Disk Manager          dmserver  Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
DNS Client          Dnscache  Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k
networkservice      Normal    NT
AUTHORITY\NetworkService      0
Error Reporting Service       ERSvc     Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k winerr
          Ignore    LocalSystem         0
Event Log Eventlog  Running   Auto      Share Process
          c:\windows\system32\services.exe
          Normal    LocalSystem         0
COM+ Event System   EventSystem         Running
          Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Help and Support    helpsvc   Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Human Interface Device Access HidServ   Stopped
          Disabled  Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
HTTP SSL  HTTPFilter          Stopped   Manual
          Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
IMAPI CD-Burning COM Service  ImapiService
          Stopped   Disabled  Own Process
          c:\windows\system32\imapi.exe Normal
          LocalSystem         0
Intersite Messaging IsmServ   Stopped   Disabled  Own
Process   c:\windows\system32\ismserv.exe
          Normal    LocalSystem         0
Kerberos Key Distribution Center        kdc
          Stopped   Disabled  Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
Server    lanmanserver        Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Workstation         lanmanworkstation   Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
License Logging     LicenseService      Stopped
          Disabled  Own Process
          c:\windows\system32\llssrv.exe
          Normal    NT AUTHORITY\NetworkService   0

TCP/IP NetBIOS Helper         LmHosts   Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k
localservice        Normal    NT
AUTHORITY\LocalService        0
```

```
Messenger Messenger Stopped   Disabled  Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
NetMeeting Remote Desktop Sharing       mnmsrvc
          Stopped   Disabled  Own Process
          c:\windows\system32\mnmsrvc.exe
          Normal    LocalSystem         0
Distributed Transaction Coordinator     MSDTC
          Running   Auto      Own Process
          c:\windows\system32\msdtc.exe Normal    NT
AUTHORITY\NetworkService      0
Windows Installer   MSIServer Stopped   Manual
          Share Process
          c:\windows\system32\msiexec.exe /v
          Normal    LocalSystem         0
MSSQLSERVER         MSSQLSERVER         Stopped
          Manual    Own Process
          c:\progra~1\micros~1\mssql\binn\sqlservr.ex
e         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   Disabled
          Share Process
          c:\windows\system32\netdde.exe
          Normal    LocalSystem         0
Network DDE DSDM    NetDDEdsdm          Stopped
          Disabled  Share Process
          c:\windows\system32\netdde.exe
          Normal    LocalSystem         0
Net Logon Netlogon  Stopped   Manual    Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
Network Connections Netman    Running   Manual
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Network Location Awareness (NLA)        Nla
          Running   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
File Replication    NtFrs     Stopped   Manual    Own
Process   c:\windows\system32\ntfrs.exe Ignore
          LocalSystem         0
NT LM Security Support Provider         NtLmSsp
          Stopped   Manual    Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
Removable Storage   NtmsSvc   Stopped   Manual
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Plug and Play       PlugPlay  Running   Auto
          Share Process
          c:\windows\system32\services.exe
          Normal    LocalSystem         0
IPSEC Services      PolicyAgent         Running
          Auto      Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
Protected Storage   ProtectedStorage    Running
          Auto      Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
Remote Access Auto Connection Manager   RasAuto
          Stopped   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Remote Access Connection Manager        RasMan
          Stopped   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Remote Desktop Help Session Manager     RDSessMgr
          Stopped   Manual    Own Process
          c:\windows\system32\sessmgr.exe
          Normal    LocalSystem         0
Routing and Remote Access     RemoteAccess
          Stopped   Disabled  Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Remote Registry     RemoteRegistry      Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k regsvc
          Normal    NT AUTHORITY\LocalService     0

Remote Procedure Call (RPC) Locator     RpcLocator
          Stopped   Manual    Own Process
          c:\windows\system32\locator.exe
          Normal    NT AUTHORITY\NetworkService   0

Remote Procedure Call (RPC)   RpcSs     Running
          Auto      Share Process
          c:\windows\system32\svchost -k rpcss
          Normal    LocalSystem         0
Resultant Set of Policy Provider        RSoPProv
          Stopped   Manual    Share Process
          c:\windows\system32\rsopprov.exe
          Normal    LocalSystem         0
Special Administration Console Helper   sacsvr
          Stopped   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Security Accounts Manager     SamSs     Running
          Auto      Share Process
          c:\windows\system32\lsass.exe Normal
          LocalSystem         0
Smart Card          SCardSvr  Stopped   Manual
          Share Process
          c:\windows\system32\scardsvr.exe
          Ignore    NT AUTHORITY\LocalService     0

Task Scheduler      Schedule  Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Secondary Logon     seclogon  Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Ignore    LocalSystem         0
System Event Notification     SENS      Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Internet Connection Firewall (ICF) / Internet
Connection Sharing (ICS)      SharedAccess
```

```
          Stopped   Disabled  Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Shell Hardware Detection      ShellHWDetection
          Running   Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Ignore    LocalSystem         0
Print Spooler       Spooler   Running   Auto      Own
Process   c:\windows\system32\spoolsv.exe
          Normal    LocalSystem         0
SQLSERVERAGENT      SQLSERVERAGENT      Stopped
          Manual    Own Process
          c:\progra~1\micros~1\mssql\binn\sqlagent.ex
e         Normal    LocalSystem         0
Windows Image Acquisition (WIA)         stisvc
          Stopped   Disabled  Share Process
          c:\windows\system32\svchost.exe -k imgsvc
          Normal    NT AUTHORITY\LocalService     0

Microsoft Software Shadow Copy Provider swprv
          Stopped   Manual    Own Process
          c:\windows\system32\svchost.exe -k swprv
          Normal    LocalSystem         0
HP ProLiant System Shutdown Service     sysdown
          Running   Auto      Own Process
          c:\windows\system32\sysdown.exe
          Normal    LocalSystem         0
Performance Logs and Alerts   SysmonLog Stopped
          Manual    Own Process
          c:\windows\system32\smlogsvc.exe
          Normal    NT Authority\NetworkService   0

Telephony TapiSrv   Stopped   Manual    Share Process
          c:\windows\system32\svchost.exe -k tapisrv
          Normal    LocalSystem         0
Terminal Services   TermService         Running
          Manual    Share Process
          c:\windows\system32\svchost.exe -k termsvcs
          Normal    LocalSystem         0
Themes    Themes    Stopped   Disabled  Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Telnet    TlntSvr   Stopped   Disabled  Own Process
          c:\windows\system32\tlntsvr.exe
          Normal    NT AUTHORITY\LocalService     0

Distributed Link Tracking Server        TrkSvr
          Stopped   Disabled  Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Distributed Link Tracking Client        TrkWks
          Running   Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Terminal Services Session Directory     Tssdis
          Stopped   Disabled  Own Process
          c:\windows\system32\tssdis.exe
          Normal    LocalSystem         0
Upload Manager      uploadmgr Stopped   Manual
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
```

```
Uninterruptible Power Supply  UPS       Stopped
          Manual    Own Process
          c:\windows\system32\ups.exe   Normal    NT
AUTHORITY\LocalService        0
Virtual Disk Service          vds       Stopped
          Manual    Own Process
          c:\windows\system32\vds.exe   Normal
          LocalSystem         0
Volume Shadow Copy  VSS       Stopped   Manual    Own
Process   c:\windows\system32\vssvc.exe Normal
          LocalSystem         0
Windows Time        W32Time   Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
WebClient WebClient Stopped   Disabled  Share Process
          c:\windows\system32\svchost.exe -k
localservice        Normal    NT
AUTHORITY\LocalService        0
WinHTTP Web Proxy Auto-Discovery Service
          WinHttpAutoProxySvc Stopped   Manual
          Share Process
          c:\windows\system32\svchost.exe -k
localservice        Normal    NT
AUTHORITY\LocalService        0
Windows Management Instrumentation      winmgmt
          Running   Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Ignore    LocalSystem         0
Portable Media Serial Number Service    WmdmPmSN
          Stopped   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Windows Management Instrumentation Driver Extensions
          Wmi       Stopped   Manual    Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
WMI Performance Adapter       WmiApSrv  Stopped
          Manual    Own Process
          c:\windows\system32\wbem\wmiapsrv.exe
          Normal    LocalSystem         0
Automatic Updates   wuauserv  Running   Auto
          Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Wireless Configuration        WZCSVC    Running
          Auto      Share Process
          c:\windows\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0

[Program Groups]

Group Name          Name      User Name
Accessories         Default User:Accessories
          Default User
Accessories\Accessibility     Default
User:Accessories\Accessibility          Default User

Accessories\Entertainment     Default
User:Accessories\Entertainment          Default User

Startup   Default User:Startup          Default User
```

```
Accessories         All Users:Accessories         All
Users
Accessories\Accessibility     All
Users:Accessories\Accessibility         All Users
Accessories\Communications    All
Users:Accessories\Communications        All Users
Accessories\Entertainment     All
Users:Accessories\Entertainment         All Users
Accessories\System Tools      All
Users:Accessories\System Tools          All Users
Administrative Tools          All
Users:Administrative Tools    All Users
Compaq System Tools All Users:Compaq System Tools All
Users
Compaq System Tools\hp Array Configuration Utility
          All Users:Compaq System Tools\hp Array
Configuration Utility         All Users
Microsoft SQL Server          All Users:Microsoft SQL
Server    All Users
Startup   All Users:Startup   All Users
Tardis    All Users:Tardis    All Users
Accessories         NT AUTHORITY\SYSTEM:Accessories
          NT AUTHORITY\SYSTEM
Accessories\Accessibility     NT
AUTHORITY\SYSTEM:Accessories\Accessibility        NT
AUTHORITY\SYSTEM
Accessories\Entertainment     NT
AUTHORITY\SYSTEM:Accessories\Entertainment        NT
AUTHORITY\SYSTEM
Startup   NT AUTHORITY\SYSTEM:Startup   NT
AUTHORITY\SYSTEM
Accessories         APARK\Administrator:Accessories
          APARK\Administrator
Accessories\Accessibility
          APARK\Administrator:Accessories\Accessibili
ty        APARK\Administrator
Accessories\Entertainment
          APARK\Administrator:Accessories\Entertainme
nt        APARK\Administrator
Administrative Tools
          APARK\Administrator:Administrative Tools
          APARK\Administrator
Startup   APARK\Administrator:Startup
          APARK\Administrator

[Startup Programs]

Program   Command   User Name Location
desktop   desktop.ini         NT AUTHORITY\SYSTEM
          Startup
desktop   desktop.ini         APARK\Administrator
          Startup
desktop   desktop.ini         .DEFAULT  Startup
desktop   desktop.ini         All Users Common
Startup
AClntUsr  c:\program
files\altiris\aclient\aclntusr.exe      All Users
          HKLM\SOFTWARE\Microsoft\Windows\CurrentVers
ion\Run

[OLE Registration]

Object    Local Server
```

```
Sound (OLE2)        sndrec32.exe
Media Clip          mplay32.exe
Video Clip          mplay32.exe /avi
MIDI Sequence       mplay32.exe /mid
Sound     Not Available
Media Clip          Not Available
WordPad Document    "%programfiles%\windows
nt\accessories\wordpad.exe"
Windows Media Services DRM Storage object         Not
Available
Bitmap Image        mspaint.exe

[Windows Error Reporting]

Time      Type      Details

[Internet Settings]



[Internet Explorer]

[ Following are sub-categories of this main category
]
[Summary]

Item      Value
Version   6.0.3790.0
Build     63790
Application Path    C:\Program Files\Internet
Explorer
Language  English (United States)
Active Printer      Not Available

Cipher Strength     128-bit
Content Advisor     Disabled
IEAK Install        No

[File Versions]

File      Version   Size      Date      Path
          Company
actxprxy.dll        6.0.3790.0          95 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

actxprxy.dll        6.0.3790.0          95 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
advpack.dll         6.0.3790.0          94 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

advpack.dll         6.0.3790.0          94 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
asctrls.ocx         6.0.3790.0          90 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

asctrls.ocx         6.0.3790.0          90 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
```

```
browselc.dll        6.0.3790.0          62 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

browselc.dll        6.0.3790.0          62 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
browseui.dll        6.0.3790.0          1,033 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

browseui.dll        6.0.3790.0          1,033 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
cdfview.dll         6.0.3790.0          144 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

cdfview.dll         6.0.3790.0          144 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
comctl32.dll        5.82.3790.0         561 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

comctl32.dll        5.82.3790.0         561 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
dxtrans.dll         6.3.3790.0          198 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

dxtrans.dll         6.3.3790.0          198 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
dxtmsft.dll         6.3.3790.0          344 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

dxtmsft.dll         6.3.3790.0          344 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
iecont.dll          <File Missing>      Not Available
          Not Available       Not Available       Not
Available
iecontlc.dll        <File Missing>      Not Available
          Not Available       Not Available       Not
Available
iedkcs32.dll        16.0.3790.0         300 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

iedkcs32.dll        16.0.3790.0         300 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
iepeers.dll         6.0.3790.0          230 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

iepeers.dll         6.0.3790.0          230 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
```

```
iesetup.dll         6.0.3790.0          59 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

iesetup.dll         6.0.3790.0          59 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
ieuinit.inf         Not Available       20 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Not Available
ieuinit.inf         Not Available       20 KB
          3/25/2003 1:00:00 AM          .         Not
Available
iexplore.exe        6.0.3790.0          90 KB
          3/25/2003 1:00:00 AM          C:\Program
Files\Internet Explorer       Microsoft Corporation

imgutil.dll         5.2.3790.0          35 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

imgutil.dll         5.2.3790.0          35 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
inetcpl.cpl         6.0.3790.0          303 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

inetcpl.cpl         6.0.3790.0          303 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
inetcplc.dll        6.0.3790.0          109 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

inetcplc.dll        6.0.3790.0          109 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
inseng.dll          6.0.3790.0          72 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

inseng.dll          6.0.3790.0          72 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
mlang.dll 6.0.3790.0          570 KB    3/25/2003
1:00:00 AM          C:\WINDOWS\system32 Microsoft
Corporation
mlang.dll 6.0.3790.0          570 KB    3/25/2003
1:00:00 AM          .         Microsoft Corporation

msencode.dll        2002.10.4.0         112 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Not Available
msencode.dll        2002.10.4.0         112 KB
          3/25/2003 1:00:00 AM          .         Not
Available
mshta.exe 6.0.3790.0          26 KB     3/25/2003
1:00:00 AM          C:\WINDOWS\system32 Microsoft
Corporation
mshta.exe 6.0.3790.0          26 KB     3/25/2003
1:00:00 AM          .         Microsoft Corporation
```

