



Hewlett-Packard Company

TPC Benchmark™ C
Full Disclosure Report
for
ProLiant ML350-G3
using
Microsoft SQL Server 2000
and
Windows Server 2003

Third Edition
September 2003

Third Edition – September 2003

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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 December, 2002.

TPC Benchmark C Overview

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

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

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

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

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

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

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

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

Abstract

Overview

This report documents the methodology and results of the TPC Benchmark C test conducted on the HP ProLiant ML350-G3. The operating system used for the benchmark was Windows Server 2003. 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:

19526.27tpmC

\$2.25 per tpmC

The availability date is May 12, 2003.

Standard and Executive Summary Statements

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

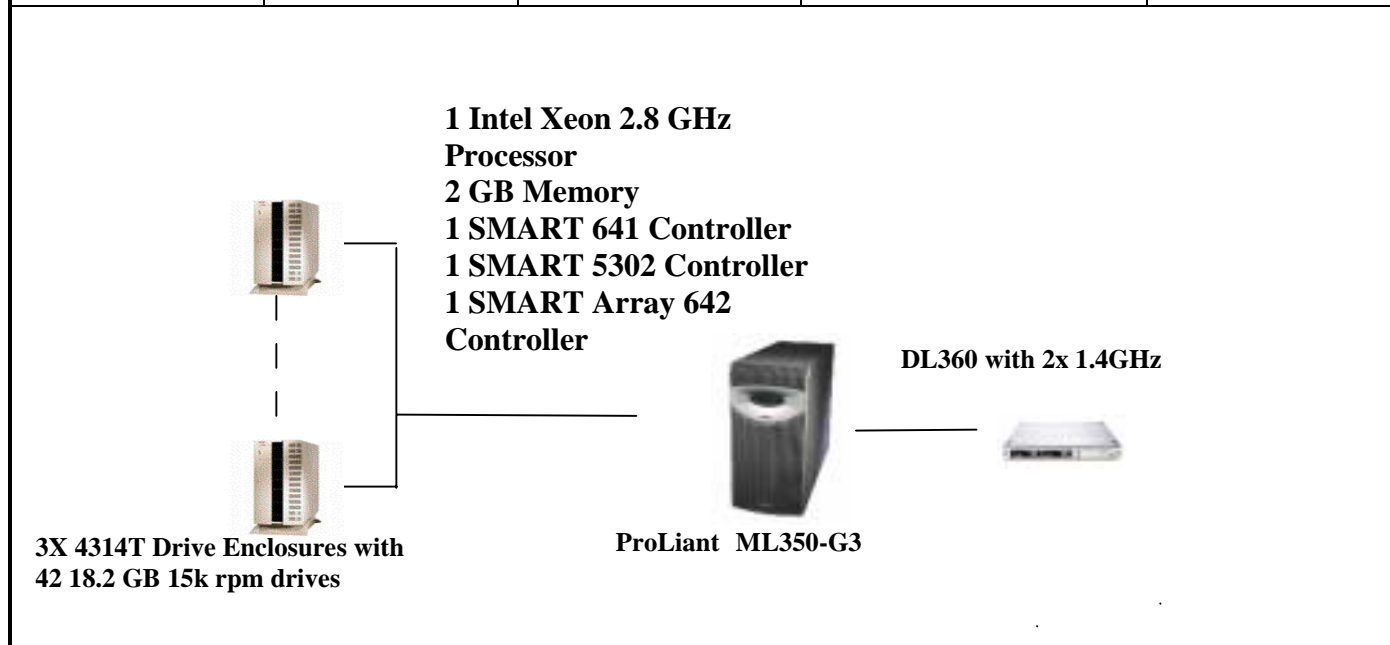
Auditor

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 ML350-G3-1P | TPC-C Rev. 5.1 |
| | C/S with 1 ProLiant DL360R | Report Date: May 12, 2003 |

| | | | |
|-------------------|------------------|-------------------|---------------------|
| Total System Cost | TPC-C Throughput | Price/Performance | Availability Date |
| \$43,826 | 19,526.27 | \$2.25 | May 12, 2003 |

| | | | | |
|---|----------------------------------|---------------------|--|-----------------|
| Processors | Database Manager | Operating System | Other Software | Number of Users |
| 1 Intel Xeon processor 2.8 GHz – Server 2 Pentium III 1.4 GHz – Clients | Microsoft SQL Server 2000 SP3 | Windows Server 2003 | Microsoft Visual C++ Microsoft COM+ | 15800 |



| | Server | | Each Client | |
|-------------------|----------|----------------------------------|-------------|--------------------------------------|
| System Components | Quantity | Description | Quantity | Description |
| Processor | 1 | 2.8GHz Intel Xeon w/ 512MB Cache | 2 | 1.4GHz Pentium III w/ 512K cache |
| Memory | 4 | 512 MB DDR | 2 | 512MB |
| Disk Controllers | 1 | HP SMART 5302 Array Controller | 1 | Integrated SMART 5i Array Controller |
| | 1 | HP SMART 641 Array Controller | | |
| | 1 | HP SMART 642 Array Controller | | |
| Disk Drives | 42 | 18.2 GB SCSI Drive 15k | 1 | 18.2 GB SCSI Drive |
| | 4 | 36.4 GB SCSI Drive 10k | | |
| | 1 | 18.2 GB SCSI Drive 10k | | |
| Total Storage | | 596 GB | | 18.2 GB |
| Tape Drives | 1 | 12/24 GB DAT | | |

| Hewlett-Packard Company | HP ProLiant ML350T-G3 1P Client/Server | | | TPC-C Rev. 5.1 Report Date: 12-May-03 | | |
|--|---|----------------------|------------|---|------------------|--------------------|
| Description | Part Number | Third Party | Unit Price | Qty | Extended Price | 3 yr. Maint. Price |
| Server Hardware | | | | | | |
| | | Brand Pricing | | | | |
| HP ProLiant ML350T 2.8 256MB | 311523-001 | 1 | 1,499 | 1 | 1,499 | |
| 512MB x 1 PC2100 DDR | 287496-B21 | 1 | 275 | 4 | 1,100 | |
| StorageWorks Enclosure Model 4314T- Tower | 190210-001 | 1 | 3,182 | 3 | 9,546 | |
| 2x1 Drive Cage with fan (ML530 G2) | 244058-B21 | 1 | 370 | 1 | 370 | |
| Smart Array 5302/128 Controller | 283552-B21 | 1 | 1,299 | 1 | 1,299 | |
| Smart Array 642 Controller | 291967-B20 | 1 | 699 | 1 | 699 | |
| Smart Array 641 Controller | 291966-B21 | 1 | 549 | 1 | 549 | |
| S5500 15 carbon / silver monitor | 261602-001 | 1 | 139 | 1 | 139 | |
| 3-Button Mouse-Carbon | 231946-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 |
| 36.4GB 10Krpm U320 UNI HDD | 286713-B22 | 1 | 339 | 1 | 339 | |
| 36.4GB 10Krpm U320 UNI HDD | 286713-B22 | 1 | 339 | 4 | 1,356 | |
| CarePac Service - Entry 300 WG Servers 3Yr,7x24,4hr (FM-EL724 | 162675-002 | 1 | 599 | 1 | | 599 |
| FM-4E724-36 3YR 24X7/4HR EMPTY DISK ENCL | 171242-002 | 1 | 157 | 3 | | 471 |
| | | | | Subtotal | 29,916 | 2,565 |
| Server Software | | | | | | |
| Database Server Support Package | PRO-PRORS-16 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 DL360R02 P1.4/133-512K 256MB | 233271-001 | 1 | 1,759 | 1 | 1,759 | |
| Two integrated Gigabit NIC, Integrated Smart Array Controller | | | | | | |
| 1.40GHz PIII Processor Option Kit (DL360 G2) | 233273-B21 | 1 | 717 | 1 | 717 | |
| 1GB 133MHz SDRAM DIMM Memory (2x512MB) | 201694-B21 | 1 | 600 | 1 | 600 | |
| 36.4GB 10Krpm U320 UNI HDD | 286713-B22 | 1 | 339 | 1 | 339 | |
| FM-EL724-36 3YR 24X7 4HR ENTRY 300 SVR | 162675-002 | 1 | 599 | 1 | | 599 |
| | | | | Subtotal | 3,415 | 599 |
| Client Software | | | | | | |
| Windows 2000 Server 32-bit | C11-00821 Microsoft | 2 | 738 | 1 | 738 | Incl. Above |
| | | | | Subtotal | 738 | 0 |
| User Connectivity | | | | | | |
| 15 ft. CAT5e Patch cable | CBLC515 | LanAdapters 3 | | 2 | 3 | 6 |
| | | | | Subtotal | 6 | 0 |
| Large Purchase and Net 30 discount (See Note 1) | 14.0% | 1 | | | | |
| | | | | | (\$4,666) | (\$443) |
| | | | | Total | \$35,255 | \$8,571 |
| 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: \$43,826 | | |
| | | | | tpmC Rating: 19526.27 | | |
| | | | | \$ / tpmC: \$2.25 | | |
| Pricing: 1=HP 2=Microsoft 3=LanAdapters.com | | | | | | |
| Note 1 = Discount based on HP Direct guidance 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

19526.27tpmC

| Response Times (in seconds) | Average | 90% | Maximum |
|------------------------------------|----------------|------------|----------------|
| New-Order | 0.69 | 1.04 | 5.61 |
| Payment | 0.42 | 0.72 | 5.20 |
| Order-Status | 0.53 | 0.86 | 5.69 |
| Delivery (interactive portion) | 0.10 | 0.11 | 0.18 |
| Delivery (deferred portion) | 1.06 | 1.50 | 2.61 |
| Stock-Level | 3.92 | 4.98 | 8.78 |
| Menu | 0.10 | 0.11 | 0.32 |

Transaction Mix, in percent of total transaction

| | |
|--------------|--------|
| New-Order | 44.94% |
| Payment | 43.03% |
| Order-Status | 4.02% |
| Delivery | 4.02% |
| Stock-Level | 4.00% |

Emulation Delay (in seconds)

Resp.Time Menu

| | | |
|------------------------|------|------|
| New-Order | 0.10 | 0.10 |
| Payment | 0.10 | 0.10 |
| Order-Status | 0.10 | 0.10 |
| Delivery (interactive) | 0.10 | 0.10 |
| Stock-Level | 0.10 | 0.10 |

Keying/Think Times (in seconds)

Min. Average Max.

| | | | |
|------------------------|------------|-------------|--------------|
| New-Order | 18.00/0.00 | 18.02/12.05 | 18.03/120.50 |
| Payment | 3.00/0.00 | 3.02/12.04 | 3.03/120.50 |
| Order-Status | 2.00/0.00 | 2.02/10.04 | 2.02/100.50 |
| Delivery (interactive) | 2.00/0.00 | 2.02/5.05 | 2.03/50.50 |
| Stock-Level | 2.00/0.00 | 2.02/5.04 | 2.03/50.50 |

Test Duration

| | |
|--|-------------|
| Ramp-up time | 15 minutes |
| Measurement interval | 120 minutes |
| Transactions (all types) completed during measurement interval | 5,190,984 |
| Ramp down time | 5 minutes |

Checkpointing

| | |
|-----------------------|------------|
| Number of checkpoints | 4 |
| Checkpoint interval | 30 minutes |

General Items

Test Sponsor

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

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

Application Code and Definition Statements

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

Appendix A contains all source code implemented in this benchmark.

Parameter Settings

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

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

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

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

Configuration Items

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

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

Figure 1a. Benchmarked Configuration

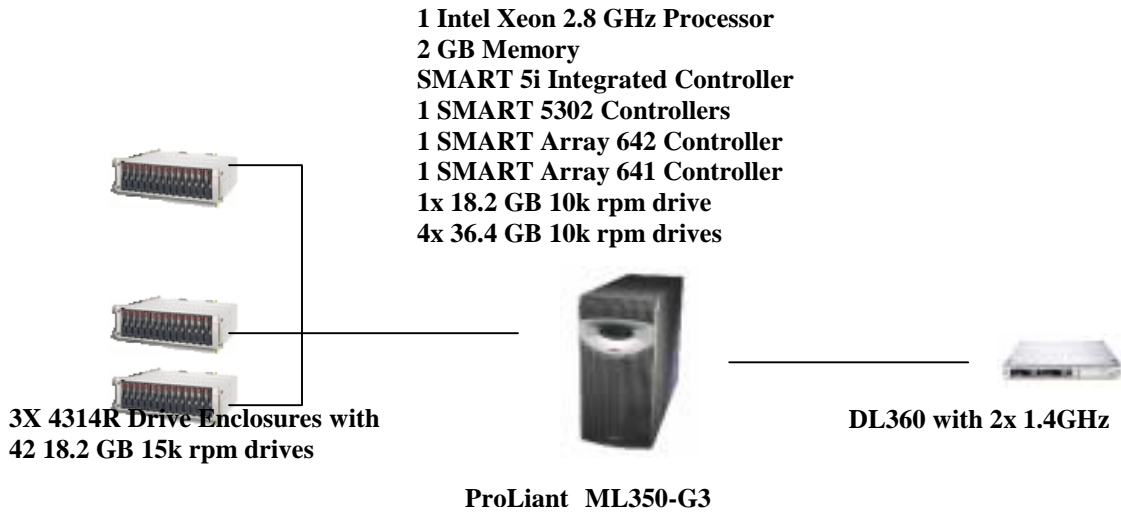
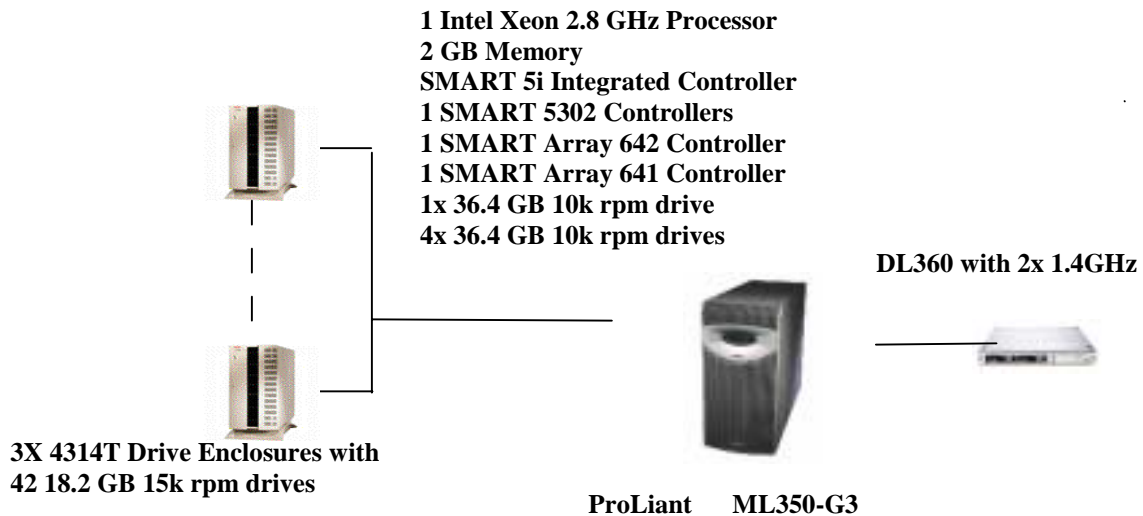


Figure 1b. Priced Configuration



Clause 2 Related Items

Random Number Generation

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

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

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

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

Input/Output Screen Layout

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

All screen layouts followed the specifications exactly.

Priced Terminal Feature Verification

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

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

Presentation Manager or Intelligent Terminal

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

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

Transaction Statistics

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

Table 2.1 Transaction Statistics

| Statistic | | Value |
|-----------------|------------------------------|--------|
| New Order | Home warehouse order lines | 99.00% |
| | Remote warehouse order lines | 1.00% |
| | Rolled back transactions | 1.00% |
| | Average items per order | 10.00 |
| Payment | Home warehouse payments | 85.00% |
| | Remote warehouse payments | 15.00% |
| | Accessed by last name | 60.04% |
| Order Status | Accessed by last name | 60.01% |
| Transaction Mix | New Order | 44.94% |
| | Payment | 43.03% |
| | Order status | 4.02% |
| | Delivery | 4.02% |
| | Stock level | 4.00% |

Queuing Mechanism

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

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

The source code is listed in Appendix A.

Clause 3 Related Items

Transaction System Properties (ACID)

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

All ACID property tests were successful. The executions are described below.

Atomicity

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

Completed Transactions

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

Aborted Transactions

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

Consistency

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

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

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

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

Isolation

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

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

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

For Isolation test seven, case A was followed.

Durability

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

Durable Media Failure

Loss of Data and Log

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

- The full database was started, but only 200 of the warehouses were accessed for this test.
- 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 2000 users.
- The test was allowed to run for a minimum of 10 minutes.
- One log disk was removed from the server.
- 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 a 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 server. 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 1580 warehouses under a full load of 15800 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 15800 users.
- The test was allowed to run for a minimum of 10 minutes.
- System crash and loss of memory was induced by removing the power cord. No battery backup or Uninterruptible Power Supply (UPS) were used to preserve the contents of memory.
- The RTE was shutdown.
- Power was restored and the system restarted.
- Microsoft SQL Server was restarted and performed an automatic recovery.
- Consistency condition #3 was executed and verified.
- Step 1 was repeated and the difference between the first and second counts was noted.
- An RTE report was generated for the entire run time giving the number of NEW-ORDERS successfully returned to the RTE.

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

Clause 4 Related Items

Initial Cardinality of Tables

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

Table 4.1 Number of Rows for Server

| Table | Cardinality as built |
|--------------------|----------------------|
| Warehouse | 1,580 |
| District | 15,800 |
| Customer | 48,300,000 |
| History | 48,300,000 |
| Orders | 48,300,000 |
| New Order | 14,490,000 |
| Order Line | 482,994,468 |
| Stock | 161,000,000 |
| 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 controllers with 2 SCSI channels, SMART-642 Array controller with 1 internal and 1 SMART-642 Array controller with 1 internal and 1 external SCSI channel. 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 array was configured as RAID 0 and housed logical drives for database data. The SMART-5302 Array controllers also housed a RAID 0+1 volume used for backup of the database. The SMART-642 Array controller was connected to one external array consisting of (14) 18.2GB 15K drives. The SMART-641 Array controller was connected to one internal array consisting of (4) 36.4GB 10K drives, and housed a RAID 0+1 logical volume for the database log. The operating system was housed internally on the integrated Smart-5i controller as one 18.2 GB 15K drive. The controller for the transaction log had the cache disabled. All RAID volumes used hardware RAID.

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

Type of Database

A statement must be provided that describes:

- The data model implemented by DBMS used (e.g. relational, network, hierarchical).
- The database interface (e.g. embedded, call level) and access language (e.g. SQL, DL/I, 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 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 19526.27tpmC
Price per tpmC \$2.25 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 | 90 th % | Maximum |
|----------------------|---------|--------------------|---------|
| New-Order | 0.69 | 1.04 | 5.61 |
| Payment | 0.42 | 0.72 | 5.20 |
| Order-Status | 0.53 | 0.86 | 5.69 |
| Interactive Delivery | 0.10 | 0.11 | 0.18 |
| Deferred Delivery | 1.06 | 1.50 | 2.61 |
| Stock-Level | 3.92 | 4.98 | 8.78 |
| Menu | 0.10 | 0.11 | 0.32 |

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 | 18.03 |
| Payment | 3.00 | 3.02 | 3.03 |
| Order-Status | 2.00 | 2.02 | 2.02 |
| Interactive Delivery | 2.00 | 2.02 | 2.03 |
| Stock-Level | 2.00 | 2.02 | 2.03 |

Table 5.4: Think Times

| Type | Minimum | Average | Maximum |
|----------------------|---------|---------|---------|
| New-Order | 0.00 | 12.05 | 120.50 |
| Payment | 0.00 | 12.04 | 120.50 |
| Order-Status | 0.00 | 10.04 | 100.50 |
| Interactive Delivery | 0.00 | 5.05 | 50.50 |
| Stock-Level | 0.00 | 5.04 | 50.50 |

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 2. New Order Response Time Distribution

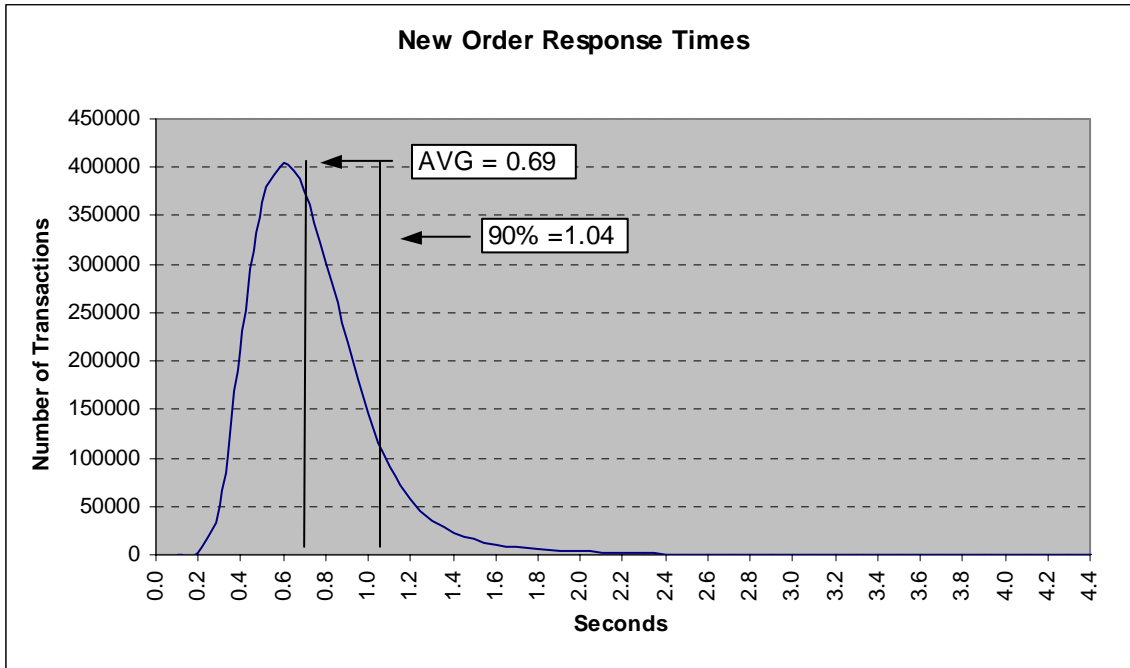


Figure 3. Payment Response Time Distribution

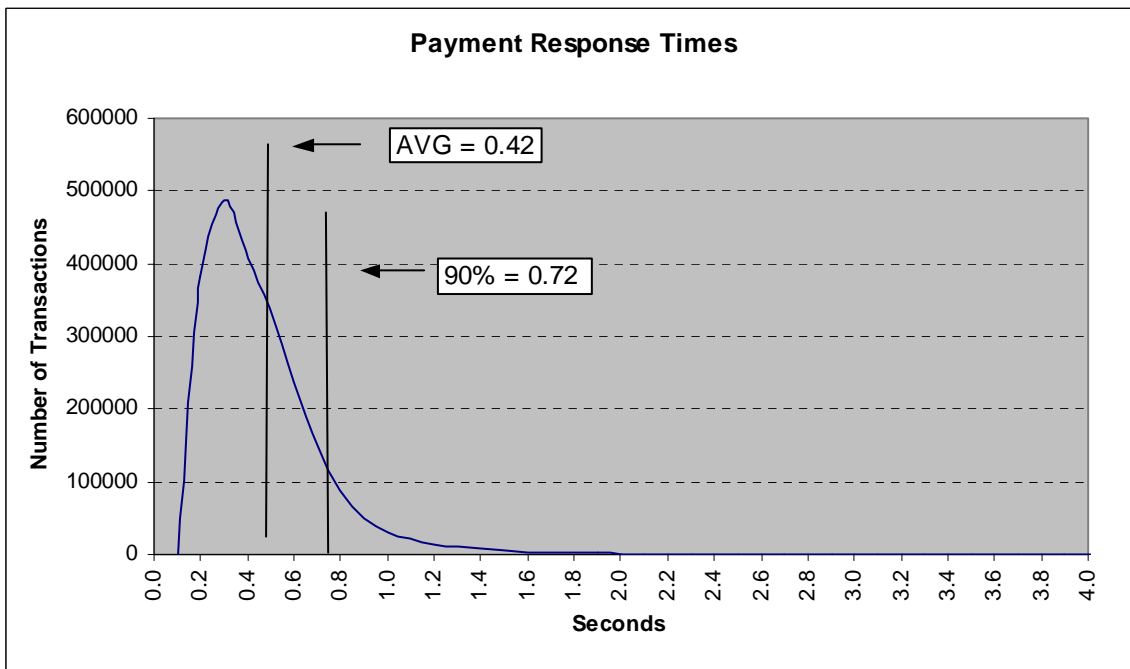


Figure 4. Order Status Response Time Distribution

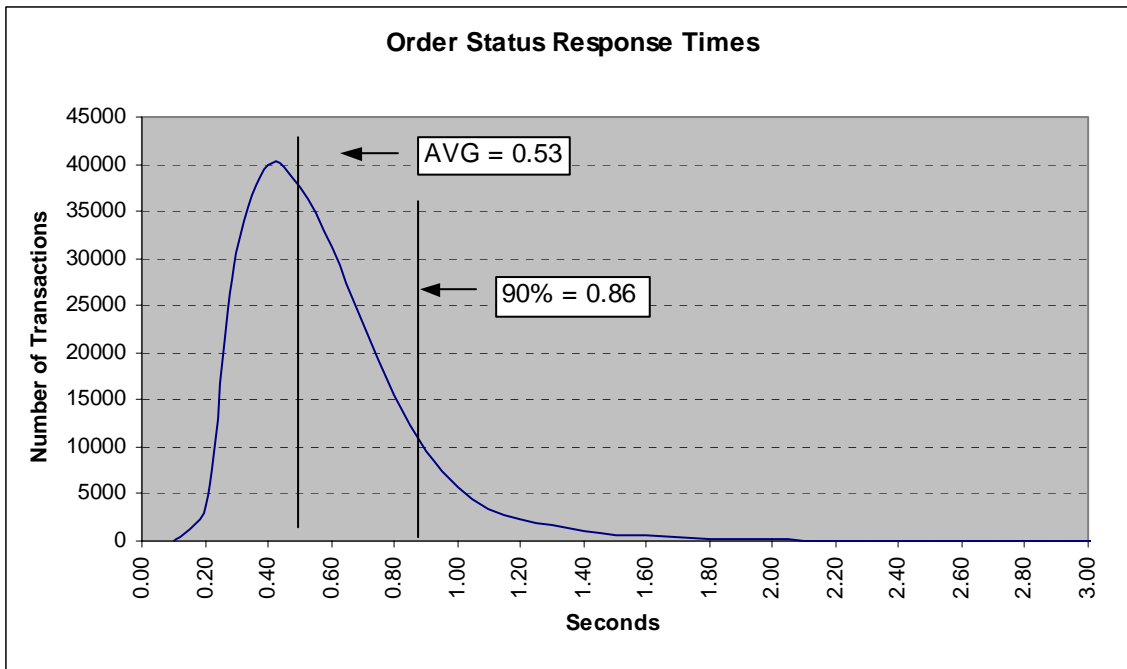


Figure 5. Delivery Response Time Distribution

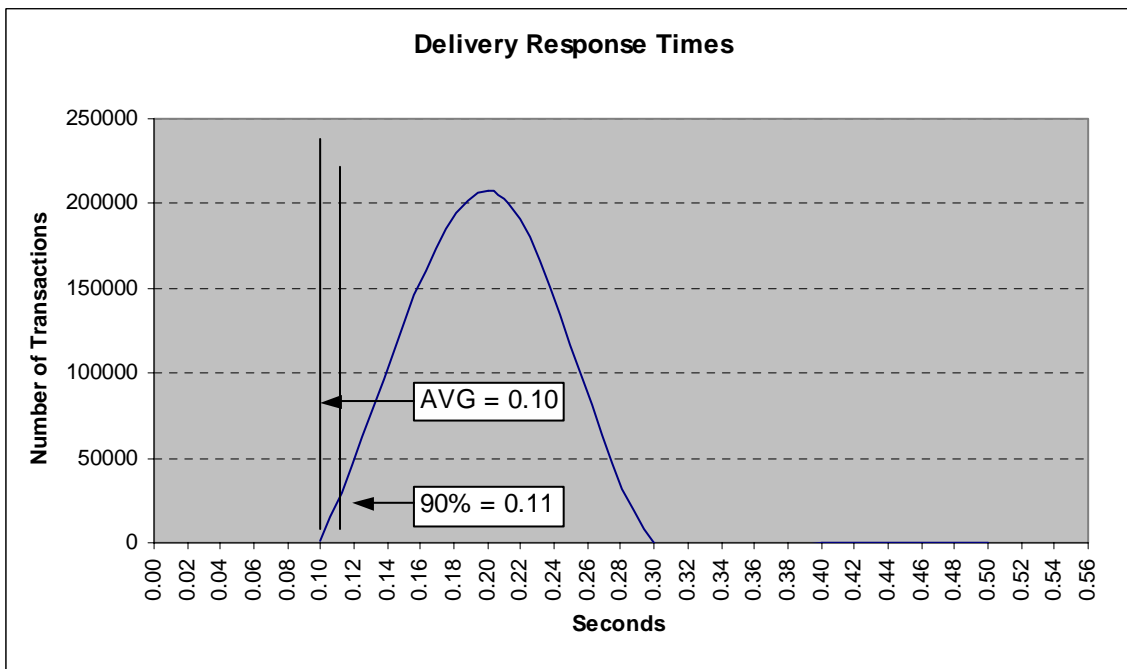


Figure 6. Stock Level Response Time Distribution

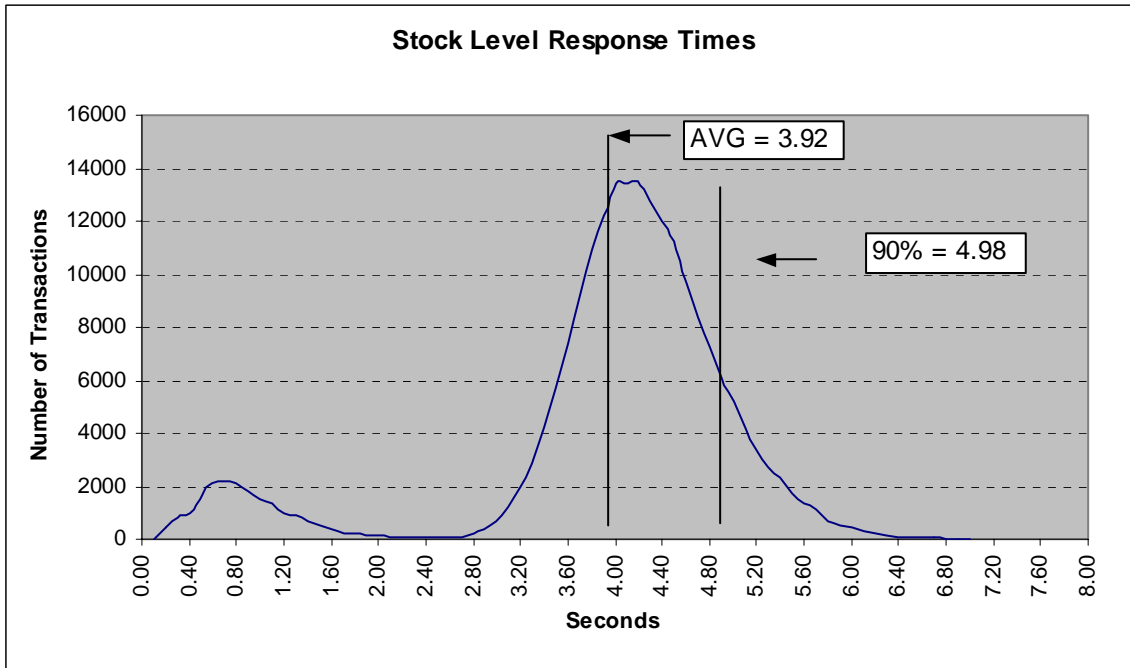


Figure 7. Response Time vs. Throughput

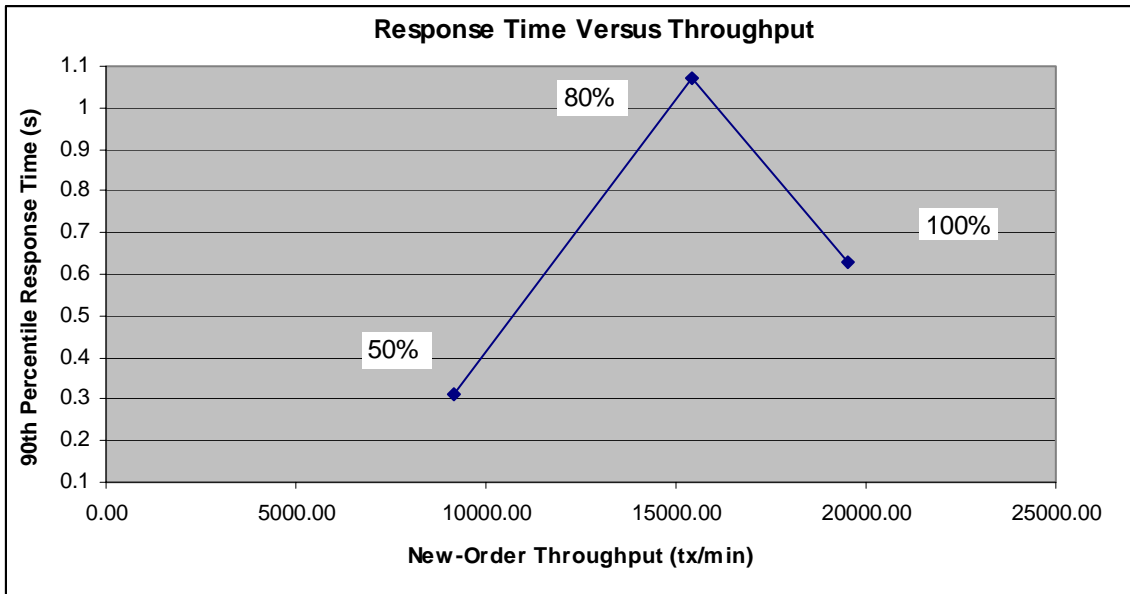


Figure 8. New Order Think Time Distribution

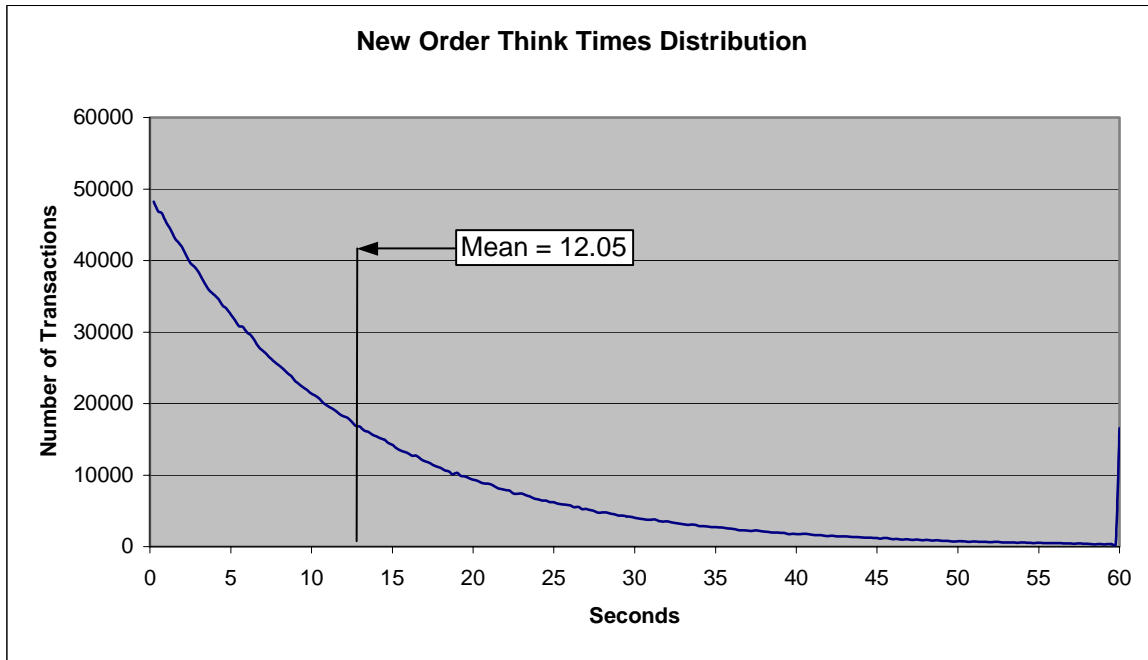
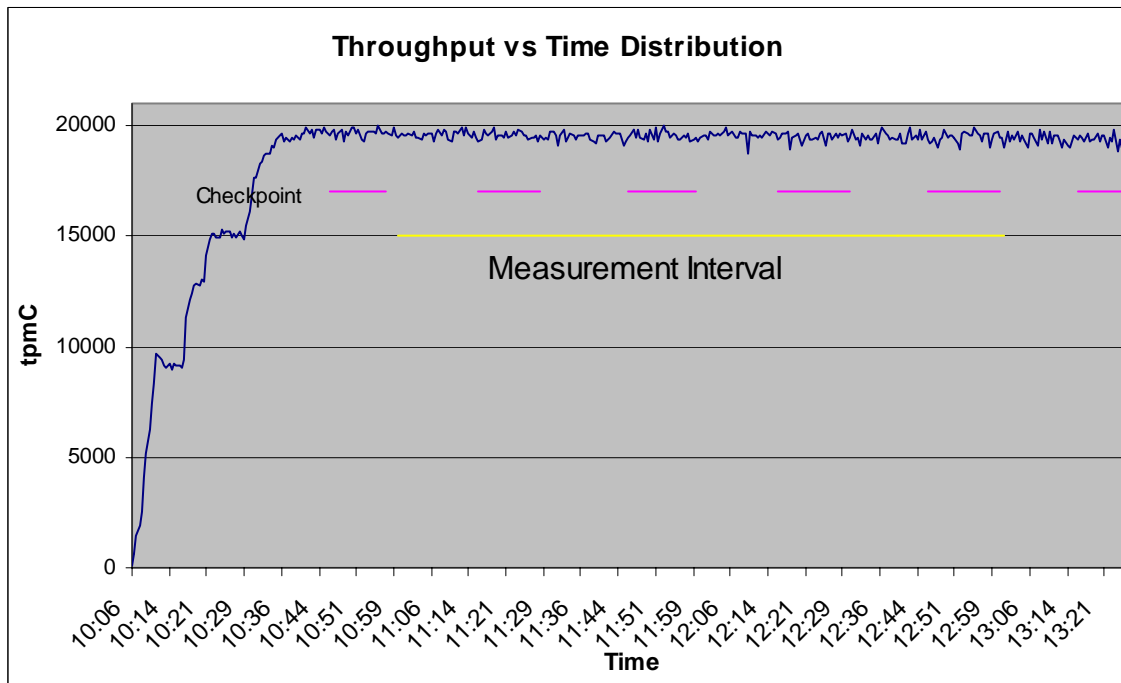


Figure 9. Throughput vs. Time Distribution



Steady State Determination

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

Steady state was determined using real time monitor utilities from the RTE. Steady state was further confirmed by the throughput data collected during the run and graphed in Figure 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 60 and a script was written to schedule multiple checkpoints at specific intervals. The script included a wait time between each checkpoint equal to 30 minutes so that the checkpoint interval was an integral multiple of the measurement interval, which was 120 minutes. The checkpoint script was started manually after the RTE had all users logged in and the database had achieved steady state.

At each checkpoint, Microsoft SQL Server wrote to disk all memory pages that had been updated but not yet physically written to disk. The positioning of the measurement interval is depicted on the graph in Figure 10.

Measurement Period Duration

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

The reported measured interval was exactly 120 minutes long.

Regulation of Transaction Mix

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

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

Transaction Statistics

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

Table 5.5: Transaction Statistics

| Statistic | | Value |
|-----------------|------------------------------------|--------|
| New Order | Home warehouse order lines | 99.00% |
| | Remote warehouse order lines | 1.00% |
| | Rolled back transactions | 1.00% |
| | Average items per order | 10.00 |
| Payment | Home warehouse payments | 85.00% |
| | Remote warehouse payments | 15.00% |
| | Accessed by last name | 59.97% |
| Delivery | Skipped transactions (interactive) | 0 |
| | Skipped transactions (deferred) | 0 |
| Order Status | Accessed by last name | 60.04% |
| Transaction Mix | New Order | 44.94% |
| | Payment | 43.03% |
| | Order status | 4.00% |
| | Delivery | 4.02% |
| | Stock level | 4.02% |

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 17 minutes after the start of the ramp-up. Subsequent checkpoints occurred every 30 minutes. Each checkpoint in the measurement interval lasted approximately 10 minutes. The measurement interval contains four checkpoints.

Checkpoint Duration

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

| Checkpoint Start Time | Duration |
|-----------------------|------------------------|
| 10:46:27a.m. | 10 minutes, 56 seconds |
| 11:16:25a.m. | 12 minutes, 26 seconds |
| 11:46:23p.m. | 13 minutes, 30 seconds |
| 12:16:20p.m. | 14 minutes, 31 seconds |
| 12:46:19p.m. | 14 minutes, 32 seconds |

Clause 6 Related Items

RTE Descriptions

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

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

Emulated Components

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

The driver system consisted of 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 that are being represented and a thorough explanation of exactly which parts of the proposed configuration are being replaced with the Driver System must be disclosed.

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

In the tested configuration, 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 through a CAT5e Ethernet cable on a separate 1000Mbps LAN.

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

Operator Intervention

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

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

Clause 7 Related Items

System Pricing

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

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

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

Availability, Throughput, and Price Performance

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

A statement of the measured tpmC as well as the respective calculations for the 3-year pricing, price/performance (price/tpmC), and the availability date must be included.

- | | |
|---------------------------------------|------------------------|
| • Maximum Qualified Throughput | 19,526.27tpmC |
| • Price per tpmC | \$2.25 per tpmC |
| • Availability | May 12, 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
- 1 Microsoft SQL Server 2000 (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

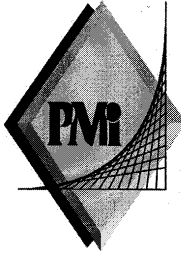
The Full Disclosure Report must be readily available to the public at a reasonable charge, similar to the charges for similar documents by the test sponsor. The report must be made available when results are made public. In order to use the phrase "TPC Benchmark™ C", the Full Disclosure Report must have 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
MS 150402
Houston, TX 77269-2000



PERFORMANCE METRICS INC.
TPC Certified Auditors

March 31, 2003

Mr. Paul Cao
Hewlett-Packard Company
20555 SH 249
Houston, TX 77070

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

Platform: ProLiant ML350T03
Database Manager: Microsoft SQL Server 2000 Standard Edition
Operating System: Microsoft Windows Server 2003 Standard Edition
Transaction Monitor: Microsoft COM+

| Servers: ProLiant mL350 with: | | | | |
|-------------------------------|-----------------------------|-----------------------|--------------|-----------|
| CPU's | Memory | Disks (total) | 90% Response | TpmC |
| 1 Pentium Xeon @ 2.8 Ghz | Main: 2 GB Cache: 512 KB | 42 @ 18GB 4 @ 36GB | 1.04 | 19,526.27 |
| 1 Client: DL360R each with: | | | | |
| 2 Pentium Xeon @ 1.4 Ghz | Main: 1 GB Cache: 512 KB | 1 @ 18 GB | 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 1,610 warehouses of which 1,580 were active during the performance run.
- The ACID properties were successfully demonstrated.

PERFORMANCE METRICS INC.
TPC Certified Auditors

- The log loss and data loss durability test were demonstrated on a subset of the configured system using 1,550 warehouses.
- Input data was generated according to the specified percentages.
- Eight hours of mirrored log space was present on the tested system.
- Eight hours of growth space for the dynamic tables was present on the tested system.
- The data for the 60 day space calculation was verified.
- The controller cache was disabled on the log disk controllers.
- The steady state portion of the test was 120 minutes.
- One checkpoint was taken before the measured interval.
- Four checkpoints were taken during the measured interval.
- The system pricing was checked for major components and maintenance.
- Third party quotes were verified for compliance.

Auditor Notes: None.

Sincerely,

Lorna Livingtree
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
    STDMETHODCALLTYPE CanBePooled() { return
m_bCanBePooled; }
    STDMETHODCALLTYPE Activate() { return S_OK; }
    // we don't support COM Services
    transactions (no enlistment)
    STDMETHODCALLTYPE Deactivate() { /*
nothing to do */ }

// IObjectConstruct
    STDMETHODCALLTYPE Construct(IDispatch * pUnk);

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.c pp

```

/* 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 ( !strcmp(szTmp,
szDBNames[ODBC]) )
                pReg->eDB_Protocol =
ODBC;
            else if ( !strcmp(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 ( !strcmp(szTmp,
szTxnMonNames[TUXEDO]) )
                pReg->eTxnMon = TUXEDO;
            else if ( !strcmp(szTmp,
szTxnMonNames[ENCINA]) )
                pReg->eTxnMon = ENCINA;
            else if ( !strcmp(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 ( !strcmp(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 **

# TARGETTYPE "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.ds
p
# 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 **

```

```

# TARGETTYPE "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
odbc32.lib /nologo /subsystem:windows /dll
/machine:I386
# ADD LINK32 ntdbllib.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 /1 0x409 /d "_DEBUG"
# ADD RSC /1 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
odbc32.lib /nologo /subsystem:windows /dll /debug
/machine:I386 /pdbtype:sept
# ADD LINK32 ntdbllib.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 /1 0x409 /d "_DEBUG"
# ADD RSC /1 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 ntdbllib.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 ntdbllib.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.ds

p

```

# 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 **

# TARGETTYPE "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
odbc32.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
odbc32.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 "NDEBUG" /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
odbc32.lib /nologo /subsystem:windows /dll /debug
/machine:I386 /pdctype: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
odbc32.lib /nologo /subsystem:windows /dll /debug
/machine:I386 /pdctype: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 odbc32.lib /nologo /subsystem:windows
/dll /debug /machine:I386 /out:".bin\tpcc_odbc.dll"
/pdctype: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

```

```

!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 "NDEBUG" /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
odbc32.lib /nologo /subsystem:windows /dll /debug
/machine:I386 /out:".bin\tpcc_odbc.dll"
/pdctype: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 odbc32.lib /nologo /subsystem:windows
/dll /debug /machine:I386 /out:".bin\tpcc_odbc.dll"
/pdctype: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;
    char szMsg[256];
} 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_WEBDDL 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_DELISTRV 15
//delivery server error
#define ERR_TYPE_TXNLOG 16
//txn log error
#define ERR_TYPE_BCONN 17
//Benchcraft connection class
#define ERR_TYPE_TPCC_CONN 18
//Benchcraft connection class
#define ERR_TYPE_ENCINA 19
//Encina error
#define ERR_TYPE_COMPONENT 20
//error from COM component
#define ERR_TYPE_RTE 21
//Benchcraft rte
```

```
#define ERR_TYPE_AUTOMATION 22
//Benchcraft automation errors
#define ERR_TYPE_DRIVER 23
//Driver engine errors
#define ERR_TYPE_RTE_BASE 24
//Framework errors

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

class CBaseErr
{
public:
    CBaseErr(LPCTSTR szLoc = NULL)
    {
        m_idMsg =
        INV_ERROR_CODE;
        if (szLoc)
        {
            m_szLoc = new
            char[m_szLoc_size];
            strcpy(m_szLoc, szLoc);
        }
        else
            m_szLoc = NULL;
        m_szApp = new
        char[m_szApp_size];
        GetModuleFileName(GetModuleHandle(NULL),
        m_szApp, m_szApp_size);
    }
    CBaseErr(int idMsg, LPCTSTR szLoc = NULL)
    {
        m_idMsg = idMsg;
        if (szLoc)
        {
            m_szLoc = new
            char[m_szLoc_size];
            strcpy(m_szLoc, szLoc);
        }
        else
            m_szLoc = NULL;
        m_szApp = new
        char[m_szApp_size];
        GetModuleFileName(GetModuleHandle(NULL),
        m_szApp, m_szApp_size);
    }
    virtual ~CBaseErr(void)
    {

```

```

        if (m_szApp)
            delete [] m_szApp;
        if (m_szLoc)
            delete [] m_szLoc;
    };

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

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

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

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

    char *GetApp(void) { return m_szApp; }
    char *GetLocation(void) { return m_szLoc; }
    virtual int ErrorNum() { return m_idMsg; }
    virtual int ErrorType() = 0; // a value
which distinguishes the kind of error that occurred
    virtual char *ErrorText() = 0; // a string
(i.e., human readable) representation of the error

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

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

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

```

```

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

class CSystemErr : public CBaseErr
{
public:
    enum Action
    {
        eNone = 0,
        eTransactNamedPipe,
        eWaitNamedPipe,
        eSetNamedPipeHandleState,
        eCreateFile,
        eCreateProcess,
        eCallNamedPipe,
        eCreateEvent,
        eCreateThread,
        eVirtualAlloc,
        eReadFile = 10,
        eWriteFile,
        eMapViewOfFile,
        eCreateFileMapping,
        eInitializeSecurityDescriptor,
        eSetSecurityDescriptorDacl,
        eCreateNamedPipe,
        eConnectNamedPipe,
        eWaitForSingleObject,
        eRegOpenKeyEx,
        eRegQueryValueEx = 20,
        eBeginThread,
        eRegEnumValue,
        eRegSetValueEx,
        eRegCreateKeyEx,
        eWaitForMultipleObjects,
    };

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

    Action        m_eAction;

private:
    char m_szMsg[ERR_MSG_BUF_SIZE];
};

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

    int ErrorType() {return ERR_TYPE_MEMORY;};
    char *ErrorText() {return ERR_INS_MEMORY;};
};

```

install.c

```

/*      FILE:            INSTALL.C
 *
 *      TPC-C Kit Ver. 4.20.000
 *
 *      Microsoft
 *
 *      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:
                    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;

    ReadTPCCRRegistrySettings( &Reg );
    ReadRegistrySettings();

    GetModuleFileName(hInst, szExePath,
sizeof(szExePath));
    GetVersionInfo(szDllPath, szExePath);
    wsprintf(szTmp,
"Version %d.%2d.%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_THREAD_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;
        }
    }
    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_THREAD_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);
}

// 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);
}

// 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\\Param
eters", 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\\Paramete
rs", 0, KEY_READ, &hKey) == ERROR_SUCCESS )
    {
        size =
sizeof(iAcceptExOutstanding);
        if ( RegQueryValueEx(hKey,
"AcceptExOutstanding", 0, &type, (char
*)&iAcceptExOutstanding, &size) == ERROR_SUCCESS )
            if (
!iAcceptExOutstanding )
                iAcceptExOutstanding = 40;

        RegCloseKey(hKey);
    }
}

```

```

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

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

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

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

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

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

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

        RegFlushKey(hKey);
        RegCloseKey(hKey);
    }

    if (
iRc=RegCreateKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\Inetinfo\\Param

```

```

eters", 0, NULL, REG_OPTION_NON_VOLATILE,
KEY_ALL_ACCESS, NULL, &hKey, &dwDisposition)) ==
ERROR_SUCCESS )
    {
        RegSetValueEx(hKey,
"PoolThreadLimit", 0, REG_DWORD, (char
*)&iPoolThreadLimit, sizeof(iPoolThreadLimit));
        RegSetValueEx(hKey,
"ThreadTimeout", 0, REG_DWORD, (char
*)&iThreadTimeout, sizeof(iThreadTimeout));
        RegSetValueEx(hKey,
"ListenBackLog", 0, REG_DWORD, (char
*)&iListenBackLog, sizeof(iListenBackLog));

        RegFlushKey(hKey);
        RegCloseKey(hKey);
    }

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

        RegFlushKey(hKey);
        RegCloseKey(hKey);
    }

    return;
}

BOOL CALLBACK CopyDlgProc(HWND hwnd, UINT uMsg,
WPARAM wParam, LPARAM lParam)
{
    if ( uMsg == WM_INITDIALOG )
    {
        SendDlgItemMessage(hwnd,
IDC_PROGRESS1, PBM_SETRANGE, 0, MAKELPARAM(0, 15));
        SendDlgItemMessage(hwnd,
IDC_PROGRESS1, PBM_SETSTEP, (WPARAM)1, 0);

        return TRUE;
    }

    return FALSE;
}

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

    hLib = LoadLibrary(szFileName);
    if ( hLib == NULL )
        return FALSE;
    // Find the entry point.
    lpDllEntryPoint = GetProcAddress(hLib,
"DllRegisterServer");
    if (lpDllEntryPoint != NULL)

```

```

    {
        return ((*lpDllEntryPoint)()) ==
S_OK);
    }
    else
        return FALSE; //unable to
locate entry point
}

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

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

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

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

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

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

    CloseHandle(hFile);

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

static int CopyFiles(HWND hDlg, char *szDllPath)
{
    BOOL          bSvcRunning;

    bSvcRunning = CheckWWWWebService();
    if ( bSvcRunning )
    {
        SetDlgItemText(hDlg, IDC_STATUS,
"Stopping Web Service.");
        SendDlgItemMessage(hDlg,
IDC_PROGRESS1, PBM_STEPIT, 0, 0);
        UpdateDialog(hDlg);
        StopWWWWebService();
    }

```

```

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

    SetDlgItemText(hDlg, IDC_STATUS, "Copying
Files...");
    SendDlgItemMessage(hDlg, IDC_PROGRESS1,
PBM_STEPIT, 0, 0);
    UpdateDialog(hDlg);

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

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

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

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

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

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

```

```

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

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

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

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

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

        return 1;
    }

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

        szDllPath[0] = 0;
        bRc = TRUE;
        if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\W3SVC\\Paramete
rs\\Virtual Roots", 0, KEY_ALL_ACCESS, &hKey) ==
ERROR_SUCCESS )
        {
            sv = sizeof(szData);
            iRc = RegQueryValueEx( hKey,
"/,", NULL, NULL, szData, &sv ); // used by IIS 3.0
            if (iRc == ERROR_FILE_NOT_FOUND)

```

```

            iRc = RegQueryValueEx(
hKey, "/", NULL, NULL, szData, &sv ); // used by
IIS 4.0
            if (iRc == ERROR_SUCCESS)
            {
                bRc = FALSE;
                strcpy(szDllPath,
szData);
                if ( (ptr =
strchr(szDllPath, ',')) )
                    *ptr = 0;

                len =
strlen(szDllPath);
                if ( szDllPath[len-1]
!= '\\\' )
                {
                    szDllPath[len] = '\\';
                    szDllPath[len+1] = 0;
                }
                RegCloseKey(hKey);
            }
            return bRc;
        }

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

        versionDllMS = 0;
        versionDllLS = 0;
        if ( _access(szDLLPath, 0) == 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 CheckWWWWebService(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 StartWWWWebService(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 StartWWWWebErr;
    //start Service pending, Check the status
until the service is running.
    if (! QueryServiceStatus(schService,
&ssStatus) )
        goto StartWWWWebErr;
    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 StartWWWWebErr;

    CloseServiceHandle(schService);
    return TRUE;
}

StartWWWWebErr:
    CloseServiceHandle(schService);
    return FALSE;
}

static BOOL StopWWWWebService(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 StopWWWWebErr;

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

    CloseServiceHandle(schService);
    return TRUE;
}

StopWWWWebErr:
    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_THREAD_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_THREAD_POOL_LIMIT,164,263,34,12,ES_RIGHT |
    ES_NUMBER,WS_EX_RTLREADING
    EDITTEXT
ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE,164,277,34,12,ES_RI
    GHT |
    ES_NUMBER,WS_EX_RTLREADING
    EDITTEXT
ED_IIS_THREAD_TIMEOUT,164,291,34,12,ES_RIGHT |
    ES_NUMBER,
    WS_EX_RTLREADING
    EDITTEXT
ED_IIS_LISTEN_BACKLOG,164,305,34,12,ES_RIGHT |
    ES_NUMBER,
    WS_EX_RTLREADING
    DEFPUSHBUTTON "OK",IDOK,53,331,50,14
    PUSHBUTTON "Cancel",IDCANCEL,119,331,50,14
    EDITTEXT
IDC_PATH,106,26,91,13,ES_AUTOHSCROLL | ES_READONLY
    LTEXT "Number of Delivery
Threads:", IDC_STATIC,35,45,115,12
    LTEXT "Max Number of
Connections:", IDC_STATIC,35,73,115,12
    RTEXT "Version
4.11", IDC_VERSION,120,4,89,9
    LTEXT "IIS Max Thread Pool
Limit:", IDC_STATIC,36,263,115,12
    LTEXT "Web Service Backlog Queue
Size:", IDC_STATIC,36,277,115,
12
    LTEXT "IIS Thread Timeout
(seconds):", IDC_STATIC,36,291,115,12
    LTEXT "IIS Listen
Backlog:", IDC_STATIC,36,307,115,10
    GROUPBOX "Database
Interface", IDC_STATIC,35,208,163,27,WS_GROUP
    LTEXT "Installation
directory:", IDC_STATIC,35,219,71,10
    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
Successful", 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, "msctl1_progress32", WS_BORD
ER,
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
#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"

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

```

```

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

#endif // !_MAC

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

IDR_LICENSE1          LICENSE DISCARDABLE
"license.txt"

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

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

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

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

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

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

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

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

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

```

```

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

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

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

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

IDR_COMALL_DLL          COM_ALL_DLL DISCARDABLE
"..\\..\\tpcc_com_all\\bin\\tpcc_com_all.dll"
#endif // English (U.S.) resources
////////////////////////////////////
////////////////////////////////////

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

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

-----
install_com.cp
-----
p
-----
/*      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 (wcsncmp(vTmp.bstrVal, L"TPC-
C"))
            {
                lCount--;
                continue;
            }
            else
            {
                hr =
pCatalogCollectionApp->Remove(lCount - 1);
                if (!SUCCEEDED(hr))
                    goto Error;

                break;
            }
        }

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

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

        // set properties
        bstrTemp = "Name";
        vTmp = "TPC-C";
        hr = pCatalogObjectApp->put_Value(bstrTemp,
vTmp);

```

```

        if (!SUCCEEDED(hr)) goto Error;

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

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

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

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

        pCatalogObjectApp->Release();
        pCatalogObjectApp = NULL;

        bstrTemp = "TPC-C";
        // app name
        bstrTemp2 = bstrDllPath +
"tpcc_com_all.dll"; // DLL
        bstrTemp3 = ""; // type

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

        hr = pCOMAdminCat-
>InstallComponent(bstrTemp,

        bstrTemp2,

        bstrTemp3,

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

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

```

```

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

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

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

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

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

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

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

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

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

```

```

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

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

>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 **

# TARGETTYPE "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 odbcc32.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\txnolog.lib wsock32.lib
kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib
oleaut32.lib uuid.lib odbcc32.lib odbccp32.lib /nologo
/subsystem:windows /dll /machine:I386
/nodefaultlib:"LIBCMDT" /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 odbcc32.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\txnolog.lib wsock32.lib
kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib
oleaut32.lib uuid.lib odbcc32.lib odbccp32.lib /nologo
/subsystem:windows /dll /debug /machine:I386
/nodefaultlib:"LIBCMDT" /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_dll"
# PROP BASE Intermediate_Dir "isapi_dll"
# 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 odbcc32.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\txnolog.lib wsock32.lib
kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib
oleaut32.lib uuid.lib odbcc32.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(
ReleaseLock( void );
~Spinlock( void );
// Disabled operations.
Spinlock( const
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.ds
p

```

# 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 **

# TARGETTYPE "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 /1 0x409 /d "NDEBUG"
# ADD RSC /1 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
odbc32.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
odbc32.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 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 /1 0x409 /d "_DEBUG"
# ADD RSC /1 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
odbc32.lib /nologo /subsystem:windows /dll /debug
/machine:I386 /pdctype: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
odbc32.lib /nologo /subsystem:windows /dll /debug
/machine:I386 /out:".bin\tpcc_com.dll" /pdctype: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
definitions 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
 *
 * ul_reason_for_call reason for call
 * LPVOID LPVOID
 *
 * lpReserved reserved for future use
 *
 * RETURNS: BOOL FALSE
 * errors occurred in
 * initialization
 *
 * TRUE DLL
 * successfully initialized
 */

BOOL APIENTRY DllMain(HANDLE hModule, DWORD
ul_reason_for_call, LPVOID lpReserved)
{
```

```

DWORD i;
char szEvent[LEN_ERR_STRING] = "\0";
char szLogFile[128];
char szDllName[128];

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

            DisableThreadLibraryCalls((HMODULE)hModule)
;
            InitializeCriticalSection(&TermCriticalSection);

            ReadTPCCRegistrySettings( &Reg )
                if (
                    throw new CWBCLNT_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
                if
                (Reg.eTxnMon == TUXEDO)
                {
                    strcpy( szDllName, Reg.szPath );

                    strcat( szDllName, "tpcc_tuxedo.dll" );

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

                        throw new CWBCLNT_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 CWBCLNT_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 CWBCLNT_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 CWBCLNT_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 CWBCLNT_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 CWBCLNT_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 CWBCLNT_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 CWBCLNT_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 CWBCLNT_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 CWBCLNT_ERR(
ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
            }
        }
    }

```

```

    }
    }
    if
(dwNumDeliveryThreads)
    {
//
for deferred delivery txns:
    hDoneEvent = CreateEvent( NULL, TRUE /*
manual reset */, FALSE /* initially not signalled */,
NULL );
    InitializeCriticalSection(&DelBuffCriticalS
ection);
    hWorkerSemaphore = CreateSemaphore( NULL,
0, dwDelBuffSize, NULL );
    dwDelBuffFreeCount = dwDelBuffSize;
    InitJulianTime(NULL);
//
create unique log file name based on delilog-yyymmdd-
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(&DelBuffCriticalSecti
on);
        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);
    lstrcpy(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:

```

```

MAIN_MENU_FORM:
            case
            break;
NEW_ORDER_FORM:
            case
            ProcessNewOrderForm(pECB, TermId,
szBuffer);
            break;
PAYMENT_FORM:
            case
            ProcessPaymentForm(pECB, TermId, szBuffer);
            break;
DELIVERY_FORM:
            case
            ProcessDeliveryForm(pECB, TermId,
szBuffer);
            break;
ORDER_STATUS_FORM:
            case
            ProcessOrderStatusForm(pECB, TermId,
szBuffer);
            break;
STOCK_LEVEL_FORM:
            case
            ProcessStockLevelForm(pECB, TermId,
szBuffer);
            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 );
    }
#endif ICECAP
StopCAP();
#endif

lpbSize = strlen(szBuffer);

```

```

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

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

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

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

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

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

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

        (VOID) DeregisterEventSource(hEventSource);
    }
}

/* FUNCTION: DeliveryWorkerThread
*
* PURPOSE: This function processes deferred
delivery txns. There are typically several
* threads running this
routine. The number of threads is determined by an
entry

```

```

* read from the registry.
The thread waits for work by waiting on semaphore.
* When a delivery txn is
posted, the semaphore is released. After processing
* the delivery txn,
information is logged to record the txn status and
execution
* time.
*/

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

    DELIVERY_TRANSACTION
delivery;
PDELIVERY_DATA
pDeliveryData;
TXN_RECORD_TPCC_DELIV_DEF txnDeliRec;

    DWORD index;
HANDLE handles[2];

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

    int
iRetryCnt = 0;
static int iMaxRetries =
10;

    assert(txnDeliLog != NULL);

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

```

```

delete e;

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

wsprintf( szTmp, "Delivery Txn
thread terminating after %d retries.", iMaxRetries );
WriteMessageToEventLog( szTmp );
goto ErrorExit;
}
catch (...)
{
    WriteMessageToEventLog(TEXT("Unhandled
exception caught in DeliveryWorkerThread. Delivery
Txn thread terminating."));
    goto ErrorExit;
}

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

            ZeroMemory(&txnDeliRec,
sizeof(txnDeliRec));

            txnDeliRec.TxnType =
TXN_REC_TYPE_TPCC_DELIV_DEF;

            // make a
local copy of current entry from delivery buffer and
increment buffer index
            EnterCriticalSection(&DelBuffCriticalSectio
n);

```

```

delivery =
*(pDelBuff+dwDelBuffBusyIndex);
dwDelBuffFreeCount++;
dwDelBuffBusyIndex++;
if
(dwDelBuffBusyIndex == dwDelBuffSize) // wrap-
around if at end of buffer
    dwDelBuffBusyIndex = 0;

LeaveCriticalSection(&DelBuffCriticalSectio
n);

pDeliveryData->w_id = delivery.w_id;
pDeliveryData->o_carrier_id =
delivery.o_carrier_id;

txnDeliRec.w_id = pDeliveryData->w_id;
txnDeliRec.o_carrier_id = pDeliveryData-
>o_carrier_id;

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

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

//log txn
txnDeliRec.TxnStatus = ERR_SUCCESS;
for (int i=0;
i<10; i++)
    txnDeliRec.o_id[i] = pDeliveryData-
>o_id[i];

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

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

if
(txnDeliLog != NULL)
    txnDeliLog->WriteToLog(&txnDeliRec);
}
catch (CBaseErr *e)
{

```

```

char szTmp[1024];
wsprintf( szTmp, "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(&DelBuffCriticalSectio
n);
    if (dwDelBuffFreeCount > 0)
    {
        bError = FALSE;
        (pDelBuff+dwDelBuffFreeIndex)-
= w_id;
        (pDelBuff+dwDelBuffFreeIndex)-
= 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
relevant 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;
            else
                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 iTTotal;

    EnterCriticalSection(&TermCriticalSection);

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

            iTTotal++;
    }

```

```

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)
    sprintf( 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 http string from client
browser *pQueryString char key
* *pKey char
value to look for *pValue char
* character array into which to place key's
value * int
* 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            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 )
        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 requester.
        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=\"TERMINID\" 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=\"TERMINID\" 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 = sprintf(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=\"TERMINID\" 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></PRE><HR>"
               "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Process\">"
               "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Menu\">"
               "</FORM></HTML>" );
    }
    else
    {
        sprintf(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></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>";

    if (!bInput)
        assert( pNewOrderData-
>exec_status_code == eOK || pNewOrderData-
>exec_status_code == eInvalidItem );

    bValid = (bInput || (pNewOrderData-
>exec_status_code == eOK));

    c = sprintf(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=\"TERMINID\" 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 += sprintf(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=\"SP0*\" SIZE=4> <INPUT NAME=\"IID00*\"
SIZE=6> <INPUT
NAME=\"Qty0*\" 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 += sprintf(szForm+c,
"Warehouse: %4.4d District: %2.2d
Date: ",
                pNewOrderData->w_id,
                pNewOrderData->d_id);

                if ( bValid )
                {
                    c += sprintf(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 += sprintf(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,
                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 %5.2f %5.2f <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 += sprintf(szForm+c,
                "%Disc:<BR>"
                "Order
                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 committed.
Total: %5.2f ",
                pNewOrderData->total_amount);
                else
                    c += sprintf(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 = sprintf(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=\TERMINID\ " VALUE=\%d\ ">"
"<INPUT TYPE=\hidden\"
NAME=\SYCID\ " VALUE=\%d\ ">"

```

```

        "PRE"><font face="Courier">
Payment<BR>"
        "Date: "
        , PAYMENT_FORM, iTermId,
Term.pClientData[iTermId].iSyncId);
        if ( !bInput )
        {
                c += sprintf(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 += sprintf(szForm+c,
                "<BR> <BR>Warehouse:
%4.4d
                "
                District: <INPUT NAME="DID*" SIZE=1><BR> <BR> <BR>
                <BR> <BR>"
                NAME="CID*" SIZE=4> "
                Customer: <INPUT
                NAME="CWI*" SIZE=4> "
                Cust-Warehouse: <INPUT
                NAME="CDI*" SIZE=1><BR>"
                Cust-District: <INPUT
                NAME="CLT*" SIZE=16>
                Since:<BR>"
                "
                Credit:<BR>"
                "
                Disc:<BR>"
                "
                Phone:<BR> <BR>"
                "
                Amount Paid:
                New Cust-
                Balance:<BR>"
                "
                Credit Limit:<BR>
                <BR><Cust-Data: <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 += sprintf(szForm+c,

```

```

                "<BR> <BR>Warehouse:
%4.4d
                District: %2.2d<BR>"
                "%-20s<BR>"
                "%-20s
                "%-20s
                "%-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_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 += sprintf(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 += sprintf(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,
                "
                "<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>";

```



```

        c = sprintf(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=\"TERMINID\" 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:
Number:<BR>"
            "Carrier-
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 += sprintf(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 += sprintf(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);
        }
        strcpy( 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 = sprintf(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=\"TERMINID\" 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> </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> <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 CWBCLNT_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 CWBCLNT_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 items;
    short ol_i_id, ol_quantity;
    char *ptr = lpszQueryString;

    static char szSP[MAX_OL_NEW_ORDER_ITEMS][6]
=
    { "SP0*", "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
CWBCLNT_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
CWBCLNT_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
CWBCLNT_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
CWBCLNT_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          client
                 lpszQueryString
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
 *
 *
 *
 *
 * 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; //synchronization 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; //synchronization 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_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
engstat.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

#ifdef _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

```

```

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
    END
END

```

```

TOPMARGIN, 7
BOTTOMMARGIN, 88
END
#endif // APSTUDIO_INVOKED

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

#endif 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
definitions 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
 *
 *      TPC-C Kit Ver. 4.20.000
 *
 *      Microsoft
 *      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.
#ifdef 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 );
    }
};

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.c

pp

```

/*      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
                EVENLOG_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
                (LPCWSTR *)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* pObjContext = NULL;

    // get our object context
    HRESULT hr = CoGetObjectContext(
IID_IObjectContext, (void **)&pObjContext );
    pObjContext->SetComplete();
    ReleaseInterface(pObjContext);
    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,
>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,
>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) ||
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,

>cElements,
        txn_in.parray->rgsabound-
>cElements);
        txn_in.parray->rgsabound-
>parray->pvData;
        pData = (COM_DATA*)txn_out-
        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,

>cElements,
        txn_in.parray->rgsabound-
>cElements);
        txn_in.parray->rgsabound-
>parray->pvData;
        pData = (COM_DATA*)txn_out-
        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.d ef

```

; 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.d sp

```

# 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 **

# TARGETTYPE "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
odbc32.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 odbc32.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
odbc32.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 odbc32.lib /nologo

```

```

/subsystem:windows /dll /debug /machine:I386
/pdbtype:sept

!ENDIF

# Begin Target

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

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

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

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

SOURCE=.\src\tpcc_com_all.idl

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

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

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

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

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

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

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

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

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

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

```

```

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

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

!ENDIF

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

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

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

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

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

```

tpcc_com_all.h

```

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

```

```

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

```

```

/* File created by MIDL compiler version 5.03.0280
*/
/* at Mon Jun 12 18:15:19 2000
*/
/* Compiler settings for .\src\tpcc_com_all.idl:
Oicf (OptLev=i2), Wl, 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;

#ifdef __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 /* __TPCCLib_LIBRARY_DEFINED__ */

/* Additional Prototypes for ALL interfaces */

/* end of Additional Prototypes */

#ifdef __cplusplus
}
#endif

#endif

tpcc_com_all.i
dl
/* 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 "oidl.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.r

C

```

//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

#ifdef // APSTUDIO_INVOKED

#ifdef _MAC
////////////////////////////////////
////////////////////////////////////
//
// Version
//

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

#endif // !_MAC

```



```

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

////////////////////////////////////
////////////////////////////////////
//
// String Table
//
STRINGTABLE DISCARDABLE
BEGIN
    IDS_PROJNAME        "tpcc_com_all"
END

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

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

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

```

tpcc_com_all.rgs

```

HKCR
{
    TPCC.AllTxns.1 = s 'All Txns Class'
    {
        CLSID = s '{122A3128-2520-11D3-
BA71-00C04FBFE08B}'
    }
    TPCC.AllTxns = s 'TPCC Class'
    {

```

```

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

```

tpcc_com_all.i.c

```

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

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

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

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

#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 =
{1,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}

#endif // !_MIDL_USE_GUIDDEF_

MIDL_DEFINE_GUID(IID,
LIBID_TPCCLib,0x122A3117,0x2520,0x11D3,0xBA,0x71,0x00,
0xC0,0x4F,0xBF,0xE0,0x8B);

MIDL_DEFINE_GUID(CLSID,
CLSID_TPCC,0x122A3128,0x2520,0x11D3,0xBA,0x71,0x00,0x
C0,0x4F,0xBF,0xE0,0x8B);

MIDL_DEFINE_GUID(CLSID,
CLSID_NewOrder,0x975BAABF,0x84A7,0x11D2,0xBA,0x47,0x0
0,0xC0,0x4F,0xBF,0xE0,0x8B);

MIDL_DEFINE_GUID(CLSID,
CLSID_OrderStatus,0x266836AD,0xA50D,0x11D2,0xBA,0x4E,
0x00,0xC0,0x4F,0xBF,0xE0,0x8B);

```

```
MIDL_DEFINE_GUID(CLSID,
CLSID_Payment, 0xCD02F7EF, 0xA4FA, 0x11D2, 0xBA, 0x4E, 0x00,
, 0xC0, 0x4F, 0xBF, 0xE0, 0x8B);
```

```
MIDL_DEFINE_GUID(CLSID,
CLSID_StockLevel, 0x2668369E, 0xA50D, 0x11D2, 0xBA, 0x4E, 0x00,
x00, 0xC0, 0x4F, 0xBF, 0xE0, 0x8B);
```

```
#undef MIDL_DEFINE_GUID
```

```
#ifdef __cplusplus
}
#endif
```

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

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

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

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

```
/* File created by MIDL compiler version 5.03.0280
*/
/* at Mon Jun 12 18:15:19 2000
*/
```

```
/* Compiler settings for .\src\tpcc_com_all.idl:
Oicf (OptLev=i2), Wl, 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_TPCLLib, 0x122A3117, 0x2520, 0x11D3, 0xBA, 0x71, 0x00,
, 0xC0, 0x4F, 0xBF, 0xE0, 0x8B);
```

```
MIDL_DEFINE_GUID(CLSID,
CLSID_TPCC, 0x122A3128, 0x2520, 0x11D3, 0xBA, 0x71, 0x00, 0x
C0, 0x4F, 0xBF, 0xE0, 0x8B);
```

```
MIDL_DEFINE_GUID(CLSID,
CLSID_NewOrder, 0x975BAABF, 0x84A7, 0x11D2, 0xBA, 0x47, 0x0
0, 0xC0, 0x4F, 0xBF, 0xE0, 0x8B);
```

```
MIDL_DEFINE_GUID(CLSID,
CLSID_OrderStatus, 0x266836AD, 0xA50D, 0x11D2, 0xBA, 0x4E,
0x00, 0xC0, 0x4F, 0xBF, 0xE0, 0x8B);
```

```
MIDL_DEFINE_GUID(CLSID,
CLSID_Payment, 0xCD02F7EF, 0xA4FA, 0x11D2, 0xBA, 0x4E, 0x00
, 0xC0, 0x4F, 0xBF, 0xE0, 0x8B);
```

```
MIDL_DEFINE_GUID(CLSID,
CLSID_StockLevel, 0x2668369E, 0xA50D, 0x11D2, 0xBA, 0x4E, 0
x00, 0xC0, 0x4F, 0xBF, 0xE0, 0x8B);
```

```
#undef MIDL_DEFINE_GUID
```

```
#ifdef __cplusplus
}
#endif
```

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

tpcc_com_no.r

gs

```
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.r

gs

```
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.sp

```

# 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 **

# TARGETTYPE "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
odbc32.lib /nologo /subsystem:windows /machine:I386
# ADD LINK32 kernel32.lib rpndr.lib rpcns4.lib
rpctr4.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 odbccp32.lib
odbc32.lib /nologo /subsystem:windows /debug
/machine:I386 /pdbtype:sept
# ADD LINK32 kernel32.lib rpcndr.lib rpcns4.lib
rpcrt4.lib oleaut32.lib uuid.lib /nologo
/entry:"DllMain" /dll /debug /machine:IX86
/def:".src\tpcc_com_ps.def" /pdbtype:sept
# SUBTRACT LINK32 /pdb:none
# Begin Custom Build - Copying tpcc_com_ps.h
InputPath=.bin\tpcc_com_ps.dll
SOURCE="$(InputPath)"

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

# End Custom Build

!ENDIF

# Begin Target

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

# PROP Default_Filter ""
# Begin Source File

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

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

SOURCE=.src\tpcc_com_ps.idl

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

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

```

```

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

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

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

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

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

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

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

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

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

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

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

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

!ENDIF

# End Source File
# Begin Source File

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

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