```
mshtml.dll          6.0.3790.0          2,848 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

mshtml.dll          6.0.3790.0          2,848 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
mshtml.tlb          6.0.3790.0          1,319 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

mshtml.tlb          6.0.3790.0          1,319 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
mshtmled.dll        6.0.3790.0          444 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

mshtmled.dll        6.0.3790.0          444 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
mshtmler.dll        6.0.3790.0          55 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

mshtmler.dll        6.0.3790.0          55 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
msident.dll         6.0.3790.0          47 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

msident.dll         6.0.3790.0          47 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
msidntld.dll        6.0.3790.0          15 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

msidntld.dll        6.0.3790.0          15 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
msieftp.dll         6.0.3790.0          230 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

msieftp.dll         6.0.3790.0          230 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
msrating.dll        6.0.3790.0          132 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

msrating.dll        6.0.3790.0          132 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
mstime.dll          6.0.3790.0          491 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

mstime.dll          6.0.3790.0          491 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
```

```
occache.dll         6.0.3790.0          89 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

occache.dll         6.0.3790.0          89 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
proctexe.ocx        6.3.3790.0          78 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Intel Corporation
proctexe.ocx        6.3.3790.0          78 KB
          3/25/2003 1:00:00 AM          .
          Intel Corporation
sendmail.dll        6.0.3790.0          52 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

sendmail.dll        6.0.3790.0          52 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
shdoclc.dll         6.0.3790.0          589 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

shdoclc.dll         6.0.3790.0          589 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
shdocvw.dll         6.0.3790.0          1,361 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

shdocvw.dll         6.0.3790.0          1,361 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
shfolder.dll        6.0.3790.0          23 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

shfolder.dll        6.0.3790.0          23 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
shlwapi.dll         6.0.3790.0          281 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

shlwapi.dll         6.0.3790.0          281 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
tdc.ocx   1.3.0.3130          58 KB     3/25/2003
1:00:00 AM          C:\WINDOWS\system32 Microsoft
Corporation
tdc.ocx   1.3.0.3130          58 KB     3/25/2003
1:00:00 AM          .         Microsoft Corporation

url.dll   6.0.3790.0          36 KB     3/25/2003
1:00:00 AM          C:\WINDOWS\system32 Microsoft
Corporation
url.dll   6.0.3790.0          36 KB     3/25/2003
1:00:00 AM          .         Microsoft Corporation

urlmon.dll          6.0.3790.0          502 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

urlmon.dll          6.0.3790.0          502 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
webcheck.dll        6.0.3790.0          262 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

webcheck.dll        6.0.3790.0          262 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation
wininet.dll         6.0.3790.0          609 KB
          3/25/2003 1:00:00 AM
          C:\WINDOWS\system32 Microsoft Corporation

wininet.dll         6.0.3790.0          609 KB
          3/25/2003 1:00:00 AM          .
          Microsoft Corporation

[Connectivity]

Item      Value
Connection Preference         Never dial

LAN Settings

AutoConfigProxy     Not Available
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\NetworkService\Local Settings\Temporary
Internet Files
Total Disk Space    Not Available
Available Disk Space          Not Available
Maximum Cache Size  Not Available
Available Cache Size          Not Available

[List of Objects]

Program File        Status    CodeBase
No cached object information available


[Content]

[ Following are sub-categories of this main category
]
[Summary]

Item      Value
```

```
Content Advisor     Disabled

[Personal Certificates]

Issued To Issued By Validity  Signature Algorithm
No personal certificate information available


[Other People Certificates]

Issued To Issued By Validity  Signature Algorithm
No other people certificate information available


[Publishers]

Name
No publisher information available

[Security]

Zone      Security Level
My Computer         Custom
Local intranet      Medium-low
Trusted sites       Medium
Internet  High
Restricted sites    High
```

Client Summary

```
System Information report written at: 05/22/2003
04:05:18 PM
[System Information]

[ Following are sub-categories of this main category
]

[System Summary]

Item      Value
OS Name   Microsoft Windows 2000 Server
Version   5.0.2195 Service Pack 2 Build 2195
OS Manufacturer     Microsoft Corporation
System Name         CL73
System Manufacturer HP
System Model        ProLiant DL360 G3
System Type         X86-based PC
Processor x86 Family 15 Model 2 Stepping 7
GenuineIntel ~37426 Mhz
Processor x86 Family 15 Model 2 Stepping 7
GenuineIntel ~37426 Mhz
BIOS Version        02/04/03
Windows Directory   C:\WINNT
System Directory    C:\WINNT\System32
Boot Device         \Device\Harddisk0\Partition1
Locale    United States
User Name CL73\Administrator
Time Zone Central Daylight Time
```

```
Total Physical Memory         1,048,084 KB
Available Physical Memory     893,080 KB
Total Virtual Memory          2,783,500 KB
Available Virtual Memory      2,565,736 KB
Page File Space     1,735,416 KB
Page File C:\pagefile.sys

[Hardware Resources]

[ Following are sub-categories of this main category
]

[Conflicts/Sharing]

Resource  Device
No conflicted/shared resources

[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
0x03B0-0x03BB       PCI bus   OK
0x03B0-0x03BB       ATI Technologies Inc. RAGE XL PCI
          OK
0x03C0-0x03DF       PCI bus   OK
0x03C0-0x03DF       ATI Technologies Inc. RAGE XL PCI
          OK
0x2400-0x24FF       ATI Technologies Inc. RAGE XL PCI
          OK
0x2800-0x28FF       Smart Array 5i      OK
0x1800-0x18FF       HP ProLiant iLO Advanced System
Management Controller         OK
0x2C00-0x2CFF       HP iLO Management Interface
Driver    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
0x0408-0x040F       Motherboard resources         OK
0x0092-0x0092       Motherboard resources         OK
0x0900-0x0903       Motherboard resources         OK
0x0910-0x0911       Motherboard resources         OK
0x0920-0x0923       Motherboard resources         OK
0x0930-0x0937       Motherboard resources         OK
0x0940-0x0947       Motherboard resources         OK
0x0950-0x0957       Motherboard resources         OK
0x0C06-0x0C08       Motherboard resources         OK
0x0C14-0x0C14       Motherboard resources         OK
0x0C49-0x0C4A       Motherboard resources         OK
```

```
0x0C50-0x0C52       Motherboard resources         OK
0x0C6C-0x0C6F       Motherboard resources         OK
0x0010-0x001F       Motherboard resources         OK
0x0230-0x0233       Motherboard resources         OK
0x0260-0x0267       Motherboard resources         OK
0x04D0-0x04D1       Motherboard resources         OK
0x0700-0x070F       Motherboard resources         OK
0x0800-0x081F       Motherboard resources         OK
0x0C80-0x0C83       Motherboard resources         OK
0x0CD4-0x0CD7       Motherboard resources         OK
0x0CF9-0x0CF9       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
0x002E-0x002F       Extended IO Bus     OK
0x0220-0x0223       Extended IO Bus     OK
0x0240-0x025F       Extended IO Bus     OK
0x0070-0x0073       Extended IO Bus     OK
0x03F8-0x03FF       Communications Port (COM1)    OK
0x03F2-0x03F5       Standard floppy disk controller
          OK
0x03F7-0x03F7       Standard floppy disk controller
          OK
0x2000-0x200F       Standard Dual Channel PCI IDE
Controller          OK
0x01F0-0x01F7       Primary IDE Channel OK
0x03F6-0x03F6       Primary IDE Channel OK
0x0170-0x0177       Secondary IDE Channel         OK
0x0376-0x0376       Secondary IDE Channel         OK

[IRQs]

IRQ Number          Device
9         Microsoft ACPI-Compliant System
31        Smart Array 5i
23        HP ProLiant iLO Advanced System Management
Controller
22        HP iLO Management Interface Driver
1         Standard 101/102-Key or Microsoft Natural
PS/2 Keyboard
12        PS/2 Compatible Mouse
4         Communications Port (COM1)
6         Standard floppy disk controller
14        Primary IDE Channel
7         Standard OpenHCD USB Host Controller
30        Compaq NC7781 Gigabit Server Adapter #2
```

```
29        Compaq NC7781 Gigabit Server Adapter

[Memory]

Range     Device    Status
0xA0000-0xBFFFF     PCI bus   OK
0xA0000-0xBFFFF     ATI Technologies Inc. RAGE XL PCI
          OK
0xF5D00000-0xF6FFFFFF         PCI bus   OK
0xF6000000-0xF6FFFFFF         ATI Technologies Inc.
RAGE XL PCI         OK
0xF5FF0000-0xF5FF0FFF         ATI Technologies Inc.
RAGE XL PCI         OK
0xF5F80000-0xF5FBFFFF         Smart Array 5i      OK
0xF5DF0000-0xF5DF3FFF         Smart Array 5i      OK
0xF5F70000-0xF5F701FF         HP ProLiant iLO
Advanced System Management Controller   OK
0xF5F60000-0xF5F607FF         HP iLO Management
Interface Driver    OK
0xF5F50000-0xF5F51FFF         HP iLO Management
Interface Driver    OK
0xF5E80000-0xF5EFFFFF         HP iLO Management
Interface Driver    OK
0xF5E70000-0xF5E70FFF         Standard OpenHCD USB
Host Controller     OK
0xF7E00000-0xF7EFFFFF         PCI bus   OK
0xF7EF0000-0xF7EFFFFF         Compaq NC7781 Gigabit
Server Adapter #2   OK
0xF7F00000-0xF7FFFFFF         PCI bus   OK
0xF7FF0000-0xF7FFFFFF         Compaq NC7781 Gigabit
Server Adapter      OK

[Components]

[ Following are sub-categories of this main category
]

[Multimedia]

[ Following are sub-categories of this main category
]

[Audio Codecs]

Codec     Manufacturer        Description
          Status    File      Version   Size
          Creation Date
c:\winnt\system32\iac25_32.ax Intel Corporation
          Indeo® audio software         OK
          C:\WINNT\System32\IAC25_32.AX 2.05.53
          195.00 KB (199,680 bytes)     12/7/1999
7:00:00 AM
c:\winnt\system32\lhacm.acm   Microsoft Corporation
                    OK
          C:\WINNT\System32\LHACM.ACM   4.4.3385
          33.27 KB (34,064 bytes)       9/13/2002
5:46:04 PM
c:\winnt\system32\msg723.acm  Microsoft Corporation
                    OK
          C:\WINNT\System32\MSG723.ACM  4.4.3385
          106.77 KB (109,328 bytes)     9/13/2002
5:46:03 PM
```

```
c:\winnt\system32\msadp32.acm Microsoft Corporation
                    OK
          C:\WINNT\System32\MSADP32.ACM 5.00.2134.1
          14.77 KB (15,120 bytes)       12/7/1999
7:00:00 AM
c:\winnt\system32\msgsm32.acm Microsoft Corporation
                    OK
          C:\WINNT\System32\MSGSM32.ACM 5.00.2134.1
          22.27 KB (22,800 bytes)       12/7/1999
7:00:00 AM
c:\winnt\system32\tssoft32.acm          DSP GROUP,
INC.                OK
          C:\WINNT\System32\TSSOFT32.ACM
          1.01      9.27 KB (9,488 bytes)
          12/7/1999 7:00:00 AM
c:\winnt\system32\msg711.acm  Microsoft Corporation
                    OK
          C:\WINNT\System32\MSG711.ACM  5.00.2134.1
          10.27 KB (10,512 bytes)       12/7/1999
7:00:00 AM
c:\winnt\system32\imaadp32.acm          Microsoft
Corporation                   OK
          C:\WINNT\System32\IMAADP32.ACM
          5.00.2134.1         16.27 KB (16,656 bytes)
          12/7/1999 7:00:00 AM

[Video Codecs]

Codec     Manufacturer        Description
          Status    File      Version   Size
          Creation Date
c:\winnt\system32\msh261.drv  Microsoft Corporation
                    OK
          C:\WINNT\System32\MSH261.DRV  4.4.3385
          163.77 KB (167,696 bytes)     9/13/2002
5:46:04 PM
c:\winnt\system32\ir50_32.dll Intel Corporation
          Indeo® video 5.10   OK
          C:\WINNT\System32\IR50_32.DLL
          R.5.10.15.2.55      737.50 KB (755,200
bytes)    12/7/1999 7:00:00 AM
c:\winnt\system32\msvidc32.dll          Microsoft
Corporation                   OK
          C:\WINNT\System32\MSVIDC32.DLL
          5.00.2134.1         27.27 KB (27,920 bytes)
          12/7/1999 7:00:00 AM
c:\winnt\system32\msh263.drv  Microsoft Corporation
                    OK
          C:\WINNT\System32\MSH263.DRV  4.4.3385
          252.27 KB (258,320 bytes)     9/13/2002
5:45:39 PM
c:\winnt\system32\ir32_32.dll Intel(R) Corporation
                    OK
          C:\WINNT\System32\IR32_32.DLL Not Available
          194.50 KB (199,168 bytes)     12/7/1999
7:00:00 AM
c:\winnt\system32\iccvid.dll  Radius Inc.
          OK        C:\WINNT\System32\ICCVID.DLL
          1.10.0.6  108.00 KB (110,592 bytes)
          12/7/1999 7:00:00 AM
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
7:00:00 AM

[CD-ROM]

Item      Value
Drive     D:
Description         CD-ROM Drive
Media Loaded        False
Media Type          CD-ROM
Name      COMPAQ CRN-8245B
Manufacturer        (Standard CD-ROM drives)
Status    OK
Transfer Rate       Not Available
SCSI Target ID      0
PNP Device ID       IDE\CDROMCOMPAQ_CRN-
8245B________________________2.19____\5&FB0C83D&0&0.0
.0