```

tpcc_com_ps.h

```

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

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

/* File created by MIDL compiler version 5.03.0280
*/
/* at Mon Jun 12 18:15:12 2000
*/
/* Compiler settings for .src\tpcc_com_ps.idl:
Oicf (OptLev=i2), Wl, 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"

#ifndef __cplusplus

```

```

extern "C"{
#ifdef
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;

#ifdef __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("FEE6AA2-84B1-11d2-BA47-00C04FBFE08B")
    ITPCC : public IUnknown
    {
    public:
        virtual HRESULT STDMETHODCALLTYPE NewOrder(
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT __RPC_FAR *txn_out) =
0;

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

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

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

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

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

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

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

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

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

        HRESULT ( STDMETHODCALLTYPE __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 STDMETHODCALLTYPE 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 STDMETHODCALLTYPE 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.i ***dl***

```

/* 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 "oidl.idl";
import "ocidl.idl";

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

```

```

[in] VARIANT txn_in,
[out] VARIANT *txn_out
);
};
HRESULT __stdcall Payment
(
[in] VARIANT txn_in,
[out] VARIANT *txn_out
);
};
HRESULT __stdcall Delivery
(
[in] VARIANT txn_in,
[out] VARIANT *txn_out
);
};
HRESULT __stdcall StockLevel
(
[in] VARIANT txn_in,
[out] VARIANT *txn_out
);
};
HRESULT __stdcall OrderStatus
(
[in] VARIANT txn_in,
[out] VARIANT *txn_out
);
};
HRESULT __stdcall CallSetComplete
(
);
}; // interface ITPCC

```

tpcc_com_ps_i ***.C***

```

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

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

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

/* File created by MIDL compiler version 5.03.0280
*/
/* at Mon Jun 12 18:15:12 2000
*/
/* Compiler settings for .\src\tpcc_com_ps.idl:
Oicf (OptLev=i2), Wl, 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_HEADERING( )

#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 =
{1,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}

#endif !_MIDL_USE_GUIDDEF_

MIDL_DEFINE_GUID(IID,
IID_ITPCC,0xFEEB6AA2,0x84B1,0x11d2,0xBA,0x47,0x00,0x0
0,0x4F,0xBF,0xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif

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

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

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

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

/* File created by MIDL compiler version 5.03.0280
*/
/* at Mon Jun 12 18:15:12 2000
*/
/* Compiler settings for .\src\tpcc_com_ps.idl:
Oicf (OptLev=i2), Wl, 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_HEADERING( )

#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 =
{1,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}

#endif !_MIDL_USE_GUIDDEF_

MIDL_DEFINE_GUID(IID,
IID_ITPCC,0xFEEB6AA2,0x84B1,0x11d2,0xBA,0x47,0x00,0x0
0,0x4F,0xBF,0xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif

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

```

tpcc_com_ps_ p.c

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

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

/* File created by MIDL compiler version 5.03.0280
*/
/* at Mon Jun 12 18:15:12 2000
*/
/* Compiler settings for .\src\tpcc_com_ps.idl:
Oicf (OptLev=i2), Wl, 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,{0x00,0x00,0x00,0x00,0
x00,0x00,0x00,0x00}} */

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

/* Object interface: ITPCC, ver. 0.0,
GUID={0xFEEB6AA2,0x84B1,0x11d2,{0xBA,0x47,0x00,0xC0,0
x4F,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,
    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,
    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_marshall] or
[user_marshall] 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 */

        FC_AUTO_HANDLE */
        0x33,
        /*
        Old Flags: object, Oi2 */
        /* 2 */ NdrFcLong( 0x0 ), /* 0 */
        /* 6 */ NdrFcShort( 0x3 ), /* 3 */
#ifdef _ALPHA_
#ifdef _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, */
3 */ 0x3, /*
/* Parameter txn_in */
/* 16 */ NdrFcShort( 0x8b ), /* Flags: must size,
must free, in, by val, */
#ifdef _ALPHA_
#ifdef _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 */
#ifdef _ALPHA_
#ifdef _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, */
#ifdef _ALPHA_
#ifdef _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 */
#ifdef _ALPHA_
#ifdef _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, */
#ifdef _ALPHA_
#ifdef _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, */
3 */              0x3,          /*

/* Parameter txn_in */

/* 118 */ NdrFcShort( 0x8b ), /* Flags:  must size,
must free, in, by val, */
#ifdef _ALPHA_
#ifdef _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 */
#ifdef _ALPHA_
#ifdef _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, */
#ifdef _ALPHA_
#ifdef _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 */
#ifdef _ALPHA_
#ifdef _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, */
#ifdef _ALPHA_
#ifdef _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
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 */
#ifdef _ALPHA_
#ifdef _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, */
#ifdef _ALPHA_
#ifdef _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 */
#ifdef _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, */
#ifdef _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( 0xffff8 ), /* -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 */
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( 0xffffc ), /* -4 */
/* 296 */ 0x6, /* FC_SHORT */
0x5b, /*
FC_END /*
/* 298 */
0x17, /*
FC_CSTRUCT /*
0x3, /*
3 */
/* 300 */ NdrFcShort( 0x8 ), /* 8 */
/* 302 */ NdrFcShort( 0xffffffff2 ), /* Offset= -
14 (288) */
/* 304 */ 0x8, /* FC_LONG */
0x8, /*
FC_LONG /*
/* 306 */ 0x5c, /* FC_PAD */
0x5b, /*
FC_END /*
/* 308 */
0x2f, /*
FC_IP /*
0x5a, /*
FC_CONSTANT_IID /*
/* 310 */ NdrFcLong( 0x0 ), /* 0 */
/* 314 */ NdrFcShort( 0x0 ), /* 0 */
/* 316 */ NdrFcShort( 0x0 ), /* 0 */
/* 318 */ 0xc0, /* 192 */
0x0, /*
0 */
/* 320 */ 0x0, /* 0 */
0x0, /*
0 */
/* 322 */ 0x0, /* 0 */
0x0, /*
0 */
/* 324 */ 0x0, /* 0 */
0x46, /*
70 */
/* 326 */
0x2E, /*
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( 0xffffffff6e ), /* 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( 0xffffffffd4 ), /* 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( 0xfffff50 ), /* 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( 0xfffffe0 ), /* 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( 0xfffff40 ), /* Offset= -
192 (326) */
/* 520 */ 0x5c, /* FC_PAD */
0x5b, /*
FC_END */

```

```

/* 522 */
FC_BOGUS_STRUCT */
0x1a, /*
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( 0xfffffe0 ), /* 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( 0xfffffd4 ), /* 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( 0xfffffd8 ), /* Offset= -
40 (584) */
/* 626 */ 0x36, /* FC_POINTER */
0x5b, /*
FC_END */
/* 628 */
0x12, 0x0, /*
FC_UP */
/* 630 */ NdrFcShort( 0xfffffe4 ), /* 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( 0xfffffd4 ), /* 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( 0xfffffd4 ), /* Offset= -
44 (632) */
/* 678 */
0x1d, /*
FC_SMPARRAY */
0x0, /*
0 */
/* 680 */ NdrFcShort( 0x8 ), /* 8 */
/* 682 */ 0x2, /* FC_CHAR */
0x5b, /*
FC_END */
/* 684 */
0x15, /*
FC_STRUCT */
0x3, /*
3 */
/* 686 */ NdrFcShort( 0x10 ), /* 16 */
/* 688 */ 0x8, /* FC_LONG */
0x6, /*
FC_SHORT */
/* 690 */ 0x6, /* FC_SHORT */
0x4c, /*
FC_EMBEDDED_COMPLEX */
/* 692 */ 0x0, /* 0 */
NdrFcShort( 0xffffff1
), /* 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( 0xfffffe8 ), /* Offset= -
24 (684) */
/* 710 */ 0x5c, /* FC_PAD */
0x5b, /*
FC_END */
/* 712 */
0x11, 0x0, /*
FC_RP */
/* 714 */ NdrFcShort( 0xfffff0c ), /* 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( 0xfffffe8 ), /* 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 */
/* 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( 0xfffffee ), /* Offset= -
18 (836) */
/* 856 */ 0x5c, /* FC_PAD */
0x5b, /*
FC_END */
/* 858 */
0x1a, /*
FC_BOGUS_STRUCT */
0x3, /*
3 */
/* 860 */ NdrFcShort( 0x28 ), /* 40 */
/* 862 */ NdrFcShort( 0xfffffee ), /* 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( 0xfffffd7
), /* 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 */
FC_UP [simple_pointer] */
/* 898 */ 0xc, /* FC_DOUBLE */
0x5c, /*
FC_PAD */
/* 900 */
FC_UP */
/* 902 */ NdrFcShort( 0xfffffd90 ), /* Offset= -
624 (278) */
/* 904 */
FC_UP [pointer_deref] */
/* 906 */ NdrFcShort( 0xfffffd92 ), /* Offset= -
622 (284) */
/* 908 */
FC_UP [pointer_deref] */
/* 910 */ NdrFcShort( 0xfffffda6 ), /* Offset= -
602 (308) */
/* 912 */
FC_UP [pointer_deref] */
/* 914 */ NdrFcShort( 0xfffffdb4 ), /* Offset= -
588 (326) */
/* 916 */
FC_UP [pointer_deref] */
/* 918 */ NdrFcShort( 0xfffffdc2 ), /* Offset= -
574 (344) */
/* 920 */
FC_UP [pointer_deref] */
/* 922 */ NdrFcShort( 0x2 ), /* Offset= 2 (924) */
/* 924 */
FC_UP */
/* 926 */ NdrFcShort( 0x16 ), /* Offset= 22 (948) */
/* 928 */
FC_STRUCT */
0x15, /*
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 */
FC_UP */

```

```

/* 942 */ NdrFcShort( 0xfffffff2 ), /* Offset= -
14 (928) */
/* 944 */
FC_UP [simple_pointer] */
/* 946 */ 0x2, /* FC_CHAR */
0x5c, /*
FC_PAD */
/* 948 */
FC_BOGUS_STRUCT */
0x1a, /*
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 */
FC_RP [allocated_on_stack] */
/* 980 */ NdrFcShort( 0x6 ), /* Offset= 6 (986) */
/* 982 */
FC_OP */
/* 984 */ NdrFcShort( 0xfffffcdc ), /* Offset= -
36 (948) */
/* 986 */ 0xb4, /* FC_USER_MARSHAL */
0x83, /*
131 */
/* 988 */ NdrFcShort( 0x0 ), /* 0 */
/* 990 */ NdrFcShort( 0x10 ), /* 16 */
/* 992 */ NdrFcShort( 0x0 ), /* 0 */
/* 994 */ NdrFcShort( 0xfffffff4 ), /* Offset= -
12 (982) */
0x0
}
};

```

```

const CInterfaceProxyVtbl *
_tpcc_com_ps_ProxyVtblList[] =
{
( CInterfaceProxyVtbl *) &ITPCCProxyVtbl,
0
};
const CInterfaceStubVtbl *
_tpcc_com_ps_StubVtblList[] =
{
( CInterfaceStubVtbl *) &ITPCCStubVtbl,
0
};
PCInterfaceName const
_tpcc_com_ps_InterfaceNamesList[] =
{
"ITPCC",
0
};
#define _tpcc_com_ps_CHECK_IID(n)
IID_GENERIC_CHECK_IID( _tpcc_com_ps, pIID,
n)
int __stdcall _tpcc_com_ps_IID_Lookup( const IID *
pIID, int * pIndex )
{
if(!_tpcc_com_ps_CHECK_IID(0))
{
*pIndex = 0;
return 1;
}
return 0;
}
const ExtendedProxyFileInfo tpcc_com_ps_ProxyFileInfo
=
{
(PCInterfaceProxyVtblList *) &
_tpcc_com_ps_ProxyVtblList,
(PCInterfaceStubVtblList *) &
_tpcc_com_ps_StubVtblList,
(const PCInterfaceName *) &
_tpcc_com_ps_InterfaceNamesList,
0, // no delegation
& _tpcc_com_ps_IID_Lookup,
1,
2,
0, /* table of [async_uuid] interfaces */
0, /* Filler1 */
0, /* Filler2 */
0, /* Filler3 */
};
#endif /* !defined(_M_IA64) && !defined(_M_AXP64) */

```

```

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

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

/* File created by MIDL compiler version 5.03.0280
*/
/* at Mon Jun 12 18:15:12 2000
*/
/* Compiler settings for .\src\tpcc_com_ps.idl:
Oicf (OptLev=12), Wl, 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_XPP64)
#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,{0x00,0x00,0x00,0x00,0
x00,0x00,0x00,0x00}} */

/* Object interface: IUnknown, ver. 0.0.0,
GUID={0x00000000,0x0000,0x0000,{0xC0,0x00,0x00,0x00,0
x00,0x00,0x00,0x46}} */

/* Object interface: ITPCC, ver. 0.0,
GUID={0xFEFE6AA2,0x84B1,0x11d2,{0xBA,0x47,0x00,0xC0,0
x4F,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,
    0
};

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

```

```

CINTERFACE_PROXY_VTABLE(9) _ITPCCProxyVtbl =
{
    &ITPCC_ProxyInfo,
    &IID_ITPCC,
    IUnknown_QueryInterface_Proxy,
    IUnknown_AddRef_Proxy,
    IUnknown_Release_Proxy ,
    (void *)-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,
    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, */
#ifdef _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 */
#ifdef _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, */
#ifdef _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 */
#ifdef _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, */
#ifdef _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 */
#ifdef _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, */
#ifdef _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 */
#ifdef _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, */
#ifdef _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 */
#ifdef _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, */
#ifdef _ALPHA_
/* 216 */ NdrFcShort( 0x30 ), /* ia64 Stack
size/offset = 48 */
#else
NdrFcShort( 0x28 ), /*
axp64 Stack size/offset = 40 */
#endif

```

```

/* 218 */ 0x8,          /* FC_LONG */
0 */
          0x0,          /*
          */

/* Procedure CallSetComplete */

/* 220 */ 0x33,        /* FC_AUTO_HANDLE */
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, */
1 */
/* 236 */ 0xa,         /* 10 */
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 */
0 */
          0x0,          /*
          */

};

static const MIDL_TYPE_FORMAT_STRING
__MIDL_TypeFormatString =
{
    0,
    {
        NdrFcShort( 0x0 ), /*
        */
        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( 0xffff8 ), /* -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 */
FC_STRUCT */
0x15, /*
7 */
0x7, /*
/* 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( 0xffffffff0 ), /* 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( 0xffffffff74 ), /* 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( 0xffffffffdc ), /* 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( 0xffffffff58 ), /* 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( 0xffffffffdc ), /* 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( 0xfffffffff ), /* -1 */
/* 514 */ NdrFcShort( 0x0 ), /* Corr flags: */
/* 516 */ 0x4c, /* FC_EMBEDDED_COMPLEX
*/
0x0, /*
0 */
/* 518 */ NdrFcShort( 0xffffffff44 ), /* 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( 0xffffffffdc ), /* 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( 0xfffffffff ), /* -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( 0xffffffffdc ), /* 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( 0xffffffffd6 ), /* Offset= -
42 (576) */
/* 620 */ 0x39, /* FC_ALIGNM8 */
0x36, /*
FC_POINTER */
/* 622 */ 0x5c, /* FC_PAD */
0x5b, /*
FC_END */
/* 624 */
0x12, 0x0, /*
FC_UP */
/* 626 */ NdrFcShort( 0xffffffffe0 ), /* 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( 0xffffffffd8 ), /* 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( 0xffffffffdc ), /* Offset= -
36 (628) */
/* 666 */
                                0x1d, /*
FC_SMFARRAY */
                                0x0, /*
0 */
/* 668 */ NdrFcShort( 0x8 ), /* 8 */
/* 670 */ 0x2, /* FC_CHAR */
                                0x5b, /*
FC_END */
/* 672 */
                                0x15, /*
FC_STRUCT */
                                0x3, /*
3 */
/* 674 */ NdrFcShort( 0x10 ), /* 16 */
/* 676 */ 0x8, /* FC_LONG */
                                0x6, /*
FC_SHORT */
/* 678 */ 0x6, /* FC_SHORT */
                                0x4c, /*
FC_EMBEDDED_COMPLEX */
/* 680 */ 0x0, /* 0 */
NdrFcShort( 0xfffffffff1
), /* 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( 0xfffffffffe7
), /* Offset= -25 (672) */
                                0x5b, /*
FC_END */
/* 700 */
                                0x11, 0x0, /*
FC_RP */
/* 702 */ NdrFcShort( 0xfffffffff10 ), /* 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( 0xfffffffffe6 ), /* 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( 0xfffffffffe6 ), /* 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( 0xfffffffffe6 ), /* 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 */
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 */
FC_ALIGNM8 /*
/* 810 */ 0x36, /* FC_POINTER */
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 */
FC_LONG /*
/* 822 */ 0x5c, /* FC_PAD */
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( 0xfffffec ), /* Offset= -
20 (816) */

```

```

/* 838 */ 0x5c, /* FC_PAD */
FC_END /*
/* 840 */
0x1a, /*
FC_BOGUS_STRUCT */
0x3, /*
3 */
/* 842 */ NdrFcShort( 0x38 ), /* 56 */
/* 844 */ NdrFcShort( 0xfffffec ), /* Offset= -
20 (824) */
/* 846 */ NdrFcShort( 0x0 ), /* Offset= 0 (846) */
/* 848 */ 0x6, /* FC_SHORT */
FC_SHORT /*
/* 850 */ 0x38, /* FC_ALIGNM4 */
FC_LONG /*
/* 852 */ 0x8, /* FC_LONG */
FC_EMBEDDED_COMPLEX /*
/* 854 */ 0x4, /* 4 */
), /* Offset= -499 (356) */
FC_END /*
/* 858 */
0x12, 0x0, /*
FC_UP */
/* 860 */ NdrFcShort( 0xfffff02 ), /* Offset= -
254 (606) */
/* 862 */
0x12, 0x8, /*
FC_UP [simple_pointer] */
/* 864 */ 0x1, /* FC_BYTE */
FC_PAD /*
/* 866 */
0x12, 0x8, /*
FC_UP [simple_pointer] */
/* 868 */ 0x6, /* FC_SHORT */
FC_PAD /*
/* 870 */
0x12, 0x8, /*
FC_UP [simple_pointer] */
/* 872 */ 0x8, /* FC_LONG */
FC_PAD /*
/* 874 */
0x12, 0x8, /*
FC_UP [simple_pointer] */
/* 876 */ 0xa, /* FC_FLOAT */
FC_PAD /*
/* 878 */
0x12, 0x8, /*
FC_UP [simple_pointer] */
/* 880 */ 0xc, /* FC_DOUBLE */
FC_PAD /*
/* 882 */

```

```

0x12, 0x0, /*
FC_UP */
/* 884 */ NdrFcShort( 0xffffda4 ), /* Offset= -
604 (280) */
/* 886 */
0x12, 0x10, /*
FC_UP [pointer_deref] */
/* 888 */ NdrFcShort( 0xffffda6 ), /* Offset= -
602 (286) */
/* 890 */
0x12, 0x10, /*
FC_UP [pointer_deref] */
/* 892 */ NdrFcShort( 0xffffdbc ), /* Offset= -
580 (312) */
/* 894 */
0x12, 0x10, /*
FC_UP [pointer_deref] */
/* 896 */ NdrFcShort( 0xffffdca ), /* Offset= -
566 (330) */
/* 898 */
0x12, 0x10, /*
FC_UP [pointer_deref] */
/* 900 */ NdrFcShort( 0xffffdd8 ), /* 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 */
FC_BYTE /*
/* 916 */ 0x1, /* FC_BYTE */
FC_ALIGNM4 /*
/* 918 */ 0x8, /* FC_LONG */
FC_ALIGNM8 /*
/* 920 */ 0xb, /* FC_HYPER */
FC_END /*
/* 922 */
0x12, 0x0, /*
FC_UP */
/* 924 */ NdrFcShort( 0xfffffff2 ), /* Offset= -
14 (910) */
/* 926 */
0x12, 0x8, /*
FC_UP [simple_pointer] */
/* 928 */ 0x2, /* FC_CHAR */
FC_PAD /*
/* 930 */

```

```

FC_BOGUS_STRUCT */          0x1a,          /*
                                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 [allocated_on_stack] */
/* 962 */ NdrFcShort( 0x6 ), /* Offset= 6 (968) */
/* 964 */
                                0x13, 0x0,          /*
FC_OP */
/* 966 */ NdrFcShort( 0xfffffcdc ), /* 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 *
_tpc_com_ps_ProxyVtblList[] =
{
    ( CInterfaceProxyVtbl * ) &ITPCProxyVtbl,
    0
};

```

```

const CInterfaceStubVtbl *
_tpc_com_ps_StubVtblList[] =
{
    ( CInterfaceStubVtbl * ) &ITPCStubVtbl,
    0
};

PCInterfaceName const
_tpc_com_ps_InterfaceNamesList[] =
{
    "ITPC",
    0
};

#define _tpc_com_ps_CHECK_IID(n)
    IID_GENERIC_CHECK_IID( _tpc_com_ps, pIID,
n)

int __stdcall _tpc_com_ps_IID_Lookup( const IID *
pIID, int * pIndex )
{
    if(!_tpc_com_ps_CHECK_IID(0))
    {
        *pIndex = 0;
        return 1;
    }

    return 0;
}

const ExtendedProxyFileInfo tpc_com_ps_ProxyFileInfo
=
{
    (PCInterfaceProxyVtblList *) &
_tpc_com_ps_ProxyVtblList,
    (PCInterfaceStubVtblList *) &
_tpc_com_ps_StubVtblList,
    (const PCInterfaceName *) &
_tpc_com_ps_InterfaceNamesList,
    0, // no delegation
    & _tpc_com_ps_IID_Lookup,
    1,
    2,
    0, /* table of [async_uuid] interfaces */
    0, /* Filler1 */
    0, /* Filler2 */
    0 /* Filler3 */
};

#ifdef _M_IA64 || defined(_M_AXP64)*/

```

tpcc_com_sl.rg

S

```

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
msgstate int
severity int
msgtext char
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, 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
destination string pointer
*pDest char
source string pointer
*pSrc 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
        if (dbprocerrhandle(login, err_handler) ==
NULL)
            ThrowError(CDBLIBERR::eDbProcHandler);

        if (dbprocmsghandle(login, msg_handler) ==
NULL)
            ThrowError(CDBLIBERR::eDbProcHandler);

        DBSETLUSER(login, szUser);
        DBSETLPWD(login, szPassword);
        DBSETLHOST(login, szHost);
        DBSETLPACKET(login, (unsigned
short)DEFCLPACKSIZE);
        DBSETLVERSION(login, DBVER60);
        // use dblib ver 6.0 client behavior

        // set time to wait for login
        if (dbsetlogintime(60) == FAIL)
            ThrowError(CDBLIBERR::eDbSet);

        // set time to wait for statement execution
        if (dbsettime(180) == FAIL)
            ThrowError(CDBLIBERR::eDbSet);

        m_dbproc = dbopen(login, szServer);

        // deallocate login structure before
checking for success
        dbfreelogin( login );

        if (m_dbproc == NULL)
            ThrowError(CDBLIBERR::eDbOpen);

        // save address of class instance so that
the message and error handler
        // can get to data.
        dbsetuserdata(m_dbproc, (LPVOID)this);

```

```

        // Use the the right database
        if (dbuse(m_dbproc, szDatabase) == FAIL)
            ThrowError(CDBLIBERR::eDbUse);

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

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

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

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

        // verify that version of stored procs on
server is correct
        dbrpcinit(m_dbproc, "tpcc_version", 0);
        if (dbrpcexec(m_dbproc) == FAIL)
            ThrowError(CDBLIBERR::eDbRpcExec);

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

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

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

        DiscardNextRows(0);
        DiscardNextResults(0);
}

```

```

CTPCC_DBLIB::~CTPCC_DBLIB( void )
{
    // close db connection and deallocate
resources
    dbcloses(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 CSQLEERR();

    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 DLib error.
        if (m_SqlErr != NULL)
        {
            CSQLEERR *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
            {
                dbrcpinit(m_dbproc,
"tpcc_stocklevel", 0);

                dbrcpparam(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); // @threshold
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
||
== iErrOleDbProvider &&
>m_msgtext, sErrTimeoutExpired) != NULL) &&
<= 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_ge
neric, pData, dbdatlen(m_dbproc, 3));

            if(pData=dbdata(m_dbproc, 4))
                dbconvert(m_dbproc, SQLNUMERIC,
(LPBYTE)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_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 &&
strchr(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.minut
e = daterec.minute;
        m_txn.OrderStatus.OL[i].ol_delivery_d.secon
d = daterec.second;
                }
                i++;
        }
        m_txn.OrderStatus.o_ol_cnt = i;

        if (dbresults(m_dbproc)
!= SUCCEEDED)
            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
== iErrOleDbProvider &&
>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)
                    if (dbrpcexec(m_dbproc)
                    ThrowError(CDBLIBERR::eDbRpcExec);

                if (dbresults(m_dbproc)
!= SUCCEEDED)
                    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
||
== iErrOleDbProvider &&
>m_msgtext, sErrTimeoutExpired) != NULL) &&
<= 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: TPC_C_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.
#ifdef 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*
        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
{
    NewOrder;           NEW_ORDER_DATA
    Payment;            PAYMENT_DATA
    Delivery;           DELIVERY_DATA
    StockLevel;         STOCK_LEVEL_DATA
    OrderStatus;        ORDER_STATUS_DATA
    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,
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);

```

tpcc_odbc.cpp

```

/* FILE: TPCC_ODBC.CPP
 * Microsoft
TPC-C Kit Ver. 4.20.000
 * Copyright
Microsoft, 1999
 * All Rights Reserved
 * Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
 *
 * PURPOSE: Implements ODBC calls for TPC-C
txns.
 * Contact: Charles Levine
(clevine@microsoft.com)
 *
 * Change history:
 * 4.20.000 - updated rev number to
match kit
 * 4.10.001 - not deleting error
class in catch handler on deadlock retry; not a
functional bug, but a memory leak
 */

#include <windows.h>
#include <stdio.h>
#include <assert.h>

#define DBNTWIN32
#include <sqltypes.h>
#include <sql.h>
#include <sqlext.h>
#include <odbcss.h>

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

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

#include "..\..\common\src\error.h"
#include "..\..\common\src\trans.h"
#include "..\..\common\src\txn_base.h"
#include "tpcc_odbc.h"

// version string; must match return value from
tpcc_version stored proc
const char sVersion[] = "4.10.000";

const iMaxRetries = 10; // how many
retries on deadlock

const int iErrOleDbProvider = 7312;
const char sErrTimeoutExpired[] = "Timeout expired";

```

```

static SQLHENV henv = SQL_NULL_HENV;
    // ODBC environment handle

BOOL APIENTRY DllMain(HMODULE hModule, DWORD
ul_reason_for_call, LPVOID lpReserved)
{
    switch( ul_reason_for_call )
    {
        case DLL_PROCESS_ATTACH:

            DisableThreadLibraryCalls(hModule);
            if (
SQLAllocHandleStd(SQL_HANDLE_ENV, SQL_NULL_HANDLE,
&henv) != SQL_SUCCESS )
                return FALSE;
            break;

        case DLL_PROCESS_DETACH:
            if (henv != NULL)
                SQLFreeEnv(henv);
            break;

        default:
            /* nothing */;
    }
    return TRUE;
}

/* FUNCTION: CTPCC_ODBC_ERR::ErrorText
 *
 */

char* CTPCC_ODBC_ERR::ErrorText(void)
{
    int i;

    static SERRORMSG errorMsgs[] =
    {
        { ERR_WRONG_SP_VERSION,
"Wrong version of stored procs on database
server" },
        { ERR_INVALID_CUST,
"Invalid Customer id,name." },
        { ERR_NO_SUCH_ORDER,
"No orders found for customer." },
        { ERR_RETRIED_TRANS,
"Retries before transaction succeeded." },
        { 0, "" }
    };

}

static char szNotFound[] = "Unknown error
number. ";

for(i=0; errorMsgs[i].szMsg[0]; i++)
{

```

```

        if ( m_errno ==
errorMsgs[i].iError )
            break;
    }
    if ( !errorMsgs[i].szMsg[0] )
        return szNotFound;
    else
        return errorMsgs[i].szMsg;
}

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_ODBC* CTPCC_ODBC_new(
LPCSTR szServer, // name of
SQL server
LPCSTR szUser, //
user name for login
LPCSTR szPassword, // password
for login
LPCSTR szHost, //
not used
LPCSTR szDatabase ) // name of
database to use
{
    return new CTPCC_ODBC( szServer, szUser,
szPassword, szHost, szDatabase );
}

CTPCC_ODBC::CTPCC_ODBC (
LPCSTR szServer,
// name of SQL server
LPCSTR szUser,
// user name for login
LPCSTR szPassword,
// password for login
LPCSTR szHost,
// not used
LPCSTR szDatabase
// name of database to use
)
{
    RETCODE rc;

    // initialization
    m_hdbc = SQL_NULL_HDBC;
    m_hstmt = SQL_NULL_HSTMT;

    m_hstmtNewOrder = SQL_NULL_HSTMT;
    m_hstmtPayment = SQL_NULL_HSTMT;
    m_hstmtDelivery = SQL_NULL_HSTMT;
    m_hstmtOrderStatus = SQL_NULL_HSTMT;
    m_hstmtStockLevel = SQL_NULL_HSTMT;

    m_descNewOrderCols1 = SQL_NULL_HDESC;
    m_descNewOrderCols2 = SQL_NULL_HDESC;
    m_descOrderStatusCols1 = SQL_NULL_HDESC;
    m_descOrderStatusCols2 = SQL_NULL_HDESC;

    if ( SQLAllocHandle(SQL_HANDLE_DBC, henv,
&m_hdbc) != SQL_SUCCESS )
        ThrowError(CODBCERR::eAllocHandle);
}

```

```

        if ( SQLSetConnectOption(m_hdbc,
SQL_PACKET_SIZE, 4096) != SQL_SUCCESS )
            ThrowError(CODBCERR::eConnOption);
    {
        char
szConnectStr[256];
        char
szOutStr[1024];
        SQLSMALLINT
iOutStrLen;

        sprintf( szConnectStr,
"DRIVER=SQL
Server;SERVER=%s;UID=%s;PWD=%s;DATABASE=%s",
szServer, szUser,
szPassword, szDatabase );

        rc = SQLDriverConnect(m_hdbc,
NULL, (SQLCHAR*)szConnectStr, sizeof(szConnectStr),
(SQLCHAR*)szOutStr,
sizeof(szOutStr), &iOutStrLen,
SQL_DRIVER_NOPROMPT );

        if (rc != SQL_SUCCESS && rc !=
SQL_SUCCESS_WITH_INFO)
            ThrowError(CODBCERR::eConnect);
    }

    if (SQLAllocHandle(SQL_HANDLE_STMT, m_hdbc,
&m_hstmt) != SQL_SUCCESS)
        ThrowError(CODBCERR::eAllocHandle);
    {
        char
buffer[128];

        // set some options affecting
connection behavior
strcpy(buffer, "set nocount on
");
        strcat(buffer, "set XACT_ABORT ON
");

        // for coyote
strcpy(buffer, "set ansi_warnings
on ");
        strcat(buffer, "set ansi_nulls on
");

        rc = SQLExecDirect(m_hstmt,
(unsigned char *)buffer, SQL_NTS);
        if (rc != SQL_SUCCESS && rc !=
SQL_SUCCESS_WITH_INFO)
            ThrowError(CODBCERR::eExecDirect);

        // verify that version of stored
procs on server is correct
char db_sp_version[10];

```

```

        strcpy(buffer, "{call
tpcc_version}");
        rc = SQLExecDirect(m_hstmt,
(unsigned char *)buffer, SQL_NTS);
        if (rc != SQL_SUCCESS && rc !=
SQL_SUCCESS_WITH_INFO)

            ThrowError(CODBCERR::eExecDirect);
            if ( SQLBindCol(m_hstmt, 1,
SQL_C_CHAR, &db_sp_version, sizeof(db_sp_version),
NULL) != SQL_SUCCESS )

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

                    ThrowError(CODBCERR::eFetch);
                    if
(strcmp(db_sp_version,sVersion))
                        throw new
CTPCC_ODBC_ERR( CTPCC_ODBC_ERR::ERR_WRONG_SP_VERSION
);

                SQLFreeHandle(SQL_HANDLE_STMT,
m_hstmt);
            }

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

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

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

void CTPCC_ODBC::ThrowError( CODBCERR::ACTION eAction
)
{
    RETCODE          rc;
    SDWORD           lNativeError;
    char             szState[6];
    char             szMsg[SQL_MAX_MESSAGE_LENGTH];

```

```

    char
    szTmp[6*SQL_MAX_MESSAGE_LENGTH];
    CODBCERR        *pODBCERR;
    // not allocated until needed (maybe never)

    pODBCERR = new CODBCERR();

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

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

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

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

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

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

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

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

```

```

        SQLFreeStmt(m_hstmt, SQL_CLOSE);
        throw pODBCERR;
    }

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

        ThrowError(CODBCERR::eAllocHandle);

        m_hstmt = m_hstmtStockLevel;

        int i = 0;
        if ( SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SSHORT, SQL_SMALLINT, 0, 0,
&m_txn.StockLevel.w_id, 0, NULL) != SQL_SUCCESS
|| SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_TINYINT, 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*)" {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 (COBDCERR *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(COBCERR::eAllocHandle);

    m_hstmt = m_hstmtNewOrder;

    if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC, m_descNewOrderCols1,
SQL_IS_POINTER ) != SQL_SUCCESS )
        ThrowError(COBCERR::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(COBCERR::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(COBCERR::eBindParam);
    }

#ifdef new_order_strstr
    // set the bind offset pointer
    if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_ROW_BIND_OFFSET_PTR, &BindOffset,
SQL_IS_POINTER ) != SQL_SUCCESS )
        ThrowError(COBCERR::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(COBCERR::eBindCol);
#else
    // prototype to eliminate patindex in
server: shift work to client
    i = 0;
    if ( SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_ol_i_name, sizeof(m_ol_i_name), NULL) !=
SQL_SUCCESS
|| SQLBindCol(m_hstmt, ++i,
SQL_C_SSHORT, &m_ol_stock, 0, NULL) != SQL_SUCCESS
|| SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_i_data, sizeof(m_i_data), NULL) !=
SQL_SUCCESS
|| SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_s_data, sizeof(m_s_data), NULL) !=
SQL_SUCCESS

```

```

|| SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE, &m_ol_i_price, 0, NULL) != SQL_SUCCESS
|| SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE, &m_ol_amount, 0, NULL) != SQL_SUCCESS
)
        ThrowError(COBCERR::eBindCol);
#endif

// associate the column bindings for the
second result set
if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC, m_descNewOrderCols2,
SQL_IS_POINTER ) != SQL_SUCCESS )
    ThrowError(COBCERR::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(COBCERR::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;
    wcsncpy( &szSqlTemplate[i], L" }" );
    // check whether any order lines are for a
remote warehouse
    m_txn.NewOrder.o_all_local = 1;
    for ( i = 0; i < m_txn.NewOrder.o_ol_cnt;
i++)
    {
        if
(m_txn.NewOrder.OL[i].ol_supply_w_id !=
m_txn.NewOrder.w_id)
        {
            m_txn.NewOrder.o_all_local = 0; // at
least one remote warehouse
            break;
        }
    }
    while (TRUE)
    {
        try
        {
            m_BindOffset = 0;
            rc =
SQLExecDirectW(m_hstmt, (SQLWCHAR*)szSqlTemplate,
SQL_NTS);
            if (rc != SQL_SUCCESS
&& rc != SQL_SUCCESS_WITH_INFO)
                ThrowError(CODBCERR::eExecDirect);
            // Get order line
            results
            m_txn.NewOrder.total_amount = 0;
            for ( i = 0;
i<m_txn.NewOrder.o_ol_cnt; i++)

```

```

    {
        #ifndef new_order_strstr
        // set the
bind offset value...
        m_BindOffset
        = i * sizeof(m_txn.NewOrder.OL[0]);
        if (
SQLFetch(m_hstmt) == SQL_ERROR)
            ThrowError(CODBCERR::eFetch);
        #else
        if (
SQLFetch(m_hstmt) == SQL_ERROR)
            ThrowError(CODBCERR::eFetch);
        strcpy(
m_txn.NewOrder.OL[i].ol_i_name, m_ol_i_name );
        if (
strstr(m_i_data, "ORIGINAL") != NULL &&
strstr(m_s_data, "ORIGINAL") != NULL )
            m_txn.NewOrder.OL[i].ol_brand_generic[0] =
'B';
        else
            m_txn.NewOrder.OL[i].ol_brand_generic[0] =
'G';
        m_txn.NewOrder.OL[i].ol_brand_generic[1] =
0;
        m_txn.NewOrder.OL[i].ol_stock
        = m_ol_stock;
        m_txn.NewOrder.OL[i].ol_i_price
        = m_ol_i_price;
        m_txn.NewOrder.OL[i].ol_amount
        = m_ol_amount;
        #endif
        // move to
the next resultset
        if (
SQLMoreResults(m_hstmt) == SQL_ERROR )
            ThrowError(CODBCERR::eMoreResults);
        m_txn.NewOrder.total_amount +=
m_txn.NewOrder.OL[i].ol_amount;
    }
    // associate the column
bindings for the second result set
    if ( SQLSetStmtAttrW(
m_hstmt, SQL_ATTR_APP_ROW_DESC, m_descNewOrderCols2,
SQL_IS_POINTER ) != SQL_SUCCESS )

```

```

        ThrowError(CODBCERR::eSetStmtAttr);
        if ( SQLFetch(m_hstmt)
== SQL_ERROR)
            ThrowError(CODBCERR::eFetch);
        SQLFreeStmt(m_hstmt,
SQL_CLOSE);
        if (m_no_commit_flag ==
1)
        {
            m_txn.NewOrder.total_amount *= ((1 +
m_txn.NewOrder.w_tax + m_txn.NewOrder.d_tax) * (1 -
m_txn.NewOrder.c_discount));
            m_txn.NewOrder.exec_status_code = eOK;
        }
        else
            m_txn.NewOrder.exec_status_code =
eInvalidItem;
        break;
    }
    catch (CODBCERR *e)
    {
        if (!e->m_bDeadLock)
            || (++iTryCount > iMaxRetries))
            throw;
        // hit deadlock;
backoff for increasingly longer period
        delete e;
        Sleep(10 * iTryCount);
    }
    // if (iTryCount)
    // throw new
CTPCC_ODBC_ERR(CTPCC_ODBC_ERR::ERR_RETRIED_TRANS,
iTryCount);
}
void CTPCC_ODBC::InitPaymentParams()
{
    if ( SQLAllocHandle(SQL_HANDLE_STMT,
m_hdbc, &m_hstmtPayment) != SQL_SUCCESS )
        ThrowError(CODBCERR::eAllocHandle);
    m_hstmt = m_hstmtPayment;
    int i = 0;
    if ( SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SSHORT, SQL_SMALLINT, 0, 0,
&m_txn.Payment.w_id, 0, NULL) != SQL_SUCCESS
        || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SSHORT, SQL_SMALLINT, 0, 0,
&m_txn.Payment.c_w_id, 0, NULL) != SQL_SUCCESS

```



```

        || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_DOUBLE, SQL_NUMERIC, 6, 2,
&m_txn.Payment.h_amount, 0, NULL) != SQL_SUCCESS
        || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.Payment.d_id, 0, NULL) != SQL_SUCCESS
        || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.Payment.c_d_id, 0, NULL) != SQL_SUCCESS
        || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.Payment.c_id, 0, NULL) != SQL_SUCCESS
        || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_CHAR, SQL_CHAR,
sizeof(m_txn.Payment.c_last), 0,
&m_txn.Payment.c_last, sizeof(m_txn.Payment.c_last),
NULL) != SQL_SUCCESS
    )
    ThrowError(CODBCERR::eBindParam);

    i = 0;
    if (
SQLBindCol(m_hstmt, ++i,
SQL_C_SLONG, &m_txn.Payment.c_id, 0,
NULL) != SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.c_last,
sizeof(m_txn.Payment.c_last), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_TYPE_TIMESTAMP, &m_txn.Payment.h_date,
0, NULL) != SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.w_street_1,
sizeof(m_txn.Payment.w_street_1), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.w_street_2,
sizeof(m_txn.Payment.w_street_2), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.w_city,
sizeof(m_txn.Payment.w_city), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.w_state,
sizeof(m_txn.Payment.w_state), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.w_zip,
sizeof(m_txn.Payment.w_zip), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.d_street_1,
sizeof(m_txn.Payment.d_street_1), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.d_street_2,
sizeof(m_txn.Payment.d_street_2), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.d_city,
sizeof(m_txn.Payment.d_city), NULL) !=
SQL_SUCCESS

```

```

        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.d_state,
sizeof(m_txn.Payment.d_state), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.d_zip,
sizeof(m_txn.Payment.d_zip), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.c_first,
sizeof(m_txn.Payment.c_first), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.c_middle,
sizeof(m_txn.Payment.c_middle), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.c_street_1,
sizeof(m_txn.Payment.c_street_1), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.c_street_2,
sizeof(m_txn.Payment.c_street_2), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.c_city,
sizeof(m_txn.Payment.c_city), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.c_state,
sizeof(m_txn.Payment.c_state), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.c_zip,
sizeof(m_txn.Payment.c_zip), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.c_phone,
sizeof(m_txn.Payment.c_phone), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_TYPE_TIMESTAMP, &m_txn.Payment.c_since,
0, NULL) != SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.c_credit,
sizeof(m_txn.Payment.c_credit), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE, &m_txn.Payment.c_credit_lim, 0,
NULL) != SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE, &m_txn.Payment.c_discount, 0,
NULL) != SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE, &m_txn.Payment.c_balance, 0,
NULL) != SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.Payment.c_data,
sizeof(m_txn.Payment.c_data), NULL) !=
SQL_SUCCESS
    )
    ThrowError(CODBCERR::eBindCol);
}

```

```

void CTPCC_ODBC::Payment()
{
    RETCODE rc;
    int iTryCount =
0;

    m_hstmt = m_hstmtPayment;

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

    while (TRUE)
    {
        try
        {
            rc =
SQLExecDirectW(m_hstmt, (SQLWCHAR*)L"call
tpcc_payment(?,?,?,?,?,?)", SQL_NTS);
            if (rc != SQL_SUCCESS
&& rc != SQL_SUCCESS_WITH_INFO)

                ThrowError(CODBCERR::eExecDirect);

            if (SQLFetch(m_hstmt)
== SQL_ERROR)

                ThrowError(CODBCERR::eFetch);

            SQLFreeStmt(m_hstmt,
SQL_CLOSE);

            if (m_txn.Payment.c_id
== 0)

                throw new
CTPCC_ODBC_ERR( CTPCC_ODBC_ERR::ERR_INVALID_CUST );
            else

                m_txn.Payment.exec_status_code = eOK;

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

                throw;

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

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

void CTPCC_ODBC::InitOrderStatusParams()
{

```

```

        if ( SQLAllocHandle(SQL_HANDLE_STMT,
m_hdbc, &m_hstmtOrderStatus) != SQL_SUCCESS
        ||
SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc,
&m_descOrderStatusCols1) != SQL_SUCCESS
        ||
SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc,
&m_descOrderStatusCols2) != SQL_SUCCESS
        )

        ThrowError(CODBCERR::eAllocHandle);

        m_hstmt = m_hstmtOrderStatus;

        if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC, m_descOrderStatusCols1,
SQL_IS_POINTER ) != SQL_SUCCESS )

        ThrowError(CODBCERR::eSetStmtAttr);

        int i = 0;
        if ( SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SSHORT, SQL_SMALLINT, 0, 0,
&m_txn.OrderStatus.w_id, 0, NULL) != SQL_SUCCESS
        || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.OrderStatus.d_id, 0, NULL) != SQL_SUCCESS
        || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.OrderStatus.c_id, 0, NULL) != SQL_SUCCESS
        || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_CHAR, SQL_CHAR,
sizeof(m_txn.OrderStatus.c_last), 0,
&m_txn.OrderStatus.c_last,
sizeof(m_txn.OrderStatus.c_last), NULL) !=
SQL_SUCCESS
        )
        ThrowError(CODBCERR::eBindParam);

        // configure block cursor
        if ( SQLSetStmtAttrW(m_hstmt,
SQL_ATTR_ROW_BIND_TYPE,
(SQLPOINTER)sizeof(m_txn.OrderStatus.OL[0]), 0) !=
SQL_SUCCESS
        || SQLSetStmtAttrW(m_hstmt,
SQL_ATTR_ROWS_FETCHED_PTR, &m_RowsFetched, 0) !=
SQL_SUCCESS
        )

        ThrowError(CODBCERR::eSetStmtAttr);

        i = 0;
        if ( SQLBindCol(m_hstmt, ++i,
SQL_C_SSHORT,
&m_txn.OrderStatus.OL[0].ol_supply_w_id, 0, NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_SLONG, &m_txn.OrderStatus.OL[0].ol_i_id, 0,
NULL) != SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_SSHORT, &m_txn.OrderStatus.OL[0].ol_quantity,
0, NULL) != SQL_SUCCESS

```

```

        || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE, &m_txn.OrderStatus.OL[0].ol_amount, 0,
NULL) != SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_TYPE_TIMESTAMP,
&m_txn.OrderStatus.OL[0].ol_delivery_d, 0, NULL) !=
SQL_SUCCESS
        )
        ThrowError(CODBCERR::eBindCol);

        if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC, m_descOrderStatusCols2,
SQL_IS_POINTER ) != SQL_SUCCESS )

        ThrowError(CODBCERR::eSetStmtAttr);

        i = 0;
        if ( SQLBindCol(m_hstmt, ++i,
SQL_C_SLONG, &m_txn.OrderStatus.c_id, 0, NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.OrderStatus.c_last,
sizeof(m_txn.OrderStatus.c_last), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.OrderStatus.c_first,
sizeof(m_txn.OrderStatus.c_first), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_CHAR, &m_txn.OrderStatus.c_middle,
sizeof(m_txn.OrderStatus.c_middle), NULL) !=
SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_TYPE_TIMESTAMP, &m_txn.OrderStatus.o_entry_d,
0, NULL) != SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_SSHORT, &m_txn.OrderStatus.o_carrier_id, 0,
NULL) != SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_DOUBLE, &m_txn.OrderStatus.c_balance, 0, NULL)
!= SQL_SUCCESS
        || SQLBindCol(m_hstmt, ++i,
SQL_C_SLONG, &m_txn.OrderStatus.o_id, 0, NULL) !=
SQL_SUCCESS
        )
        ThrowError(CODBCERR::eBindCol);
}

void CTPCC_ODBC::OrderStatus()
{
    int        iTryCount = 0;
    RETCODE
    rc;

    m_hstmt = m_hstmtOrderStatus;

    if ( SQLSetStmtAttrW( m_hstmt,
SQL_ATTR_APP_ROW_DESC, m_descOrderStatusCols1,
SQL_IS_POINTER ) != SQL_SUCCESS )

        ThrowError(CODBCERR::eSetStmtAttr);

```

```

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

        while (TRUE)
        {
            try
            {
                // configure block
                cursor
                if (
SQLSetStmtAttrW(m_hstmt, SQL_ATTR_ROW_ARRAY_SIZE,
(SQLPOINTER)1, 0) != SQL_SUCCESS )

                ThrowError(CODBCERR::eSetStmtAttr);

                rc =
SQLExecDirectW(m_hstmt, (SQLWCHAR*)"L'{call
tpcc_orderstatus(?,?,?,?)}'", SQL_NTS);
                if ( (rc ==
SQL_SUCCESS_WITH_INFO) && (m_RowsFetched != 0) ||
(rc == SQL_ERROR) )

                ThrowError(CODBCERR::eExecDirect);

                // configure block
                cursor
                if (
SQLSetStmtAttrW(m_hstmt, SQL_ATTR_ROW_ARRAY_SIZE,
(SQLPOINTER)MAX_OL_ORDER_STATUS_ITEMS, 0) !=
SQL_SUCCESS )

                ThrowError(CODBCERR::eSetStmtAttr);

                rc = SQLFetchScroll(
m_hstmt, SQL_FETCH_NEXT, 0 );
                if ( (rc ==
SQL_SUCCESS_WITH_INFO) && (m_RowsFetched != 0) ||
(rc == SQL_ERROR) )

                ThrowError(CODBCERR::eFetchScroll);

                m_txn.OrderStatus.o_ol_cnt =
(short)m_RowsFetched;

                if
(m_txn.OrderStatus.o_ol_cnt != 0)
                {
                    if (
SQLSetStmtAttrW( m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descOrderStatusCols2, SQL_IS_POINTER ) !=
SQL_SUCCESS )

                    ThrowError(CODBCERR::eSetStmtAttr);

                    if (
SQLMoreResults(m_hstmt) == SQL_ERROR )

                    ThrowError(CODBCERR::eMoreResults);

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

```

```

        ThrowError(CODBCERR::eFetch);
    }

    SQLFreeStmt(m_hstmt,
SQL_CLOSE);

    if
(m_txn.OrderStatus.o_ol_cnt == 0)
        throw new
CTPCC_ODBC_ERR( CTPCC_ODBC_ERR::ERR_NO_SUCH_ORDER );
    else if
(m_txn.OrderStatus.c_id == 0 &&
m_txn.OrderStatus.c_last[0] == 0)
        throw new
CTPCC_ODBC_ERR( CTPCC_ODBC_ERR::ERR_INVALID_CUST );
    else
        m_txn.OrderStatus.exec_status_code = eOK;

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

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

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

void CTPCC_ODBC::InitDeliveryParams()
{
    if ( SQLAllocHandle(SQL_HANDLE_STMT,
m_hdbc, &m_hstmtDelivery) != SQL_SUCCESS )

        ThrowError(CODBCERR::eAllocHandle);

    m_hstmt = m_hstmtDelivery;

    int i = 0;
    if ( SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SSHORT, SQL_SMALLINT, 0, 0,
&m_txn.Delivery.w_id, 0, NULL) != SQL_SUCCESS
|| SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SSHORT, SQL_SMALLINT, 0, 0,
&m_txn.Delivery.o_carrier_id, 0, NULL) != SQL_SUCCESS
)
        ThrowError(CODBCERR::eBindParam);

    for (i=0;i<10;i++)
    {

```

```

        if ( SQLBindCol(m_hstmt,
(UWORD)(i+1), SQL_C_SLONG, &m_txn.Delivery.o_id[i],
0, NULL) != SQL_SUCCESS )

            ThrowError(CODBCERR::eBindCol);
    }
}

void CTPCC_ODBC::Delivery()
{
    RETCODE rc;
    int iTryCount =
0;

    m_hstmt = m_hstmtDelivery;

    while (TRUE)
    {
        try
        {
            rc =
SQLExecDirectW(m_hstmt, (SQLWCHAR*)L"call
tpcc_delivery(?,?)", SQL_NTS);
            if (rc != SQL_SUCCESS
&& rc != SQL_SUCCESS_WITH_INFO)

                ThrowError(CODBCERR::eExecDirect);

            if ( SQLFetch(m_hstmt)
== SQL_ERROR )

                ThrowError(CODBCERR::eFetch);

            SQLFreeStmt(m_hstmt,
SQL_CLOSE);

            m_txn.Delivery.exec_status_code = eOK;
            break;
        }
        catch (CODBCERR *e)
        {
            if (!(e->m_bDeadLock)
|| (++iTryCount > iMaxRetries))
                throw;

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

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

tpcc_odbc.h
/* FILE: TPCC_ODBC.H

```

```

* Microsoft
TPC-C Kit Ver. 4.20.000
* Copyright
Microsoft, 1999
* All Rights Reserved
*
* Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
*
* PURPOSE: Header file for TPC-C txn class
implementation.
*
* Change history:
* 4.20.000 - updated rev number to
match kit
*/
#pragma once

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

class CODBCERR : public CBaseErr
{
public:
    enum ACTION
    {
        eNone,
        eUnknown,
        eAllocConn,
        // error from SQLAllocConnect
        eAllocHandle,
        // error from SQLAllocHandle
        eConnOption,
        // error from SQLSetConnectOption
        eConnect,
        // error from SQLConnect
        eAllocStmt,
        // error from SQLAllocStmt
        eExecDirect,
        // error from SQLExecDirect
        eBindParam,
        // error from SQLBindParameter
        eBindCol,
        // error from SQLBindCol
        eFetch,
        // error from SQLFetch
        eFetchScroll,
        // error from SQLFetchScroll
        eMoreResults,
        // error from SQLMoreResults
        ePrepare,
        // error from SQLPrepare
        eExecute,
        // error from SQLExecute
        eSetEnvAttr,
        // error from SQLSetEnvAttr
        eSetStmtAttr,
        // error from SQLSetStmtAttr
    }
};

```

```

};
COBDCERR(void)
{
    m_eAction = eNone;
    m_NativeError = 0;
    m_bDeadLock = FALSE;
    m_odbcerrstr = NULL;
};
~COBDCERR()
{
    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
    SQLUIINTEGER m_BindOffset;
    SQLUIINTEGER
m_RowsFetched;
    int
m_no_commit_flag;

#ifdef new_order_strstr
// for new-order txn;
// output params
char
m_ol_i_name[I_NAME_LEN+1];
double m_ol_i_price;
double m_ol_amount;
short m_ol_stock;
// used locally, but not returned

to caller
    char
m_i_data[I_DATA_LEN];
    char
m_s_data[S_DATA_LEN];
#endif

    void ThrowError( COBDCERR::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
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*
* 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 dllib, 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.
#ifdef __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 /*
SQLINTEGER */ fraction;
} TIMESTAMP_STRUCT;
#endif

// possible values for exec_status_code after
transaction completes
enum EXEC_STATUS
{
eOK, // 0
"Transaction committed.",
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_ORDER_STATUS_DATA;
    } ORDER_STATUS_DATA, *PORDER_STATUS_DATA;

typedef struct
{
        // input params
        short
        w_id;
        short
        o_carrier_id;

```

```

        // output params
        EXEC_STATUS
        exec_status_code;
        SYSTEMTIME
        queue_time;
        long
        o_id[10]; // id's of delivered
orders for districts 1 to 10
    } DELIVERY_DATA, *PDELIVERY_DATA;

//This structure is used for posting delivery
transactions and for writing them to the delivery
server.
typedef struct _DELIVERY_TRANSACTION
{
        SYSTEMTIME
        queue;
        //time delivery transaction queued
        short
        w_id;
        //delivery warehouse
        short
        o_carrier_id;
        //carrier id
    } DELIVERY_TRANSACTION;

typedef struct
{
        // input params
        short
        w_id;
        short
        d_id;
        short
        threshold;

        // output params
        EXEC_STATUS
        exec_status_code;
        long
        low_stock;
    } STOCK_LEVEL_DATA, *PSTOCK_LEVEL_DATA;

txn_base.h
/* FILE: TXN_BASE.H
Microsoft
TPC-C Kit Ver. 4.20.000
Copyright
Microsoft, 1999
All Rights Reserved
Version
4.10.000 audited by Richard Gimarc, Performance
Metrics, 3/17/99
PURPOSE: Header file for TPC-C txn class
implementation.
Change history:
4.20.000 - updated rev number to
match kit
*/
#pragma once

```

```

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

class DllDecl CTPCC_BASE
{
        public:
                CTPCC_BASE(void) {};
                virtual ~CTPCC_BASE(void) {};

                virtual PNEW_ORDER_DATA
                BuffAddr_NewOrder() = 0;
                virtual PPAYMENT_DATA
                BuffAddr_Payment() = 0;
                virtual PDELIVERY_DATA
                BuffAddr_Delivery() = 0;
                virtual PSTOCK_LEVEL_DATA
                BuffAddr_StockLevel() = 0;
                virtual PORDER_STATUS_DATA
                BuffAddr_OrderStatus() = 0;

                virtual void NewOrder
                () = 0;
                virtual void Payment
                () = 0;
                virtual void Delivery
                () = 0;
                virtual void StockLevel
                () = 0;
                virtual void OrderStatus
                () = 0;
};

```

txnlog.h

```

/* FILE: TXNLOG.H
Microsoft
TPC-C Kit Ver. 4.10.000
not yet
audited
PURPOSE: Header file for txn log class
Copyright
Microsoft, 1999
All Rights Reserved
*/

#pragma once

typedef struct _TXN_NEWORDER
{
        BYTE
        OL_Count; //range 0 to
31
        BYTE
        OL_Remote_Count; //range 0 to
31
        WORD
        c_id;
        int
        o_id;
    } TXN_NEWORDER;

```

```

typedef struct _TXN_PAYMENT
{
    BYTE    CustByName;
    BYTE    IsRemote;
} TXN_PAYMENT;

typedef struct _TXN_ORDERSTATUS
{
    BYTE    CustByName;
} TXN_ORDERSTATUS;

typedef union _TXN_DETAILS
{
    TXN_NEWORDER    NewOrder;
    TXN_PAYMENT     Payment;
    TXN_ORDERSTATUS OrderStatus;
} TXN_DETAILS;

// Common header for all records in txn
log. The TxnType field is
// a switch which identifies the particular
variant.
#define TXN_REC_TYPE_CONTROL    1
//
#define TXN_REC_TYPE_TPCC      2
// replaces TRANSACTION_TYPE_TPCC
#define TXN_REC_TYPE_TPCC_DELIV_DEF    3

typedef struct _TXN_RECORD_HEADER
{
    JULIAN_TIME    TxnStartT0;
    // start of txn
    BYTE    TxnType;
    // one of TXN_REC_TYPE_*
    BYTE    TxnSubType;
    // depends on TxnType
} TXN_RECORD_HEADER, *PTXN_RECORD_HEADER;

typedef struct _TXN_RECORD_CONTROL
{
    // common header; must exactly
match TXN_RECORD_HEADER
    JULIAN_TIME    TxnStartT0;
    // start of txn
    BYTE    TxnType;
    // = TXN_REC_TYPE_CONTROL
    BYTE    TxnSubType;
    // depends on TxnType
    // end of common header

    DWORD    Len;
    // number of bytes after this
field
} TXN_RECORD_CONTROL, *PTXN_RECORD_CONTROL;

// TPC-C Txn Record Layout:
//

```

```

//'TxnStartT0' is a Julian timestamp
corresponding to the moment the
//txn is sent to the SUT, i.e., beginning of
response time. Deltas
//are in milliseconds. Note that if RTDelay > 0,
then the txn was
//delayed by this amount. The delay occurs at
the beginning of the
//response time. So if RTDelay > 0, then the txn
was actually sent
//at TxnStartT0 + RTDelay.
//
//Graphically:
//
// time -->
//
// |--- Menu ---|--- Keying ---|--- Response ---
|--- Think ---|
//
// <- DeltaT3 -> <- DeltaT1 -> <- DeltaT2 -> <- DeltaT4 ->
<- DeltaT3 ->
//
// ^
// TxnStartT0
//
//RTDelay is the amount of response time delay
included in DeltaT4.
//RTDelay is recorded per txn because this value
can be changed on
//the fly, and so may vary from txn to txn.
//
//TxnStatus is the txn completion code. It is
used to indicate errors.
//For example, in the New Order txn, 1% of txns
abort. TxnStatus will
//reflect this.

typedef struct _TXN_RECORD_TPCC
{
    // common header; must exactly
match TXN_RECORD_HEADER
    JULIAN_TIME    TxnStartT0;
    // start of txn
    BYTE    TxnType;
    // = TXN_REC_TYPE_TPCC
    BYTE    TxnSubType;
    // depends on TxnType
    // end of common header

    int    DeltaT1;
    // menu time (ms)

    int    DeltaT2;
    // keying time (ms)

    int    DeltaT3;
    // think time (ms)

    int    DeltaT4;
    // response time (ms)

    int    RTDelay;
    // response time delay (ms)

    int    TxnError;
    // error code providing more detail for
TxnStatus

    WORD    w_id;
    // warehouse ID

```

```

    BYTE    d_id;
    // assigned district ID for this thread
    BYTE    d_id_ThisTxn;
    // district ID chosen for this particular
    BYTE    TxnStatus;
    // completion status for txn to indicate
errors
    BYTE    reserved;
    // for word alignment
    TXN_DETAILS    TxnDetails;
    //
    TXN_RECORD_TPCC, *PTXN_RECORD_TPCC;
    //
    // TPC-C Deferred Delivery Txn Record
Layout:
    //
    //Incorporating delivery transaction information
into the above
    //structure would increase the size of
TXN_DETAILS from 8 to 42 bytes.
    //Hence, we store delivery transaction details in
a separate structure.
    //
    typedef struct _TXN_RECORD_TPCC_DELIV_DEF
    {
        // common header; must exactly
match TXN_RECORD_HEADER
        JULIAN_TIME    TxnStartT0;
        // start of txn
        BYTE    TxnType;
        // = TXN_REC_TYPE_TPCC_DELIV_DEF
        BYTE    TxnSubType;
        // = 0
        // end of common header

        int    DeltaT4;
        // response time (ms)

        int    DeltaTxnExec;
        // execution time (ms)

        WORD    w_id;
        // warehouse ID

        BYTE    TxnStatus;
        // completion status for txn to indicate
errors
        BYTE    reserved;
        // for word alignment
        short    o_carrier_id;
        // carrier id

        long    o_id[10];
        // returned delivery transaction ids
    } TXN_RECORD_TPCC_DELIV_DEF,
    *PTXN_RECORD_TPCC_DELIV_DEF;

#define TXN_LOG_VERSION    1
#define TXN_DATA_START    4096
// offset in log file where log
records start
#define TXN_LOG_EYE_CATCHER "BC"
// signature bytes at the start of log file

```

```

////////////////////////////////////
////////////////////////////////////
// The transaction log has a header as the
first 4K block.
//
typedef struct _TXN_LOG_HEADER
{
    char
    EyeCatcher[2];    // signature bytes;
should always be "BC"
    int
    LogVersion;      // set to
TXN_LOG_VERSION
    JULIAN_TIME
    BeginTxnTS;     // timestamp
of first (lowest) txn start
    JULIAN_TIME
    EndTxnTS;      // timestamp of last
(highest) txn completion time
    int
    iRecCount;     // number of
records in log file
    BOOL
    bLogSorted;
    int
    iFileSize;     // file size
in bytes

    // the record map provides a fast
way to get close to a particular timestamp in a
sorted log file.
//
    struct
    {
        JULIAN_TIME
        TS;        // timestamp
of record
    }
    int
    iPos;         // byte
position in file
}
RecMap[RecMapSize];
// #define
200
RecMapSize
} TXN_LOG_HEADER, *PTXN_LOG_HEADER;

#define READ_BUFFER_SIZE 64*1024
#define WRITE_BUFFER_SIZE 8*1024

#define NUM_READ_BUFFERS 1
#define NUM_WRITE_BUFFERS 2
#define MAX_NUM_BUFFERS 2

// flags passed in to the constructor
#define TXN_LOG_WRITE 0x01
#define TXN_LOG_READ 0x02
#define TXN_LOG_SORTED 0x04

#define TXN_LOG_OS_ERROR 1
#define TXN_LOG_NOT_SORTED 2

```

```

#define SKIP_CTRL_RECS 1

class CTxnLog
{
private:
    DWORD iBufferSize; //buffer allocated size
    DWORD iBytesFreeInBuffer; //total bytes
available for use in buffer
    int iNumBuffers; //buffers in use
    int iActiveBuffer; //indicates which buffer is active: 0 or 1
    int iIoBuffer; //buffer for any pending IO operation
    int iFilePointer; //position in file.
    int iNextRec; //when reading, ordinal value of next
record

    // A "save point" is remembered
each time GetNextRecord is called with a start time
specified.
    // The next time it is called, if
start time is after the save point, we start scanning
from the
    // save point. This is
particularly useful in FindBestInterval, where the
log is scanned repeatedly.
    JULIAN_TIME
    SavePtTime;
    int
    iSavePtFilePointer;
    int
    iSavePtNextRec;

    JULIAN_TIME lastTS;
//when
writing sorted output, used to verify records are
sorted
    BOOL bWrite; //writing log
file

    BOOL
    bLogSorted; //
is log file sorted? applies to both input and output
    JULIAN_TIME
    BeginTxnTS; //
timestamp of first (lowest) txn start
    JULIAN_TIME
    EndTxnTS; // timestamp
of last (highest) txn completion time

```

```

    int
    iRecCount; //
number of records in log file
    BYTE *pCurrent; //ptr to
current buffer
    BYTE *pBuffer[MAX_NUM_BUFFERS];
    PTXN_RECORD_HEADER *TxnArray; //transaction record pointer
array for sort
    DWORD dwError;
    HANDLE hTxnFile;
    HANDLE //handle to log file
    HANDLE hMapFile; //map file used when
sorting the log
    HANDLE hIoComplete; //event to signify that
there are no pending IOs
    HANDLE hLogFileIo; //event to
signal the IO thread to write the inactive buffer

    Spinlock Spin; //spin lock to protect
the txn log file buffers

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

public:
    CTxnLog:CTxnLog(LPCTSTR
szFileName, DWORD dwOpts);
    ~CTxnLog(void);

    int WriteToLog(PTXN_RECORD_TPCC
pTxnRcnd);
    int
    WriteToLog(PTXN_RECORD_TPCC_DELIV_DEF pTxnRcnd);
    int
    WriteToLog(PTXN_RECORD_CONTROL pCtrlRec);
    int WriteToLog(PTXN_RECORD_HEADER
pCtrlRec);

    int WriteCtrlRecToLog(BYTE
SubType, LPCTSTR lpStr, DWORD dwLen);

    void
    CloseTransactionLogFile(void);

    PTXN_RECORD_HEADER
    GetNextRecord(BOOL bSkipCtrlRecs = FALSE);
    PTXN_RECORD_HEADER
    GetNextRecord(JULIAN_TIME SeekTimeT0, BOOL
bSkipCtrlRecs = FALSE);

    int Sort(void);
    PTXN_RECORD_HEADER
    GetSortedRecord(int index);

```



```

inline BOOL IsSorted(void) {
return bLogSorted; };
inline JULIAN_TIME BeginTS(void)
{ return BeginTxnTS; };
inline JULIAN_TIME EndTS(void) {
return EndTxnTS; };
inline int RecordCount(void) {
return iRecCount; };
};

class CTXNLOG_ERR : public CBaseErr
{
public:
enum CTXNLOG_ERRS
{
ERR_BAD_FILE_FORMAT,
// "File format is invalid."

ERR_UNKNOWN_LOG_VERSION, // "Log file
version is unknown."
ERR_BROKEN_LOG_FILE,
// "Log file is broken."
ERR_LOG_NOT_SORTED,
// "Log file is not sorted"
ERR_INVALID_TIME_SEQ,
// "Internal Error: Record Time
Sequence invalid."
};

CTXNLOG_ERR(int iErr) :
CBaseErr(iErr) {};

int ErrorType() {return
ERR_TYPE_TXNLOG;};

char *ErrorText()
{
static char *szMsgs[] =
{
"File format
is invalid.",
"Log file
version is unknown.",
"Log file is
broken.",
"Log file is
not sorted",
"Internal
Error: Record Time Sequence invalid.",
""
};

for(int i = 0;
szMsgs[i][0]; i++)
{
if ( m_idMsg
== i )
break;
}
};
};
return(szMsgs[i][0] ?
szMsgs[i] : ERR_UNKNOWN);
};
};
};

```

Appendix B: Database Design

The TPC-C database was created with the following Transact-SQL scripts:

VerifyTpccLoad.sql

```
-- File:      VERIFYTPCCLOAD.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Performs series of TPCC database checks to verify
--           that database load completed correctly
```

```
print      " "
select     convert(char(30), getdate(),9)
print     " "

use tpcc
go

--
-- *****
-- Check rows per table from SYSINDEXES
--
-- *****

print      'WAREHOUSE TABLE'

select     rows
from       sysindexes
where      id      = object_id("warehouse")
go

print      'DISTRICT TABLE = (10 * No of warehouses)\'

select     rows
from       sysindexes
where      id      =object_id("district")
go

print      'ITEM TABLE = 100,000\'

select     rows
from       sysindexes
where      id      =object_id("item")
go

print      'CUSTOMER TABLE = (30,000 * No of warehouses)\'

select     rows
from       sysindexes
```

```
where      id      =object_id("customer")
go

print      'ORDERS TABLE = (30,000 * No of warehouses)\'

select     rows
from       sysindexes
where      id      =object_id("orders")
go

print      'HISTORY TABLE = (30,000 * No of warehouses)\'

select     rows
from       sysindexes
where      id      =object_id("history")
go

print      'STOCK TABLE = (100,000 * No of warehouses)\'

select     rows
from       sysindexes
where      id      =object_id("stock")
go

print      'ORDER_LINE TABLE = (300,000 * No of warehouses + some change)\'

select     rows
from       sysindexes
where      id      =object_id("order_line")
go

print      'NEW_ORDER TABLE = (9000 * No of warehouses)\'

select     rows
from       sysindexes
where      id      =object_id("new_order")
go

--
-- *****
-- Check indices
--
-- *****

print      '*****Index Check*****'

use tpcc
go

sp_helpindex      customer
go

sp_helpindex      stock
go

sp_helpindex      district
go

sp_helpindex      item
go

sp_helpindex      new_order
go
```

```

sp_helpindex      orders
go

sp_helpindex      order_line
go

sp_helpindex      warehouse
go

```

backup.sql

```

-- File:      BACKUP.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Creates backup of tpcc database

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

dump database tpcc to tpccback1, tpccback2 with init, stats = 1

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

go

```

backupdev.sql

```

-- File:      BACKUPDEVB.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Creates tpcc database Backup Devices

use master
go

-- create backup devices

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

```

createdb.sql

```

-- File:      CREATEDB.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Creates tpcc database and backup files for 3700 warehouses

use master
go

```

```

-- Create temporary table for timing

if exists ( select name from sysobjects where name = 'tpcc_timer' )
drop table tpcc_timer
go

create table tpcc_timer
(
    start_date          char(30),
    end_date            char(30)
)

insert into tpcc_timer values (0,0)
go

-- Store starting time

update tpcc_timer
set start_date = (select convert(char(30), getdate(),9))
go

-- create main database files

CREATE DATABASE tpcc
ON PRIMARY
(
    NAME              = MSSQL_tpcc_root,
    FILENAME          = "C:\MSSQL_tpcc_root.mdf",
    SIZE              = 8MB,
    FILEGROWTH        =0),

FILEGROUP MSSQL_cs_fg
(
    NAME              = MSSQL_cs1,
    FILENAME          = "F:",
    SIZE              = 32000MB,
    FILEGROWTH        = 0),
(
    NAME              = MSSQL_cs2,
    FILENAME          = "G:",
    SIZE              = 32000MB,
    FILEGROWTH        = 0),
(
    NAME              = MSSQL_cs3,
    FILENAME          = "H:",
    SIZE              = 32000MB,
    FILEGROWTH        = 0),

FILEGROUP MSSQL_misc_fg
(
    NAME              = MSSQL_misc1,
    FILENAME          = "I:",
    SIZE              = 15500MB,
    FILEGROWTH        = 0),
(
    NAME              = MSSQL_misc2,
    FILENAME          = "J:",
    SIZE              = 15500MB,
    FILEGROWTH        = 0),
(
    NAME              = MSSQL_misc3,
    FILENAME          = "K:",
    SIZE              = 15500MB,
    FILEGROWTH        = 0)

LOG ON
(
    NAME              =MSSQL_tpcc_log,
    FILENAME          = "E:",

```

```

        SIZE                =55000MB,
        FILEGROWTH          =0)
go

-- Store ending time
update  tpcc_timer
set     end_date = (select convert(char(30), getdate(),9))
go

select "Elapsed time (in seconds): ", datediff(second,(select start_date from
tpcc_timer),(select end_date from tpcc_timer))

--      remove temporary table

if exists ( select name from sysobjects where name = 'tpcc_timer' )
drop table tpcc_timer
go

```

config.sql

```

-- File:      CONFIG.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.00
--           Copyright Microsoft, 1996
-- Purpose:   Collects SQL Server configuration parameters

```

```

print " "
select convert(char(30), getdate(),9)
print " "
go

```

```

sp_configure "show advanced",1
go
reconfigure with override
go
exec sp_configure "affinity mask",          3
exec sp_configure "awe enabled",            0
exec sp_configure "cost threshold for parallelism", 5
exec sp_configure "index create memory",    704
exec sp_configure "lightweight pooling",    1
exec sp_configure "locks",                  0
exec sp_configure "max degree of parallelism", 1
exec sp_configure "max server memory",     2147483647
exec sp_configure "max worker threads",    310
exec sp_configure "min memory per query",  512
exec sp_configure "min server memory",     0
exec sp_configure "nested triggers",       1
exec sp_configure "network packet size",   2048
exec sp_configure "open objects",          0
exec sp_configure "priority boost",        1
exec sp_configure "recovery interval",     60
exec sp_configure "set working set size",  0
exec sp_configure "user connections",      0

```

```

go

reconfigure with override
go
sp_configure
go

```

dbopt1.sql

```

-- File:      DBOPT1.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Sets database options for data load

```

```

use master
go

```

```

exec sp_dboption tpcc,'select into/bulkcopy',true
exec sp_dboption tpcc,'trunc. log on chkpt.',true
go

```

```

use tpcc
go

```

```

checkpoint
go

```

dbopt2.sql

```

-- File:      DBOPT2.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Resets database options after data load

```

```

sp_dboption tpcc,'select into/bulkcopy',FALSE
GO

```

```

sp_dboption tpcc,'trunc. log on chkpt.',FALSE
GO

```

```

USE tpcc
GO

```

```

CHECKPOINT
GO

```

```

sp_configure 'allow updates',1
GO

```

```

RECONFIGURE WITH OVERRIDE
GO

```

```

DECLARE  @msg                varchar(50)

```

```

--                                     --
--          OPTIONS FOR SQL SERVER 8.0  --
-- Set option values for user-defined indexes --
--                                     --

```

```

SET      @msg                = ' '
PRINT   @msg

```

```

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

EXEC sp_indexoption 'customer',      'DisallowPageLocks',      TRUE
EXEC sp_indexoption 'district',      'DisallowPageLocks',      TRUE
EXEC sp_indexoption 'warehouse',     'DisallowPageLocks',      TRUE
EXEC sp_indexoption 'stock',         'DisallowPageLocks',      TRUE
EXEC sp_indexoption 'order_line',    'DisallowRowLocks',      TRUE
EXEC sp_indexoption 'orders',        'DisallowRowLocks',      TRUE
EXEC sp_indexoption 'new_order',     'DisallowRowLocks',      TRUE
EXEC sp_indexoption 'item',          'DisallowRowLocks',      TRUE
EXEC sp_indexoption 'item',          'DisallowPageLocks',      TRUE
GO

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

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

ORDER  BY lockflags asc
GO

sp_configure 'allow updates',0
GO

RECONFIGURE WITH OVERRIDE
GO

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

EXEC sp_tableoption 'district',      'pintable',true
EXEC sp_tableoption 'warehouse',     'pintable',true
EXEC sp_tableoption 'new_order',     'pintable',true
EXEC sp_tableoption 'item',          'pintable',true
GO

```

delivery.sql

```

-- File:      DELIVERY.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Creates delivery transaction stored procedure
--

```

```

--           Interface Level: 4.10.000

use tpcc
go

if exists (select name from sysobjects where name = "tpcc_delivery" )
drop procedure tpcc_delivery
go

create proc tpcc_delivery      @w_id      smallint,
                              @o_carrier_id  smallint
as

declare @d_id      tinyint,
        @o_id      int,
        @c_id      int,
        @total     numeric(12,2),
        @oid1      int,
        @oid2      int,
        @oid3      int,
        @oid4      int,
        @oid5      int,
        @oid6      int,
        @oid7      int,
        @oid8      int,
        @oid9      int,
        @oid10     int

select @d_id = 0

begin tran d

        while (@d_id < 10)
        begin

                select      @d_id = @d_id + 1,
                            @total = 0,
                            @o_id = 0

                select      top 1
                            @o_id      = no_o_id
                        from    new_order (serializable uplock)
                        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

-- accumulate lineitem amounts for this order into customer

                update  customer
                set      c_balance = c_balance + @total,
                        c_delivery_cnt = c_delivery_cnt + 1
                where   c_w_id      = @w_id and
                        c_d_id      = @d_id and
                        c_id        = @c_id

                end

                select @oid1 = case @d_id when 1 then @o_id else @oid1 end,
                       @oid2 = case @d_id when 2 then @o_id else @oid2 end,
                       @oid3 = case @d_id when 3 then @o_id else @oid3 end,
                       @oid4 = case @d_id when 4 then @o_id else @oid4 end,
                       @oid5 = case @d_id when 5 then @o_id else @oid5 end,
                       @oid6 = case @d_id when 6 then @o_id else @oid6 end,
                       @oid7 = case @d_id when 7 then @o_id else @oid7 end,
                       @oid8 = case @d_id when 8 then @o_id else @oid8 end,
                       @oid9 = case @d_id when 9 then @o_id else @oid9 end,
                       @oid10 = case @d_id when 10 then @o_id else @oid10 end

                end

commit tran d

-- return delivery data to client

select @oid1,
       @oid2,
       @oid3,
       @oid4,
       @oid5,
       @oid6,
       @oid7,
       @oid8,
       @oid9,
       @oid10

go