[Sound Device]

Item      Value
No sound devices

[Display]

Item      Value
Name      ATI Technologies Inc. RAGE XL PCI
PNP Device ID
          PCI\VEN_1002&DEV_4752&SUBSYS_001E0E11&REV_2
7\3&267A616A&0&18
Adapter Type        ATI RAGE XL PCI, ATI Technologies
Inc. compatible
Adapter Description ATI Technologies Inc. RAGE XL PCI
Adapter RAM         8.00 MB (8,388,608 bytes)
Installed Drivers   atidrab.dll
Driver Version      5.00.2179.1
INF File  display.inf (atirage3 section)
Color Planes        1
Color Table Entries 65536
Resolution          640 x 480 x 60 hertz
Bits/Pixel          16


[Infrared]

Item      Value
No infrared devices

[Input]

[ Following are sub-categories of this main category
]

[Keyboard]

Item      Value
Description         Standard 101/102-Key or Microsoft
Natural PS/2 Keyboard
Name      Enhanced (101- or 102-key)
Layout    00000409
PNP Device ID       ACPI\PNP0303\4&35118DFF&0
```

```
NumberOfFunctionKeys          12


[Pointing Device]

Item      Value
Hardware Type       PS/2 Compatible Mouse
Number of Buttons   5
Status    OK
PNP Device ID       ACPI\PNP0F13\4&35118DFF&0
Power Management Supported    False
Double Click Threshold        6
Handedness          Right Handed Operation



[Modem]

Item      Value
No modems

[Network]

[ Following are sub-categories of this main category
]

[Adapter]

Item      Value
Name      [00000000] RAS Async Adapter
Adapter Type        Not Available
Product Name        RAS Async Adapter
Installed True
PNP Device ID       Not Available
Last Reset          5/22/2003 10:58:42 AM
Index     0
Service Name        AsyncMac
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Service Name        Not Available

Name      [00000001] WAN Miniport (L2TP)
Adapter Type        Not Available
Product Name        WAN Miniport (L2TP)
Installed True
PNP Device ID       ROOT\MS_L2TPMINIPORT\0000
Last Reset          5/22/2003 10:58:42 AM
Index     1
Service Name        Rasl2tp
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Service Name        Rasl2tp
```

```
Driver    c:\winnt\system32\drivers\rasl2tp.sys
(50800, 5.00.2179.1)

Name      [00000002] WAN Miniport (PPTP)
Adapter Type        Wide Area Network (WAN)
Product Name        WAN Miniport (PPTP)
Installed True
PNP Device ID       ROOT\MS_PPTPMINIPORT\0000
Last Reset          5/22/2003 10:58:42 AM
Index     2
Service Name        PptpMiniport
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         50:50:54:50:30:30
Service Name        PptpMiniport
Driver    c:\winnt\system32\drivers\raspptp.sys
(47856, 5.00.2160.1)

Name      [00000003] Direct Parallel
Adapter Type        Not Available
Product Name        Direct Parallel
Installed True
PNP Device ID       ROOT\MS_PTIMINIPORT\0000
Last Reset          5/22/2003 10:58:42 AM
Index     3
Service Name        Raspti
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Service Name        Raspti
Driver    c:\winnt\system32\drivers\raspti.sys
(16880, 5.00.2146.1)

Name      [00000004] WAN Miniport (IP)
Adapter Type        Not Available
Product Name        WAN Miniport (IP)
Installed True
PNP Device ID       ROOT\MS_NDISWANIP\0000
Last Reset          5/22/2003 10:58:42 AM
Index     4
Service Name        NdisWan
IP Address          Not Available
IP Subnet Not Available
Default IP Gateway  Not Available
DHCP Enabled        False
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained Not Available
MAC Address         Not Available
Service Name        NdisWan
Driver    c:\winnt\system32\drivers\ndiswan.sys
(90096, 5.00.2195.2779)
```

```
Name      [00000005] Compaq NC7780 Gigabit Server
Adapter
Adapter Type        Not Available
Product Name        Compaq NC7780 Gigabit Server
Adapter
Installed True
PNP Device ID       Not Available
Last Reset          5/22/2003 10:58:42 AM
Index     5
Service Name        q57w2k
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      [00000006] Compaq NC7780 Gigabit Server
Adapter
Adapter Type        Not Available
Product Name        Compaq NC7780 Gigabit Server
Adapter
Installed True
PNP Device ID       Not Available
Last Reset          5/22/2003 10:58:42 AM
Index     6
Service Name        q57w2k
IP Address          130.172.11.73
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         00:0B:CD:37:00:FD
Service Name        Not Available

Name      [00000007] Compaq NC3123 Fast Ethernet NIC
Adapter Type        Not Available
Product Name        Compaq NC3123 Fast Ethernet NIC
Installed True
PNP Device ID       Not Available
Last Reset          5/22/2003 10:58:42 AM
Index     7
Service Name        N100
IP Address          130.172.11.73
IP Subnet 255.255.0.0
Default IP Gateway  Not Available
DHCP Enabled        True
DHCP Server         130.168.253.2
DHCP Lease Expires  9/16/2002 3:58:55 PM
DHCP Lease Obtained 9/15/2002 3:58:55 PM
MAC Address         00:0B:CD:37:00:FD
Service Name        Not Available

Name      [00000008] Compaq NC7781 Gigabit Server
Adapter
Adapter Type        Ethernet 802.3
Product Name        Compaq NC7781 Gigabit Server
Adapter
Installed True
PNP Device ID
          PCI\VEN_14E4&DEV_16A7&SUBSYS_00CB0E11&REV_0
2\3&1070020&0&10
Last Reset          5/22/2003 10:58:42 AM
Index     8
Service Name        q57w2k
IP Address          130.172.11.73
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         00:0B:CD:37:00:FD
Service Name        q57w2k
IRQ Number          29
Driver    c:\winnt\system32\drivers\q57w2k.sys
(79336, 2.90.0.0)

Name      [00000009] Compaq NC7781 Gigabit Server
Adapter
Adapter Type        Ethernet 802.3
Product Name        Compaq NC7781 Gigabit Server
Adapter
Installed True
PNP Device ID
          PCI\VEN_14E4&DEV_16A7&SUBSYS_00CB0E11&REV_0
2\3&13C0B0C5&0&10
Last Reset          5/22/2003 10:58:42 AM
Index     9
Service Name        q57w2k
IP Address          130.168.40.73
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         00:0B:CD:37:00:C0
Service Name        q57w2k
IRQ Number          30
Driver    c:\winnt\system32\drivers\q57w2k.sys
(79336, 2.90.0.0)


[Protocol]

Item      Value
Name      MSAFD Tcpip [TCP/IP]
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  16 bytes
MaximumMessageSize  0 bytes
MessageOriented     False
MinimumAddressSize  16 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         True
SupportsGracefulClosing       True
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD Tcpip [UDP/IP]
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  16 bytes
MaximumMessageSize  65467 bytes
MessageOriented     True
MinimumAddressSize  16 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          True

Name      RSVP UDP Service Provider
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  16 bytes
MaximumMessageSize  65467 bytes
MessageOriented     True
MinimumAddressSize  16 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  True
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          True

Name      RSVP TCP Service Provider
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  16 bytes
MaximumMessageSize  0 bytes
MessageOriented     False
MinimumAddressSize  16 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  True
SupportsExpeditedData         True
SupportsGracefulClosing       True
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{60E37ACA-8A9E-4B00-840D-
B290A4CCF817}] SEQPACKET 6
ConnectionlessService         False
GuaranteesDelivery  True
```

```
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{60E37ACA-8A9E-4B00-840D-
B290A4CCF817}] DATAGRAM 6
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{125841CA-8599-48AB-89A9-
92AFAE43C70C}] SEQPACKET 5
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{125841CA-8599-48AB-89A9-
92AFAE43C70C}] DATAGRAM 5
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
```

```
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{4249431A-469E-4735-A292-
01AA526741FC}] SEQPACKET 4
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{4249431A-469E-4735-A292-
01AA526741FC}] DATAGRAM 4
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{3B09DDB7-7EB8-4941-8121-
52DC6359F5A6}] SEQPACKET 3
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
```

```
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{3B09DDB7-7EB8-4941-8121-
52DC6359F5A6}] DATAGRAM 3
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{684FA660-D082-4A8C-AC8C-
C9D449B21686}] SEQPACKET 0
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{684FA660-D082-4A8C-AC8C-
C9D449B21686}] DATAGRAM 0
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
```

```
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{D90E04F2-3AD9-4F98-9464-
751E106D7E6A}] SEQPACKET 1
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{D90E04F2-3AD9-4F98-9464-
751E106D7E6A}] DATAGRAM 1
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{3F1BA297-E685-416B-82D7-
70E771CC8745}] SEQPACKET 2
ConnectionlessService         False
GuaranteesDelivery  True
GuaranteesSequencing          True
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          False
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
```

```
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False

Name      MSAFD NetBIOS
[\Device\NetBT_Tcpip_{3F1BA297-E685-416B-82D7-
70E771CC8745}] DATAGRAM 2
ConnectionlessService         True
GuaranteesDelivery  False
GuaranteesSequencing          False
MaximumAddressSize  20 bytes
MaximumMessageSize  64000 bytes
MessageOriented     True
MinimumAddressSize  20 bytes
PseudoStreamOriented          False
SupportsBroadcasting          True
SupportsConnectData False
SupportsDisconnectData        False
SupportsEncryption  False
SupportsExpeditedData         False
SupportsGracefulClosing       False
SupportsGuaranteedBandwidth   False
SupportsMulticasting          False


[WinSock]

Item      Value
File      c:\winnt\system32\winsock.dll
Version   3.10
Size      2.80 KB (2,864 bytes)

File      c:\winnt\system32\wsock32.dll
Version   5.00.2195.2871
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)


[Parallel]

Item      Value
No parallel port information

[Storage]

[ Following are sub-categories of this main category
]

[Drives]

Item      Value
Drive     A:
Description         3 1/2 Inch Floppy Drive

Drive     C:
Description         Local Fixed Disk
Compressed          False
File System         NTFS
Size      33.91 GB (36,414,734,336 bytes)
Free Space          30.95 GB (33,229,119,488 bytes)
Volume Name
Volume Serial Number          C8B488FA
Partition Disk #0, Partition #0
Partition Size      33.91 GB (36,414,734,336 bytes)
Starting Offset     16384 bytes
Drive Description   Disk drive
Drive Manufacturer  (Standard disk drives)
Drive Model         COMPAQ LOGICAL VOLUME SCSI Disk
Device
Drive BytesPerSector          512
Drive MediaLoaded   True
Drive MediaType     Fixed hard disk media
Drive Partitions    1
Drive SCSIBus       0
Drive SCSILogicalUnit         0
Drive SCSIPort      2
Drive SCSITargetId  4
Drive SectorsPerTrack         32
Drive Size          36414750720 bytes
Drive TotalCylinders          8716
Drive TotalSectors  71122560
Drive TotalTracks   2222580
Drive TracksPerCylinder       255


[SCSI]

Item      Value
Name      Smart Array 5i
Caption   Smart Array 5i
Driver    cpqcissm
Status    OK
PNP Device ID
          PCI\VEN_0E11&DEV_B178&SUBSYS_40800E11&REV_0
1\3&267A616A&0&20
Device ID
          PCI\VEN_0E11&DEV_B178&SUBSYS_40800E11&REV_0
1\3&267A616A&0&20
Device Map          Not Available
Index     Not Available
Max Number Controlled         Not Available
IRQ Number          31
I/O Port  0x2800-0x28FF
Driver    c:\winnt\system32\drivers\cpqcissm.sys
(15568, 5.42.2.32 Build 1)


[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
Standard OpenHCD USB Host Controller
          PCI\VEN_1166&DEV_0220&SUBSYS_02201166&REV_0
5\3&267A616A&0&7A
USB Root Hub        USB\ROOT_HUB\4&AF5358C&0

[Software Environment]

[ Following are sub-categories of this main category
]

[Drivers]

Name      Description         File      Type
          Started   Start Mode          State
          Status    Error Control       Accept Pause
          Accept Stop
```

```
abiosdsk  Abiosdsk  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Ignore    False     False
abp480n5  abp480n5  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
acpi      Microsoft ACPI Driver
          c:\winnt\system32\drivers\acpi.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
acpiec    ACPIEC
          c:\winnt\system32\drivers\acpiec.sys
          Kernel Driver       False     Disabled
          Stopped   OK        Normal    False
          False
adpu160m  adpu160m  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
afd       AFD Networking Support Environment
          c:\winnt\system32\drivers\afd.sys
          Kernel Driver       True      Auto
          Running   OK        Normal    False
          True
aha154x   Aha154x   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
aic116x   aic116x   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
aic78u2   aic78u2   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
aic78xx   aic78xx   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
alkernel  Altiris Kernel Driver
          c:\winnt\system32\drivers\alkernel.sys
          Kernel Driver       False     Manual
          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
atirage3  atirage3
          c:\winnt\system32\drivers\atimpab.sys
          Kernel Driver       True      Manual
          Running   OK        Ignore    False
          True
atmarpc   ATM ARP Client Protocol
          c:\winnt\system32\drivers\atmarpc.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
audstub   Audio Stub Driver
          c:\winnt\system32\drivers\audstub.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
beep      Beep
          c:\winnt\system32\drivers\beep.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
buslogic  BusLogic  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
cd20xrnt  cd20xrnt  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
cdaudio   Cdaudio
          c:\winnt\system32\drivers\cdaudio.sys
          Kernel Driver       False     System
          Stopped   OK        Ignore    False
          False
cdfs      Cdfs
          c:\winnt\system32\drivers\cdfs.sys
          File System Driver  True      Disabled
          Running   OK        Normal    False
          True
cdrom     CD-ROM Driver
          c:\winnt\system32\drivers\cdrom.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
changer   Changer   Not Available       Kernel Driver
          False     System    Stopped   OK
          Ignore    False     False
cpqarray  Cpqarray  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
cpqarry2  cpqarry2  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
cpqasm2   HP ProLiant iLO Advanced System Management
Controller
          c:\winnt\system32\drivers\cpqasm2.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
```