```

getargs.c

```

// File: GETARGS.C
// Microsoft TPC-C Kit Ver. 4.22
// Copyright Microsoft, 1996, 1997, 1998, 1999,
2000, 2001
// Purpose: Source file for command line processing

```

```

// Includes
#include "tpcc.h"

//=====
//
// Function name: GetArgsLoader
//
//=====

void GetArgsLoader(int argc, char **argv, TPCCCLR_ARGS *pargs)
{
    int i;
    char *ptr;

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

    /* init args struct with some useful values */
    pargs->server = SERVER;
    pargs->user = USER;
    pargs->password = PASSWORD;
    pargs->database = DATABASE;
    pargs->batch = BATCH;
    pargs->num_warehouses = UNDEF;
    pargs->tables_all = TRUE;
    pargs->table_item = FALSE;
    pargs->table_warehouse = FALSE;
    pargs->table_customer = FALSE;
    pargs->table_orders = FALSE;
    pargs->loader_res_file = LOADER_RES_FILE;
    pargs->pack_size = DEFDPACKSIZE;
    pargs->starting_warehouse = DEF_STARTING_WAREHOUSE;
    pargs->build_index = BUILD_INDEX;
    pargs->index_order = INDEX_ORDER;
    pargs->index_script_path = INDEX_SCRIPT_PATH;
    pargs->scale_down = SCALE_DOWN;

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

    for ( i = 1; i < argc; ++i )
    {
        if ( argv[i][0] != '-' && argv[i][0] != '/' )
        {
            printf("\nUnrecognized command");
            GetArgsLoaderUsage();
            exit(1);
        }

        ptr = argv[i];

        switch ( ptr[1] )
        {
            case 'h': /* Fall through */
            case 'H':
                GetArgsLoaderUsage();
                break;

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

```

```

                                break;
case 'P':
    pargs->password = ptr+2;
    break;
case 'S':
    pargs->server = ptr+2;
    break;
case 'U':
    pargs->user = ptr+2;
    break;
case 'b':
    pargs->batch = atol(ptr+2);
    break;
case 'W':
    pargs->num_warehouses = atol(ptr+2);
    break;
case 's':
    pargs->starting_warehouse = atol(ptr+2);
    break;
case 't':
    {
        pargs->tables_all = FALSE;
        if (strcmp(ptr+2,"item") == 0)
            pargs->table_item =
TRUE;
== 0)
            pargs->table_warehouse =
TRUE;
== 0)
            pargs->table_customer =
TRUE;
0)
            pargs->table_orders =
TRUE;
            else
            {
                printf("\nUnrecognized command");
                GetArgsLoaderUsage();
                exit(1);
            }
            break;
    }
case 'f':
    pargs->loader_res_file = ptr+2;
    break;
case 'p':
    pargs->pack_size = atol(ptr+2);
    break;
case 'i':

```

```

                                pargs->build_index = atol(ptr+2);
                                break;
case 'o':
    pargs->index_order = atol(ptr+2);
    break;
case 'c':
    pargs->scale_down = atol(ptr+2);
    break;
case 'd':
    pargs->index_script_path = ptr+2;
    break;
default:
    GetArgsLoaderUsage();
    exit(-1);
    break;
}
}

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

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

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

    printf("TPCCLDR:\n\n");
    printf("Parameter                               Default\n");
    printf("-----\n\n");
    printf("-W Number of Warehouses to Load             Required \n");
    printf("-S Server                                     %s\n", SERVER);
    printf("-U Username                                   %s\n", USER);
    printf("-P Password                                   %s\n", PASSWORD);
    printf("-D Database                                  %s\n", DATABASE);
    printf("-b Batch Size                               %ld\n",
(long) BATCH);
    printf("-p TDS packet size                           %ld\n",
(long) DEFLDPACKSIZE);
    printf("-f Loader Results Output Filename           %s\n",
LOADER_RES_FILE);

```

```

        printf("-s Starting Warehouse           %ld\n",
(long) DEF_STARTING_WAREHOUSE);
        printf("-i Build Option (data = 0, data and index = 1) %ld\n",
(long) BUILD_INDEX);
        printf("-o Cluster Index Build Order (before = 1, after = 0) %ld\n",
(long) INDEX_ORDER);
        printf("-c Build Scaled Database (normal = 0, tiny = 1) %ld\n",
(long) SCALE_DOWN);
        printf("-d Index Script Path                %s\n",
INDEX_SCRIPT_PATH);
        printf("-t Table to Load                          all tables
\n");
        printf("    [item|warehouse|customer|orders]\n");
        printf("    Notes: \n");
        printf("    - the '-t' parameter may be included multiple times to \n");
        printf("    specify multiple tables to be loaded \n");
        printf("    - 'item' loads ITEM table \n");
        printf("    - 'warehouse' loads WAREHOUSE, DISTRICT, and STOCK tables \n");
        printf("    - 'customer' loads CUSTOMER and HISTORY tables \n");
        printf("    - 'orders' load NEW-ORDER, ORDERS, ORDER-LINE tables \n");

        printf("\nNote: Command line switches are case sensitive.\n");

        exit(0);
}

```

idxcuscl.sql

```

-- File:      IDXCUSCL.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Creates clustered index on customer table

use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'customer_c1' )
    drop index customer.customer_c1

create unique clustered index customer_c1 on customer(c_w_id, c_d_id, c_id)
on MSSQL_cust_fg

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

go

```

idxcusnc.sql

```

-- File:      IDXCUSNC.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22

```

```

--           Copyright Microsoft, 2001
-- Purpose:   Creates non-clustered index on customer table

use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'customer_nc1' )
    drop index customer.customer_nc1

create unique nonclustered index customer_nc1 on customer(c_w_id, c_d_id, c_last,
c_first, c_id)
on MSSQL_cust_fg

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

go

```

idxdiscl.sql

```

-- File:      IDXDISCL.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Creates clustered index on district table

use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'district_c1' )
    drop index district.district_c1

create unique clustered index district_c1 on district(d_w_id, d_id)
with fillfactor=100 on MSSQL_misc_fg

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

go

```

idxitmcl.sql

```

-- File:      IDXITMCL.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22

```



```

--          Copyright Microsoft, 2001
-- Purpose:  Creates clustered index on item table

use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'item_c1' )
    drop index item.item_c1

create unique clustered index item_c1 on item(i_id)
    on MSSQL_misc_fg

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

go

```

idxnodcl.sql

```

-- File:      IDXNODCL.SQL
-- Microsoft TPC-C Benchmark Kit Ver. 4.22
-- Copyright Microsoft, 2001
-- Purpose:   Creates clustered index on new_order table

use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'new_order_c1' )
    drop index new_order.new_order_c1

create unique clustered index new_order_c1 on new_order(no_w_id, no_d_id, no_o_id)

    on MSSQL_misc_fg

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

go

```

idxodlcl.sql

```

-- File:      IDXODLCL.SQL
-- Microsoft TPC-C Benchmark Kit Ver. 4.22
-- Copyright Microsoft, 2001
-- Purpose:   Creates clustered index on order_line table

```

```

use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'order_line_c1' )
    drop index order_line.order_line_c1

create unique clustered index order_line_c1 on order_line(ol_w_id, ol_d_id, ol_o_id,
ol_number)
    on MSSQL_ordln_fg

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

go

```

idxordcl.sql

```

-- File:      IDXORDCL.SQL
-- Microsoft TPC-C Benchmark Kit Ver. 4.22
-- Copyright Microsoft, 2001
-- Purpose:   Creates clustered index on orders table

use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'orders_c1' )
    drop index orders.orders_c1

create unique clustered index orders_c1 on orders(o_w_id, o_d_id, o_id)
    on MSSQL_ord_fg

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

go

```

idxordnc.sql

```

-- File:      IDXORDNC.SQL
-- Microsoft TPC-C Benchmark Kit Ver. 4.22
-- Copyright Microsoft, 2001
-- Purpose:   Creates non-clustered index on orders table

```

```

use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'orders_ncl' )
drop index orders.orders_ncl

create index orders_ncl on orders(o_w_id, o_d_id, o_c_id, o_id)
on MSSQL_ord_fg

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

go

```

idxstkcl.sql

```

-- File:      IDXSTKCL.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Creates clustered index on stock table

use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'stock_c1' )
drop index stock.stock_c1

create unique clustered index stock_c1 on stock(s_i_id, s_w_id)
on MSSQL_stk_fg

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

go

```

idxwarcl.sql

```

-- File:      IDXWARCL.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Creates clustered index on warehouse table

use tpcc
go

```

```

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'warehouse_c1' )
drop index warehouse.warehouse_c1

create unique clustered index warehouse_c1 on warehouse(w_id)
with fillfactor=100 on MSSQL_misc_fg

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

go

```

neword.sql

```

-- File:      NEWORD.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Creates new order transaction stored procedure
--           Interface Level: 4.10.000

use tpcc
go

if exists ( select name from sysobjects where name = "tpcc_neworder" )
drop procedure tpcc_neworder

go

create proc tpcc_neworder

@w_id          smallint,
@d_id          tinyint,
@c_id          int,
@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,

```

```

smallint = 0, @ol_qty11 smallint = 0,
smallint = 0, @ol_qty12 smallint = 0,
smallint = 0, @ol_qty13 smallint = 0,
smallint = 0, @ol_qty14 smallint = 0,
smallint = 0, @ol_qty15 smallint = 0

as
declare @w_tax          numeric(4,4),
        @d_tax         numeric(4,4),
        @c_last        char(16),
        @c_credit      char(2),
        @c_discount    numeric(4,4),
        @i_price       numeric(5,2),
        @i_name        char(24),
        @i_data        char(50),
        @o_entry_d     datetime,
        @remote_flag   int,
        @s_quantity    smallint,
        @s_data        char(50),
        @s_dist        char(24),
        @li_no         int,
        @o_id          int,
        @commit_flag   tinyint,
        @li_id        int,
        @li_s_w_id     smallint,
        @li_qty        smallint,
        @ol_number     int,
        @c_id_local    int

        @i_id11 int = 0, @s_w_id11
        @i_id12 int = 0, @s_w_id12
        @i_id13 int = 0, @s_w_id13
        @i_id14 int = 0, @s_w_id14
        @i_id15 int = 0, @s_w_id15

begin
begin transaction n

-- get district tax and next available 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
        rollback transaction n

-- all that work for nuthn!!!
        rollback transaction n

-- return order data to client
        select    @w_tax,
                @d_tax,
                @o_id,
                @c_last,
                @c_discount,
                @c_credit,
                @o_entry_d,
                @commit_flag
end
go

```

ordstat.sql

```
-- File:      ORDSTAT.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Creates order status transaction stored procedure
--
--           Interface Level: 4.10.000

use tpcc
go

if exists ( select name from sysobjects where name = "tpcc_orderstatus" )
    drop procedure    tpcc_orderstatus
go

create proc tpcc_orderstatus @w_id    smallint,
                             @d_id    tinyint,
                             @c_id    int,
                             @c_last  char(16) = ""
as

declare @c_balance    numeric(12,2),
        @c_first     char(16),
        @c_middle    char(2),
        @o_id        int,
        @o_entry_d   datetime,
        @o_carrier_id smallint,
        @cnt         smallint

begin tran o

if (@c_id = 0)
    begin

-- get customer id and info using last name

        select @cnt = (count(*)+1)/2
        from customer (repeatableread)
        where c_last = @c_last and
              c_w_id = @w_id and
              c_d_id = @d_id

        set rowcount @cnt

        select @c_id = c_id,
               @c_balance = c_balance,
               @c_first = c_first,
               @c_last = c_last,
               @c_middle = c_middle
        from customer (repeatableread)
        where c_last = @c_last and
              c_w_id = @w_id and
              c_d_id = @d_id

        order by c_w_id, c_d_id, c_last, c_first

        set rowcount 0

    end
else
```

```
begin

-- get customer info if by id

        select @c_balance = c_balance,
               @c_first = c_first,
               @c_middle = c_middle,
               @c_last = c_last
        from customer (repeatableread)
        where c_id = @c_id and
              c_d_id = @d_id and
              c_w_id = @w_id

        select @cnt = @@rowcount

    end

-- if no such customer

    if (@cnt = 0)
        begin
            raiserror("Customer not found",18,1)
            goto custnotfound
        end

-- get order info

        select @o_id = o_id,
               @o_entry_d = o_entry_d,
               @o_carrier_id = o_carrier_id
        from orders (serializable)
        where o_c_id = @c_id and
              o_d_id = @d_id and
              o_w_id = @w_id

        order by o_id asc

-- select order lines for the current order

        select ol_supply_w_id,
               ol_i_id,
               ol_quantity,
               ol_amount,
               ol_delivery_d
        from order_line (repeatableread)
        where ol_o_id = @o_id and
              ol_d_id = @d_id and
              ol_w_id = @w_id

custnotfound:

commit tran o

-- return data to client

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

go

payment.sql

```
-- File:      PAYMENT.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Creates payment transaction stored procedure
--
--           Interface Level: 4.10.000

use tpcc
go

if exists (select name from sysobjects where name = "tpcc_payment" )
    drop procedure tpcc_payment
go

create proc tpcc_payment      @w_id          smallint,
                             @c_w_id       smallint,
                             @h_amount     numeric(6,2),
                             @d_id         tinyint,
                             @c_d_id       tinyint,
                             @c_id        int,
                             @c_last      char(16) = ""

as
declare @w_street_1 char(20),
        @w_street_2 char(20),
        @w_city     char(20),
        @w_state    char(2),
        @w_zip      char(9),
        @w_name     char(10),
        @d_street_1 char(20),
        @d_street_2 char(20),
        @d_city     char(20),
        @d_state    char(2),
        @d_zip      char(9),
        @d_name     char(10),
        @c_first    char(16),
        @c_middle   char(2),
        @c_street_1 char(20),
        @c_street_2 char(20),
        @c_city     char(20),
        @c_state    char(2),
        @c_zip      char(9),
        @c_phone    char(16),
        @c_since    datetime,
        @c_credit   char(2),
        @c_credit_lim numeric(12,2),
        @c_balance  numeric(12,2),
        @c_discount numeric(4,4),
        @data       char(500),
        @c_data     char(500),
        @datetime   datetime,
        @w_ytd     numeric(12,2),
        @d_ytd     numeric(12,2),
        @cnt       smallint,
        @val       smallint,
        @screen_data char(200),
```

```
@d_id_local    tinyint,
@w_id_local    smallint,
@c_id_local    int
```

```
select @screen_data = ""
```

```
begin tran p
```

```
-- get payment date
```

```
select @datetime = getdate()
```

```
if (@c_id = 0)
begin
```

```
-- get customer id and info using last name
```

```
select @cnt = count(*)
from customer (repeatableread)
where c_last = @c_last and
      c_w_id = @c_w_id and
      c_d_id = @c_d_id
```

```
select @val = (@cnt + 1) / 2
set rowcount @val
```

```
select @c_id = c_id
from customer (repeatableread)
where c_last = @c_last and
      c_w_id = @c_w_id and
      c_d_id = @c_d_id

order by c_last, c_first
```

```
set rowcount 0
end
```

```
-- get customer info and update balances
```

```
update customer
set @c_balance = c_balance - @h_amount,
    c_payment_cnt = c_payment_cnt + 1,
    c_ytd_payment = c_ytd_payment + @h_amount,
    @c_first = c_first,
    @c_middle = c_middle,
    @c_last = c_last,
    @c_street_1 = c_street_1,
    @c_street_2 = c_street_2,
    @c_city = c_city,
    @c_state = c_state,
    @c_zip = c_zip,
    @c_phone = c_phone,
    @c_credit = c_credit,
    @c_credit_lim = c_credit_lim,
    @c_discount = c_discount,
    @c_since = c_since,
    @data = c_data,
    @c_id_local = c_id
where c_id = @c_id and
      c_w_id = @c_w_id and
      c_d_id = @c_d_id
```

```
-- if customer has bad credit get some more info
```

```

        if (@c_credit = "BC")
        begin
--      compute new info
                select @c_data      = convert(char(5),@c_id) +
                convert(char(4),@c_d_id) +
                convert(char(5),@c_w_id) +
                convert(char(4),@d_id) +
                convert(char(5),@w_id) +
                convert(char(19),@h_amount) +
                substring(@data, 1, 458)

--      update customer info
                update  customer
                set     c_data = @c_data
                where  c_id = @c_id and
                c_w_id = @c_w_id and
                c_d_id = @c_d_id

                select  @screen_data = substring (@c_data,1,200)
        end

--      get district data and update year-to-date
                update  district
                set     d_ytd      = d_ytd + @h_amount,
                @d_street_1 = d_street_1,
                @d_street_2 = d_street_2,
                @d_city     = d_city,
                @d_state   = d_state,
                @d_zip     = d_zip,
                @d_name    = d_name,
                @d_id_local = d_id

                where  d_w_id = @w_id and
                d_id   = @d_id

--      get warehouse data and update year-to-date
                update  warehouse
                set     w_ytd      = w_ytd + @h_amount,
                @w_street_1 = w_street_1,
                @w_street_2 = w_street_2,
                @w_city     = w_city,
                @w_state   = w_state,
                @w_zip     = w_zip,
                @w_name    = w_name,
                @w_id_local = w_id

                where  w_id   = @w_id

--      create history record
                insert into history values ( @c_id_local,
                @c_d_id,
                @c_w_id,
                @d_id_local,
                @w_id_local,
                @datetime,
                @h_amount,
                @w_name + " " + @d_name)

commit tran p

```

```
-- return data to client
```

```

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

```

```
go
```

random.c

```

//      File:                RANDOM.C
//
//      Microsoft TPC-C Kit Ver. 4.22
//      Copyright Microsoft, 1996, 1997, 1998, 1999,
//      2000, 2001
//      Purpose: Random number generation routines for database loader

// Includes
#include "tpcc.h"
#include "math.h"

// Defines
#define A      16807
#define M      2147483647
#define Q      127773      /* M div A */
#define R      2836       /* M mod A */
#define Thread __declspec(thread)

// Globals
long      Thread Seed = 0;      /* thread local seed */

/*****
 *
 * random -
 *      Implements a GOOD pseudo random number generator. This generator
 *      will/should? run the complete period before repeating.
 *
 *****/

```

```

* Copied from:
* Random Numbers Generators: Good Ones Are Hard to Find.
* Communications of the ACM - October 1988 Volume 31 Number 10
*
* Machine Dependencies:
* long must be 2 ^ 31 - 1 or greater.
*
*****/
/*****
* seed - load the Seed value used in irand and drand. Should be used before
* first call to irand or drand.
*****/

void seed(long val)
{
#ifdef DEBUG
    printf("[%ld]DBG: Entering seed()...\n", (int) GetCurrentThreadId());
    printf("Old Seed %ld New Seed %ld\n",Seed, val);
#endif

    if ( val < 0 )
        val = abs(val);

    Seed = val;
}

/*****
* irand - returns a 32 bit integer pseudo random number with a period of
* 1 to 2 ^ 32 - 1.
* parameters:
* none.
* returns:
* 32 bit integer - defined as long ( see above ).
* side effects:
* seed get recomputed.
*****/

long irand()
{
    register long s; /* copy of seed */
    register long test; /* test flag */
    register long hi; /* tmp value for speed */
    register long lo; /* tmp value for speed */

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

    s = Seed;
    hi = s / Q;
    lo = s % Q;

    test = A * lo - R * hi;
    if ( test > 0 )
        Seed = test;
}

```

```

else
    Seed = test + M;

return( Seed );
}

/*****
* drand - returns a double pseudo random number between 0.0 and 1.0.
* See irand.
*****/
double drand()
{
#ifdef DEBUG
    printf("[%ld]DBG: Entering drand()...\n", (int) GetCurrentThreadId());
#endif

    return( (double)irand() / 2147483647.0);
}

//=====
// Function : RandomNumber
//
// Description:
//=====
long RandomNumber(long lower, long upper)
{
    long rand_num;

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

    if ( upper == lower ) /* pgd 08-13-96 perf enhancement */
        return lower;

    upper++;

    if ( upper <= lower )
        rand_num = upper;
    else
        rand_num = lower + irand() % (upper - lower); /* pgd 08-13-96
perf enhancement */

#ifdef DEBUG
    printf("[%ld]DBG: RandomNumber between %ld & %ld ==> %ld\n",
(int) GetCurrentThreadId(), lower, upper,
rand_num);
#endif

    return rand_num;
}

#if 0
//Original code pgd 08/13/96

```



```

long RandomNumber(long lower,
                  long upper)
{
    long rand_num;

#ifdef DEBUG
    printf("[%d]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("[%d]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("[%d]DBG: Entering NURand()...\n", (int) GetCurrentThreadId());
#endif

    rand_num = (((RandomNumber(0,iConst) | RandomNumber(x,y)) + C) % (y-x+1))+x;

#ifdef DEBUG
    printf("[%d]DBG: NURand: num = %d\n", (int) GetCurrentThreadId(), rand_num);
#endif

    return rand_num;
}

```

removedb.sql

```

-- File:      REMOVEDB.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Removes tpcc database and backup files

```

```

use master
go

-- remove any existing database and backup files

exec sp_dbremove tpcc, dropdev
go

exec sp_dropdevice 'tpccback1'
exec sp_dropdevice 'tpccback2'
exec sp_dropdevice 'tpccback3'
exec sp_dropdevice 'tpccback4'
go

```

restore.sql

```

-- File:      RESTORE.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Loads database backup from backup files

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

load database tpcc from tpccback1, tpccback2 with stats = 1, replace

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

go

sp_dboption tpcc,'torn page detection','false'
go

```

sqlshutdown.sql

```

use tpcc
go
checkpoint
go
shutdown
go

```

stocklev.sql

```

-- File:      STOCKLEV.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Creates stock level transaction stored procedure
--
--           Interface Level: 4.10.000

use tpcc

```

```

go

if exists (select name from sysobjects where name = "tpcc_stocklevel" )
    drop procedure tpcc_stocklevel
go

create proc tpcc_stocklevel @w_id          smallint,
                           @d_id          tinyint,
                           @threshold     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   < @threshold

go

```

strings.c

```

// File: STRINGS.C
// Microsoft TPC-C Kit Ver. 4.22
// Copyright Microsoft, 1996, 1997, 1998, 1999,
2000, 2001
// Purpose: Source file for database loader string functions

// Includes
#include "tpcc.h"
#include <string.h>
#include <ctype.h>

//=====
//
// Function name: MakeAddress
//
//=====

void MakeAddress(char *street_1,
                char *street_2,
                char *city,
                char *state,
                char *zip)
{
#ifdef DEBUG
    printf("[%ld]DBG: Entering MakeAddress()\n", (int) GetCurrentThreadId());

```

```

#endif

    MakeAlphaString (10, 20, ADDRESS_LEN, street_1);
    MakeAlphaString (10, 20, ADDRESS_LEN, street_2);
    MakeAlphaString (10, 20, ADDRESS_LEN, city);
    MakeAlphaString ( 2,  2, STATE_LEN, state);
    MakeZipNumberString( 9,  9, ZIP_LEN, zip);

#ifdef DEBUG
    printf("[%ld]DBG: MakeAddress: street_1: %s, street_2: %s, city: %s, state: %s,
zip: %s\n",
                (int) GetCurrentThreadId(), street_1, street_2, city,
state, zip);
#endif
    return;
}

//=====
//
// Function name: LastName
//
//=====

void LastName(int num,
             char *name)
{
    static char *n[] =
    {
        "BAR", "OUGHT", "ABLE", "PRI", "PRES",
        "ESE", "ANTI", "CALLY", "ATION", "EING"
    };

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

    if ((num >= 0) && (num < 1000))
    {
        strcpy(name, n[(num/100)%10]);
        strcat(name, n[(num/10)%10]);
        strcat(name, n[(num/1)%10]);

        if (strlen(name) < LAST_NAME_LEN)
        {
            PaddString(LAST_NAME_LEN, name);
        }
    }
    else
    {
        printf("\nError in LastName()... num < %ld> out of range
(0,999)\n", num);
        exit(-1);
    }

#ifdef DEBUG
    printf("[%ld]DBG: LastName: num = [%d] ==> [%d][%d][%d]\n",
                (int) GetCurrentThreadId(), num, num/100, (num/10)%10,
num%10);

```

```

        printf("[%ld]DBG: LastName: String = %s\n", (int) GetCurrentThreadId(),
name);
#endif
    return;
}

//=====
//
// Function name: MakeAlphaString
//
//=====

//philipdu 08/13/96 Changed MakeAlphaString to use A-Z, a-z, and 0-9 in
//accordance with spec see below:
//The spec says:
//4.3.2.2 The notation random a-string [x .. y]
//(respectively, n-string [x .. y]) represents a string of random alphanumeric
//(respectively, numeric) characters of a random length of minimum x, maximum y,
//and mean (y+x)/2. Alphanumerics are A..Z, a..z, and 0..9. The only other
//requirement is that the character set used "must be able to represent a minimum
//of 128 different characters". We are using 8-bit chars, so this is a non issue.
//It is completely unreasonable to stuff non-printing chars into the text fields.
//-CLevine 08/13/96

int MakeAlphaString( int x, int y, int z, char *str)
{
    int len;
    int i;
    char cc = 'a';
    static char chArray[] =
"0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz";
    static int chArrayMax = 61;

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

    len= RandomNumber(x, y);

    for (i=0; i<len; i++)
    {
        cc = chArray[RandomNumber(0, chArrayMax)];
        str[i] = cc;
    }
    if ( len < z )
        memset(str+len, ' ', z - len);
    str[len] = 0;

    return len;
}

//=====
//
// Function name: MakeOriginalAlphaString
//
//=====

int MakeOriginalAlphaString(int x,
int y,

```

```

int z,
char *str,
int percent)
{
    int len;
    int val;
    int start;

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

    // verify percentage is valid
    if ((percent < 0) || (percent > 100))
    {
        printf("MakeOriginalAlphaString: Invalid percentage: %d\n",
percent);
        exit(-1);
    }

    // verify string is at least 8 chars in length
    if ((x + y) <= 8)
    {
        printf("MakeOriginalAlphaString: string length must be >= 8\n");
        exit(-1);
    }

    // Make Alpha String
    len = MakeAlphaString(x,y, z, str);

    val = RandomNumber(1,100);
    if (val <= percent)
    {
        start = RandomNumber(0, len - 8);
        strncpy(str + start, "ORIGINAL", 8);
    }

#ifdef DEBUG
    printf("[%ld]DBG: MakeOriginalAlphaString: : %s\n",
(int) GetCurrentThreadId(), str);
#endif

    return strlen(str);
}

//=====
//
// Function name: MakeNumberString
//
//=====
int MakeNumberString(int x, int y, int z, char *str)
{
    char tmp[16];

    //MakeNumberString is always called MakeZipNumberString(16, 16, 16,
string)

    memset(str, '0', 16);
    itoa(RandomNumber(0, 99999999), tmp, 10);
    memcpy(str, tmp, strlen(tmp));
}

```

```

        itoa(RandomNumber(0, 99999999), tmp, 10);
        memcpy(str+8, tmp, strlen(tmp));

        str[16] = 0;

    return 16;
}

//=====
//
// Function name: MakeZipNumberString
//
//=====
int MakeZipNumberString(int x, int y, int z, char *str)
{
    char tmp[16];

    //MakeZipNumberString is always called MakeZipNumberString(9, 9, 9,
string)

    strcpy(str, "000011111");

    itoa(RandomNumber(0, 9999), tmp, 10);
    memcpy(str, tmp, strlen(tmp));

    return 9;
}

//=====
//
// Function name: InitString
//
//=====
void InitString(char *str, int len)
{
#ifdef DEBUG
    printf("[%ld]DBG: Entering InitString()\n", (int) GetCurrentThreadId());
#endif

    memset(str, ' ', len);
    str[len] = 0;
}

//=====
// Function name: InitAddress
//
// Description:
//
//=====
void InitAddress(char *street_1, char *street_2, char *city, char *state, char *zip)
{
    memset(street_1, ' ', ADDRESS_LEN+1);
    memset(street_2, ' ', ADDRESS_LEN+1);
    memset(city, ' ', ADDRESS_LEN+1);

    street_1[ADDRESS_LEN+1] = 0;
    street_2[ADDRESS_LEN+1] = 0;
    city[ADDRESS_LEN+1] = 0;
}

```

```

        memset(state, ' ', STATE_LEN+1);
        state[STATE_LEN+1] = 0;

        memset(zip, ' ', ZIP_LEN+1);
        zip[ZIP_LEN+1] = 0;
}

//=====
//
// Function name: PaddString
//
//=====
void PaddString(int max, char *name)
{
    int len;

    len = strlen(name);
    if ( len < max )
        memset(name+len, ' ', max - len);
    name[max] = 0;

    return;
}

```

tables.sql

```

-- File: TABLES.SQL
-- Microsoft TPC-C Benchmark Kit Ver. 4.22
-- Copyright Microsoft, 2001
-- Purpose: Creates TPC-C tables

use tpcc
go

--
-- Remove all existing TPC-C tables
--

if exists ( select name from sysobjects where name = 'warehouse' )
    drop table warehouse
go
if exists ( select name from sysobjects where name = 'district' )
    drop table district
go
if exists ( select name from sysobjects where name = 'customer' )
    drop table customer
go
if exists ( select name from sysobjects where name = 'history' )
    drop table history
go
if exists ( select name from sysobjects where name = 'new_order' )
    drop table new_order
go
if exists ( select name from sysobjects where name = 'orders' )
    drop table orders
go
if exists ( select name from sysobjects where name = 'order_line' )
    drop table order_line

```

```

go
if exists ( select name from sysobjects where name = 'item' )
drop table item
go
if exists ( select name from sysobjects where name = 'stock' )
drop table stock
go
--
-- Create new tables
--
create table warehouse
(
    w_id                smallint,
    w_name              char(10),
    w_street_1          char(20),
    w_street_2          char(20),
    w_city              char(20),
    w_state             char(2),
    w_zip              char(9),
    w_tax              numeric(4,4),
    w_ytd              numeric(12,2)
) on MSSQL_misc_fg
go

create table district
(
    d_id                tinyint,
    d_w_id              smallint,
    d_name              char(10),
    d_street_1          char(20),
    d_street_2          char(20),
    d_city              char(20),
    d_state             char(2),
    d_zip              char(9),
    d_tax              numeric(4,4),
    d_ytd              numeric(12,2),
    d_next_o_id        int
) on MSSQL_misc_fg
go

create table customer
(
    c_id                int,
    c_d_id              tinyint,
    c_w_id              smallint,
    c_first             char(16),
    c_middle            char(2),
    c_last              char(16),
    c_street_1          char(20),
    c_street_2          char(20),
    c_city              char(20),
    c_state             char(2),
    c_zip              char(9),
    c_phone            char(16),
    c_since            datetime,
    c_credit            char(2),
    c_credit_lim        numeric(12,2),
    c_discount          numeric(4,4),
    c_balance           numeric(12,2),
    c_ytd_payment       numeric(12,2),
    c_payment_cnt       smallint,

```

```

    c_delivery_cnt      smallint,
    c_data             char(500)
) on MSSQL_cust_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_ord_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_ordln_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_stk_fg
go

```

time.c

```

// File: TIME.C
// Microsoft TPC-C Kit Ver. 4.22
// Copyright Microsoft, 1996, 1997, 1998, 1999,
// 2000, 2001
// Purpose: Source file for time functions

// Includes
#include "tpcc.h"

// Globals
static long start_sec;

//=====
//
// Function name: TimeNow
//
//=====

long TimeNow()
{
    long time_now;
    struct _timeb e1_time;

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

    _ftime(&e1_time);

    time_now = ((e1_time.time - start_sec) * 1000) + e1_time.millitm;

    return time_now;
}

```

tpcc.h

```

// File: TPCC.H
// Microsoft TPC-C Kit Ver. 4.22
// Copyright Microsoft, 1996, 1997, 1998, 1999,
// 2000, 2001
// Purpose: Header file for TPC-C database loader

// Build number of TPC Benchmark Kit
#define TPCKIT_VER "4.22"

// General headers
#include <windows.h>
#include <winbase.h>
#include <stdlib.h>
#include <stdio.h>
#include <process.h>
#include <stddef.h>
#include <stdarg.h>
#include <string.h>
#include <time.h>
#include <sys\timeb.h>
#include <sys\types.h>

// ODBC headers
#include <sql.h>
#include <sqlext.h>
#include <odbcss.h>

// General constants
#define MILLI 1000
#define FALSE 0
#define TRUE 1
#define UNDEF -1
#define MINPRINTASCII 32
#define MAXPRINTASCII 126

// Default environment constants
#define SERVER ""
#define DATABASE "tpcc"
#define USER "sa"
#define PASSWORD ""

// Default loader arguments
#define BATCH 10000
#define DEFLDPACKSIZE 32768
#define LOADER_RES_FILE "logs\\load.out"
#define LOADER_NURAND_C 123
#define DEF_STARTING_WAREHOUSE 1
#define BUILD_INDEX 1 // build both
data and indexes
#define INDEX_ORDER 1 // build
indexes before load
#define SCALE_DOWN 0 // build a normal
scale database
#define INDEX_SCRIPT_PATH "scripts"

typedef struct
{
    char *server;
    char *database;
}

```

```

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

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

// Functions in random.c
void      seed();
long      irand();

```

```

double    drand();
void      WUCreate();
short     WURand();
long      RandomNumber(long lower, long upper);

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

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

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

```

tpccldr.c

```

// File: TPCCLDR.C
// Microsoft TPC-C Kit Ver. 4.22
// Copyright Microsoft, 2000, 2001
// Purpose: Source file for TPC-C database loader

// Includes
#include "tpcc.h"
#include "search.h"

// Defines
#define MAXITEMS              100000
#define MAXITEMS_SCALE_DOWN  100
#define CUSTOMERS_PER_DISTRICT 3000
#define CUSTOMERS_SCALE_DOWN 30
#define DISTRICT_PER_WAREHOUSE 10
#define ORDERS_PER_DISTRICT  3000
#define ORDERS_SCALE_DOWN    30
#define MAX_CUSTOMER_THREADS 2
#define MAX_ORDER_THREADS    3
#define MAX_MAIN_THREADS     4

// Functions declarations

void HandleErrorDBC (SQLHDBC hdbc1);

void CheckSQL();
void CheckDataBase();

long NURand();
void LoadItem();
void LoadWarehouse();

void Stock();
void District();

void LoadCustomer();

```

```

void CustomerBufInit();
void CustomerBufLoad();
void LoadCustomerTable();
void LoadHistoryTable();

void LoadOrders();
void OrdersBufInit();
void OrdersBufLoad();
void LoadOrdersTable();
void LoadNewOrderTable();
void LoadOrderLineTable();
void GetPermutation();
void CheckForCommit();
void OpenConnections();
void BuildIndex();
void FormatDate ();

// Shared memory structures

typedef struct
{
    long            ol;
    long            ol_i_id;
    short           ol_supply_w_id;
    short           ol_quantity;
    double          ol_amount;
    char            ol_dist_info[DIST_INFO_LEN+1];
    char            ol_delivery_d[OL_DELIVERY_D_LEN+1];
} ORDER_LINE_STRUCT;

typedef struct
{
    long            o_id;
    short           o_d_id;
    short           o_w_id;
    long            o_c_id;
    short           o_carrier_id;
    short           o_ol_cnt;
    short           o_all_local;
    ORDER_LINE_STRUCT o_ol[15];
} ORDERS_STRUCT;

typedef struct
{
    long            c_id;
    short           c_d_id;
    short           c_w_id;
    char            c_first[FIRST_NAME_LEN+1];
    char            c_middle[MIDDLE_NAME_LEN+1];
    char            c_last[LAST_NAME_LEN+1];
    char            c_street_1[ADDRESS_LEN+1];
    char            c_street_2[ADDRESS_LEN+1];
    char            c_city[ADDRESS_LEN+1];
    char            c_state[STATE_LEN+1];
    char            c_zip[ZIP_LEN+1];
    char            c_phone[PHONE_LEN+1];
    char            c_credit[CREDIT_LEN+1];
    double          c_credit_lim;
    double          c_discount;
    // fix to avoid ODBC float to numeric conversion problem.
    // double          c_balance;
    char            c_balance[6];
}

```

```

double            c_ytd_payment;
short            c_payment_cnt;
short            c_delivery_cnt;
char            c_data[C_DATA_LEN+1];
double          h_amount;
char            h_data[H_DATA_LEN+1];
} CUSTOMER_STRUCT;

typedef struct
{
    char            c_last[LAST_NAME_LEN+1];
    char            c_first[FIRST_NAME_LEN+1];
    long            c_id;
} CUSTOMER_SORT_STRUCT;

typedef struct
{
    long            time_start;
} LOADER_TIME_STRUCT;

// Global variables

char            szLastError[300];

HENV            henv;

HDBC            v_hdbc; // for SQL
Server version verification
HDBC            i_hdbc1; // for ITEM table
HDBC            w_hdbc1; // for WAREHOUSE,
DISTRICT, STOCK
HDBC            c_hdbc1; // for CUSTOMER
HDBC            c_hdbc2; // for HISTORY
HDBC            o_hdbc1; // for ORDERS
HDBC            o_hdbc2; // for NEW-ORDER

HDBC            o_hdbc3; // for ORDER-LINE

HSTMT           v_hstmt; // for SQL Server
version verification
HSTMT           i_hstmt1;
HSTMT           w_hstmt1;
HSTMT           c_hstmt1, c_hstmt2;
HSTMT           o_hstmt1, o_hstmt2, o_hstmt3;

ORDERS_STRUCT  orders_buf[ORDERS_PER_DISTRICT];
CUSTOMER_STRUCT customer_buf[CUSTOMERS_PER_DISTRICT];
long            orders_rows_loaded;
long            new_order_rows_loaded;
long            order_line_rows_loaded;
long            history_rows_loaded;
long            customer_rows_loaded;
long            stock_rows_loaded;
long            district_rows_loaded;
long            item_rows_loaded;
long            warehouse_rows_loaded;
long            main_time_start;
long            main_time_end;
long            max_items;
long            customers_per_district;
long            orders_per_district;

```



```

long                first_new_order;
long                last_new_order;