```
cpqcidrv  HP Integrated Lights-Out
          c:\winnt\system32\drivers\cpqcidrv.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
cpqcisse  CPQCISSE
          c:\winnt\system32\drivers\cpqcisse.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
cpqcissm  cpqcissm
          c:\winnt\system32\drivers\cpqcissm.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
cpqfcalm  cpqfcalm  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
cpqfws2e  cpqfws2e  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
dac960nt  dac960nt  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
deckzpsx  deckzpsx  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
dfsdriver DfsDriver c:\winnt\system32\drivers\dfs.sys
          File System Driver  True      Boot
          Running   OK        Normal    False
          True
disk      Disk Driver
          c:\winnt\system32\drivers\disk.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
diskperf  Diskperf
          c:\winnt\system32\drivers\diskperf.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
dmboot    dmboot
          c:\winnt\system32\drivers\dmboot.sys
          Kernel Driver       False     Disabled
          Stopped   OK        Normal    False
          False
dmio      Logical Disk Manager Driver
          c:\winnt\system32\drivers\dmio.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
dmload    dmload
          c:\winnt\system32\drivers\dmload.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
efs       EFS       c:\winnt\system32\drivers\efs.sys
          File System Driver  True      Disabled
          Running   OK        Normal    False
          True
fastfat   Fastfat
          c:\winnt\system32\drivers\fastfat.sys
          File System Driver  True      Disabled
```

```
          Running   OK        Normal    False
          True
fd16_700  Fd16_700  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
fdc       Floppy Disk Controller Driver
          c:\winnt\system32\drivers\fdc.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
fips      Fips
          c:\winnt\system32\drivers\fips.sys
          Kernel Driver       True      Auto
          Running   OK        Normal    False
          True
fireport  fireport  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
flashpnt  flashpnt  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
flpydisk  Floppy Disk Driver
          c:\winnt\system32\drivers\flpydisk.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ftdisk    Volume Manager Driver
          c:\winnt\system32\drivers\ftdisk.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
gpc       Generic Packet Classifier
          c:\winnt\system32\drivers\msgpc.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
i8042prt  i8042 Keyboard and PS/2 Mouse Port Driver
          c:\winnt\system32\drivers\i8042prt.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
ini910u   ini910u   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
intelide  IntelIde  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ipfilterdriver      IP Traffic Filter Driver
          c:\winnt\system32\drivers\ipfltdrv.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
ipinip    IP in IP Tunnel Driver
          c:\winnt\system32\drivers\ipinip.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
ipnat     IP Network Address Translator
          c:\winnt\system32\drivers\ipnat.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
```

```
ipsec     IPSEC driver
          c:\winnt\system32\drivers\ipsec.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ipsraidn  ipsraidn  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
isapnp    PnP ISA/EISA Bus Driver
          c:\winnt\system32\drivers\isapnp.sys
          Kernel Driver       True      Boot
          Running   OK        Critical  False
          True
kbdclass  Keyboard Class Driver
          c:\winnt\system32\drivers\kbdclass.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
ksecdd    KSecDD
          c:\winnt\system32\drivers\ksecdd.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
lbrtfdc   lbrtfdc   Not Available       Kernel Driver
          False     System    Stopped   OK
          Ignore    False     False
lp6nds35  lp6nds35  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
mnmdd     mnmdd
          c:\winnt\system32\drivers\mnmdd.sys
          Kernel Driver       True      System
          Running   OK        Ignore    False
          True
modem     Modem
          c:\winnt\system32\drivers\modem.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
mouclass  Mouse Class Driver
          c:\winnt\system32\drivers\mouclass.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
mountmgr  MountMgr
          c:\winnt\system32\drivers\mountmgr.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
mraid35x  mraid35x  Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
mrxsmb    MRXSMB
          c:\winnt\system32\drivers\mrxsmb.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
msfs      Msfs
          c:\winnt\system32\drivers\msfs.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
```

```
mskssrv   Microsoft Streaming Service Proxy
          c:\winnt\system32\drivers\mskssrv.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
mspclock  Microsoft Streaming Clock Proxy
          c:\winnt\system32\drivers\mspclock.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
mspqm     Microsoft Streaming Quality Manager Proxy
          c:\winnt\system32\drivers\mspqm.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
mup       Mup       c:\winnt\system32\drivers\mup.sys
          File System Driver  True      Boot
          Running   OK        Normal    False
          True
n100      Compaq Ethernet or Fast Ethernet NIC NT
Driver    c:\winnt\system32\drivers\n100nt5.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
ncrc710   Ncrc710   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ndis      NDIS System Driver
          c:\winnt\system32\drivers\ndis.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
ndistapi  Remote Access NDIS TAPI Driver
          c:\winnt\system32\drivers\ndistapi.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ndiswan   Remote Access NDIS WAN Driver
          c:\winnt\system32\drivers\ndiswan.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ndproxy   NDIS Proxy
          c:\winnt\system32\drivers\ndproxy.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
netbios   NetBIOS Interface
          c:\winnt\system32\drivers\netbios.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
netbt     NetBios over Tcpip
          c:\winnt\system32\drivers\netbt.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
netdetect NetDetect
          c:\winnt\system32\drivers\netdtect.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
```

```
npfs      Npfs
          c:\winnt\system32\drivers\npfs.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
ntfs      Ntfs
          c:\winnt\system32\drivers\ntfs.sys
          File System Driver  True      Disabled
          Running   OK        Normal    False
          True
null      Null
          c:\winnt\system32\drivers\null.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
nwlnkflt  IPX Traffic Filter Driver
          c:\winnt\system32\drivers\nwlnkflt.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
nwlnkfwd  IPX Traffic Forwarder Driver
          c:\winnt\system32\drivers\nwlnkfwd.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
openhci   Microsoft USB Open Host Controller Driver
          c:\winnt\system32\drivers\openhci.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
parallel  Parallel
          c:\winnt\system32\drivers\parallel.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
parport   Parport
          c:\winnt\system32\drivers\parport.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
partmgr   PartMgr
          c:\winnt\system32\drivers\partmgr.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
parvdm    ParVdm
          c:\winnt\system32\drivers\parvdm.sys
          Kernel Driver       False     Manual
          Stopped   OK        Ignore    False
          False
pci       PCI Bus Driver
          c:\winnt\system32\drivers\pci.sys
          Kernel Driver       True      Boot
          Running   OK        Critical  False
          True
pcidump   PCIDump   Not Available       Kernel Driver
          False     System    Stopped   OK
          Ignore    False     False
pciide    PCIIde
          c:\winnt\system32\drivers\pciide.sys
          Kernel Driver       True      Boot
          Running   OK        Normal    False
          True
```

```
pcmcia    Pcmcia
          c:\winnt\system32\drivers\pcmcia.sys
          Kernel Driver       False     Disabled
          Stopped   OK        Normal    False
          False
pdcomp    PDCOMP    Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False
pdframe   PDFRAME   Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False
pdreli    PDRELI    Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False
pdrframe  PDRFRAME  Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False
pptpminiport        WAN Miniport (PPTP)
          c:\winnt\system32\drivers\raspptp.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ptilink   Direct Parallel Link Driver
          c:\winnt\system32\drivers\ptilink.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
q57w2k    Compaq NC7781 Gigabit Server Adapter
          c:\winnt\system32\drivers\q57w2k.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
ql1080    ql1080    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ql10wnt   Ql10wnt   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ql1240    ql1240    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
ql2100    ql2100    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
rasacd    Remote Access Auto Connection Driver
          c:\winnt\system32\drivers\rasacd.sys
          Kernel Driver       True      System
          Running   OK        Normal    False
          True
rasl2tp   WAN Miniport (L2TP)
          c:\winnt\system32\drivers\rasl2tp.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
raspti    Direct Parallel
          c:\winnt\system32\drivers\raspti.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
rca       Microsoft Streaming Network Raw Channel
Access    c:\winnt\system32\drivers\rca.sys
          Kernel Driver       False     Manual
          Stopped   OK        Normal    False
          False
rdbss     Rdbss
          c:\winnt\system32\drivers\rdbss.sys
          File System Driver  True      System
          Running   OK        Normal    False
          True
rdpdr     Terminal Server Device Redirector Driver
          c:\winnt\system32\drivers\rdpdr.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
rdpwd     RDPWD
          c:\winnt\system32\drivers\rdpwd.sys
          Kernel Driver       True      Manual
          Running   OK        Ignore    False
          True
redbook   Digital CD Audio Playback Filter Driver
          c:\winnt\system32\drivers\redbook.sys
          Kernel Driver       False     System
          Stopped   OK        Normal    False
          False
serenum   Serenum Filter Driver
          c:\winnt\system32\drivers\serenum.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
serial    Serial port driver
          c:\winnt\system32\drivers\serial.sys
          Kernel Driver       True      Manual
          Running   OK        Ignore    False
          True
sfloppy   Sfloppy
          c:\winnt\system32\drivers\sfloppy.sys
          Kernel Driver       False     System
          Stopped   OK        Ignore    False
          False
sglfb     sglfb     Not Available       Kernel Driver
          False     System    Stopped   OK
          Normal    False     False
simbad    Simbad    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
sparrow   Sparrow   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
spud      Special Purpose Utility Driver
          c:\winnt\system32\drivers\spud.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
srv       Srv       c:\winnt\system32\drivers\srv.sys
          File System Driver  True      Manual
          Running   OK        Normal    False
          True
swenum    Software Bus Driver
          c:\winnt\system32\drivers\swenum.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
symc810   symc810   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
```

```
symc8xx   symc8xx   Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
sym_hi    sym_hi    Not Available       Kernel Driver
          False     Disabled  Stopped   OK
          Normal    False     False
sysmgmt   HP ProLiant System Management Interface
Driver    c:\winnt\system32\drivers\sysmgmt.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
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
usbhub    Microsoft USB Standard Hub Driver
          c:\winnt\system32\drivers\usbhub.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
vgasave   VgaSave   c:\winnt\system32\drivers\vga.sys
          Kernel Driver       True      System
          Running   OK        Ignore    False
          True
wanarp    Remote Access IP ARP Driver
          c:\winnt\system32\drivers\wanarp.sys
          Kernel Driver       True      Manual
          Running   OK        Normal    False
          True
wdica     WDICA     Not Available       Kernel Driver
          False     Manual    Stopped   OK
          Ignore    False     False

[Environment Variables]

Variable  Value     User Name
ComSpec   %SystemRoot%\system32\cmd.exe <SYSTEM>
Os2LibPath          %SystemRoot%\system32\os2\dll;
          <SYSTEM>
Path
          %SystemRoot%\system32;%SystemRoot%;%SystemR
oot%\System32\Wbem;C:\Program Files\Microsoft SQL
Server\80\Tools\BINN          <SYSTEM>
windir    %SystemRoot%        <SYSTEM>
OS        Windows_NT          <SYSTEM>
PROCESSOR_ARCHITECTURE        x86       <SYSTEM>
PROCESSOR_LEVEL     15        <SYSTEM>
PROCESSOR_IDENTIFIER          x86 Family 15 Model 2
Stepping 7, GenuineIntel      <SYSTEM>
PROCESSOR_REVISION  0207      <SYSTEM>
NUMBER_OF_PROCESSORS          2         <SYSTEM>
PATHEXT
          .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF
;.WSH     <SYSTEM>
TEMP      %SystemRoot%\TEMP   <SYSTEM>
TMP       %SystemRoot%\TEMP   <SYSTEM>
TEMP      %USERPROFILE%\Local Settings\Temp
          CL73\Administrator
TMP       %USERPROFILE%\Local Settings\Temp
          CL73\Administrator

[Jobs]

[ Following are sub-categories of this main category
]

[Print]

Document  Size      Owner     Notify    Status
          Time Submitted      Start Time
          Until Time          Elapsed Time
          Pages Printed       Job ID    Priority
          Parameters          Driver Name
          Print Processor     Host Print Queue
          Data Type Name
Unknown   Unknown   Unknown   Unknown   Unknown
          Unknown   Unknown   Unknown   Unknown
          Unknown   Unknown   Unknown   Unknown
          Unknown   Unknown   Unknown   Unknown
          Unknown

[Network Connections]

Local Name          Remote Name         Type
          Status    User Name
No network connections information


[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    220       11
          204800    1413120   5/22/2003 3:58:52 PM
          5.00.2195.2901      44.27 KB (45,328 bytes)
          12/7/1999 7:00:00 AM
csrss.exe Not Available       248       13        Not
Available Not Available       5/22/2003 3:58:54 PM
          Unknown   Unknown   Unknown
winlogon.exe        c:\winnt\system32\winlogon.exe
          272       13        204800    1413120
          5/22/2003 3:58:55 PM
          5.00.2195.2953      173.77 KB (177,936
bytes)    12/7/1999 7:00:00 AM
services.exe        c:\winnt\system32\services.exe
          296       9         204800    1413120
          5/22/2003 3:58:55 PM
          5.00.2195.2780      86.77 KB (88,848 bytes)
          12/7/1999 7:00:00 AM
lsass.exe c:\winnt\system32\lsass.exe   308       9
          204800    1413120   5/22/2003 3:58:55 PM
          5.00.2195.2964      32.77 KB (33,552 bytes)
          12/7/1999 7:00:00 AM
termsrv.exe         c:\winnt\system32\termsrv.exe 420
          10        204800    1413120   5/22/2003
3:58:56 PM          5.00.2195.2342      137.27 KB
(140,560 bytes)     9/13/2002 6:09:44 PM
rsys.exe  c:\benchcraft\rsys.exe        528       8
          204800    1413120   5/22/2003 3:58:57 PM
          Not Available       32.00 KB (32,768 bytes)
          9/13/2002 6:30:57 PM
svchost.exe         c:\winnt\system32\svchost.exe 564
          8         204800    1413120   5/22/2003
3:58:58 PM          5.00.2134.1         7.77 KB
(7,952 bytes)       12/7/1999 7:00:00 AM
sysdown.exe         c:\winnt\system32\sysdown.exe 196
          8         204800    1413120   5/22/2003
3:59:04 PM          5.27.2195.0         34.77 KB
(35,600 bytes)      11/25/2002 5:08:19 AM
```

```
winmgmt.exe
          c:\winnt\system32\wbem\winmgmt.exe      672
          8         204800    1413120   5/22/2003
3:59:04 PM          1.50.1085.0029      192.08 KB
(196,685 bytes)     9/13/2002 6:09:52 PM
svchost.exe         c:\winnt\system32\svchost.exe 688
          8         204800    1413120   5/22/2003
3:59:04 PM          5.00.2134.1         7.77 KB
(7,952 bytes)       12/7/1999 7:00:00 AM
mstask.exe          c:\winnt\system32\mstask.exe  716
          8         204800    1413120   5/22/2003
3:59:04 PM          4.71.2195.1         115.27 KB
(118,032 bytes)     9/13/2002 6:09:32 PM
inetinfo.exe
          c:\winnt\system32\inetsrv\inetinfo.exe  752
          8         204800    1413120   5/22/2003
3:59:04 PM          5.00.0984 14.27 KB (14,608 bytes)
          9/13/2002 6:10:42 PM
dfssvc.exe          c:\winnt\system32\dfssvc.exe  844
          8         204800    1413120   5/22/2003
3:59:06 PM          5.00.2195.2841      88.27 KB
(90,384 bytes)      9/13/2002 6:09:18 PM
svchost.exe         c:\winnt\system32\svchost.exe
          1016      8         204800    1413120
          5/22/2003 3:59:22 PM          5.00.2134.1
          7.77 KB (7,952 bytes)         12/7/1999
7:00:00 AM
explorer.exe        c:\winnt\explorer.exe         332
          8         204800    1413120   5/22/2003
3:59:53 PM          5.00.3315.2846      237.27 KB
(242,960 bytes)     9/13/2002 6:09:47 PM
aclntusr.exe        c:\altiris\aclient\aclntusr.exe
          948       8         204800    1413120
          5/22/2003 3:59:54 PM          5, 6, 0, 50
          176.00 KB (180,224 bytes)     4/29/2003
2:47:14 PM
tardis.exe          c:\program files\tardis 2000
v1.4\tardis.exe     1080      8         204800
          1413120   5/22/2003 3:59:54 PM          5,
0, 1, 4   308.00 KB (315,392 bytes)     9/13/2002
6:21:25 PM
mmc.exe   c:\winnt\system32\mmc.exe     988       8
          204800    1413120   5/22/2003 4:04:39 PM
          5.00.2195.2301      589.27 KB (603,408
bytes)    9/13/2002 6:09:26 PM
rsvp.exe  c:\winnt\system32\rsvp.exe    1240      8
          204800    1413120   5/22/2003 4:05:05 PM
          5.00.2167.1         172.77 KB (176,912
bytes)    12/7/1999 7:00:00 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 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\traffic.dll
rsvp.exe  5.00.2167.1         172.77 KB (176,912
bytes)    12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\rsvp.exe
wbemprox.dll        1.50.1085.0045      40.08 KB
(41,040 bytes)      9/13/2002 6:09:52 PM
```

```
          Microsoft Corporation
          c:\winnt\system32\wbem\wbemprox.dll
mlang.dll 5.00.3103.1000      510.77 KB (523,024
bytes)    9/13/2002 6:09:26 PM          Microsoft
Corporation         c:\winnt\system32\mlang.dll
cabinet.dll         5.00.2147.1         54.77 KB
(56,080 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\cabinet.dll
msinfo32.dll        5.00.2177.1         312.27 KB
(319,760 bytes)     9/13/2002 5:46:00 PM
          Microsoft Corporation         c:\program
files\common files\microsoft
shared\msinfo\msinfo32.dll
mmcndmgr.dll        5.00.2178.1         815.27 KB
(834,832 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mmcndmgr.dll
msvcp50.dll         5.00.7051 552.50 KB (565,760
bytes)    12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\msvcp50.dll
mmc.exe   5.00.2195.2301      589.27 KB (603,408
bytes)    9/13/2002 6:09:26 PM          Microsoft
Corporation         c:\winnt\system32\mmc.exe
rapilib.dll         5.00.2195.2717      24.77 KB
(25,360 bytes)      9/13/2002 6:09:39 PM
          Microsoft Corporation
          c:\winnt\system32\rapilib.dll
rsvpsp.dll          5.00.2195.2749      74.77 KB
(76,560 bytes)      9/13/2002 6:09:40 PM
          Microsoft Corporation
          c:\winnt\system32\rsvpsp.dll
comdlg32.dll        5.00.3103.1000      236.77 KB
(242,448 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\comdlg32.dll
tardis.exe          5, 0, 1, 4          308.00 KB
(315,392 bytes)     9/13/2002 6:21:25 PM
          H.C.Mingham-Smith Ltd.        c:\program
files\tardis 2000 v1.4\tardis.exe
aclntusr.exe        5, 6, 0, 50         176.00 KB
(180,224 bytes)     4/29/2003 2:47:14 PM
          c:\altiris\aclient\aclntusr.exe
actxprxy.dll        5.00.3103.1000      70.27 KB
(71,952 bytes)      9/13/2002 6:09:09 PM
          Microsoft Corporation
          c:\winnt\system32\actxprxy.dll
shdoclc.dll         5.00.3315.2879      324.50 KB
(332,288 bytes)     9/13/2002 6:09:41 PM
          Microsoft Corporation
          c:\winnt\system32\shdoclc.dll
urlmon.dll          5.00.3315.1000      441.27 KB
(451,856 bytes)     9/13/2002 6:09:44 PM
          Microsoft Corporation
          c:\winnt\system32\urlmon.dll
faxshell.dll        5.00.2134.1         8.27 KB
(8,464 bytes)       12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\faxshell.dll
msacm32.dll         5.00.2134.1         65.27 KB
(66,832 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msacm32.dll
```

```
avifil32.dll        5.00.2134.1         76.27 KB
(78,096 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\avifil32.dll
msvfw32.dll         5.00.2134.1         113.77 KB
(116,496 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msvfw32.dll
docprop2.dll        5.00.2178.1         297.77 KB
(304,912 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\docprop2.dll
browselc.dll        5.00.3315.2846      34.50 KB
(35,328 bytes)      9/13/2002 6:09:14 PM
          Microsoft Corporation
          c:\winnt\system32\browselc.dll
linkinfo.dll        5.00.2134.1         15.77 KB
(16,144 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\linkinfo.dll
msi.dll   1.11.2405.0         1.69 MB (1,767,184
bytes)    9/13/2002 6:09:29 PM          Microsoft
Corporation         c:\winnt\system32\msi.dll
powrprof.dll        5.00.3103.1000      13.27 KB
(13,584 bytes)      9/13/2002 6:09:38 PM
          Microsoft Corporation
          c:\winnt\system32\powrprof.dll
batmeter.dll        5.00.3103.1000      20.27 KB
(20,752 bytes)      9/13/2002 6:09:14 PM
          Microsoft Corporation
          c:\winnt\system32\batmeter.dll
stobject.dll        5.00.2195.2780      79.27 KB
(81,168 bytes)      9/13/2002 6:09:43 PM
          Microsoft Corporation
          c:\winnt\system32\stobject.dll
webcheck.dll        5.00.3315.1000      251.77 KB
(257,808 bytes)     9/13/2002 6:09:45 PM
          Microsoft Corporation
          c:\winnt\system32\webcheck.dll
ntshrui.dll         5.00.2134.1         46.77 KB
(47,888 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\ntshrui.dll
mydocs.dll          5.00.2920.0000      55.77 KB
(57,104 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mydocs.dll
browseui.dll        5.00.3315.2846      788.77 KB
(807,696 bytes)     9/13/2002 6:09:14 PM
          Microsoft Corporation
          c:\winnt\system32\browseui.dll
shdocvw.dll         5.00.3315.2879      1.05 MB
(1,104,144 bytes)   9/13/2002 6:09:42 PM
          Microsoft Corporation
          c:\winnt\system32\shdocvw.dll
explorer.exe        5.00.3315.2846      237.27 KB
(242,960 bytes)     9/13/2002 6:09:47 PM
          Microsoft Corporation
          c:\winnt\explorer.exe
tapisrv.dll         5.00.2195.2955      169.27 KB
(173,328 bytes)     9/13/2002 6:09:44 PM
          Microsoft Corporation
          c:\winnt\system32\tapisrv.dll
```