TPCCCLDR_ARGS      *aptr, args;

//=====
//
// Function name: main
//
//=====

int main(int  argc, char **argv)
{
    DWORD          dwThreadID[MAX_MAIN_THREADS];
    HANDLE         hThread[MAX_MAIN_THREADS];
    FILE           *fLoader;
    char           buffer[255];
    int            i;

    for (i=0; i<MAX_MAIN_THREADS; i++)
        hThread[i] = NULL;

    printf("\n*****");
    printf("\n*                *");
    printf("\n* Microsoft SQL Server *");
    printf("\n*                *");
    printf("\n* TPC-C BENCHMARK KIT: Database loader *");
    printf("\n* Version %s          *", TPCKIT_VER);
    printf("\n*                *");
    printf("\n*****\n\n");

    // process command line arguments

    aptr = &args;
    GetArgsLoader(argc, argv, aptr);

    // verify database and tables exist before attempting to load

    CheckSQL();
    CheckDataBase();

    printf("Build interface is ODBC.\n");

    if (aptr->build_index == 0)
        printf("Data load only - no index creation.\n");
    else
        printf("Data load and index creation.\n");

    if (aptr->index_order == 0)
        printf("Clustered indexes will be created after bulk load.\n");
    else
        printf("Clustered indexes will be created before bulk load.\n");

    // set database scale values
    if (aptr->scale_down == 1)
    {
        printf("**** Scaled Down Database ****\n");
        max_items = MAXITEMS_SCALE_DOWN;
        customers_per_district = CUSTOMERS_SCALE_DOWN;
        orders_per_district = ORDERS_SCALE_DOWN;
    }
}

```

```

        first_new_order = 0;
        last_new_order = 30;
    }
    else
    {
        max_items = MAXITEMS;
        customers_per_district = CUSTOMERS_PER_DISTRICT;
        orders_per_district = ORDERS_PER_DISTRICT;
        first_new_order = 2100;
        last_new_order = 3000;
    }

    // open connections to SQL Server
    OpenConnections();

    // open file for loader results
    fLoader = fopen(aptr->loader_res_file, "w");

    if (fLoader == NULL)
    {
        printf("Error, loader result file open failed.");
        exit(-1);
    }

    // start loading data

    sprintf(buffer, "TPC-C load started for %ld warehouses.\n", aptr->num_warehouses);

    printf("%s", buffer);
    fprintf(fLoader, "%s", buffer);

    main_time_start = (TimeNow() / MILLI);

    // start parallel load threads

    if (aptr->tables_all || aptr->table_item)
    {
        fprintf(fLoader, "\nStarting loader threads for: item\n");

        hThread[0] = CreateThread(NULL,
                                0,
                                (LPTHREAD_START_ROUTINE) LoadItem,
                                NULL,
                                0,
                                &dwThreadID[0]);

        if (hThread[0] == NULL)
        {
            printf("Error, failed in creating creating thread =
0.\n");
            exit(-1);
        }
    }

    if (aptr->tables_all || aptr->table_warehouse)
    {
        fprintf(fLoader, "Starting loader threads for: warehouse\n");
    }
}

```

```

        hThread[1] = CreateThread(NULL,
                                0,
(LPTHREAD_START_ROUTINE) LoadWarehouse,
                                0,
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,
                                0,
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,
                                0,
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          bcpint[128];

    // Seed with unique number
    seed(1);

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

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

    InitString(i_name, I_NAME_LEN+1);
    InitString(i_data, I_DATA_LEN+1);

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

    rc = bcp_init(i_hdbc1, name, NULL, "logs\\item.err", DB_IN);

```

```

    if (rc != SUCCEED)
        HandleErrorDBC(i_hdbc1);

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

    rc = bcp_bind(i_hdbc1, (BYTE *) &i_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 1);
    if (rc != SUCCEED)
        HandleErrorDBC(i_hdbc1);

    rc = bcp_bind(i_hdbc1, (BYTE *) &i_im_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 2);
    if (rc != SUCCEED)
        HandleErrorDBC(i_hdbc1);

    rc = bcp_bind(i_hdbc1, (BYTE *) i_name, 0, I_NAME_LEN, NULL, 0, 0, 3);
    if (rc != SUCCEED)
        HandleErrorDBC(i_hdbc1);

    rc = bcp_bind(i_hdbc1, (BYTE *) &i_price, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 4);
    if (rc != SUCCEED)
        HandleErrorDBC(i_hdbc1);

    rc = bcp_bind(i_hdbc1, (BYTE *) i_data, 0, I_DATA_LEN, NULL, 0, 0, 5);
    if (rc != SUCCEED)
        HandleErrorDBC(i_hdbc1);

    time_start = (TimeNow() / MILLI);

    item_rows_loaded = 0;

    for (i_id = 1; i_id <= max_items; i_id++)
    {
        i_im_id = RandomNumber(1L, 10000L);

        MakeAlphaString(14, 24, I_NAME_LEN, i_name);

        i_price = ((float) RandomNumber(100L, 10000L))/100.0;

        MakeOriginalAlphaString(26, 50, I_DATA_LEN, i_data, 10);

        rc = bcp_sendrow(i_hdbc1);
        if (rc != SUCCEED)
            HandleErrorDBC(i_hdbc1);

        item_rows_loaded++;
        CheckForCommit(i_hdbc1, i_hstmt1, item_rows_loaded, "item",
&time_start);
    }

    rcint = bcp_done(i_hdbc1);
    if (rcint < 0)
        HandleErrorDBC(i_hdbc1);

    printf("Finished loading item table.\n");

```

```

SQLFreeStmt(i_hstmt1, SQL_DROP);
SQLDisconnect(i_hdbc1);
SQLFreeConnect(i_hdbc1);

// if build index after load
if ((aptr->build_index == 1) && (aptr->index_order == 0))
    BuildIndex("idxitmc1");
}

//=====
//
// Function   : LoadWarehouse
//
// Loads WAREHOUSE table and loads Stock and District as Warehouses are created
//
//=====

void LoadWarehouse()
{
    short w_id;
    char w_name[W_NAME_LEN+1];
    char w_street_1[ADDRESS_LEN+1];
    char w_street_2[ADDRESS_LEN+1];
    char w_city[ADDRESS_LEN+1];
    char w_state[STATE_LEN+1];
    char w_zip[ZIP_LEN+1];
    double w_tax;
    double w_ytd;
    char name[20];
    long time_start;
    RETCODE rc;
    DBINT rcint;
    char bcphint[128];

    // Seed with unique number
    seed(2);

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

    // if build index before load...
    if ((aptr->build_index == 1) && (aptr->index_order == 1))
        BuildIndex("idxwarc1");

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

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

    rc = bcp_init(w_hdbc1, name, NULL, "logs\\whouse.err", DB_IN);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

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

```

```

    }
    rc = bcp_bind(w_hdbc1, (BYTE *) &w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 1);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) w_name, 0, W_NAME_LEN, NULL, 0, 0, 2);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) w_street_1, 0, ADDRESS_LEN, NULL, 0, 0,
3);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) w_street_2, 0, ADDRESS_LEN, NULL, 0, 0,
4);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) w_city, 0, ADDRESS_LEN, NULL, 0, 0, 5);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) w_state, 0, STATE_LEN, NULL, 0, 0, 6);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) w_zip, 0, ZIP_LEN, NULL, 0, 0, 7);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) &w_tax, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 8);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) &w_ytd, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 9);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    time_start = (TimeNow() / MILLI);
    warehouse_rows_loaded = 0;

    for (w_id = (short)aptr->starting_warehouse; w_id <= aptr->num_warehouses;
w_id++)
    {
        MakeAlphaString(6,10, W_NAME_LEN, w_name);
        MakeAddress(w_street_1, w_street_2, w_city, w_state, w_zip);

        w_tax = ((float) RandomNumber(0L,2000L))/10000.00;
        w_ytd = 300000.00;

        rc = bcp_sendrow(w_hdbc1);
        if (rc != SUCCEED)
            HandleErrorDBC(w_hdbc1);

        warehouse_rows_loaded++;
    }

```

```

        CheckForCommit(w_hdbc1, i_hstmt1, warehouse_rows_loaded,
"warehouse", &time_start);
    }

    rcint = bcp_done(w_hdbc1);
    if (rcint < 0)
        HandleErrorDBC(w_hdbc1);

    printf("Finished loading warehouse table.\n");

    // if build index after load...
    if ((aptr->build_index == 1) && (aptr->index_order == 0))
        BuildIndex("idxwarc1");

    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 bcpint[128];

    // Seed with unique number
    seed(4);

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

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

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

    rc = bcp_init(w_hdbc1, name, NULL, "logs\\district.err", DB_IN);
}

```

```

    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

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

    rc = bcp_bind(w_hdbc1, (BYTE *) &d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 1);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) &d_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 2);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) d_name, 0, D_NAME_LEN, NULL, 0, 0, 3);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) d_street_1, 0, ADDRESS_LEN, NULL, 0, 0,
4);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) d_street_2, 0, ADDRESS_LEN, NULL, 0, 0,
5);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) d_city, 0, ADDRESS_LEN, NULL, 0, 0, 6);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) d_state, 0, STATE_LEN, NULL, 0, 0, 7);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) d_zip, 0, ZIP_LEN, NULL, 0, 0, 8);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) &d_tax, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 9);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) &d_ytd, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 10);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) &d_next_o_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 11);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

```

```

    d_ytd = 30000.0;
    d_next_o_id = orders_per_district+1;
    time_start = (TimeNow() / MILLI);
    for (w_id = aptr->starting_warehouse; w_id <= aptr->num_warehouses;
w_id++)
    {
        d_w_id = w_id;

        for (d_id = 1; d_id <= DISTRICT_PER_WAREHOUSE; d_id++)
        {
            MakeAlphaString(6,10,D_NAME_LEN, d_name);
            MakeAddress(d_street_1, d_street_2, d_city, d_state,
d_zip);

            d_tax = ((float) RandomNumber(0L,2000L))/10000.00;
            rc = bcp_sendrow(w_hdbc1);
            if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

            district_rows_loaded++;
            CheckForCommit(w_hdbc1, w_hstmt1,
district_rows_loaded, "district", &time_start);
        }
    }

    rcint = bcp_done(w_hdbc1);
    if (rcint < 0)
        HandleErrorDBC(w_hdbc1);

    printf("Finished loading district table.\n");

    // if build index after load...
    if ((aptr->build_index == 1) && (aptr->index_order == 0))
        BuildIndex("idxdisc1");

    return;
}

//=====
//
// Function   : Stock
//
//=====

void Stock()
{
    long  s_i_id;
    short s_w_id;
    short s_quantity;
    char  s_dist_01[S_DIST_LEN+1];
    char  s_dist_02[S_DIST_LEN+1];
    char  s_dist_03[S_DIST_LEN+1];
    char  s_dist_04[S_DIST_LEN+1];
    char  s_dist_05[S_DIST_LEN+1];
    char  s_dist_06[S_DIST_LEN+1];
    char  s_dist_07[S_DIST_LEN+1];
    char  s_dist_08[S_DIST_LEN+1];

```

```

char s_dist_09[S_DIST_LEN+1];
char s_dist_10[S_DIST_LEN+1];
long s_ytd;
short s_order_cnt;
short s_remote_cnt;
char s_data[S_DATA_LEN+1];
short len;
char name[20];
long time_start;
RETCODE rc;
DBINT rcint;
char bcphint[128];

// Seed with unique number
seed(3);

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

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

rc = bcp_init(w_hdbc1, name, NULL, "logs\\stock.err", DB_IN);
if (rc != SUCCEEDED)
    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 != SUCCEEDED)
        HandleErrorDBC(w_hdbc1);
}

rc = bcp_bind(w_hdbc1, (BYTE *) &s_i_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 1);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

bcp_bind(w_hdbc1, (BYTE *) &s_w_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
2);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) &s_quantity, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 3);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_01, 0, S_DIST_LEN, NULL, 0, 4);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_02, 0, S_DIST_LEN, NULL, 0, 5);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_03, 0, S_DIST_LEN, NULL, 0, 6);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_04, 0, S_DIST_LEN, NULL, 0, 7);

```

```

if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_05, 0, S_DIST_LEN, NULL, 0, 8);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_06, 0, S_DIST_LEN, NULL, 0, 9);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_07, 0, S_DIST_LEN, NULL, 0, 10);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_08, 0, S_DIST_LEN, NULL, 0, 11);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_09, 0, S_DIST_LEN, NULL, 0, 12);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_10, 0, S_DIST_LEN, NULL, 0, 13);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) &s_ytd, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 14);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) &s_order_cnt, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 15);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) &s_remote_cnt, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT2, 16);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_data, 0, S_DATA_LEN, NULL, 0, 17);
if (rc != SUCCEEDED)
    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);

s_data,10);

len = MakeOriginalAlphaString(26,50, S_DATA_LEN,

rc = bcp_sendrow(w_hdbc1);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

stock_rows_loaded++;
CheckForCommit(w_hdbc1, w_hstmt1, stock_rows_loaded,

"stock", &time_start);
    }
}

rcint = bcp_done(w_hdbc1);
if (rcint < 0)
    HandleErrorDBC(w_hdbc1);

printf("Finished loading stock table.\n");

SQLFreeStmt(w_hstmt1, SQL_DROP);
SQLDisconnect(w_hdbc1);
SQLFreeConnect(w_hdbc1);

// if build index after load...
if ((aptr->build_index == 1) && (aptr->index_order == 0))
    BuildIndex("idxstkcl*");

return;
}

//=====
//
// Function   : LoadCustomer
//
//=====
void LoadCustomer()
{
    LOADER_TIME_STRUCT    customer_time_start;
    LOADER_TIME_STRUCT    history_time_start;
    short                 w_id;
    short                 d_id;
    DWORD                 dwThreadID[MAX_CUSTOMER_THREADS];
    HANDLE                 hThread[MAX_CUSTOMER_THREADS];
    char                   name[20];
    RETCODE                rc;
    DBINT                 rcint;
    char                   bcphint[128];
    char                   cmd[256];
    // SQLRETURN           rc_l;
    // SQLSMALLINT          recnum, MsgLen;
    // SQLCHAR              SqlState[6],
Msg[SQL_MAX_MESSAGE_LENGTH];

```

```

// SQLINTEGER                                     NativeError;

// Seed with unique number
seed(5);

printf("Loading customer and history tables...\n");

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

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

rc = bcp_init(c_hdbc1, name, NULL, "logs\\customer.err", DB_IN);
if (rc != SUCCEEDED)
    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 != SUCCEEDED)
        HandleErrorDBC(c_hdbc1);
}

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

rc = bcp_init(c_hdbc2, name, NULL, "logs\\history.err", DB_IN);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc2);

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

customer_rows_loaded    = 0;
history_rows_loaded     = 0;

CustomerBufInit();

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

for (w_id = (short)aptr->starting_warehouse; w_id <= aptr->num_warehouses;
w_id++)
{
    for (d_id = 1; d_id <= DISTRICT_PER_WAREHOUSE; d_id++)
    {
        CustomerBufLoad(d_id, w_id);

        // Start parallel loading threads here...

        // Start customer table thread

        printf("...Loading customer table for: d_id = %d, w_id
= %d\n", d_id, w_id);

        hThread[0] = CreateThread(NULL,

```

```

0,
(LPTHREAD_START_ROUTINE) LoadCustomerTable,
&customer_time_start,
0,
&dwThreadID[0]);
    if (hThread[0] == NULL)
    {
        printf("Error, failed in creating creating
thread = 0.\n");
        exit(-1);
    }
    // Start History table thread
    printf("...Loading history table for: d_id = %d, w_id
= %d\n", d_id, w_id);
    hThread[1] = CreateThread(NULL,
0,
(LPTHREAD_START_ROUTINE) LoadHistoryTable,
&history_time_start,
0,
&dwThreadID[1]);
    if (hThread[1] == NULL)
    {
        printf("Error, failed in creating creating
thread = 1.\n");
        exit(-1);
    }
    WaitForSingleObject( hThread[0], INFINITE );
    WaitForSingleObject( hThread[1], INFINITE );
    if (CloseHandle(hThread[0]) == FALSE)
    {
        printf("Error, failed in closing customer
thread handle with errno: %d\n", GetLastError());
    }
    if (CloseHandle(hThread[1]) == FALSE)
    {
        printf("Error, failed in closing history
thread handle with errno: %d\n", GetLastError());
    }
}
// flush the bulk connection

```

```

rcint = bcp_done(c_hdbc1);
if (rcint < 0)
    HandleErrorDBC(c_hdbc1);

rcint = bcp_done(c_hdbc2);
if (rcint < 0)
    HandleErrorDBC(c_hdbc2);

printf("Finished loading customer table.\n");

// if build index after load...
if ((aptr->build_index == 1) && (aptr->index_order == 0))
    BuildIndex("idxcuscl");

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

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

system(cmd);

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

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

return;
}

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

void CustomerBufInit()
{
    int i;

    for (i=0;i<customers_per_district;i++)
    {
        customer_buf[i].c_id = 0;
        customer_buf[i].c_d_id = 0;
        customer_buf[i].c_w_id = 0;

        strcpy(customer_buf[i].c_first,"");
        strcpy(customer_buf[i].c_middle,"");
    }
}

```



```

strcpy(customer_buf[i].c_last,"");
strcpy(customer_buf[i].c_street_1,"");
strcpy(customer_buf[i].c_street_2,"");
strcpy(customer_buf[i].c_city,"");
strcpy(customer_buf[i].c_state,"");
strcpy(customer_buf[i].c_zip,"");
strcpy(customer_buf[i].c_phone,"");
strcpy(customer_buf[i].c_credit,"");

customer_buf[i].c_credit_lim = 0;
customer_buf[i].c_discount = (float) 0;

// fix to avoid ODBC float to numeric conversion problem.
// customer_buf[i].c_balance = 0;
strcpy(customer_buf[i].c_balance,"");

customer_buf[i].c_ytd_payment = 0;
customer_buf[i].c_payment_cnt = 0;
customer_buf[i].c_delivery_cnt = 0;

strcpy(customer_buf[i].c_data,"");

customer_buf[i].h_amount = 0;

strcpy(customer_buf[i].h_data,"");
}

}

//=====
//
// Function : CustomerBufLoad
//
// Fills shared buffer for HISTORY and CUSTOMER
//=====
void CustomerBufLoad(int d_id, int w_id)
{
    long i;
    CUSTOMER_SORT_STRUCT c[CUSTOMERS_PER_DISTRICT];

    for (i=0;i<customers_per_district;i++)
    {
        if (i < 1000)
            LastName(i, c[i].c_last);
        else
            LastName(NURand(255,0,999,LOADER_NURAND_C),
c[i].c_last);

        MakeAlphaString(8,16,FIRST_NAME_LEN, c[i].c_first);

        c[i].c_id = i+1;
    }

    printf("...Loading customer buffer for: d_id = %d, w_id = %d\n",
d_id, w_id);

    for (i=0;i<customers_per_district;i++)

```

```

{
    customer_buf[i].c_d_id = d_id;
    customer_buf[i].c_w_id = w_id;
    customer_buf[i].h_amount = 10.0;

    customer_buf[i].c_ytd_payment = 10.0;

    customer_buf[i].c_payment_cnt = 1;
    customer_buf[i].c_delivery_cnt = 0;

    // Generate CUSTOMER and HISTORY data
    customer_buf[i].c_id = c[i].c_id;

    strcpy(customer_buf[i].c_first, c[i].c_first);
    strcpy(customer_buf[i].c_last, c[i].c_last);

    customer_buf[i].c_middle[0] = 'O';
    customer_buf[i].c_middle[1] = 'E';

    MakeAddress(customer_buf[i].c_street_1,
customer_buf[i].c_street_2,
customer_buf[i].c_city,
customer_buf[i].c_state,
customer_buf[i].c_zip);

    MakeNumberString(16, 16, PHONE_LEN, customer_buf[i].c_phone);

    if (RandomNumber(1L, 100L) > 10)
        customer_buf[i].c_credit[0] = 'G';
    else
        customer_buf[i].c_credit[0] = 'B';
    customer_buf[i].c_credit[1] = 'C';

    customer_buf[i].c_credit_lim = 50000.0;
    customer_buf[i].c_discount = ((float) RandomNumber(0L, 5000L)) /
10000.0;

    // fix to avoid ODBC float to numeric conversion problem.

    // customer_buf[i].c_balance = -10.0;
    strcpy(customer_buf[i].c_balance,"-10.0*");

    MakeAlphaString(300, 500, C_DATA_LEN, customer_buf[i].c_data);

    // Generate HISTORY data
    MakeAlphaString(12, 24, H_DATA_LEN, customer_buf[i].h_data);
}

}

//=====
//
// Function : LoadCustomerTable
//
//=====
void LoadCustomerTable(LOADER_TIME_STRUCT *customer_time_start)
{
    int i;
    long c_id;

```

```

short      c_d_id;
short      c_w_id;
char       c_first[FIRST_NAME_LEN+1];
char       c_middle[MIDDLE_NAME_LEN+1];
char       c_last[LAST_NAME_LEN+1];
char       c_street_1[ADDRESS_LEN+1];
char       c_street_2[ADDRESS_LEN+1];
char       c_city[ADDRESS_LEN+1];
char       c_state[STATE_LEN+1];
char       c_zip[ZIP_LEN+1];
char       c_phone[PHONE_LEN+1];
char       c_credit[CREDIT_LEN+1];
double     c_credit_lim;
double     c_discount;

// fix to avoid ODBC float to numeric conversion problem.
// double      c_balance;
char       c_balance[6];

double     c_ytd_payment;
short      c_payment_cnt;
short      c_delivery_cnt;
char       c_data[C_DATA_LEN+1];
char       c_since[C_SINCE_LEN+1];
RETCODE    rc;

rc = bcp_bind(c_hdbc1, (BYTE *) &c_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT4, 1);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
2);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 3);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) c_first, 0, FIRST_NAME_LEN, NULL, 0, 0, 4);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) c_middle, 0, MIDDLE_NAME_LEN, NULL, 0, 0, 5);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) c_last, 0, LAST_NAME_LEN, NULL, 0, 0, 6);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) c_street_1, 0, ADDRESS_LEN, NULL, 0, 0, 7);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) c_street_2, 0, ADDRESS_LEN, NULL, 0, 0, 8);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) c_city, 0, ADDRESS_LEN, NULL, 0, 0, 9);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

```

```

rc = bcp_bind(c_hdbc1, (BYTE *) c_state, 0, STATE_LEN, NULL, 0, 0, 10);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) c_zip, 0, ZIP_LEN, NULL, 0, 0, 11);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) c_phone, 0, PHONE_LEN, NULL, 0, 0, 12);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) &c_since, 0, C_SINCE_LEN, NULL, 0,
SQLCHARACTER, 13);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) c_credit, 0, CREDIT_LEN, NULL, 0, 0, 14);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) &c_credit_lim, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 15);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) &c_discount, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 16);
if (rc != SUCCEEDED)
    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 != SUCCEEDED)
//     HandleErrorDBC(c_hdbc1);
rc = bcp_bind(c_hdbc1, (BYTE *) c_balance, 0, 5, NULL, 0, SQLCHARACTER, 17);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) &c_ytd_payment, 0, SQL_VARLEN_DATA, NULL, 0,
SQLFLT8, 18);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) &c_payment_cnt, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 19);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) &c_delivery_cnt, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 20);
if (rc != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = bcp_bind(c_hdbc1, (BYTE *) c_data, 0, 500, NULL, 0, 0, 21);
if (rc != SUCCEEDED)
    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 != SUCCEEDED)
        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 != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
2);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
3);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
4);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA, NULL, 0, SQLINT2,
5);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &h_date, 0, H_DATE_LEN, NULL, 0,
SQLCHARACTER, 6);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &h_amount, 0, SQL_VARLEN_DATA, NULL, 0, SQLFLT8,
7);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) h_data, 0, H_DATA_LEN, NULL, 0, 0, 8);
    if (rc != SUCCEEDED)
        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 != SUCCEEDED)
            HandleErrorDBC(c_hdbc2);

        history_rows_loaded++;
        CheckForCommit(c_hdbc2, c_hstmt2, history_rows_loaded,
"history", &history_time_start->time_start);
    }
}

//=====

```

```

//
// Function   : LoadOrders
//
//=====
void LoadOrders()
{
    LOADER_TIME_STRUCT    orders_time_start;
    LOADER_TIME_STRUCT    new_order_time_start;
    LOADER_TIME_STRUCT    order_line_time_start;
    short                 w_id;
    short                 d_id;
    DWORD                 dwThreadID[MAX_ORDER_THREADS];
    HANDLE                 hThread[MAX_ORDER_THREADS];
    char                   name[20];
    RETCODE                rc;
    char                   bcphint[128];

    // seed with unique number
    seed(6);

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

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

    // initialize bulk copy
    sprintf(name, "%s..%s", aptr->database, "orders");
    rc = bcp_init(o_hdbc1, name, NULL, "logs\\orders.err", DB_IN);
    if (rc != SUCCEED)
        HandleErrorDBC(o_hdbc1);

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

    sprintf(name, "%s..%s", aptr->database, "new_order");
    rc = bcp_init(o_hdbc2, name, NULL, "logs\\neword.err", DB_IN);
    if (rc != SUCCEED)
        HandleErrorDBC(o_hdbc2);

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

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

```

```

rc = bcp_init(o_hdbc3, name, NULL, "logs\\ordline.err", DB_IN);
if (rc != SUCCEED)
    HandleErrorDBC(o_hdbc3);

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

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

OrdersBufInit();

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

for (w_id = (short)aptr->starting_warehouse; w_id <= aptr->num_warehouses;
w_id++)
{
    for (d_id = 1; d_id <= DISTRICT_PER_WAREHOUSE; d_id++)
    {
        OrdersBufLoad(d_id, w_id);

        // start parallel loading threads here...

        // start Orders table thread
        printf("...Loading Order Table for: d_id = %d, w_id =
%d\n", d_id, w_id);

        hThread[0] = CreateThread(NULL,
0,
(LPTHREAD_START_ROUTINE) LoadOrdersTable,
&orders_time_start,
0,
&dwThreadID[0]);

        if (hThread[0] == NULL)
        {
            printf("Error, failed in creating creating
thread = 0.\n");
            exit(-1);
        }

        // start NewOrder table thread
        printf("...Loading New-Order Table for: d_id = %d,
w_id = %d\n", d_id, w_id);

```

```

        hThread[1] = CreateThread(NULL,
0,
(LPTHREAD_START_ROUTINE) LoadNewOrderTable,
&new_order_time_start,
0,
&dwThreadID[1]);

        if (hThread[1] == NULL)
        {
            printf("Error, failed in creating creating
thread = 1.\n");
            exit(-1);
        }

        // start Order-Line table thread
        printf("...Loading Order-Line Table for: d_id = %d,
w_id = %d\n", d_id, w_id);

        hThread[2] = CreateThread(NULL,
0,
(LPTHREAD_START_ROUTINE) LoadOrderLineTable,
&order_line_time_start,
0,
&dwThreadID[2]);

        if (hThread[2] == NULL)
        {
            printf("Error, failed in creating creating
thread = 2.\n");
            exit(-1);
        }

        WaitForSingleObject( hThread[0], INFINITE );
        WaitForSingleObject( hThread[1], INFINITE );
        WaitForSingleObject( hThread[2], INFINITE );

        if (CloseHandle(hThread[0]) == FALSE)
        {
            printf("Error, failed in closing Orders
thread handle with errno: %d\n", GetLastError());
        }

        if (CloseHandle(hThread[1]) == FALSE)
        {
            printf("Error, failed in closing NewOrder
thread handle with errno: %d\n", GetLastError());
        }

        if (CloseHandle(hThread[2]) == FALSE)
        {
            printf("Error, failed in closing OrderLine
thread handle with errno: %d\n", GetLastError());
        }

```

```

        }
    }
}

printf("Finished loading orders.\n");

return;
}

//=====
//
// Function   : OrdersBufInit
//
// Clears shared buffer for ORDERS, NEWORDER, and ORDERLINE
//
//=====
void OrdersBufInit()
{
    int    i;
    int    j;

    for (i=0;i<orders_per_district;i++)
    {
        orders_buf[i].o_id = 0;
        orders_buf[i].o_d_id = 0;
        orders_buf[i].o_w_id = 0;
        orders_buf[i].o_c_id = 0;
        orders_buf[i].o_carrier_id = 0;
        orders_buf[i].o_ol_cnt = 0;
        orders_buf[i].o_all_local = 0;

        for (j=0;j<=14;j++)
        {
            orders_buf[i].o_ol[j].ol = 0;
            orders_buf[i].o_ol[j].ol_i_id = 0;
            orders_buf[i].o_ol[j].ol_supply_w_id = 0;
            orders_buf[i].o_ol[j].ol_quantity = 0;
            orders_buf[i].o_ol[j].ol_amount = 0;
            strcpy(orders_buf[i].o_ol[j].ol_dist_info, "");
        }
    }
}

//=====
//
// Function   : OrdersBufLoad
//
// Fills shared buffer for ORDERS, NEWORDER, and ORDERLINE
//
//=====
void OrdersBufLoad(int d_id, int w_id)
{
    int    cust[ORDERS_PER_DISTRICT+1];
    long   o_id;

```

```

short  ol;

printf("...Loading Order Buffer for: d_id = %d, w_id = %d\n",
      d_id, w_id);

GetPermutation(cust, orders_per_district);

for (o_id=0;o_id<orders_per_district;o_id++)
{
    // Generate ORDER and NEW-ORDER data

    orders_buf[o_id].o_d_id = d_id;
    orders_buf[o_id].o_w_id = w_id;
    orders_buf[o_id].o_id = o_id+1;
    orders_buf[o_id].o_c_id = cust[o_id+1];
    orders_buf[o_id].o_ol_cnt = (short)RandomNumber(5L, 15L);

    if (o_id < first_new_order)
    {
        orders_buf[o_id].o_carrier_id =
(short)RandomNumber(1L, 10L);
    }
    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

            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("idxordc1");

        // 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("idxnmodc1");
        }
    }
}

//=====
//
// 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("idxodlcl1");

        }

    }

    //=====
    //
    // 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 != SUCCEEDED)
    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 != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = SQLDriverConnect ( w_hdbc1,
NULL,
(SQLCHAR*)&szDriverString[0] ,
SQL_NTS,
(SQLCHAR*)&szDriverStringOut[0],
sizeof(szDriverStringOut),
&cbDriverStringOut,
SQL_DRIVER_NOPROMPT );
if (rc != SUCCEEDED)
    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 != SUCCEEDED)
    HandleErrorDBC(c_hdbc1);

rc = SQLDriverConnect ( c_hdbc1,
NULL,
(SQLCHAR*)&szDriverString[0] ,
SQL_NTS,
(SQLCHAR*)&szDriverStringOut[0],
sizeof(szDriverStringOut),
&cbDriverStringOut,
SQL_DRIVER_NOPROMPT );
if (rc != SUCCEEDED)
    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 != SUCCEEDED)
    HandleErrorDBC(c_hdbc2);

rc = SQLDriverConnect ( c_hdbc2,
NULL,
(SQLCHAR*)&szDriverString[0] ,
SQL_NTS,
(SQLCHAR*)&szDriverStringOut[0],
sizeof(szDriverStringOut),
&cbDriverStringOut,
SQL_DRIVER_NOPROMPT );
if (rc != SUCCEEDED)
    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 != SUCCEEDED)
    HandleErrorDBC(o_hdbc1);

rc = SQLDriverConnect ( o_hdbc1,
NULL,
(SQLCHAR*)&szDriverString[0] ,
SQL_NTS,
(SQLCHAR*)&szDriverStringOut[0],
sizeof(szDriverStringOut),
&cbDriverStringOut,
SQL_DRIVER_NOPROMPT );
if (rc != SUCCEEDED)
    HandleErrorDBC(o_hdbc1);

// Connection 6
sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
aptr->server,
aptr->user,

```

```

                                aptr->password,
                                aptr->database );

rc = SQLSetConnectOption (o_hdbc2, SQL_PACKET_SIZE, aptr->pack_size);
if (rc != SUCCEED)
    HandleErrorDBC(o_hdbc2);

rc = SQLDriverConnect ( o_hdbc2,
                                NULL,
                                (SQLCHAR*)&szDriverString[0] ,
                                SQL_NTS,
                                (SQLCHAR*)&szDriverStringOut[0],
                                sizeof(szDriverStringOut),
                                &cbDriverStringOut,
                                SQL_DRIVER_NOPROMPT );
if (rc != SUCCEED)
    HandleErrorDBC(o_hdbc2);

// Connection 7

    sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
                                aptr->server,
                                aptr->user,
                                aptr->password,
                                aptr->database );

rc = SQLSetConnectOption (o_hdbc3, SQL_PACKET_SIZE, aptr->pack_size);
if (rc != SUCCEED)
    HandleErrorDBC(o_hdbc3);

rc = SQLDriverConnect ( o_hdbc3,
                                NULL,
                                (SQLCHAR*)&szDriverString[0] ,
                                SQL_NTS,
                                (SQLCHAR*)&szDriverStringOut[0],
                                sizeof(szDriverStringOut),
                                &cbDriverStringOut,
                                SQL_DRIVER_NOPROMPT );
if (rc != SUCCEED)
    HandleErrorDBC(o_hdbc3);
}

//=====
//
// Function name: BuildIndex
//
//=====

void BuildIndex(char                *index_script)
{
    char    cmd[256];

```

```

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

    sprintf(cmd, "isql -S%s -U%s -P%s -e -i%s\\%s.sql > logs\\%s.log",
                                aptr->server,
                                aptr->user,
                                aptr->password,
                                aptr->index_script_path,
                                index_script,
                                index_script);

    system(cmd);

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

void HandleErrorDBC (SQLHDBC  hdbc1)
{
    SQLCHAR            SqlState[6], Msg[SQL_MAX_MESSAGE_LENGTH];
    SQLINTEGER  NativeError;
    SQLSMALLINT i, MsgLen;
    SQLRETURN  rc2;
    char        timebuf[128];
    char        datebuf[128];
    FILE        *fpl;

    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);

        fpl = fopen("logs\\tpccldr.err","w");
        if (fpl == NULL)
            printf("ERROR:  Unable to open errorlog file.\n");
        else
        {
            fprintf(fpl, "[%s : %s] %s\n" , datebuf, timebuf,
szLastError);
            fclose(fpl);
        }

        i++;
    }
}

void HandleErrorSTMT (HSTMT  hstmt1)
{
    SQLCHAR            SqlState[6], Msg[SQL_MAX_MESSAGE_LENGTH];
    SQLINTEGER  NativeError;
    SQLSMALLINT i, MsgLen;

```

```

SQLRETURN rc2;
char timebuf[128];
char datebuf[128];
FILE *fp1;

i = 1;
while (( rc2 = SQLGetDiagRec(SQL_HANDLE_STMT , hstmt1, i, SqlState ,
&NativeError,
Msg, sizeof(Msg) , &MsgLen )) !=
SQL_NO_DATA )
{
    sprintf( szLastError , "%s" , Msg );
    _strtime(timebuf);
    _strdate(datebuf);
    printf( "[%s : %s] %s\n" , datebuf, timebuf, szLastError);
    fp1 = fopen("logs\\tpccldr.err", "w");
    if (fp1 == NULL)
        printf("ERROR: Unable to open errorlog file.\n");
    else
    {
        fprintf(fp1, "[%s : %s] %s\n" , datebuf, timebuf,
szLastError);
        fclose(fp1);
    }
    i++;
}

void FormatDate ( char* szTimeOutput )
{
    struct tm when;
    time_t now;

    time( &now );
    when = *localtime( &now );

    mktime( &when );

    // odbc datetime format
    strftime( szTimeOutput , 30 , "%Y-%m-%d %H:%M:%S.000" , &when );

    return;
}

//=====
//
// Function : CheckSQL
//
//=====

void CheckSQL()
{
    RETCODE rc;

```

```

char szDriverString[300];
char szDriverStringOut[1024];
int SQLBuildFlag;
char resp;

SQLSMALLINT cbDriverStringOut;
SQLCHAR SQLVersion[19];
SQLINTEGER SQLVersionInd;

SQLAllocHandle(SQL_HANDLE_ENV, SQL_NULL_HANDLE, &henv );

SQLSetEnvAttr(henv, SQL_ATTR_ODBC_VERSION, (void*)SQL_OV_ODBC3, 0 );

SQLAllocHandle(SQL_HANDLE_DBC, henv , &v_hdbc);

SQLSetConnectAttr(v_hdbc, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );

// Open connection to SQL Server
sprintf( szDriverString , "DRIVER={SQL Server};SERVER=%s;UID=%s;PWD=%s" ,
aptr->server,
aptr->user,
aptr->password );

if ( SQLSetConnectAttr( v_hdbc, SQL_ATTR_PACKET_SIZE, (SQLPOINTER)aptr-
>pack_size, SQL_IS_INTEGER ) != SQL_SUCCESS )
    HandleErrorDBC(v_hdbc);

rc = SQLDriverConnect ( v_hdbc,
NULL,
(SQLCHAR*)&szDriverString[0] ,
SQL_NTS,
(SQLCHAR*)&szDriverStringOut[0],
sizeof(szDriverStringOut),
&cbDriverStringOut,
SQL_DRIVER_NOPROMPT );

if ((rc != SQL_SUCCESS) && (rc != SQL_SUCCESS_WITH_INFO))
    HandleErrorDBC(v_hdbc);

if ( SQLAllocHandle(SQL_HANDLE_STMT, v_hdbc , &v_hstmt) != SQL_SUCCESS )
    HandleErrorSTMT(v_hstmt);

rc = SQLBindCol(v_hstmt, 4, SQL_C_CHAR, &SQLVersion, sizeof(SQLVersion),
&SQLVersionInd);

// issue SQL Server extended stored procedure (xp_msver) to determine
installed version
rc = SQLExecDirect(v_hstmt, "EXECUTE xp_msver ProductVersion", SQL_NTS);

if ((rc != SQL_SUCCESS) && (rc != SQL_SUCCESS_WITH_INFO))
    HandleErrorSTMT(v_hstmt);

rc = SQLFetch(v_hstmt);

if (rc != SQL_SUCCESS)

```

```

        HandleErrorDBC(v_hdbc);

// Check build number to ensure 8.00.194 or higher
SQLBuildFlag = 1;