```
resutils.dll        5.00.2195.2787      39.77 KB
(40,720 bytes)      9/13/2002 6:09:40 PM
          Microsoft Corporation
          c:\winnt\system32\resutils.dll
clusapi.dll         5.00.2195.2104      54.27 KB
(55,568 bytes)      9/13/2002 6:09:16 PM
          Microsoft Corporation
          c:\winnt\system32\clusapi.dll
dfssvc.exe          5.00.2195.2841      88.27 KB
(90,384 bytes)      9/13/2002 6:09:18 PM
          Microsoft Corporation
          c:\winnt\system32\dfssvc.exe
iislog.dll          5.00.0984 75.27 KB (77,072 bytes)
          9/13/2002 6:10:42 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\iislog.dll
httpext.dll         0.9.3940.21         435.27 KB
(445,712 bytes)     9/13/2002 6:10:42 PM
          Microsoft Corporation
          c:\winnt\system32\inetsrv\httpext.dll
fpexedll.dll        4.0.2.4324          20.06 KB
(20,541 bytes)      9/13/2002 6:10:33 PM
          Microsoft Corporation         c:\program
files\common files\microsoft shared\web server
extensions\40\bin\fpexedll.dll
md5filt.dll         5.00.0984 32.77 KB (33,552 bytes)
          9/13/2002 6:10:43 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\md5filt.dll
gzip.dll  5.00.0984 30.27 KB (30,992 bytes)
          9/13/2002 6:10:42 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\gzip.dll
compfilt.dll        5.00.0984 22.77 KB (23,312 bytes)
          9/13/2002 6:10:41 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\compfilt.dll
sspifilt.dll        5.00.0984 43.27 KB (44,304 bytes)
          9/13/2002 6:10:43 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\sspifilt.dll
iscomlog.dll        5.00.0984 24.77 KB (25,360 bytes)
          9/13/2002 6:10:43 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\iscomlog.dll
lonsint.dll         5.00.0984 11.77 KB (12,048 bytes)
          9/13/2002 6:10:43 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\lonsint.dll
inetsloc.dll        5.00.0984 20.27 KB (20,752 bytes)
          9/13/2002 6:09:24 PM          Microsoft
Corporation         c:\winnt\system32\inetsloc.dll
iisfecnv.dll        5.00.0984 7.27 KB (7,440 bytes)
          9/13/2002 5:45:32 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\iisfecnv.dll
isatq.dll 5.00.0984 60.27 KB (61,712 bytes)
          9/13/2002 6:10:43 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\isatq.dll
infocomm.dll        5.00.0984 238.27 KB (243,984
bytes)    9/13/2002 6:10:43 PM          Microsoft
```

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Corporation
          c:\winnt\system32\inetsrv\infocomm.dll
w3svc.dll 5.00.0984 343.27 KB (351,504 bytes)
          9/13/2002 6:10:44 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\w3svc.dll
security.dll        5.00.2154.1         5.77 KB
(5,904 bytes)       12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\security.dll
svcext.dll          5.00.0984 39.77 KB (40,720 bytes)
          9/13/2002 6:10:44 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\svcext.dll
admexs.dll          5.00.0984 27.77 KB (28,432 bytes)
          9/13/2002 6:10:41 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\admexs.dll
wamreg.dll          5.00.0984 45.77 KB (46,864 bytes)
          9/13/2002 6:10:44 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\wamreg.dll
metadata.dll        5.00.0984 68.77 KB (70,416 bytes)
          9/13/2002 6:10:43 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\metadata.dll
iismap.dll          5.00.0984 55.77 KB (57,104 bytes)
          9/13/2002 6:09:23 PM          Microsoft
Corporation         c:\winnt\system32\iismap.dll
nsepm.dll 5.00.0984 43.27 KB (44,304 bytes)
          9/13/2002 6:10:43 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\nsepm.dll
admwprox.dll        5.00.0984 31.77 KB (32,528 bytes)
          9/13/2002 5:45:33 PM          Microsoft
Corporation         c:\winnt\system32\admwprox.dll
coadmin.dll         5.00.0984 39.27 KB (40,208 bytes)
          9/13/2002 6:10:41 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\coadmin.dll
iisadmin.dll        5.00.0984 15.27 KB (15,632 bytes)
          9/13/2002 6:10:42 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\iisadmin.dll
rpcref.dll          5.00.0984 4.27 KB (4,368 bytes)
          9/13/2002 6:10:43 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\rpcref.dll
iisrtl.dll          5.00.0984 119.77 KB (122,640
bytes)    9/13/2002 6:09:23 PM          Microsoft
Corporation         c:\winnt\system32\iisrtl.dll
inetinfo.exe        5.00.0984 14.27 KB (14,608 bytes)
          9/13/2002 6:10:42 PM          Microsoft
Corporation
          c:\winnt\system32\inetsrv\inetinfo.exe
msidle.dll          5.00.2920.0000      6.27 KB
(6,416 bytes)       12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msidle.dll
mstask.exe          4.71.2195.1         115.27 KB
(118,032 bytes)     9/13/2002 6:09:32 PM
          Microsoft Corporation
          c:\winnt\system32\mstask.exe
```

```
netshell.dll        5.00.2195.2779      457.27 KB
(468,240 bytes)     9/13/2002 6:09:34 PM
          Microsoft Corporation
          c:\winnt\system32\netshell.dll
netman.dll          5.00.2195.2779      89.27 KB
(91,408 bytes)      9/13/2002 6:09:34 PM
          Microsoft Corporation
          c:\winnt\system32\netman.dll
ntmsdba.dll         5.00.2195.2779      167.27 KB
(171,280 bytes)     9/13/2002 6:09:35 PM
          Microsoft Corporation
          c:\winnt\system32\ntmsdba.dll
rasdlg.dll          5.00.2195.2671      514.27 KB
(526,608 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\rasdlg.dll
netcfgx.dll         5.00.2195.2228      534.77 KB
(547,600 bytes)     9/13/2002 6:09:34 PM
          Microsoft Corporation
          c:\winnt\system32\netcfgx.dll
rasmans.dll         5.00.2195.2728      147.27 KB
(150,800 bytes)     9/13/2002 6:09:39 PM
          Microsoft Corporation
          c:\winnt\system32\rasmans.dll
sens.dll  5.00.2163.1         36.77 KB (37,648 bytes)
          12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\sens.dll
ntmssvc.dll         5.00.2195.2779      391.27 KB
(400,656 bytes)     9/13/2002 6:09:35 PM
          Microsoft Corporation
          c:\winnt\system32\ntmssvc.dll
txfaux.dll          2000.2.3471.1       374.27 KB
(383,248 bytes)     9/13/2002 6:09:44 PM
          Microsoft Corporation
          c:\winnt\system32\txfaux.dll
es.dll    2000.2.3471.1       222.27 KB (227,600
bytes)    9/13/2002 6:09:21 PM          Microsoft
Corporation         c:\winnt\system32\es.dll
netui1.dll          5.00.2134.1         210.27 KB
(215,312 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\netui1.dll
netui0.dll          5.00.2134.1         70.27 KB
(71,952 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\netui0.dll
ntlanman.dll        5.00.2157.1         35.27 KB
(36,112 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\ntlanman.dll
ntmarta.dll         5.00.2195.2862      98.77 KB
(101,136 bytes)     9/13/2002 6:09:35 PM
          Microsoft Corporation
          c:\winnt\system32\ntmarta.dll
provthrd.dll        1.50.1085.0000      68.07 KB
(69,708 bytes)      9/13/2002 5:45:53 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\provthrd.dll
ntevt.dll 1.50.1085.0000      192.06 KB (196,669
bytes)    12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\wbem\ntevt.dll
perfos.dll          5.00.2155.1         21.27 KB
(21,776 bytes)      12/7/1999 7:00:00 AM
```

```
          Microsoft Corporation
          c:\winnt\system32\perfos.dll
wmi.dll   5.00.2191.1         6.27 KB (6,416 bytes)
          12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\wmi.dll
psapi.dll 5.00.2134.1         28.27 KB (28,944 bytes)
          12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\psapi.dll
framedyn.dll        1.50.1085.0000      164.05 KB
(167,992 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\wbem\framedyn.dll
cimwin32.dll        1.50.1085.0038      1.02 MB
(1,073,232 bytes)   9/13/2002 6:09:50 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\cimwin32.dll
wbemsvc.dll         1.50.1085.0007      40.07 KB
(41,036 bytes)      9/13/2002 6:09:52 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\wbemsvc.dll
wbemess.dll         1.50.1085.0039      364.07 KB
(372,804 bytes)     9/13/2002 6:09:52 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\wbemess.dll
fastprox.dll        1.50.1085.0037      144.08 KB
(147,536 bytes)     9/13/2002 6:09:51 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\fastprox.dll
wbemcore.dll        1.50.1085.0036      628.07 KB
(643,140 bytes)     9/13/2002 6:09:52 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\wbemcore.dll
wbemcomn.dll        1.50.1085.0021      692.07 KB
(708,675 bytes)     9/13/2002 6:09:51 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\wbemcomn.dll
winmgmt.exe         1.50.1085.0029      192.08 KB
(196,685 bytes)     9/13/2002 6:09:52 PM
          Microsoft Corporation
          c:\winnt\system32\wbem\winmgmt.exe
utildll.dll         5.00.2153.1         25.77 KB
(26,384 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\utildll.dll
wtsapi32.dll        5.00.2134.1         14.27 KB
(14,608 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\wtsapi32.dll
sysdown.exe         5.27.2195.0         34.77 KB
(35,600 bytes)      11/25/2002 5:08:19 AM
          Compaq Computer Corporation
          c:\winnt\system32\sysdown.exe
rpcss.dll 5.00.2195.2815      231.27 KB (236,816
bytes)    9/13/2002 6:09:40 PM          Microsoft
Corporation         c:\winnt\system32\rpcss.dll
svchost.exe         5.00.2134.1         7.77 KB
(7,952 bytes)       12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\svchost.exe
rsys.exe  Not Available       32.00 KB (32,768 bytes)
          9/13/2002 6:30:57 PM          Not Available
          c:\benchcraft\rsys.exe
```

```
rdpwsx.dll          5.00.2180.1         94.40 KB
(96,664 bytes)      9/13/2002 5:45:10 PM
          Microsoft Corporation
          c:\winnt\system32\rdpwsx.dll
ntlsapi.dll         5.00.2134.1         6.77 KB
(6,928 bytes)       12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\ntlsapi.dll
mstlsapi.dll        5.00.2181.1         24.77 KB
(25,360 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mstlsapi.dll
icaapi.dll          5.00.2134.1         118.77 KB
(121,616 bytes)     9/13/2002 5:45:09 PM
          Microsoft Corporation
          c:\winnt\system32\icaapi.dll
regapi.dll          5.00.2155.1         35.27 KB
(36,112 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\regapi.dll
termsrv.exe         5.00.2195.2342      137.27 KB
(140,560 bytes)     9/13/2002 6:09:44 PM
          Microsoft Corporation
          c:\winnt\system32\termsrv.exe
dssenh.dll          5.00.2195.2228      142.77 KB
(146,192 bytes)     9/13/2002 6:10:37 PM
          Microsoft Corporation
          c:\winnt\system32\dssenh.dll
oakley.dll          5.00.2195.2785      378.77 KB
(387,856 bytes)     9/13/2002 6:09:36 PM
          Microsoft Corporation
          c:\winnt\system32\oakley.dll
mfc42u.dll          6.00.8665.0         972.05 KB
(995,384 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mfc42u.dll
polagent.dll        5.00.2183.1         108.27 KB
(110,864 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\polagent.dll
scecli.dll          5.00.2195.2780      105.27 KB
(107,792 bytes)     9/13/2002 6:09:41 PM
          Microsoft Corporation
          c:\winnt\system32\scecli.dll
atl.dll   3.00.8449 57.56 KB (58,938 bytes)
          12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\atl.dll
certcli.dll         5.00.2195.2778      130.77 KB
(133,904 bytes)     9/13/2002 6:09:16 PM
          Microsoft Corporation
          c:\winnt\system32\certcli.dll
esent.dll 6.0.3940.13         1.08 MB (1,135,376
bytes)    9/13/2002 6:09:21 PM          Microsoft
Corporation         c:\winnt\system32\esent.dll
ntdsatq.dll         5.00.2195.2878      31.27 KB
(32,016 bytes)      9/13/2002 6:09:35 PM
          Microsoft Corporation
          c:\winnt\system32\ntdsatq.dll
ntdsa.dll 5.00.2195.2899      990.77 KB (1,014,544
bytes)    9/13/2002 6:09:34 PM          Microsoft
Corporation         c:\winnt\system32\ntdsa.dll
kdcsvc.dll          5.00.2195.2878      137.77 KB
(141,072 bytes)     9/13/2002 6:09:26 PM
```

```
          Microsoft Corporation
          c:\winnt\system32\kdcsvc.dll
sfmapi.dll          5.00.2134.1         38.77 KB
(39,696 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\sfmapi.dll
rassfm.dll          5.00.2195.2671      21.27 KB
(21,776 bytes)      9/13/2002 6:09:39 PM
          Microsoft Corporation
          c:\winnt\system32\rassfm.dll
mpr.dll   5.00.2195.2779      53.27 KB (54,544 bytes)
          9/13/2002 6:09:27 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)     9/13/2002 6:09:34 PM
          Microsoft Corporation
          c:\winnt\system32\netlogon.dll
kerberos.dll        5.00.2195.2913      198.77 KB
(203,536 bytes)     9/13/2002 6:09:26 PM
          Microsoft Corporation
          c:\winnt\system32\kerberos.dll
msprivs.dll         5.00.2154.1         41.50 KB
(42,496 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msprivs.dll
samsrv.dll          5.00.2195.2918      369.77 KB
(378,640 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\samsrv.dll
lsasrv.dll          5.00.2195.2964      492.77 KB
(504,592 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\lsasrv.dll
lsass.exe 5.00.2195.2964      32.77 KB (33,552 bytes)
          12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\lsass.exe
wmicore.dll         5.00.2195.2842      72.27 KB
(74,000 bytes)      9/13/2002 6:09:46 PM
          Microsoft Corporation
          c:\winnt\system32\wmicore.dll
browser.dll         5.00.2195.2778      48.27 KB
(49,424 bytes)      9/13/2002 6:09:14 PM
          Microsoft Corporation
          c:\winnt\system32\browser.dll
psbase.dll          5.00.2195.2779      111.77 KB
(114,448 bytes)     9/13/2002 6:09:39 PM
          Microsoft Corporation
          c:\winnt\system32\psbase.dll
cryptsvc.dll        5.00.2181.1         61.77 KB
(63,248 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\cryptsvc.dll
trkwks.dll          5.00.2166.1         88.77 KB
(90,896 bytes)      12/7/1999 7:00:00 AM
```

```
          Microsoft Corporation
          c:\winnt\system32\trkwks.dll
seclogon.dll        5.00.2135.1         15.77 KB
(16,144 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\seclogon.dll
cryptdll.dll        5.00.2135.1         41.27 KB
(42,256 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\cryptdll.dll
wkssvc.dll          5.00.2195.2780      95.27 KB
(97,552 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\wkssvc.dll
srvsvc.dll          5.00.2195.2904      79.27 KB
(81,168 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\srvsvc.dll
cfgmgr32.dll        5.00.2134.1         16.77 KB
(17,168 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\cfgmgr32.dll
dmserver.dll        2195.2778.297.3     11.77 KB
(12,048 bytes)      9/13/2002 6:09:19 PM
          VERITAS Software Corp.
          c:\winnt\system32\dmserver.dll
lmhsvc.dll          5.00.2195.2778      9.77 KB
(10,000 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\lmhsvc.dll
eventlog.dll        5.00.2178.1         43.77 KB
(44,816 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\eventlog.dll
scesrv.dll          5.00.2195.2780      226.27 KB
(231,696 bytes)     9/13/2002 6:09:41 PM
          Microsoft Corporation
          c:\winnt\system32\scesrv.dll
umpnpmgr.dll        5.00.2182.1         86.27 KB
(88,336 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\umpnpmgr.dll
services.exe        5.00.2195.2780      86.77 KB
(88,848 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\services.exe
cscui.dll 5.00.2195.2959      228.27 KB (233,744
bytes)    9/13/2002 6:09:17 PM          Microsoft
Corporation         c:\winnt\system32\cscui.dll
wshnetbs.dll        5.00.2134.1         7.77 KB
(7,952 bytes)       12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\wshnetbs.dll
mswsock.dll         5.00.2195.2871      62.77 KB
(64,272 bytes)      9/13/2002 6:09:33 PM
          Microsoft Corporation
          c:\winnt\system32\mswsock.dll
wininet.dll         5.00.3315.1000      456.77 KB
(467,728 bytes)     9/13/2002 6:09:46 PM
          Microsoft Corporation
          c:\winnt\system32\wininet.dll
cryptnet.dll        5.131.2157.1        41.77 KB
(42,768 bytes)      12/7/1999 7:00:00 AM
```

```
          Microsoft Corporation
          c:\winnt\system32\cryptnet.dll
msv1_0.dll          5.00.2195.2900      111.77 KB
(114,448 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msv1_0.dll
ntdsapi.dll         5.00.2195.2661      55.77 KB
(57,104 bytes)      9/13/2002 6:09:35 PM
          Microsoft Corporation
          c:\winnt\system32\ntdsapi.dll
rasadhlp.dll        5.00.2168.1         7.27 KB
(7,440 bytes)       12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\rasadhlp.dll
winrnr.dll          5.00.2160.1         18.77 KB
(19,216 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\winrnr.dll
rnr20.dll 5.00.2195.2871      35.77 KB (36,624 bytes)
          9/13/2002 6:09:40 PM          Microsoft
Corporation         c:\winnt\system32\rnr20.dll
clbcatq.dll         2000.2.3471.1       496.77 KB
(508,688 bytes)     9/13/2002 6:09:16 PM
          Microsoft Corporation
          c:\winnt\system32\clbcatq.dll
dhcpcsvc.dll        5.00.2195.2778      88.77 KB
(90,896 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\dhcpcsvc.dll
tapi32.dll          5.00.2182.1         123.27 KB
(126,224 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\tapi32.dll
rasman.dll          5.00.2195.2780      54.77 KB
(56,080 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\rasman.dll
rasapi32.dll        5.00.2195.2671      189.77 KB
(194,320 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\rasapi32.dll
rtutils.dll         5.00.2168.1         43.77 KB
(44,816 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\rtutils.dll
adsldpc.dll         5.00.2195.2842      127.27 KB
(130,320 bytes)     9/13/2002 6:09:12 PM
          Microsoft Corporation
          c:\winnt\system32\adsldpc.dll
activeds.dll        5.00.2195.2778      174.77 KB
(178,960 bytes)     9/13/2002 6:09:09 PM
          Microsoft Corporation
          c:\winnt\system32\activeds.dll
oleaut32.dll        2.40.4517 612.27 KB (626,960
bytes)    12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\oleaut32.dll
mprapi.dll          5.00.2181.1         79.27 KB
(81,168 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mprapi.dll
icmp.dll  5.00.2134.1         7.27 KB (7,440 bytes)
          12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\icmp.dll
```

```
iphlpapi.dll        5.00.2173.2         67.77 KB
(69,392 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\iphlpapi.dll