// first check the Major version
if ( SQLVersion[0] == '8' )
{
    if ( ( SQLVersion[2] == '0' ) & ( SQLVersion[3] == '0' ) )
    {
        if ( SQLVersion[5] == '1' )
        {
            if ( (SQLVersion[6] == '9') &
(SQLVersion[7] == '4') )
            {
                SQLBuildFlag = 0;
                printf("You are using SQL Server
version = %9s\n\n", SQLVersion);
            }
            else
            {
                SQLBuildFlag = 1;
            }
        }
        else
        {
            if ( SQLVersion[5] == '3' )
            {
                if ( (SQLVersion[6] >= 53) &
(SQLVersion[7] >= 48) )
                {
                    SQLBuildFlag = 0;
                    printf("You are using
SQL Server version = %9s\n\n", SQLVersion);
                }
                else
                {
                    SQLBuildFlag = 1;
                }
            }
        }
    }
    else
    {
        SQLBuildFlag = 1;
    }
}

if ( SQLBuildFlag == 1 )
{
    printf("NOTE: The SQL Server version you are using is not
supported\n");
    printf("for TPC-C benchmarking. You currently have SQL Server
version %9s\n",SQLVersion);
    printf("installed. Please upgrade to Microsoft SQL Server 2000
(8.00.0194) or better.\n");
    printf("and re-run the SETUP program.\n");
    printf("Do you wish to continue with setup? (Y/N): ");
    resp = getchar();
    if ( ( resp == 'N' ) || (resp == 'n') )
    {

```

```

        printf("\nSetup Aborted!\n");
        exit(1);
    }
}

SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
SQLDisconnect(v_hdbc);
SQLFreeHandle(SQL_HANDLE_DBC, v_hdbc);

return;
}

//=====
//
// Function : CheckDataBase
//
//=====

void CheckDataBase()
{
    RETCODE rc;

    char szDriverString[300];
    char szDriverStringOut[1024];
    char TablesBitMap[9] = {"000000000"};
    int i, ExitFlag;

    SQLSMALLINT cbDriverStringOut;
    SQLCHAR TabName[10];
    SQLINTEGER TabNameInd, TabCount, TabCountInd;

    ExitFlag = 0;

    SQLAllocHandle(SQL_HANDLE_ENV, SQL_NULL_HANDLE, &henv );

    SQLSetEnvAttr(henv, SQL_ATTR_ODBC_VERSION, (void*)SQL_OV_ODBC3, 0 );

    SQLAllocHandle(SQL_HANDLE_DBC, henv , &v_hdbc);

    SQLSetConnectAttr(v_hdbc, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );

    // Open connection to SQL Server

    sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
aptr->server,
aptr->user,
aptr->password,
aptr->database );

    rc = SQLSetConnectAttr( v_hdbc, SQL_ATTR_PACKET_SIZE, (SQLPOINTER)aptr-
>pack_size, SQL_IS_UINTEGER );
    if (rc != SQL_SUCCESS)
        HandleErrorDBC(v_hdbc);

    rc = SQLDriverConnect ( v_hdbc,
NULL,

```

```

(SQLCHAR*)&szDriverString[0] ,
                                SQL_NTS,

(SQLCHAR*)&szDriverStringOut[0],
sizeof(szDriverStringOut),
                                &cbDriverStringOut,
                                SQL_DRIVER_NOPROMPT );

// if the rc is SQL_ERROR, the the TPCC database probably does not exist
if (rc == SQL_ERROR)
{
    printf("The database TPCC does not appear to exist!\n");
    printf("\nCheck LOGS\\ directory for database creation
errors.\n");

    // cleanup database connections and handles
    SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
    SQLDisconnect(v_hdbc);
    SQLFreeHandle(SQL_HANDLE_DBC, v_hdbc);

    // since there is not a database, exit back to SETUP.CMD
    exit(1);
}

if ( SQLAllocHandle(SQL_HANDLE_STMT, v_hdbc , &v_hstmt) != SQL_SUCCESS )
    HandleErrorDBC(v_hdbc);

if ( SQLBindCol(v_hstmt, 1, SQL_C_ULONG, &TabCount, 0, &TabCountInd) !=
SQL_SUCCESS )
    HandleErrorSTMT(v_hstmt);

// count the number of user tables from sysobjects
rc = SQLExecDirect(v_hstmt, "select count(*) from sysobjects where xtype =
'\U'", SQL_NTS);
if ((rc != SQL_SUCCESS) && (rc != SQL_SUCCESS_WITH_INFO))
    HandleErrorSTMT(v_hstmt);

if ( SQLFetch(v_hstmt) != SQL_SUCCESS )
    HandleErrorSTMT(v_hstmt);

// if the number of tables is less than 9, select all the user tables in
TPCC
if (TabCount != 9)
{
    SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);

    SQLAllocHandle(SQL_HANDLE_STMT, v_hdbc , &v_hstmt);

    if ( SQLBindCol(v_hstmt, 1, SQL_C_CHAR, &TabName,
sizeof(TabName), &TabNameInd) != SQL_SUCCESS )
        HandleErrorSTMT(v_hstmt);

    // select the list of user tables into a result set
    rc = SQLExecDirect(v_hstmt, "select * from sysobjects where
xtype = '\U'", SQL_NTS);
    if ((rc != SQL_SUCCESS) && (rc != SQL_SUCCESS_WITH_INFO))
        HandleErrorSTMT(v_hstmt);

    // go through the result set and set the bitmap for each found
table
    // set the bitmap to '1' if the table name is found

```

```

while ((rc = SQLFetch(v_hstmt)) != SQL_NO_DATA)
{
    switch( TabName[0] )
    {
        case 'w':
            TablesBitMap[0] = '1';
            break;

        case 'd':
            TablesBitMap[1] = '1';
            break;

        case 'c':
            TablesBitMap[2] = '1';
            break;

        case 'h':
            TablesBitMap[3] = '1';
            break;

        case 'n':
            TablesBitMap[4] = '1';
            break;

        case 'o':
            if (TabName[5] = 's')
                TablesBitMap[5] = '1';
            if (TabName[5] = '_')
                TablesBitMap[6] = '1';

            break;

        case 'i':
            TablesBitMap[7] = '1';
            break;

        case 's':
            TablesBitMap[8] = '1';
            break;

    }

    // a '0' ExitFlag means do NOT exit the loader early, a '1'
means exit the loader early
    ExitFlag = 0;

    // iterate 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')

```

```

missing or damaged.\n");
        {
            printf("The Customer table is
missing or damaged.\n");
            ExitFlag = 1;
        }
        break;
case 3:
    if (TablesBitMap[i] == '0')
    {
        printf("The History table is
missing or damaged.\n");
        ExitFlag = 1;
    }
    break;
case 4:
    if (TablesBitMap[i] == '0')
    {
        printf("The New_Order table is
missing or damaged.\n");
        ExitFlag = 1;
    }
    break;
case 5:
    if (TablesBitMap[i] == '0')
    {
        printf("The Orders table is
missing or damaged.\n");
        ExitFlag = 1;
    }
    break;
case 6:
    if (TablesBitMap[i] == '0')
    {
        printf("The Order_Line table is
missing or damaged.\n");
        ExitFlag = 1;
    }
    break;
case 7:
    if (TablesBitMap[i] == '0')
    {
        printf("The Item table is missing
or damaged.\n");
        ExitFlag = 1;
    }
    break;
case 8:
    if (TablesBitMap[i] == '0')
    {
        printf("The Stock table is missing
or damaged.\n");
        ExitFlag = 1;
    }
    break;
    }
}
// if one or more tables are missing, display message and exit
the loader
if (ExitFlag = 1)
{
    printf("\nExiting TPC-C Loader!\n");
    printf("\nCheck LOGS\ directory for database\n");
}

```

```

        printf("or table creation errors.\n");
        // cleanup database connections and handles
        SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
        SQLDisconnect(v_hdbc);
        SQLFreeHandle(SQL_HANDLE_DBC, v_hdbc);
        exit(1);
    }
}
// cleanup database connections and handles
SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
SQLDisconnect(v_hdbc);
SQLFreeHandle(SQL_HANDLE_DBC, v_hdbc);
return;
}

```

version.sql

```

-- File:      VERSION.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.22
--           Copyright Microsoft, 2001
-- Purpose:   Returns 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

```

null-txn.sql

```

-- TPC-C Null Txn Stored Procs
-- Microsoft TPC-C Kit
-- 8/17/99
--
-- 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 = 'OpGdOHjv8mR9vNI8V',
@c_street_2 = 'dzKcObBqbC3yu',
@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, @threshold
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

```

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=30
default=multi(0)disk(0)rdisk(0)partition(2)\WINNT
[operating systems]
multi(0)disk(0)rdisk(0)partition(2)\WINNT="Microsoft
Windows 2000 Server" /fastdetect
```

Microsoft SQL Server 2000

Configuration Parameters

```
-- File: CONFIG.SQL
-- Microsoft TPC-C Benchmark Kit Ver. 4.22
-- Copyright Microsoft, 2001
-- Purpose: Collects SQL Server configuration
parameters

print " "
select convert(char(30), getdate(),9)
print " "

-----
Nov 12 2002 10:59:04:223AM

(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 704 704
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 512 512
min server memory (MB)
0 2147483647 0 0
nested triggers
0 1 1 1
network packet size (B)
512 65536 2048 2048
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 60 60
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>
```

Benchcraft Profile

```
Profile: lilo_1580wh
File Path: C:\Benchcraft\lilo_1580wh.pro
Version: 3
```

Number of Engines: 2

Name: cr11b
 Description:
 Directory: c:\temp\cr11b.log
 Machine: n10
 Parameter Set: 1.05 better
 Index: 100000000
 Seed: 18546
 Configured Users: 7900
 Pipe Name: DRIVER53164609
 Connect Rate: 4111
 Start Rate: 4111
 Max. Concurrency: 7900
 Concurrency Rate: 0
 CLIENT_NURAND: 233
 CPU: 1

Name: cr11
 Description:
 Directory: c:\temp\cr11.log
 Machine: n10
 Parameter Set: 1.05 better
 Index: 200000000
 Seed: 18546
 Configured Users: 7900
 Pipe Name: DRIVER44265281
 Connect Rate: 4111
 Start Rate: 4111
 Max. Concurrency: 7900
 Concurrency Rate: 0
 CLIENT_NURAND: 233
 CPU: 0

Number of User groups: 2

Driver Engine: cr11
 IIS Server: cr11
 SQL Server: lilo
 Database: tpcc
 User: sa
 Protocol: HTML
 w_id Range: 1 - 790
 w_id Min Warehouse: 1
 w_id Max Warehouse: 1580
 Scale: Normal
 User Count: 7900
 District id: 1
 Scale Down: No

Driver Engine: cr11b
 IIS Server: cr11
 SQL Server: lilo
 Database: tpcc
 User: sa
 Protocol: HTML
 w_id Range: 791 - 1580
 w_id Min Warehouse: 1
 w_id Max Warehouse: 1580
 Scale: Normal
 User Count: 7900
 District id: 1
 Scale Down: No

Number of Parameter Sets: 65

~Default
Default Parameter Set

| Key | RT | RT | Menu | Txn | Think |
|-------|-------|-------|--------------|--------|-------|
| Time | Delay | Fence | Delay | Weight | Time |
| | | | 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

| Key | RT | RT | Menu | Txn | Think |
|-------|-------|-------|--------------|--------|-------|
| Time | Delay | Fence | Delay | Weight | Time |
| | | | 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

| Key | RT | RT | Menu | Txn | Think |
|------|-------|-------|--------------|--------|-------|
| Time | Delay | Fence | Delay | Weight | Time |
| | | | 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%

| Key | RT | RT | Menu | Txn | Think |
|-------|-------|-------|-----------|--------|-------|
| Time | Delay | Fence | Delay | Weight | Time |
| | | | 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%

| Key | RT | RT | Menu | Txn | Think |
|-------|-------|-------|--------------|--------|-------|
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 16.00 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 16.00 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 9.00 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 9.00 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 14.00 | 2.01 | | 0.10 | 5.00 | 0.10 |

3.0

| Key | RT | RT | Menu | Txn | Think |
|-------|-------|-------|--------------|--------|-------|
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 36.15 | 0.00 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 36.15 | 0.00 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 15.15 | 0.00 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 15.15 | 0.00 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 30.15 | 0.00 | | 0.10 | 5.00 | 0.10 |

4.0
4.0 tt

| Key | RT | RT | Menu | Txn | Think |
|-------|-------|-------|--------------|--------|-------|
| Time | Delay | Fence | Delay | Weight | Time |
| | | | 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

| Key | RT | RT | Menu | Txn | Think |
|-------|-------|-------|-----------|--------|-------|
| Time | Delay | Fence | Delay | Weight | Time |
| | | | 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 |

| Time | Delay | Fence | Delay | Weight | Time |
|-------|-------|-------|--------------|--------|-------|
| | | | New Order | 44.75 | |
| 45.70 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 45.70 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 19.10 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 19.10 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 38.10 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 3.6 | | |
| | | | 3.6 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 43.30 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 43.30 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 18.10 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 18.10 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 36.18 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 3.4 | | |
| | | | 3.4 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 40.90 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 40.90 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 17.10 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 17.10 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 17.10 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 3.2 | | |
| | | | 3.2 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 36.00 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 36.00 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 15.00 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 15.00 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 30.00 | 2.01 | | 0.10 | 5.00 | 0.10 |

| | | | | | |
|-------|-------|-------|--------------|--------|-------|
| | | | | 2.8 | |
| | | | | 2.8 tt | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 33.74 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 33.74 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 14.14 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 14.14 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 28.14 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 2.6 | | |
| | | | 2.6 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 31.30 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 31.30 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 13.10 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 13.10 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 26.10 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 2.4 | | |
| | | | 2.4 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 28.90 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 28.90 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 12.10 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 12.10 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 24.10 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 2.2 | | |
| | | | 2.2 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 28.90 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 28.90 | 3.01 | | 0.10 | 5.00 | 0.10 |

| | | | | | |
|-------|-------|-------|--------------|----------|-------|
| | | | | Delivery | 4.05 |
| 12.10 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 12.10 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 24.12 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 2.0 | | |
| | | | 2.0 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 24.10 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 24.10 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 10.10 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 10.10 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 20.10 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 5.0 | | |
| | | | 5.0 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 60.25 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 60.25 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 25.25 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 25.25 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 50.25 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 4.5 | | |
| | | | 4.5 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 54.20 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 54.20 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 22.70 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 22.70 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 45.20 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 3.5 | | |
| | | | 3.5 tt | | |
| Key | RT | RT | Menu | Txn | Think |

| Time | Delay | Fence | Delay | Weight | Time |
|-------|-------|-------|--------------|--------|-------|
| | | | New Order | 44.75 | |
| 42.10 | 18.01 | 0.10 | 5.00 | 0.10 | |
| | | | Payment | 43.10 | |
| 42.10 | 3.01 | 0.10 | 5.00 | 0.10 | |
| | | | Delivery | 4.05 | |
| 17.60 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | Stock Level | 4.05 | |
| 17.60 | 2.01 | 0.10 | 20.00 | 0.10 | |
| | | | Order Status | 4.05 | |
| 35.10 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | 1.8 | | |
| | | | 1.8 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 21.60 | 18.01 | 0.10 | 5.00 | 0.10 | |
| | | | Payment | 43.10 | |
| 21.60 | 3.01 | 0.10 | 5.00 | 0.10 | |
| | | | Delivery | 4.05 | |
| 9.09 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | Stock Level | 4.05 | |
| 9.09 | 2.01 | 0.10 | 20.00 | 0.10 | |
| | | | Order Status | 4.05 | |
| 18.09 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | 4.2 | | |
| | | | 4.2 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 54.20 | 18.01 | 0.10 | 5.00 | 0.10 | |
| | | | Payment | 43.10 | |
| 54.20 | 3.01 | 0.10 | 5.00 | 0.10 | |
| | | | Delivery | 4.05 | |
| 22.70 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | Stock Level | 4.05 | |
| 22.70 | 2.01 | 0.10 | 20.00 | 0.10 | |
| | | | Order Status | 4.05 | |
| 45.20 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | 1.6 | | |
| | | | 1.6 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 18.00 | 18.01 | 0.10 | 5.00 | 0.10 | |
| | | | Payment | 43.10 | |
| 18.00 | 3.01 | 0.10 | 5.00 | 0.10 | |
| | | | Delivery | 4.05 | |
| 7.30 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | Stock Level | 4.05 | |
| 7.30 | 2.01 | 0.10 | 20.00 | 0.10 | |
| | | | Order Status | 4.05 | |
| 15.20 | 2.01 | 0.10 | 5.00 | 0.10 | |

| Time | Delay | Fence | Delay | Weight | Time |
|-------|-------|-------|--------------|--------|-------|
| | | | New Order | 44.75 | |
| 16.87 | 18.01 | 0.10 | 5.00 | 0.10 | |
| | | | Payment | 43.10 | |
| 16.87 | 3.01 | 0.10 | 5.00 | 0.10 | |
| | | | Delivery | 4.05 | |
| 7.07 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | Stock Level | 4.05 | |
| 7.07 | 2.01 | 0.10 | 20.00 | 0.10 | |
| | | | Order Status | 4.05 | |
| 14.07 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | 1.2 | | |
| | | | 1.2 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 14.46 | 18.01 | 0.10 | 5.00 | 0.10 | |
| | | | Payment | 43.05 | |
| 14.46 | 3.01 | 0.10 | 5.00 | 0.10 | |
| | | | Delivery | 4.04 | |
| 6.06 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | Stock Level | 4.04 | |
| 6.06 | 2.01 | 0.10 | 20.00 | 0.10 | |
| | | | Order Status | 4.04 | |
| 12.06 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | 3.5 | | |
| | | | 3.5 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 42.10 | 18.01 | 0.10 | 5.00 | 0.10 | |
| | | | Payment | 43.10 | |
| 42.10 | 3.01 | 0.10 | 5.00 | 0.10 | |
| | | | Delivery | 4.05 | |
| 17.60 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | Stock Level | 4.05 | |
| 17.60 | 2.01 | 0.10 | 20.00 | 0.10 | |
| | | | Order Status | 4.05 | |
| 35.10 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | 1.9 | | |
| | | | 1.9 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 22.89 | 18.01 | 0.10 | 5.00 | 0.10 | |
| | | | Payment | 43.10 | |
| 22.89 | 3.01 | 0.10 | 5.00 | 0.10 | |

| Time | Delay | Fence | Delay | Weight | Time |
|-------|-------|-------|----------------|--------|-------|
| | | | New Order | 44.83 | |
| 9.59 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | Stock Level | 4.05 | |
| 9.59 | 2.01 | 0.10 | 20.00 | 0.10 | |
| | | | Order Status | 4.05 | |
| 19.09 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | 1.1 | | |
| | | | 1.1 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 13.25 | 18.01 | 0.10 | 5.00 | 0.10 | |
| | | | Payment | 43.05 | |
| 13.25 | 3.01 | 0.10 | 5.00 | 0.10 | |
| | | | Delivery | 4.04 | |
| 5.55 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | Stock Level | 4.04 | |
| 5.55 | 2.01 | 0.10 | 20.00 | 0.10 | |
| | | | Order Status | 4.04 | |
| 11.05 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | 1.05 better | | |
| | | | 1.05 tt better | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.92 | |
| 12.65 | 18.01 | 0.10 | 5.00 | 0.10 | |
| | | | Payment | 43.01 | |
| 12.65 | 3.01 | 0.10 | 5.00 | 0.10 | |
| | | | Delivery | 4.02 | |
| 5.30 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | Stock Level | 4.03 | |
| 5.30 | 2.01 | 0.10 | 20.00 | 0.10 | |
| | | | Order Status | 4.02 | |
| 10.55 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | 1.09 | | |
| | | | 1.09 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 13.13 | 18.01 | 0.10 | 5.00 | 0.10 | |
| | | | Payment | 43.05 | |
| 13.13 | 3.01 | 0.10 | 5.00 | 0.10 | |
| | | | Delivery | 4.04 | |
| 5.50 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | Stock Level | 4.04 | |
| 5.50 | 2.01 | 0.10 | 20.00 | 0.10 | |
| | | | Order Status | 4.04 | |
| 10.95 | 2.01 | 0.10 | 5.00 | 0.10 | |
| | | | 1.08 | | |
| | | | 1.08 tt | | |
| Key | RT | RT | Menu | Txn | Think |

| Time | Delay | Fence | Delay | Weight | Time |
|-------|-------|-------|--------------|--------|-------|
| | | | New Order | 44.83 | |
| 13.01 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 13.01 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 5.45 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 5.45 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 10.85 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.07 | | |
| | | | 1.07 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 12.89 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 12.89 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 5.40 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 5.40 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 10.75 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.06 | | |
| | | | 1.06 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 12.77 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 12.77 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 5.35 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 5.35 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 10.65 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.15 | | |
| | | | 1.15 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 13.85 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 13.85 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 5.80 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 5.80 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 11.55 | 2.01 | | 0.10 | 5.00 | 0.10 |

| Key | RT | RT | Menu | Txn | Think |
|-------|-------|-------|--------------|--------|-------|
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 15.06 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 15.06 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 6.31 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 6.31 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 12.56 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.3 | | |
| | | | 1.3 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 15.66 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 15.66 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 6.56 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 6.56 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 13.06 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.12 | | |
| | | | 1.12 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 13.49 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 13.49 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 5.65 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 5.65 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 11.25 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.18 | | |
| | | | 1.18 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 14.21 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 14.21 | 3.01 | | 0.10 | 5.00 | 0.10 |

| Key | RT | RT | Menu | Txn | Think |
|-------|-------|-------|--------------|--------|-------|
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 14.70 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 14.70 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 6.16 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 6.16 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 12.26 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.28 | | |
| | | | 1.28 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.75 | |
| 15.42 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.10 | |
| 15.42 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.05 | |
| 6.46 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.05 | |
| 6.46 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.05 | |
| 12.86 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.04 | | |
| | | | 1.04 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 12.53 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 12.53 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 5.25 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 5.25 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 10.45 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.03 | | |
| | | | 1.03 tt | | |
| Key | RT | RT | Menu | Txn | Think |

| Time | Delay | Fence | Delay | Weight | Time |
|-------|-------|-------|---------------|--------|-------|
| | | | New Order | 44.83 | |
| 12.41 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 12.41 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 5.20 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 5.20 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 10.35 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.02 | | |
| | | | 1.02 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 12.29 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 12.29 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 5.15 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 5.15 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 10.25 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.01 | | |
| | | | 1.01 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 12.17 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 12.17 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 5.10 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 5.10 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 10.15 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.005_best | | |
| | | | 1.005 tt best | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.96 | |
| 12.11 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.00 | |
| 12.11 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.00 | |
| 5.07 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.03 | |
| 5.07 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.01 | |
| 10.10 | 2.01 | | 0.10 | 5.00 | 0.10 |

| Time | Delay | Fence | Delay | Weight | Time |
|-------|-------|-------|--------------------------|--------|-------|
| | | | New Order | 44.96 | |
| 12.06 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.00 | |
| 12.06 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.00 | |
| 5.06 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.03 | |
| 5.06 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.01 | |
| 10.06 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.03_better | | |
| | | | 1.03 tt more aggressive | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.92 | |
| 12.41 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.01 | |
| 12.41 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.02 | |
| 5.20 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.03 | |
| 5.20 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.02 | |
| 10.35 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.005_better | | |
| | | | 1.005 tt more aggressive | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.92 | |
| 12.11 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.01 | |
| 12.11 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.02 | |
| 5.07 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.03 | |
| 5.07 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.02 | |
| 10.10 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.02_better | | |
| | | | 1.02 tt more aggressive | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.92 | |
| 12.29 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.01 | |
| 12.29 | 3.01 | | 0.10 | 5.00 | 0.10 |

| Time | Delay | Fence | Delay | Weight | Time |
|-------|-------|-------|--------------|--------|-------|
| | | | New Order | 44.96 | |
| 12.29 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.00 | |
| 12.29 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.00 | |
| 5.15 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.03 | |
| 5.15 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.01 | |
| 10.25 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.03_best | | |
| | | | 1.03 tt best | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.96 | |
| 12.41 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.01 | |
| 12.41 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.01 | |
| 5.20 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.01 | |
| 5.20 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.01 | |
| 10.35 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 5.5 | | |
| | | | 5.5 tt | | |
| Key | RT | RT | Menu | Txn | Think |

| Time | Delay | Fence | Delay | Weight | Time |
|-------|-------|-------|--------------|--------|-------|
| | | | New Order | 44.83 | |
| 66.28 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 66.28 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 27.77 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 27.77 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 55.27 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 6.0 | | |
| | | | 6.0 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 72.30 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 72.30 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 30.30 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 30.30 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 60.30 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 6.5 | | |
| | | | 6.5 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 79.53 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 79.53 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 33.33 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 33.33 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 66.33 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 7.0 | | |
| | | | 7.0 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 84.35 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 84.35 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 35.35 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 35.35 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 70.35 | 2.01 | | 0.10 | 5.00 | 0.10 |

| Key | RT | RT | Menu | Txn | Think |
|--------|-------|-------|--------------|--------|-------|
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 90.38 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 90.38 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 37.88 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 37.88 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 75.38 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 8.0 | | |
| | | | 8.0 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 96.40 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 96.40 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 40.40 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 40.40 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 80.40 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 8.5 | | |
| | | | 8.5 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 102.43 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 192.43 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 42.92 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 42.92 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 85.42 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 9.0 | | |
| | | | 9.0 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 108.45 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 108.45 | 3.01 | | 0.10 | 5.00 | 0.10 |

| Key | RT | RT | Menu | Txn | Think |
|--------|-------|-------|----------------------|--------|-------|
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 45.45 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 45.45 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 90.45 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 9.5 | | |
| | | | 9.5 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 114.47 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 114.47 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 47.98 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 47.98 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 95.47 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 10 | | |
| | | | 10 tt | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.83 | |
| 120.50 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.05 | |
| 120.50 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.04 | |
| 50.50 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.04 | |
| 50.50 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.04 | |
| 100.50 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.02 better | | |
| | | | 1.02 more aggressive | | |
| Key | RT | RT | Menu | Txn | Think |
| | | | | Weight | Time |
| Time | Delay | Fence | Delay | Weight | Time |
| | | | New Order | 44.92 | |
| 12.05 | 18.01 | | 0.10 | 5.00 | 0.10 |
| | | | Payment | 43.01 | |
| 12.05 | 3.01 | | 0.10 | 5.00 | 0.10 |
| | | | Delivery | 4.02 | |
| 5.05 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | Stock Level | 4.03 | |
| 5.05 | 2.01 | | 0.10 | 20.00 | 0.10 |
| | | | Order Status | 4.02 | |
| 10.05 | 2.01 | | 0.10 | 5.00 | 0.10 |
| | | | 1.01 better | | |
| | | | 1.01 more aggressive | | |
| Key | RT | RT | Menu | Txn | Think |


```
"WbemAdapStatus"=dword:00000000
"Last Counter"=dword:00000af4
"Last Help"=dword:00000af5
"First Counter"=dword:00000a52
"First Help"=dword:00000a53
"Library Validation
Code"=hex:c2,10,7e,95,d8,81,c2,01,10,1d,00,00,00,00,0,00
```

```
[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,00,01,01,00,00,00,01,00,00,\
```

```
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\00000"
"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"="lilo"
"DbName"="tpcc"
"DbUser"="sa"
```

```
"DbPassword"=""
"COM_SinglePool"="YES"
```

Server Bus Performance Driver Registry Parameters

```
Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\hpqcissb
Class Name: <NO CLASS>
Last Write Time: 11/11/2002 - 5:12 PM
Value 0
```

```
Name: Type
Type: REG_DWORD
Data: 0x1
```

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

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

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

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

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

```
Value 6
Name: Group
Type: REG_SZ
Data: port
```

```
Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\hpqcissb\Parameters
Class Name: <NO CLASS>
Last Write Time: 11/8/2002 - 8:53 AM
Value 0
Name: CompletionMode
```

```
Type: REG_DWORD
Data: 0x2
```

```
Value 1
Name: CosTimerRate
Type: REG_DWORD
Data: 0x4
```

```
Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\hpqcissb\Parameters\Controller2
Class Name: <NO CLASS>
Last Write Time: 11/5/2002 - 1:45 PM
Value 0
```

```
Name: CompletionMode
Type: REG_DWORD
Data: 0x1
```

```
Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\hpqcissb\Security
Class Name: <NO CLASS>
Last Write Time: 11/5/2002 - 1:34 PM
Value 0
```

```
Name: Security
Type: REG_BINARY
Data:
```

```
00000000 01 00 14 80 90 00 00 00 - 9c 00 00 00 14
00 00 00 .....
00000010 30 00 00 00 02 00 1c 00 - 01 00 00 00 02
80 14 00 0.....
00000020 ff 01 0f 00 01 01 00 00 - 00 00 00 01 00
00 00 00 Ÿ.....
00000030 02 00 60 00 04 00 00 00 - 00 00 14 00 fd
01 02 00 ..`.....Ÿ...
00000040 01 01 00 00 00 00 00 05 - 12 00 00 00 00
00 18 00 .....
00000050 ff 01 0f 00 01 02 00 00 - 00 00 00 05 20
00 00 00 Ÿ.....
00000060 20 02 00 00 00 14 00 - 8d 01 02 00 01
01 00 00 .....
00000070 00 00 00 05 0b 00 00 00 - 00 00 18 00 fd
01 02 00 .....Ÿ...
00000080 01 02 00 00 00 00 00 05 - 20 00 00 00 23
02 00 00 .....#...
00000090 01 01 00 00 00 00 00 05 - 12 00 00 00 01
01 00 00 .....
00 00 00 05 12 00 00 00 -
.....
```

```
Key Name:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\hpqcissb\Enum
Class Name: <NO CLASS>
Last Write Time: 11/11/2002 - 5:12 PM
Value 0
Name: 0
Type: REG_SZ
```

```

Data:
PCI\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_02\3&29e819
82&0&08

Value 1
Name:          Count
Type:         REG_DWORD
Data:         0x3

Value 2
Name:          NextInstance
Type:         REG_DWORD
Data:         0x3

Value 3
Name:          1
Type:         REG_SZ
Data:

PCI\VEN_0E11&DEV_B060&SUBSYS_40700E11&REV_02\3&172e68
dd&0&08

Value 4
Name:          2
Type:         REG_SZ
Data:

PCI\VEN_0E11&DEV_0046&SUBSYS_409B0E11&REV_01\3&172e68
dd&0&10

```

System Summary

System Information report written at: 07/10/03
18:08:26
System Name: LILO
[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   LILO
System Manufacturer   Compaq
System Model   ProLiant ML370 G3
System Type   X86-based PC
Processor x86 Family 15 Model 2 Stepping 5
GenuineIntel ~3065 Mhz
Processor x86 Family 15 Model 2 Stepping 5
GenuineIntel ~3065 Mhz
BIOS Version/Date   Compaq P28, 5/5/2003
SMBIOS Version      2.3
Windows Directory  C:\WINDOWS.0
System Directory   C:\WINDOWS.0\system32
Boot Device        \Device\HarddiskVolume9
Locale             United States

```

```

Hardware Abstraction Layer   Version = "5.2.3790.0
(srv03_rtm.030324-2048)"
User Name LIL0\Administrator
Time Zone Central Daylight Time
Total Physical Memory       2,048.00 MB
Available Physical Memory   1.83 GB
Total Virtual Memory        5.92 GB
Available Virtual Memory    5.65 GB
Page File Space             3.92 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 Standard VGA
Graphics Adapter

Memory Address 0xF7F00000-0xF7FFFFFF PCI bus
Memory Address 0xF7F00000-0xF7FFFFFF Smart Array
642 Controller (Non-Miniport)

I/O Port 0x00006000-0x000064FF PCI bus
I/O Port 0x00006000-0x000064FF Smart Array
642 Controller (Non-Miniport)

I/O Port 0x00003000-0x000034FF PCI bus
I/O Port 0x00003000-0x000034FF Compaq 64-
bit/66MHz Dual Channel Wide Ultra3 SCSI
Adapter

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

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

Memory Address 0xF5F00000-0xF6FFFFFF PCI bus
Memory Address 0xF5F00000-0xF6FFFFFF Base System
Device

I/O Port 0x000003B0-0x000003BB PCI bus
I/O Port 0x000003B0-0x000003BB Standard VGA
Graphics Adapter

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 Standard VGA Graphics
Adapter OK
0x000003C0-0x000003DF PCI bus OK
0x000003C0-0x000003DF Standard VGA Graphics
Adapter OK
0x00002400-0x000024FF Standard VGA Graphics
Adapter OK
0x00001800-0x000018FF Base System Device OK
0x00002800-0x000028FF Base System Device 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

```

```

0x0000010-0x000001F 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

0x00000378-0x0000037F Printer Port (LPT1) OK

0x000003F8-0x000003FF Communications Port
(COM1) OK
0x000002F8-0x000002FF Communications Port
(COM2) 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
0x00003000-0x000034FF PCI bus OK
0x00003000-0x000034FF Compaq 64-bit/66MHz
Dual Channel Wide Ultra3 SCSI Adapter OK
0x00003400-0x000034FF Compaq 64-bit/66MHz
Dual Channel Wide Ultra3 SCSI Adapter OK
0x00004000-0x000040FF PCI bus OK
0x00004000-0x000040FF Smart Array 642
Controller (Non-Miniport) OK
0x00005000-0x000050FF PCI bus OK
0x00005000-0x000050FF Smart Array 641
Controller (Non-Miniport) OK
0x00006000-0x000064FF PCI bus OK
0x00006000-0x000064FF Smart Array 642
Controller (Non-Miniport) OK
0x00006400-0x000064FF Smart Array 642
Controller (Non-Miniport) OK

[IRQs]

Resource Device Status
IRQ 9 Microsoft ACPI-Compliant System OK

IRQ 5 Base System Device OK
IRQ 15 Base System Device OK
IRQ 0 System timer OK
IRQ 1 Standard 101/102-Key or Microsoft Natural
PS/2 Keyboard OK
IRQ 12 PS/2 Compatible Mouse OK
IRQ 4 Communications Port (COM1) OK
IRQ 3 Communications Port (COM2) OK
IRQ 6 Standard floppy disk controller OK

IRQ 14 Primary IDE Channel OK
IRQ 30 Compaq 64-bit/66MHz Dual Channel Wide
Ultra3 SCSI Adapter OK
IRQ 31 Compaq 64-bit/66MHz Dual Channel Wide
Ultra3 SCSI Adapter OK
IRQ 29 BCM5703 Gigabit Ethernet OK
IRQ 18 Smart Array 642 Controller (Non-Miniport)
OK
IRQ 26 Smart Array 641 Controller (Non-Miniport)
OK
IRQ 20 Smart Array 642 Controller (Non-Miniport)
OK
IRQ 22 Smart Array 642 Controller (Non-Miniport)
OK

[Memory]

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

0xF5F00000-0xF6FFFFFF PCI bus OK
0xF5F00000-0xF6FFFFFF Base System Device OK

```

```

0xF6000000-0xF6FFFFFF Standard VGA Graphics
Adapter OK
0xF5FF0000-0xF5FF0FFF Standard VGA Graphics
Adapter OK
0xF5FE0000-0xF5FE01FF Base System Device OK

0xF5FD0000-0xF5FD07FF Base System Device OK

0xF5FC0000-0xF5FC1FFF Base System Device OK

0xF7C00000-0xF7CFFFFF PCI bus OK
0xF7CF0000-0xF7CF0FFF Compaq 64-bit/66MHz
Dual Channel Wide Ultra3 SCSI Adapter OK
0xF7CE0000-0xF7CE0FFF Compaq 64-bit/66MHz
Dual Channel Wide Ultra3 SCSI Adapter OK
0xF7CD0000-0xF7CDFFFF BCM5703 Gigabit
Ethernet OK
0xF7D00000-0xF7DFFFFF PCI bus OK
0xF7DF0000-0xF7DF1FFF Smart Array 642
Controller (Non-Miniport) OK
0xF7D80000-0xF7DBFFFF Smart Array 642
Controller (Non-Miniport) OK
0xF7E00000-0xF7EFFFFF PCI bus OK
0xF7EF0000-0xF7EF1FFF Smart Array 641
Controller (Non-Miniport) OK
0xF7E80000-0xF7EBFFFF Smart Array 641
Controller (Non-Miniport) OK
0xF7F00000-0xF7FFFFFF PCI bus OK
0xF7F00000-0xF7FFFFFF Smart Array 642
Controller (Non-Miniport) OK
0xF7FF0000-0xF7FF1FFF Smart Array 642
Controller (Non-Miniport) OK
0xF7F80000-0xF7FBFFFF Smart Array 642
Controller (Non-Miniport) OK
0xF7F70000-0xF7F71FFF Smart Array 642
Controller (Non-Miniport) OK

[Components]

[Multimedia]

[Audio Codecs]

CODEC Manufacturer Description
Status File Version Size
Creation Date
c:\windows.0\system32\sl_anet.acm Sipro Lab
Telecom Inc. Sipro Lab Telecom Audio Codec OK
C:\WINDOWS.0\system32\SL_ANET.ACM
3.02 84.00 KB (86,016 bytes)
3/25/2003 12:00 AM
c:\windows.0\system32\msaud32.acm Microsoft
Corporation Windows Media Audio Codec OK
C:\WINDOWS.0\system32\MSAUD32.ACM
8.00.00.4487 288.00 KB (294,912
bytes) 3/25/2003 12:00 AM
c:\windows.0\system32\msg711.acm Microsoft
Corporation OK
C:\WINDOWS.0\system32\MSG711.ACM

```

```

5.2.3790.0 (srv03_rtm.030324-2048)
12:00 AM 10.00 KB (10,240 bytes) 3/25/2003
c:\windows.0\system32\imaadp32.acm Microsoft Corporation
OK
C:\WINDOWS.0\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.0\system32\l3codeca.acm Fraunhofer Institut Integrierte Schaltungen IIS Fraunhofer IIS MPEG Layer-3 Codec
OK
C:\WINDOWS.0\system32\L3CODECA.ACM 1, 9, 0, 0305 284.00 KB (290,816 bytes)
3/25/2003 12:00 AM
c:\windows.0\system32\msg723.acm Microsoft Corporation
OK
C:\WINDOWS.0\system32\MSG723.ACM
4.4.4000 116.00 KB (118,784 bytes)
5/14/2003 5:00 PM
c:\windows.0\system32\tssoft32.acm DSP GROUP, INC.
OK
C:\WINDOWS.0\system32\TSSOFT32.ACM
1.01 9.50 KB (9,728 bytes)
3/25/2003 12:00 AM
c:\windows.0\system32\msadp32.acm Microsoft Corporation
OK
C:\WINDOWS.0\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.0\system32\msgsm32.acm Microsoft Corporation
OK
C:\WINDOWS.0\system32\MSGSM32.ACM
5.2.3790.0 (srv03_rtm.030324-2048)
20.50 KB (20,992 bytes) 3/25/2003
12:00 AM