wshtcpip.dll        5.00.2195.2104      17.27 KB
(17,680 bytes)      9/13/2002 6:09:46 PM
          Microsoft Corporation
          c:\winnt\system32\wshtcpip.dll
msafd.dll 5.00.2195.2779      106.77 KB (109,328
bytes)    9/13/2002 6:09:27 PM          Microsoft
Corporation         c:\winnt\system32\msafd.dll
winspool.drv        5.00.2195.2780      109.77 KB
(112,400 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\winspool.drv
winscard.dll        5.00.2134.1         77.27 KB
(79,120 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\winscard.dll
wlnotify.dll        5.00.2195.2780      53.77 KB
(55,056 bytes)      9/13/2002 6:09:46 PM
          Microsoft Corporation
          c:\winnt\system32\wlnotify.dll
cscdll.dll          5.00.2195.2401      98.27 KB
(100,624 bytes)     9/13/2002 6:09:17 PM
          Microsoft Corporation
          c:\winnt\system32\cscdll.dll
lz32.dll  5.00.2134.1         9.77 KB (10,000 bytes)
          12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\lz32.dll
version.dll         5.00.2134.1         15.77 KB
(16,144 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\version.dll
rsaenh.dll          5.00.2195.2228      130.77 KB
(133,904 bytes)     9/13/2002 6:10:37 PM
          Microsoft Corporation
          c:\winnt\system32\rsaenh.dll
mscat32.dll         5.131.2134.1        7.77 KB
(7,952 bytes)       12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\mscat32.dll
ole32.dll 5.00.2195.2887      969.77 KB (993,040
bytes)    9/13/2002 6:09:38 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 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msasn1.dll
crypt32.dll         5.131.2195.2833     451.27 KB
(462,096 bytes)     9/13/2002 6:09:17 PM
          Microsoft Corporation
          c:\winnt\system32\crypt32.dll
wintrust.dll        5.131.2195.2779     162.27 KB
(166,160 bytes)     9/13/2002 6:09:46 PM
          Microsoft Corporation
          c:\winnt\system32\wintrust.dll
shlwapi.dll         5.00.3315.1000      282.77 KB
(289,552 bytes)     9/13/2002 6:09:42 PM
```

```
          Microsoft Corporation
          c:\winnt\system32\shlwapi.dll
shell32.dll         5.00.3315.2902      2.25 MB
(2,359,056 bytes)   9/13/2002 6:09:42 PM
          Microsoft Corporation
          c:\winnt\system32\shell32.dll
msgina.dll          5.00.2195.2779      324.27 KB
(332,048 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\msgina.dll
comctl32.dll        5.81      537.77 KB (550,672
bytes)    12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\comctl32.dll
setupapi.dll        5.00.2195.2663      555.77 KB
(569,104 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\setupapi.dll
winmm.dll 5.00.2161.1         184.77 KB (189,200
bytes)    12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\winmm.dll
winsta.dll          5.00.2195.2386      36.77 KB
(37,648 bytes)      9/13/2002 6:09:46 PM
          Microsoft Corporation
          c:\winnt\system32\winsta.dll
wsock32.dll         5.00.2195.2871      21.27 KB
(21,776 bytes)      9/13/2002 6:09:46 PM
          Microsoft Corporation
          c:\winnt\system32\wsock32.dll
dnsapi.dll          5.00.2195.2785      130.77 KB
(133,904 bytes)     9/13/2002 6:09:19 PM
          Microsoft Corporation
          c:\winnt\system32\dnsapi.dll
wldap32.dll         5.00.2195.2797      125.27 KB
(128,272 bytes)     9/13/2002 6:09:46 PM
          Microsoft Corporation
          c:\winnt\system32\wldap32.dll
ws2help.dll         5.00.2134.1         17.77 KB
(18,192 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\ws2help.dll
ws2_32.dll          5.00.2195.2780      67.77 KB
(69,392 bytes)      9/13/2002 6:09:46 PM
          Microsoft Corporation
          c:\winnt\system32\ws2_32.dll
samlib.dll          5.00.2195.2780      49.77 KB
(50,960 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\samlib.dll
netrap.dll          5.00.2134.1         11.27 KB
(11,536 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\netrap.dll
netapi32.dll        5.00.2195.2808      303.77 KB
(311,056 bytes)     9/13/2002 6:09:34 PM
          Microsoft Corporation
          c:\winnt\system32\netapi32.dll
profmap.dll         5.00.2181.1         29.27 KB
(29,968 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\profmap.dll
secur32.dll         5.00.2195.2862      46.77 KB
(47,888 bytes)      9/13/2002 6:09:41 PM
```

```
          Microsoft Corporation
          c:\winnt\system32\secur32.dll
sfc.dll   5.00.2195.2896      92.11 KB (94,320 bytes)
          9/13/2002 6:09:41 PM          Microsoft
Corporation         c:\winnt\system32\sfc.dll
nddeapi.dll         5.00.2137.1         15.27 KB
(15,632 bytes)      12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\nddeapi.dll
userenv.dll         5.00.2195.2780      361.77 KB
(370,448 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\userenv.dll
user32.dll          5.00.2195.2821      392.77 KB
(402,192 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\user32.dll
gdi32.dll 5.00.2195.2778      228.77 KB (234,256
bytes)    12/7/1999 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\gdi32.dll
rpcrt4.dll          5.00.2195.2832      437.27 KB
(447,760 bytes)     9/13/2002 6:09:40 PM
          Microsoft Corporation
          c:\winnt\system32\rpcrt4.dll
advapi32.dll        5.00.2195.2867      351.77 KB
(360,208 bytes)     12/7/1999 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\advapi32.dll
kernel32.dll        5.00.2195.2778      714.77 KB
(731,920 bytes)     12/7/1999 7:00:00 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 7:00:00 AM
          Microsoft Corporation
          c:\winnt\system32\winlogon.exe
sfcfiles.dll        5.00.2195.2967      948.27 KB
(971,024 bytes)     9/13/2002 6:09:41 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 7:00:00 AM          Microsoft
Corporation         c:\winnt\system32\smss.exe

[Services]

Display Name        Name      State     Start Mode
          Service Type        Path      Error Control
          Start Name          Tag ID
Altiris Client Service        AClient   Stopped
          Disabled  Own Process
          c:\altiris\aclient\aclient.exe -service
          Normal    LocalSystem         0
Alerter   Alerter   Stopped   Manual    Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
```

```
Application Management        AppMgmt   Stopped
          Manual    Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Computer Browser    Browser   Running   Auto
          Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Indexing Service    cisvc     Stopped   Manual
          Share Process
          c:\winnt\system32\cisvc.exe   Normal
          LocalSystem         0
ClipBook  ClipSrv   Stopped   Manual    Own Process
          c:\winnt\system32\clipsrv.exe Normal
          LocalSystem         0
Compaq Remote Monitor Service CpqRcmc   Stopped
          Manual    Own Process
          c:\winnt\system32\cpqrcmc.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  Stopped   Manual
          Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Event Log Eventlog  Running   Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
COM+ Event System   EventSystem         Running
          Manual    Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Fax Service         Fax       Stopped   Manual    Own
Process   c:\winnt\system32\faxsvc.exe  Normal
          LocalSystem         0
IIS Admin Service   IISADMIN  Running   Auto
          Share Process
          c:\winnt\system32\inetsrv\inetinfo.exe
          Normal    LocalSystem         0
Intersite Messaging IsmServ   Stopped   Disabled  Own
Process   c:\winnt\system32\ismserv.exe Normal
          LocalSystem         0
Kerberos Key Distribution Center        kdc
          Stopped   Disabled  Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
Server    lanmanserver        Running   Auto
          Share Process
```

```
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Workstation         lanmanworkstation   Running
          Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
License Logging Service       LicenseService
          Stopped   Manual    Own Process
          c:\winnt\system32\llssrv.exe  Normal
          LocalSystem         0
TCP/IP NetBIOS Helper Service LmHosts   Running
          Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Messenger Messenger Stopped   Manual    Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
NetMeeting Remote Desktop Sharing       mnmsrvc
          Stopped   Manual    Own Process
          c:\winnt\system32\mnmsrvc.exe Normal
          LocalSystem         0
Distributed Transaction Coordinator     MSDTC
          Stopped   Manual    Own Process
          c:\winnt\system32\msdtc.exe   Normal
          LocalSystem         0
Windows Installer   MSIServer Stopped   Manual
          Share Process
          c:\winnt\system32\msiexec.exe /v
          Normal    LocalSystem         0
Network DDE         NetDDE    Stopped   Manual
          Share Process
          c:\winnt\system32\netdde.exe  Normal
          LocalSystem         0
Network DDE DSDM    NetDDEdsdm          Stopped
          Manual    Share Process
          c:\winnt\system32\netdde.exe  Normal
          LocalSystem         0
Net Logon Netlogon  Stopped   Manual    Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
Network Connections Netman    Running   Manual
          Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
File Replication    NtFrs     Stopped   Manual    Own
Process   c:\winnt\system32\ntfrs.exe   Ignore
          LocalSystem         0
NT LM Security Support Provider         NtLmSsp
          Stopped   Manual    Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
Removable Storage   NtmsSvc   Running   Auto
          Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Plug and Play       PlugPlay  Running   Auto
          Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
IPSEC Policy Agent  PolicyAgent         Running
          Auto      Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
```

```
Protected Storage   ProtectedStorage    Running
          Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Remote Access Auto Connection Manager   RasAuto
          Stopped   Manual    Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Remote Access Connection Manager        RasMan
          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
          Stopped   Manual    Own Process
          c:\winnt\system32\regsvc.exe  Normal
          LocalSystem         0
Remote Command Service        RMSYS     Running
          Auto      Own Process
          c:\benchcraft\rsys.exe        Normal
          LocalSystem         0
Remote Procedure Call (RPC) Locator     RpcLocator
          Stopped   Manual    Own Process
          c:\winnt\system32\locator.exe Normal
          LocalSystem         0
Remote Procedure Call (RPC)   RpcSs     Running
          Auto      Share Process
          c:\winnt\system32\svchost -k rpcss
          Normal    LocalSystem         0
QoS RSVP  RSVP      Running   Manual    Own Process
          c:\winnt\system32\rsvp.exe -s Normal
          LocalSystem         0
Security Accounts Manager     SamSs     Running
          Auto      Share Process
          c:\winnt\system32\lsass.exe   Normal
          LocalSystem         0
Smart Card Helper   SCardDrv  Stopped   Manual
          Share Process
          c:\winnt\system32\scardsvr.exe
          Ignore    LocalSystem         0
Smart Card          SCardSvr  Stopped   Manual
          Share Process
          c:\winnt\system32\scardsvr.exe
          Ignore    LocalSystem         0
Task Scheduler      Schedule  Running   Auto
          Share Process
          c:\winnt\system32\mstask.exe  Normal
          LocalSystem         0
RunAs Service       seclogon  Running   Auto
          Share Process
          c:\winnt\system32\services.exe
          Ignore    LocalSystem         0
System Event Notification     SENS      Running
          Auto      Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
Internet Connection Sharing   SharedAccess
          Stopped   Manual    Share Process
          c:\winnt\system32\svchost.exe -k netsvcs
          Normal    LocalSystem         0
```

```
Print Spooler       Spooler   Stopped   Manual    Own
Process   c:\winnt\system32\spoolsv.exe Normal
          LocalSystem         0
HP ProLiant System Shutdown Service     sysdown
          Running   Auto      Own Process
          c:\winnt\system32\sysdown.exe Normal
          LocalSystem         0
Performance Logs and Alerts   SysmonLog Stopped
          Manual    Own Process
          c:\winnt\system32\smlogsvc.exe
          Normal    LocalSystem         0
Telephony TapiSrv   Running   Manual    Share Process
          c:\winnt\system32\svchost.exe -k tapisrv
          Normal    LocalSystem         0
Terminal Services   TermService         Running
          Auto      Own Process
          c:\winnt\system32\termsrv.exe Normal
          LocalSystem         0
Telnet    TlntSvr   Stopped   Manual    Own Process
          c:\winnt\system32\tlntsvr.exe Normal
          LocalSystem         0
Distributed Link Tracking Server        TrkSvr
          Stopped   Manual    Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Distributed Link Tracking Client        TrkWks
          Running   Auto      Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
Uninterruptible Power Supply  UPS       Stopped
          Manual    Own Process
          c:\winnt\system32\ups.exe     Normal
          LocalSystem         0
Utility Manager     UtilMan   Stopped   Manual    Own
Process   c:\winnt\system32\utilman.exe Normal
          LocalSystem         0
Windows Time        W32Time   Stopped   Manual
          Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0
World Wide Web Publishing Service       W3SVC
          Running   Auto      Share Process
          c:\winnt\system32\inetsrv\inetinfo.exe
          Normal    LocalSystem         0
Windows Management Instrumentation      WinMgmt
          Running   Auto      Own Process
          c:\winnt\system32\wbem\winmgmt.exe
          Ignore    LocalSystem         0
Windows Management Instrumentation Driver Extensions
          Wmi       Running   Manual    Share Process
          c:\winnt\system32\services.exe
          Normal    LocalSystem         0

[Program Groups]

Group Name          Name      User Name
Accessories         Default User:Accessories
          Default User
Accessories\Accessibility     Default
User:Accessories\Accessibility          Default User
Accessories\Entertainment     Default
User:Accessories\Entertainment          Default User
```

```
Accessories\System Tools      Default
User:Accessories\System Tools Default User
Startup   Default User:Startup          Default User
Accessories         All Users:Accessories         All
Users
Accessories\Communications    All
Users:Accessories\Communications        All Users
Accessories\Entertainment     All
Users:Accessories\Entertainment         All Users
Accessories\Microsoft Script Debugger   All
Users:Accessories\Microsoft Script Debugger       All
Users
Accessories\System Tools      All
Users:Accessories\System Tools          All Users
Administrative Tools          All
Users:Administrative Tools    All Users
Compaq System Tools All Users:Compaq System Tools All
Users
Microsoft SQL Server          All Users:Microsoft SQL
Server    All Users
Startup   All Users:Startup   All Users
Tardis    All Users:Tardis    All Users
Accessories         CL73\Administrator:Accessories
          CL73\Administrator
Accessories\Accessibility
          CL73\Administrator:Accessories\Accessibilit
y         CL73\Administrator
Accessories\Entertainment
          CL73\Administrator:Accessories\Entertainmen
t         CL73\Administrator
Accessories\System Tools
          CL73\Administrator:Accessories\System Tools
          CL73\Administrator
Administrative Tools
          CL73\Administrator:Administrative Tools
          CL73\Administrator
Compaq System Tools CL73\Administrator:Compaq System
Tools     CL73\Administrator
Startup   CL73\Administrator:Startup
          CL73\Administrator

[Startup Programs]

Program   Command   User Name Location
Tardis 2000         c:\progra~1\tardis~1.4\tardis.exe
          CL73\Administrator  Startup
AClntUsr  c:\altiris\aclient\aclntusr.exe         All
Users
          HKLM\SOFTWARE\Microsoft\Windows\CurrentVers
ion\Run

[OLE Registration]

Object    Local Server
Sound (OLE2)        sndrec32.exe
Media Clip          mplay32.exe
Video Clip          mplay32.exe /avi
MIDI Sequence       mplay32.exe /mid
Sound     Not Available
Media Clip          Not Available
Image Document      "C:\Program Files\Windows
NT\Accessories\ImageVue\KodakImg.exe"
```

```
WordPad Document    "%ProgramFiles%\Windows
NT\Accessories\WORDPAD.EXE"
Windows Media Services DRM Storage object         Not
Available
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          51876-270-9567332-05753
Application Path    C:\Program Files\Internet
Explorer
Language  English (United States)
Active Printer      Not Available

Cipher Strength     168-bit
Content Advisor     Disabled
IEAK Install        No

[File Versions]

File      Version   Size      Date      Path
          Company
advapi32.dll        5.0.2195.2867       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
8:00:00 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 8:00:00 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
8:00:00 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 8:00:00 AM
          C:\WINNT\system32   Microsoft Corporation
msaahtml.dll        <File Missing>      Not Available
          Not Available       Not Available       Not
Available
mshtml.dll          5.0.3315.2870       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
8:00:00 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
8:00:00 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 8:00:00 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    34727 MB
Available Disk Space          31689 MB
Maximum Cache Size  542 MB
Available Cache Size          542 MB

[List of Objects]

Program File        Status    CodeBase
No cached object information available

[Content]

[ Following are sub-categories of this main category
]

[Summary]

Item      Value
Content Advisor     Disabled

[Personal Certificates]

Issued To Issued By Validity  Signature Algorithm
Administrator       Administrator       9/13/2002 to
8/20/2102 sha1RSA

[Other People Certificates]

Issued To Issued By Validity  Signature Algorithm
No other people certificate information available


[Publishers]

Name
No publisher information available

[Security]

Zone      Security Level
Local intranet      Medium-low
Trusted sites       Low
Internet  Medium
Restricted sites    High
```

Microsoft SQL Server 2000

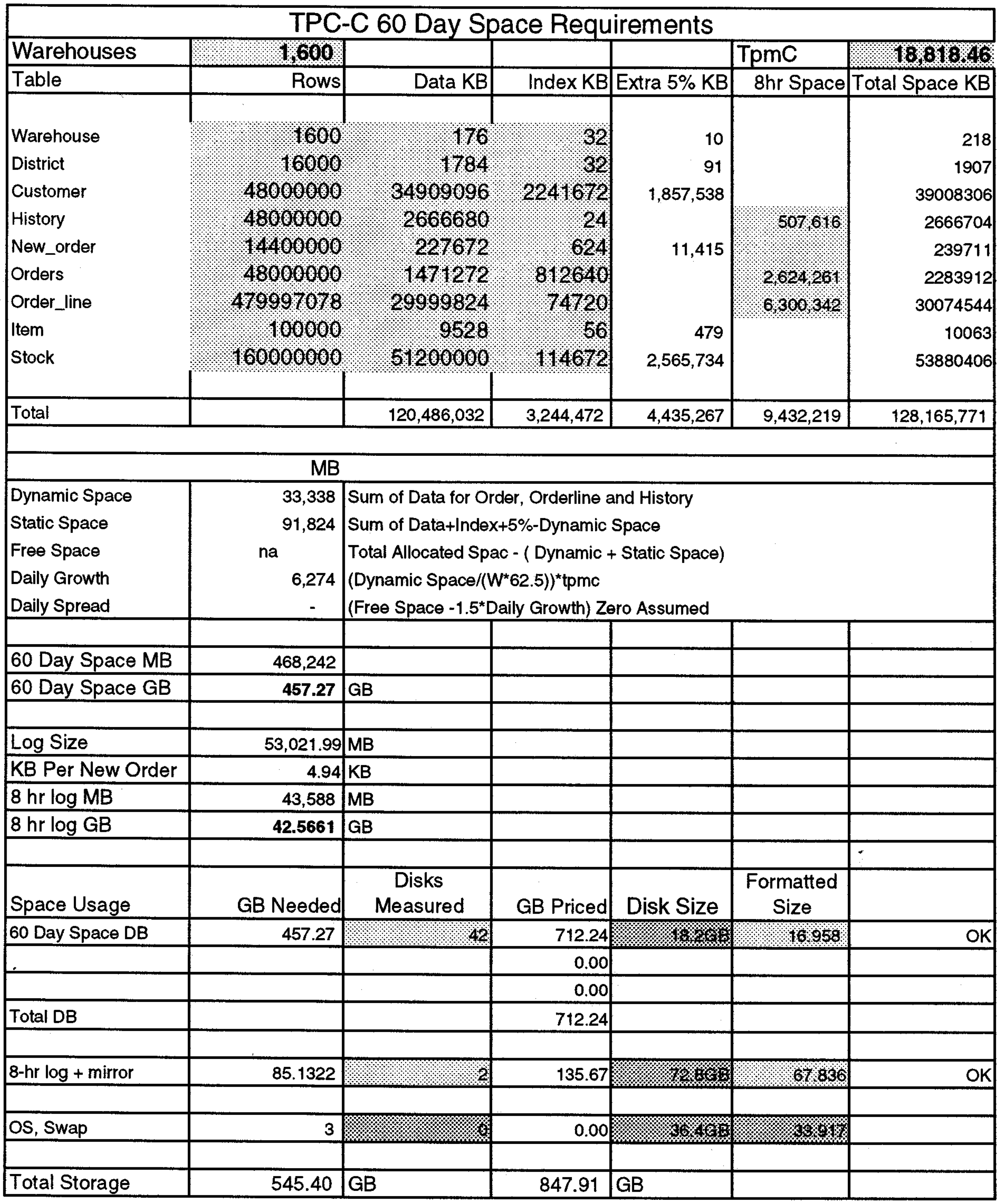
Installation Procedures

```
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 SQL Collation binary
sort order/Latin_1_General
```

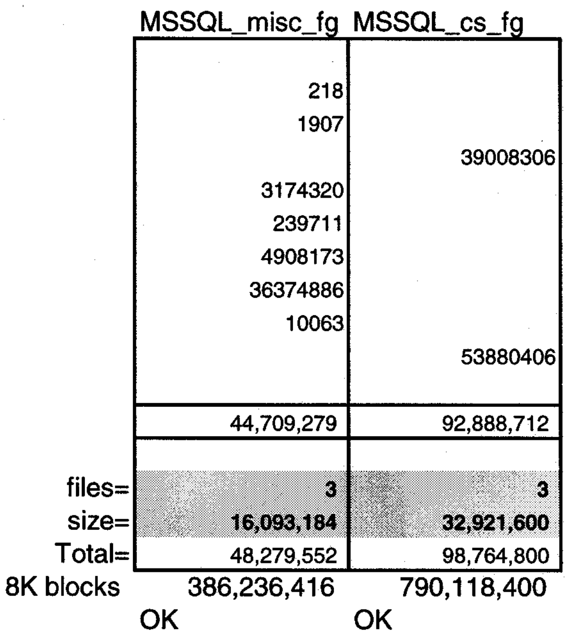
Microsoft COM Component Configuration Parameters

```
The component services tool in Windows 2000 Server
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 the client was 268.
Delivery threads were set under the TPCC key
in the registry. The construction string was Dummy
String
```

Appendix D: 60-Day Space



TPC-C 60 Day Space Requirements						
Warehouses	1,600				TpmC	18,818.46
Table	Rows	Data KB	Index KB	Extra 5% KB	8hr Space	Total Space KB
Warehouse	1600	176	32	10		218
District	16000	1784	32	91		1907
Customer	48000000	34909096	2241672	1,857,538		39008306
History	48000000	2666680	24		507,616	2666704
New_order	14400000	227672	624	11,415		239711
Orders	48000000	1471272	812640		2,624,261	2283912
Order_line	479997078	29999824	74720		6,300,342	30074544
Item	100000	9528	56	479		10063
Stock	160000000	51200000	114672	2,565,734		53880406
Total		120,486,032	3,244,472	4,435,267	9,432,219	128,165,771
	MB					
Dynamic Space	33,338	Sum of Data for Order, Orderline and History				
Static Space	91,824	Sum of Data+Index+5%-Dynamic Space				
Free Space	na	Total Allocated Spac - (Dynamic + Static Space)				
Daily Growth	6,274	(Dynamic Space/(W*62.5))*tpmc				
Daily Spread	-	(Free Space -1.5*Daily Growth) Zero Assumed				
60 Day Space MB	468,242					
60 Day Space GB	**457.27**	GB				
Log Size	53,021.99	MB				
KB Per New Order	4.94	KB				
8 hr log MB	43,588	MB				
8 hr log GB	**42.5661**	GB				
Space Usage	GB Needed	Disks Measured	GB Priced	Disk Size	Formatted Size	
60 Day Space DB	457.27	42	712.24	18.2GB	16.958	OK
			0.00			
			0.00			
Total DB			712.24			
8-hr log + mirror	85.1322	2	135.67	72.8GB	67.836	OK
OS, Swap	3	0	0.00	36.4GB	33.917	
Total Storage	545.40	GB	847.91	GB		



	MSSQL_misc_fg	MSSQL_cs_fg
	218	
	1907	
		39008306
	3174320	
	239711	
	4908173	
	36374886	
	10063	
		53880406
	44,709,279	92,888,712
files=	3	3
size=	**16,093,184**	**32,921,600**
Total=	48,279,552	98,764,800
8K blocks	386,236,416	790,118,400
	OK	OK

tpmC	18,818.46									
	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	2,666,680	24	2896712	80	230,032	56	230,088	0.0562	507,615.85	495.72
Order	1,471,272	812,640	1844880	1628536	373,608	815,896	1,189,504	0.2905	2,624,261.49	2,562.76
Order-Line	29,999,824	74,720	32,780,760	149552	2,780,936	74,832	2,855,768	0.6975	6,300,341.99	6,152.68
										9,211.15
	sum(*) Before		sum(*) After		Num New-					
d_next_o_id	48,016,000		52,110,342		4,094,342					
	48,316,100		51,814,009							
	Before MB		After MB		Grow MB			KB/New-Order	8-Hr Growth MB	8-Hr Growth GB
Log	620.20		20377.28		19757.08			4.9413	43,587.70	42.57
								5,059.8605	bytes	
53021.992	1.1697		38.431747							
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

May 23, 2003

Hewlett-Packard Company
James Barrett
MS150402
20555 SH 249
Houston, TX 77070

Mr. Barrett:

Here is the information you requested regarding pricing for several Microsoft products to be used in conjunction with your TPC-C benchmark testing.

All pricing shown is in US Dollars ($).

Part Number	Description	Unit Price	Quantity	Price
228-01079	**SQL Server 2000 Standard Edition** *Per processor licensing* *No discounts applied*	$4,999	1	$4,999
C11-00821	**Windows 2000 Server** *Server license only - No CALs* *Discount Schedule: Open Program - No Level* *Unit Price reflects a 8% discount from the retail unit price of $799.*	$738	1	$738
P73-00295	**Windows Server 2003, Standard Server** *Server license only - No CALs* *Discount Schedule: Open Program - No Level* *Unit Price reflects a 26% discount from the retail unit price of $999.*	$738	1	$738
254-00170	**Visual C++ Standard** *No discounts applied*	$109	1	$109
PRO-PRORS-16U-01	**Database Server Support Package** *1 Year Term*	$1,950	3	$5,850

Some products may not be currently orderable but will be available through Microsoft's normal distribution channels by April 2, 2003.

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.

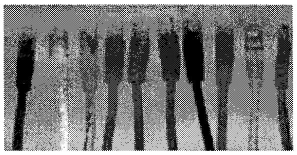
Reference ID: PCjaba0323054919
Please include this Reference ID in any correspondence regarding this price quote.

- Home
- Network Cards
- Network Cables & MISC Cat5e
- Crossover Cables
- Print Servers
- Barcode Readers
- Extension Cables
- Miscellaneous
- TEST
- WE ARE ANTI SPAM
- Blacklisted Brands
- gaming
- Cables - Misc
- SCSI Cables & devices
- Boneyard Cables
- 6ft 4 wire black molded
As low as 34 cents each

network patch cable
- supports 10 / 100 mbps networks
Order quantities over 5 ONLY

- Show Order
- Privacy Policy
- Info &
Shipping Notes
& Ways to delay
Processing of order
- Search
- Index
- Y! SHOPPING

LanAdapters.com



7ft Cat 5e Network Patch Cables. (compatible with cat 5)

7ft Category 5 and (Cat5e)Enhanced Network patch cables MOLDED. 350MHZ RJ45/RJ45 Twist Pair supports fast ethernet. These cat 5 e cables are backwards compatible with cat 5
green purple come with booted snagless ends
blue light gray white black red yellow orange come with compact molded soft snagless

Availability: Usually ships the same business day.

CBLC57 **$1.00, 125/$118.75** Color: ANYshipASAP Order