[Video Codecs]

CODEC Manufacturer Description
Status File Version Size
Creation Date
c:\windows.0\system32\msh261.drv Microsoft Corporation
OK
C:\WINDOWS.0\system32\MSH261.DRV
4.4.4000 180.00 KB (184,320 bytes)
5/14/2003 5:00 PM
c:\windows.0\system32\msyuv.dll Microsoft Corporation
OK
C:\WINDOWS.0\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.0\system32\msvidc32.dll Microsoft Corporation
OK
C:\WINDOWS.0\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.0\system32\msh263.drv Microsoft Corporation
OK
C:\WINDOWS.0\system32\MSH263.DRV

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4.4.4000 284.00 KB (290,816 bytes)
3/24/2003 7:46 PM
c:\windows.0\system32\iyuv_32.dll Microsoft Corporation
OK
C:\WINDOWS.0\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.0\system32\msrle32.dll Microsoft Corporation
OK
C:\WINDOWS.0\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.0\system32\tsbyuv.dll Microsoft Corporation
OK
C:\WINDOWS.0\system32\TSBYUV.DLL
5.2.3790.0 (srv03_rtm.030324-2048)
8.00 KB (8,192 bytes) 3/24/2003
7:50 PM

[CD-ROM]

Item Value
Drive E:
Description CD-ROM Drive
Media Loaded No
Media Type CD-ROM
Name COMPAQ CD-ROM LTN486S
Manufacturer (Standard CD-ROM drives)
Status OK
Transfer Rate Not Available
SCSI Target ID 1
PNP Device ID IDE\CDROMCOMPAQ_CD-ROM_LTN486S_____YQSD____\5\FB0C83D&0&0.1.0
Driver c:\windows.0\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 Standard VGA Graphics Adapter
PNP Device ID PCI\VEN_1002&DEV_4752&SUBSYS_001E0E11&REV_27\3&267A616A&0&18
Adapter Type ATI MACH64, (Standard display types) compatible
Adapter Description Standard VGA Graphics Adapter
Adapter RAM 7.94 MB (8,323,072 bytes)
Installed Drivers vga.dll,framebuf.dll,vga256.dll,vga64k.dll

Driver Version 5.2.3790.0
INF File display.inf (vga section)
Color Planes 1
Color Table Entries 65536
Resolution 800 x 600 x 1 hertz

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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.0\system32\drivers\vgapnp.sys (5.2.3790.0 (srv03_rtm.030324-2048), 23.00 KB (23,552 bytes), 5/15/2003 3:11 PM)

[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.0\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.0\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} BCM5703 Gigabit Ethernet
Adapter Type Ethernet 802.3

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Product Type      BCM5703 Gigabit Ethernet
Installed Yes
PNP Device ID
PCI\VEN_14E4&DEV_16A7&SUBSYS_00CB0E11&REV_0
2\3&l3C0B0C5&0&20
Last Reset       7/10/2003 6:06 PM
Index           1
Service Name     b57w2k
IP Address       130.168.209.46
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:FF:2E:E0
Memory Address   0xF7CD0000-0xF7CDFFFF
IRQ Channel      IRQ 29
Driver           c:\windows.0\system32\drivers\b57xp32.sys
(2.91.0.0 built by: WindDK, 137.00 KB (140,288
bytes), 5/14/2003 11:53 AM)

Name [00000002] RAS Async Adapter
Adapter Type     Not Available
Product Type     RAS Async Adapter
Installed Yes
PNP Device ID   Not Available
Last Reset      7/10/2003 6:06 PM
Index          2
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 [00000003] WAN Miniport (L2TP)
Adapter Type     Not Available
Product Type     WAN Miniport (L2TP)
Installed Yes
PNP Device ID   ROOT\MS_L2TPMINIPORT\0000
Last Reset      7/10/2003 6:06 PM
Index          3
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.0\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 [00000004] WAN Miniport (PPTP)
Adapter Type     Wide Area Network (WAN)
Product Type     WAN Miniport (PPTP)
Installed Yes

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PNP Device ID     ROOT\MS_PPTPMINIPORT\0000
Last Reset       7/10/2003 6:06 PM
Index           4
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.0\system32\drivers\raspppt.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 70.50 KB (72,192
bytes), 3/25/2003 12:00 AM)

Name [00000005] 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      7/10/2003 6:06 PM
Index          5
Service Name     Rasppoe
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.0\system32\drivers\rasppoe.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 38.00 KB (38,912
bytes), 3/25/2003 12:00 AM)

Name [00000006] Direct Parallel
Adapter Type     Not Available
Product Type     Direct Parallel
Installed Yes
PNP Device ID   ROOT\MS_PTMINIPORT\0000
Last Reset      7/10/2003 6:06 PM
Index          6
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.0\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 [00000007] WAN Miniport (IP)
Adapter Type     Not Available
Product Type     WAN Miniport (IP)
Installed Yes
PNP Device ID   ROOT\MS_NDISWANIP\0000
Last Reset      7/10/2003 6:06 PM
Index          7

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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.0\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      MSFDF 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      MSFDF 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

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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_{6798A982-E2D7-4827-835B-A68BACCF668}] 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_{6798A982-E2D7-4827-835B-A68BACCF668}] 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

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

Name MSAFD NetBIOS
[\Device\NetBT_Tcpip_{5DBF478C-94D2-479E-973D-5B485792159A}] 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_{5DBF478C-94D2-479E-973D-5B485792159A}] 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_{C00B20B8-E433-4CBC-AC68-37F94150D27A}] 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

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

Name MSAFD NetBIOS
[\Device\NetBT_Tcpip_{C00B20B8-E433-4CBC-AC68-37F94150D27A}] DATAGRAM 2
Connectionless Service Yes
Guarantees Delivery No
Guarantees Sequencing No
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)

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

[WinSock]

Item Value
File c:\windows.0\system32\winsock.dll
Size 2.80 KB (2,864 bytes)
Version 3.10

File c:\windows.0\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

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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.0\system32\drivers\serial.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 76.00 KB (77,824
bytes), 3/25/2003 12:00 AM)

Name      Communications Port (COM2)
Status    OK
PNP Device ID      ACPI\PNP0501\1
Maximum Input Buffer Size 0
Maximum Output Buffer Size No
Settable Baud Rate Yes
Settable Data Bits Yes
Settable Flow Control Yes
Settable Parity Yes
Settable Parity Check Yes
Settable Stop Bits Yes
Settable RLSD Yes
Supports RLSD Yes
Supports 16 Bit Mode No
Supports Special Characters No
Baud Rate 9600
Bits/Byte 8
Stop Bits 1
Parity None
Busy No
Abort Read/Write on Error  No
Binary Mode Enabled Yes
Continue XMit on XOff      No
CTS Outflow Control No
Discard NULL Bytes No
DSR Outflow Control 0
DSR Sensitivity 0
DTR Flow Control Type      Enable
EOF Character 0
Error Replace Character 0
Error Replacement Enabled No
Event Character 0
Parity Check Enabled      No
RTS Flow Control Type      Enable
Xoff Character 19

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XOffXMit Threshold 512
XOn Character 17
XOnXMit Threshold 2048
XOnXOff InFlow Control 0
XOnXOff OutFlow Control 0
IRQ Channel      IRQ 3
I/O Port 0x000002F8-0x000002FF
Driver c:\windows.0\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
Name      LPT1
PNP Device ID      ACPI\PNP0400\5&13237358&0
I/O Port 0x00000378-0x0000037F
Driver c:\windows.0\system32\drivers\parport.sys
(5.2.3790.0 (srv03_rtm.030324-2048), 76.50 KB (78,336
bytes), 3/24/2003 5:04 PM)

[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 16.94 GB (18,186,092,544 bytes)
Free Space 12.29 GB (13,192,896,512 bytes)

Volume Name
Volume Serial Number 2497BA6A

Drive E:
Description CD-ROM Disc

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:

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

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

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

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

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

Drive Z:
Description Network Connection
Provider Name \\inforb\audit_fdr

[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 67.83 GB (72,826,629,120 bytes)
 Total Cylinders 8,854
 Total Sectors 142,239,510
 Total Tracks 2,257,770
 Tracks/Cylinder 255
 Partition Disk #3, Partition #0
 Partition Size 67.83 GB (72,826,596,864 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 31.25 GB (33,550,917,120 bytes)
 Total Cylinders 4,079
 Total Sectors 65,529,135
 Total Tracks 1,040,145
 Tracks/Cylinder 255
 Partition Disk #7, Partition #0
 Partition Size 31.25 GB (33,550,884,864 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 15.62 GB (16,771,345,920 bytes)
 Total Cylinders 2,039
 Total Sectors 32,756,535
 Total Tracks 519,945
 Tracks/Cylinder 255
 Partition Disk #8, Partition #0
 Partition Size 15.62 GB (16,771,313,664 bytes)

Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE9
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 0
 SCSI Bus Not Available
 SCSI Logical Unit Not Available

SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 95.23 GB (102,256,680,960 bytes)
 Total Cylinders 12,432
 Total Sectors 199,720,080
 Total Tracks 3,170,160
 Tracks/Cylinder 255

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 31.25 GB (33,550,917,120 bytes)
 Total Cylinders 4,079
 Total Sectors 65,529,135
 Total Tracks 1,040,145
 Tracks/Cylinder 255
 Partition Disk #0, Partition #0
 Partition Size 31.25 GB (33,550,884,864 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 15.62 GB (16,771,345,920 bytes)
 Total Cylinders 2,039
 Total Sectors 32,756,535
 Total Tracks 519,945
 Tracks/Cylinder 255
 Partition Disk #1, Partition #0
 Partition Size 15.62 GB (16,771,313,664 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 0
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available

SCSI Target ID Not Available
 Sectors/Track 63
 Size 95.23 GB (102,256,680,960 bytes)
 Total Cylinders 12,432
 Total Sectors 199,720,080
 Total Tracks 3,170,160
 Tracks/Cylinder 255

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 31.25 GB (33,550,917,120 bytes)
 Total Cylinders 4,079
 Total Sectors 65,529,135
 Total Tracks 1,040,145
 Tracks/Cylinder 255
 Partition Disk #4, Partition #0
 Partition Size 31.25 GB (33,550,884,864 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 15.62 GB (16,771,345,920 bytes)
 Total Cylinders 2,039
 Total Sectors 32,756,535
 Total Tracks 519,945
 Tracks/Cylinder 255
 Partition Disk #5, Partition #0
 Partition Size 15.62 GB (16,771,313,664 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 0
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available

Sectors/Track 63
 Size 95.23 GB (102,256,680,960 bytes)
 Total Cylinders 12,432
 Total Sectors 199,720,080
 Total Tracks 3,170,160
 Tracks/Cylinder 255

Description Disk drive
 Manufacturer (Standard disk drives)
 Model COMPAQ BD0186459A SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 2
 SCSI Bus 0
 SCSI Logical Unit 0
 SCSI Port 3
 SCSI Target ID 0
 Sectors/Track 63
 Size 16.95 GB (18,202,544,640 bytes)
 Total Cylinders 2,213
 Total Sectors 35,551,845
 Total Tracks 564,315
 Tracks/Cylinder 255
 Partition Disk #10, Partition #0
 Partition Size 7.81 MB (8,193,024 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #10, Partition #1
 Partition Size 16.94 GB (18,186,094,080 bytes)

Partition Starting Offset 8,225,280 bytes

[SCSI]

Item Value
 Name Compaq 64-bit/66MHz Dual Channel Wide
 Ultra3 SCSI Adapter
 Manufacturer Adaptec
 Status OK
 PNP Device ID
 PCI\VEN_9005&DEV_00C0&SUBSYS_F6200E11&REV_0
 1\3&13C0B0C5&0&18
 I/O Port 0x00003000-0x000034FF
 Memory Address 0xF7CF0000-0xF7CF0FFF
 IRQ Channel IRQ 30
 Driver c:\windows.0\system32\drivers\adpul60m.sys
 (RTC_XP07 (lab01_n(storbuild).010917-1031), 99.63 KB
 (102,016 bytes), 3/25/2003 12:00 AM)

Name Compaq 64-bit/66MHz Dual Channel Wide
 Ultra3 SCSI Adapter
 Manufacturer Adaptec
 Status OK
 PNP Device ID
 PCI\VEN_9005&DEV_00C0&SUBSYS_F6200E11&REV_0
 1\3&13C0B0C5&0&19
 I/O Port 0x00003400-0x000034FF
 Memory Address 0xF7CE0000-0xF7CE0FFF
 IRQ Channel IRQ 31
 Driver c:\windows.0\system32\drivers\adpul60m.sys
 (RTC_XP07 (lab01_n(storbuild).010917-1031), 99.63 KB
 (102,016 bytes), 3/25/2003 12:00 AM)

Name Smart Array 642 Controller (Non-Miniport)
 Manufacturer Hewlett-Packard
 Status OK
 PNP Device ID
 PCI\VEN_0E11&DEV_0046&SUBSYS_409B0E11&REV_0
 1\3&1070020&0&10
 Memory Address 0xF7DF0000-0xF7DF1FFF
 I/O Port 0x00004000-0x000040FF
 Memory Address 0xF7D80000-0xF7DBFFFF
 IRQ Channel IRQ 18
 Driver c:\windows.0\system32\drivers\hpgccissb.sys
 (5.5.59.32 built by: WinDDK, 35.50 KB (36,352 bytes),
 5/14/2003 5:14 PM)

Name Smart Array 641 Controller (Non-Miniport)
 Manufacturer Hewlett-Packard
 Status OK
 PNP Device ID
 PCI\VEN_0E11&DEV_0046&SUBSYS_409A0E11&REV_0
 1\3&29E81982&0&10
 Memory Address 0xF7EF0000-0xF7EF1FFF
 I/O Port 0x00005000-0x000050FF
 Memory Address 0xF7E80000-0xF7EBFFFF
 IRQ Channel IRQ 26
 Driver c:\windows.0\system32\drivers\hpgccissb.sys
 (5.5.59.32 built by: WinDDK, 35.50 KB (36,352 bytes),
 5/14/2003 5:14 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&172E68DD&0&08
 Memory Address 0xF7FF0000-0xF7FF1FFF
 I/O Port 0x00006000-0x000064FF
 Memory Address 0xF7F80000-0xF7FBFFFF
 IRQ Channel IRQ 20
 Driver c:\windows.0\system32\drivers\hpgccissb.sys
 (5.5.59.32 built by: WinDDK, 35.50 KB (36,352 bytes),
 5/14/2003 5:14 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&172E68DD&0&10
 Memory Address 0xF7F70000-0xF7F71FFF
 I/O Port 0x00006400-0x000064FF
 Memory Address 0xF7F00000-0xF7FFFFF
 IRQ Channel IRQ 22
 Driver c:\windows.0\system32\drivers\hpgccissb.sys
 (5.5.59.32 built by: WinDDK, 35.50 KB (36,352 bytes),
 5/14/2003 5:14 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.0\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.0\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.0\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

[Problem Devices]

| Device | PNP Device ID | Error Code |
|--------------------|---|--|
| Base System Device | PCI\VEN_0E11&DEV_B203&SUBSYS_B2060E11&REV_0 | 1\3&267A616A&0&20 The drivers for this device are not installed. |
| Base System Device | PCI\VEN_0E11&DEV_B204&SUBSYS_B2060E11&REV_0 | 1\3&267A616A&0&22 The drivers for this device are not installed. |

[USB]

Device PNP Device ID

[Software Environment]

[System Drivers]

| Name | Description | File | Type | Started | Start Mode | 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.0\system32\drivers\acpi.sys | Kernel Driver | Yes | Boot | Running | OK | Normal No Yes |
| acpiec | ACPIEC | c:\windows.0\system32\drivers\acpiec.sys | Kernel Driver | No | Disabled | Stopped | OK | Normal No No |
| adpu160m | adpu160m | c:\windows.0\system32\drivers\adpu160m.sys | Kernel Driver | Yes | Boot | Running | OK | Normal No Yes |
| 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.0\system32\drivers\afd.sys | Kernel Driver | Yes | Auto | Running | OK | Normal No Yes |
| ahal54x | Ahal54x | 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 |
| asynctac | RAS Asynchronous Media Driver | c:\windows.0\system32\drivers\asynctac.sys | Kernel Driver | No | Manual | Stopped | OK | Normal No No |
| ataapi | Standard IDE/ESDI Hard Disk Controller | c:\windows.0\system32\drivers\ataapi.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.0\system32\drivers\ati2mpad.sys | Kernel Driver | No | Manual | Stopped | OK | Ignore No No |

| | | | | | | | | |
|-----------|--------------------------|--|--------------------|-----|----------|---------|----|---------------|
| atmarpc | ATM ARP Client Protocol | c:\windows.0\system32\drivers\atmarpc.sys | Kernel Driver | No | Manual | Stopped | OK | Normal No No |
| audstub | Audio Stub Driver | c:\windows.0\system32\drivers\audstub.sys | Kernel Driver | Yes | Manual | Running | OK | Normal No Yes |
| b57w2k | BCM5703 Gigabit Ethernet | c:\windows.0\system32\drivers\b57xp32.sys | Kernel Driver | Yes | Manual | Running | OK | Normal No Yes |
| beep | Beep | c:\windows.0\system32\drivers\beep.sys | Kernel Driver | Yes | System | Running | OK | Normal No Yes |
| cbidf2k | cbidf2k | c:\windows.0\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.0\system32\drivers\cdfs.sys | File System Driver | Yes | Disabled | Running | OK | Normal No Yes |
| cdrom | CD-ROM Driver | c:\windows.0\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.0\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 |
| cpqarray2 | cpqarray2 | Not Available | Kernel Driver | No | Disabled | Stopped | OK | Normal No No |
| cpqcissm | cpqcissm | c:\windows.0\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 |

| | | | | | | | | |
|-----------|-------------------------------|--|--------------------|-----|----------|---------|----|---------------|
| crtdisk | CRC Disk Filter Driver | c:\windows.0\system32\drivers\crtdisk.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.0\system32\drivers\dfs.sys | File System Driver | Yes | Boot | Running | OK | Normal No Yes |
| disk | Disk Driver | c:\windows.0\system32\drivers\disk.sys | Kernel Driver | Yes | Boot | Running | OK | Normal No Yes |
| dmboot | dmboot | c:\windows.0\system32\drivers\dmboot.sys | Kernel Driver | No | Disabled | Stopped | OK | Normal No No |
| dmio | Logical Disk Manager Driver | c:\windows.0\system32\drivers\dmio.sys | Kernel Driver | Yes | Boot | Running | OK | Normal No Yes |
| dmload | dmload | c:\windows.0\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.0\system32\drivers\fastfat.sys | File System Driver | No | Disabled | Stopped | OK | Normal No No |
| fdc | Floppy Disk Controller Driver | c:\windows.0\system32\drivers\fdc.sys | Kernel Driver | Yes | Manual | Running | OK | Normal No Yes |
| fips | Fips | c:\windows.0\system32\drivers\fips.sys | Kernel Driver | Yes | System | Running | OK | Normal No Yes |
| flpydisk | Floppy Disk Driver | c:\windows.0\system32\drivers\flpydisk.sys | Kernel Driver | Yes | Manual | Running | OK | Normal No Yes |
| ftdisk | Volume Manager Driver | c:\windows.0\system32\drivers\ftdisk.sys | Kernel Driver | Yes | Boot | | | |

| | | | | | | | | | | | | | | | | |
|--------------------|---|----|--------|----|-----|----------|---|----|--------|----|----|----------|--|-----|--------|--|
| | Running | OK | Normal | No | Yes | | Stopped | OK | Normal | No | No | | File System Driver | Yes | System | |
| gpc | Generic Packet Classifier c:\windows.0\system32\drivers\msgpc.sys Kernel Driver Yes Manual Running OK Normal No Yes | | | | | ipse | IPSEC driver c:\windows.0\system32\drivers\ipse.sys Kernel Driver Yes System Running OK Normal No Yes | | | | | msfs | Msfs c:\windows.0\system32\drivers\msfs.sys File System Driver Yes System Running OK Normal No Yes | | | |
| hpn | hpn Not Available Kernel Driver No Disabled Stopped OK Normal No No | | | | | ipsraidn | ipsraidn Not Available Kernel Driver No Disabled Stopped OK Normal No No | | | | | mup | Mup c:\windows.0\system32\drivers\mup.sys File System Driver Yes Boot Running OK Normal No Yes | | | |
| hpgcissb Driver | Smart Array Controllers Non-Miniport Bus c:\windows.0\system32\drivers\hpgcissb.sys Kernel Driver Yes Boot Running OK Normal No Yes | | | | | irenum | IR Enumerator Service c:\windows.0\system32\drivers\irenum.sys Kernel Driver No Manual Stopped OK Normal No No | | | | | ndis | NDIS System Driver c:\windows.0\system32\drivers\ndis.sys Kernel Driver Yes Boot Running OK Normal No Yes | | | |
| hpgcissd Driver | Smart Array Controllers Non-Miniport Disk c:\windows.0\system32\drivers\hpgcissd.sys Kernel Driver Yes Boot Running OK Normal No Yes | | | | | isapnp | PnP ISA/EISA Bus Driver c:\windows.0\system32\drivers\isapnp.sys Kernel Driver Yes Boot Running OK Critical No Yes | | | | | ndistapi | Remote Access NDIS TAPI Driver c:\windows.0\system32\drivers\ndistapi.sys Kernel Driver Yes Manual Running OK Normal No Yes | | | |
| hpt3xx | hpt3xx Not Available Kernel Driver No Disabled Stopped OK Normal No No | | | | | kbdclass | Keyboard Class Driver c:\windows.0\system32\drivers\kbdclass.sys Kernel Driver Yes System Running OK Normal No Yes | | | | | ndisuio | NDIS Usermode I/O Protocol c:\windows.0\system32\drivers\ndisuio.sys Kernel Driver Yes Manual Running OK Normal No Yes | | | |
| http | HTTP c:\windows.0\system32\drivers\http.sys Kernel Driver No Manual Stopped OK Normal No No | | | | | ksecdd | KSecDD c:\windows.0\system32\drivers\ksecdd.sys Kernel Driver Yes Boot Running OK Normal No Yes | | | | | ndiswan | Remote Access NDIS WAN Driver c:\windows.0\system32\drivers\ndiswan.sys Kernel Driver Yes Manual Running OK Normal No Yes | | | |
| i2omgmt | i2omgmt Not Available Kernel Driver No System Stopped OK Normal No No | | | | | lp6nds35 | lp6nds35 Not Available Kernel Driver No Disabled Stopped OK Normal No No | | | | | ndproxy | NDIS Proxy c:\windows.0\system32\drivers\ndproxy.sys Kernel Driver Yes Manual Running OK Normal No Yes | | | |
| i2omp | i2omp Not Available Kernel Driver No Disabled Stopped OK Normal No No | | | | | mmdd | mmdd c:\windows.0\system32\drivers\mmdd.sys Kernel Driver Yes System Running OK Ignore No Yes | | | | | netbios | NetBIOS Interface c:\windows.0\system32\drivers\netbios.sys File System Driver Yes System Running OK Normal No Yes | | | |
| i8042prt | i8042 Keyboard and PS/2 Mouse Port Driver c:\windows.0\system32\drivers\i8042prt.sys Kernel Driver Yes System Running OK Normal No Yes | | | | | modem | Modem c:\windows.0\system32\drivers\modem.sys Kernel Driver No Manual Stopped OK Ignore No No | | | | | netbt | NetBios over Tcpip c:\windows.0\system32\drivers\netbt.sys Kernel Driver Yes System Running OK Normal No Yes | | | |
| iirsp | iirsp Not Available Kernel Driver No Disabled Stopped OK Normal No No | | | | | mouclass | Mouse Class Driver c:\windows.0\system32\drivers\mouclass.sys Kernel Driver Yes System Running OK Normal No Yes | | | | | nfrd960 | nfrd960 Not Available Kernel Driver No Disabled Stopped OK Normal No No | | | |
| imapi | CD-Burning Filter Driver c:\windows.0\system32\drivers\imapi.sys Kernel Driver No System Stopped OK Normal No No | | | | | mountmgr | Mount Point Manager c:\windows.0\system32\drivers\mountmgr.sys Kernel Driver Yes Boot Running OK Normal No Yes | | | | | npfs | Npfs c:\windows.0\system32\drivers\npfs.sys File System Driver Yes System Running OK Normal No Yes | | | |
| intelide | IntelIde Not Available Kernel Driver No Disabled Stopped OK Normal No No | | | | | mraid35x | mraid35x Not Available Kernel Driver No Disabled Stopped OK Normal No No | | | | | ntfs | Ntfs c:\windows.0\system32\drivers\ntfs.sys File System Driver Yes Disabled Running OK Normal No Yes | | | |
| ipfilterdriver | IP Traffic Filter Driver c:\windows.0\system32\drivers\ipfltdrv.sys Kernel Driver No Manual Stopped OK Normal No No | | | | | mrxdav | WebDav Client Redirector c:\windows.0\system32\drivers\mrxdav.sys File System Driver No Manual Stopped OK Normal No No | | | | | null | Null c:\windows.0\system32\drivers\null.sys | | | |
| ipinip | IP in IP Tunnel Driver c:\windows.0\system32\drivers\ipinip.sys Kernel Driver No Manual Stopped OK Normal No No | | | | | mrxsmb | MRXSMB c:\windows.0\system32\drivers\mrxsmb.sys | | | | | | | | | |
| ipnat | IP Network Address Translator c:\windows.0\system32\drivers\ipnat.sys Kernel Driver No Manual | | | | | | | | | | | | | | | |

| | | | | | |
|--------------|--|---------------|----------|---------------|-----|
| | Kernel Driver | Yes | System | | |
| | Running | OK | Normal | No | Yes |
| parport | Parallel port driver | | | | |
| | c:\windows.0\system32\drivers\parport.sys | | | | |
| | Kernel Driver | Yes | Manual | | |
| | Running | OK | Normal | No | Yes |
| partmgr | Partition Manager | | | | |
| | c:\windows.0\system32\drivers\partmgr.sys | | | | |
| | Kernel Driver | Yes | Boot | | |
| | Running | OK | Normal | No | Yes |
| parvdm | Parvdm | | | | |
| | c:\windows.0\system32\drivers\parvdm.sys | | | | |
| | Kernel Driver | Yes | Auto | | |
| | Running | OK | Ignore | No | Yes |
| pci | PCI Bus Driver | | | | |
| | c:\windows.0\system32\drivers\pci.sys | | | | |
| | Kernel Driver | Yes | Boot | | |
| | Running | OK | Critical | No | Yes |
| pciide | PCIIde | | | | |
| | c:\windows.0\system32\drivers\pciide.sys | | | | |
| | Kernel Driver | Yes | Boot | | |
| | Running | OK | Normal | No | Yes |
| pcmcia | Pcmcia | | | | |
| | c:\windows.0\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.0\system32\drivers\raspttp.sys | | | | |
| | Kernel Driver | Yes | Manual | | |
| | Running | OK | Normal | No | Yes |
| processor | Processor Driver | | | | |
| | c:\windows.0\system32\drivers\processr.sys | | | | |
| | Kernel Driver | Yes | Manual | | |
| | Running | OK | Normal | No | Yes |
| ptilink | Direct Parallel Link Driver | | | | |
| | c:\windows.0\system32\drivers\ptilink.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.0\system32\drivers\rasacd.sys | | | | |
| | Kernel Driver | Yes | System | | |
| | Running | OK | Normal | No | Yes |
| rasl2tp | WAN Miniport (L2TP) | | | | |
| | c:\windows.0\system32\drivers\rasl2tp.sys | | | | |
| | Kernel Driver | Yes | Manual | | |
| | Running | OK | Normal | No | Yes |
| raspppoe | Remote Access PPPOE Driver | | | | |
| | c:\windows.0\system32\drivers\raspppoe.sys | | | | |
| | Kernel Driver | Yes | Manual | | |
| | Running | OK | Normal | No | Yes |
| raspti | Direct Parallel | | | | |
| | c:\windows.0\system32\drivers\raspti.sys | | | | |
| | Kernel Driver | Yes | Manual | | |
| | Running | OK | Normal | No | Yes |
| rdbs | Rdbss | | | | |
| | c:\windows.0\system32\drivers\rdbs.sys | | | | |
| | File System Driver | Yes | System | | |
| | Running | OK | Normal | No | Yes |
| rdpcdd | RDPDCC | | | | |
| | c:\windows.0\system32\drivers\rdpcdd.sys | | | | |
| | Kernel Driver | Yes | System | | |
| | Running | OK | Ignore | No | Yes |
| rdpdr | Terminal Server Device Redirector Driver | | | | |
| | c:\windows.0\system32\drivers\rdpdr.sys | | | | |
| | Kernel Driver | Yes | Manual | | |
| | Running | OK | Normal | No | Yes |

| | | | | | |
|---------|---|---------------|---------|---------------|-----|
| rdpwd | RDPWD | | | | |
| | c:\windows.0\system32\drivers\rdpwd.sys | | | | |
| | Kernel Driver | No | Manual | | |
| | Stopped | OK | Ignore | No | No |
| redbook | Digital CD Audio Playback Filter Driver | | | | |
| | c:\windows.0\system32\drivers\redbook.sys | | | | |
| | Kernel Driver | Yes | System | | |
| | Running | OK | Normal | No | Yes |
| secdrv | Secdrv | | | | |
| | c:\windows.0\system32\drivers\secdrv.sys | | | | |
| | Kernel Driver | No | Manual | | |
| | Stopped | OK | Normal | No | No |
| serenum | Serenum Filter Driver | | | | |
| | c:\windows.0\system32\drivers\serenum.sys | | | | |
| | Kernel Driver | Yes | Manual | | |
| | Running | OK | Normal | No | Yes |
| serial | Serial port driver | | | | |
| | c:\windows.0\system32\drivers\serial.sys | | | | |
| | Kernel Driver | Yes | System | | |
| | Running | OK | Ignore | No | Yes |
| sfloppy | Sfloppy | | | | |
| | c:\windows.0\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.0\system32\drivers\srv.sys | | | | |
| | File System Driver | Yes | Manual | | |
| | Running | OK | Normal | No | Yes |
| swenum | Software Bus Driver | | | | |
| | c:\windows.0\system32\drivers\swenum.sys | | | | |
| | Kernel Driver | Yes | Manual | | |
| | Running | OK | Normal | No | Yes |
| symc810 | symc810 | Not Available | | Kernel Driver | |
| | No | Disabled | Stopped | OK | |
| | Normal | No | No | | |
| symc8xx | symc8xx | Not Available | | Kernel Driver | |
| | No | Disabled | Stopped | OK | |
| | Normal | No | No | | |
| symmpi | symmpi | Not Available | | Kernel Driver | |
| | No | Disabled | Stopped | OK | |
| | Normal | No | No | | |
| sym_hi | sym_hi | Not Available | | Kernel Driver | |
| | No | Disabled | Stopped | OK | |
| | Normal | No | No | | |
| sym_u3 | sym_u3 | Not Available | | Kernel Driver | |
| | No | Disabled | Stopped | OK | |
| | Normal | No | No | | |
| tcpip | TCP/IP Protocol Driver | | | | |
| | c:\windows.0\system32\drivers\tcpip.sys | | | | |

| | | | | |
|--------------------|---|---------------|---------------|-----|
| Kernel Driver | Yes | System | | |
| Running | OK | Normal | No | Yes |
| tdpipe | TDPIPE | | | |
| | c:\windows.0\system32\drivers\tdpipe.sys | | | |
| Kernel Driver | No | Manual | | |
| Stopped | OK | Ignore | No | No |
| tdtcp | TDTCP | | | |
| | c:\windows.0\system32\drivers\tdtcp.sys | | | |
| Kernel Driver | No | Manual | | |
| Stopped | OK | Ignore | No | No |
| termdd | Terminal Device Driver | | | |
| | c:\windows.0\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.0\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.0\system32\drivers\update.sys | | | |
| Kernel Driver | Yes | Manual | | |
| Running | OK | Normal | No | Yes |
| vga | vga | | | |
| | c:\windows.0\system32\drivers\vgapnp.sys | | | |
| Kernel Driver | Yes | Manual | | |
| Running | OK | Ignore | No | Yes |
| vgasave | VGA Display Controller. | | | |
| | c:\windows.0\system32\drivers\vga.sys | | | |
| Kernel Driver | No | System | | |
| Stopped | OK | Ignore | No | No |
| viaide | ViaIde | Not Available | Kernel Driver | |
| | No | Disabled | Stopped | OK |
| Normal | No | No | | |
| volsnap | Storage volumes | | | |
| | c:\windows.0\system32\drivers\volsnap.sys | | | |
| Kernel Driver | Yes | Boot | | |
| Running | OK | Normal | No | Yes |
| wanarp | Remote Access IP ARP Driver | | | |
| | c:\windows.0\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.0\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 | | |
| Available | Not Available | Not Available | Not | |
| 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 | | | | |
| Standard VGA Graphics Adapter | Yes | DISPLAY | | |
| 5.2.3790.0 | 10/1/2002 (Standard | | | |
| display types) | display.inf | Not Available | | |
| PCI\VEN_1002&DEV_4752&SUBSYS_001E0E11&REV_2 | | | | |
| 7\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&12345678&0&03 | | | | |

| | | | |
|--|---------------------|---------------|------------|
| Base System Device | Not Available | UNKNOWN | Not |
| Available | Not Available | Not Available | Not |
| Available | Not Available | | |
| PCI\VEN_0E11&DEV_B203&SUBSYS_B2060E11&REV_0 | | | |
| 1\3&267A616A&0&20 | | | |
| Base System Device | Not Available | UNKNOWN | Not |
| Available | Not Available | Not Available | Not |
| Available | Not Available | | |
| PCI\VEN_0E11&DEV_B204&SUBSYS_B2060E11&REV_0 | | | |
| 1\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 | | | |
| Printer Port | Yes | PORTS | 5.2.3790.0 |
| 10/1/2002 (Standard port types) | msports.inf | Not Available | |
| ACPI\PNP0400\5&13237358&0 | | | |
| Printer Port Logical Interface | Yes | | |
| SYSTEM | 5.2.3790.0 | 10/1/2002 | |
| (Standard system devices) | machine.inf | | |
| Not Available | | | |


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LPTENUM\MICROSOFTRAWPORT\6&BCCF519&0&LPT1
Communications Port Yes PORTS 5.2.3790.0
10/1/2002 (Standard port types)
msports.inf Not Available
ACPI\PNP0501\0
Communications Port Yes PORTS 5.2.3790.0
10/1/2002 (Standard port types)
msports.inf Not Available
ACPI\PNP0501\1
Standard floppy disk controller Yes FDC
5.2.3790.0 10/1/2002 (Standard
floppy disk controllers) fdcc.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
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
PCI\IDE\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_LTN486S_____YQSD_____5&FB0C83D&0&0.
1.0
Secondary IDE Channel Yes HDC
5.2.3790.0 10/1/2002 (Standard IDE
ATA/ATAPI controllers) mshdc.inf Not Available
PCI\IDE\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

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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
Compaq 64-bit/66MHz Dual Channel Wide Ultra3 SCSI
Adapter Yes SCSIADAPTER 5.2.3790.0
10/1/2002 Adaptec pnpscsi.inf Not
Available
PCI\VEN_9005&DEV_00C0&SUBSYS_F6200E11&REV_0
1\3&13C0B0C5&0&18
Compaq 64-bit/66MHz Dual Channel Wide Ultra3 SCSI
Adapter Yes SCSIADAPTER 5.2.3790.0
10/1/2002 Adaptec pnpscsi.inf Not
Available
PCI\VEN_9005&DEV_00C0&SUBSYS_F6200E11&REV_0
1\3&13C0B0C5&0&19
Disk drive Yes DISKDRIVE 5.2.3790.0
10/1/2002 (Standard disk drives)
disk.inf Not Available
SCSI\DISK&VEN_COMPAQ&PROD_BD0186459A&REV_B0
14\4&39814A06&0&000
Compaq StorageWorks/ProLiant Storage Subsystem Yes
SYSTEM 5.2.3790.0 10/1/2002
Compaq scsidev.inf Not Available
SCSI\PROCESSOR&VEN_COMPAQ&PROD_PROLIANT_4L2
I&REV_1.70\4&39814A06&0&0F0
BCM5703 Gigabit Ethernet Yes NET
2.91.0.0 10/1/2002 Narrowcom netb57xp.inf
Not Available
PCI\VEN_14E4&DEV_16A7&SUBSYS_00CB0E11&REV_0
2\3&13C0B0C5&0&20
PCI bus Yes SYSTEM 5.2.3790.0
10/1/2002 (Standard system devices)
machine.inf Not Available
ACPI\PNP0A03\2
Smart Array 642 Controller (Non-Miniport) No
SCSIADAPTER 5.5.59.32 12/16/2002
Hewlett-Packard oem0.inf Not Available
PCI\VEN_0E11&DEV_0046&SUBSYS_409B0E11&REV_0
1\3&1070020&0&10
Smart Array Logical Volume No DISKDRIVE
5.5.56.32 12/16/2002 Hewlett-
Packard oeml.inf Not Available
HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\4&3
8B0C764&0&0000004000000000
Smart Array Logical Volume No DISKDRIVE
5.5.56.32 12/16/2002 Hewlett-
Packard oeml.inf Not Available
HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\4&3
8B0C764&0&0100004000000000
Smart Array Logical Volume No DISKDRIVE
5.5.56.32 12/16/2002 Hewlett-
Packard oeml.inf Not Available
HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\4&3
8B0C764&0&0200004000000000
PCI bus Yes SYSTEM 5.2.3790.0
10/1/2002 (Standard system devices)
machine.inf Not Available
ACPI\PNP0A03\3

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Smart Array 641 Controller (Non-Miniport) No
SCSIADAPTER 5.5.59.32 12/16/2002
Hewlett-Packard oem0.inf Not Available
PCI\VEN_0E11&DEV_0046&SUBSYS_409A0E11&REV_0
1\3&29E81982&0&10
Smart Array Logical Volume No DISKDRIVE
5.5.56.32 12/16/2002 Hewlett-
Packard oeml.inf Not Available
HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\4&1
ACD7877&0&0000004000000000
PCI bus Yes SYSTEM 5.2.3790.0
10/1/2002 (Standard system devices)
machine.inf Not Available
ACPI\PNP0A03\4
Smart Array 642 Controller (Non-Miniport) No
SCSIADAPTER 5.5.59.32 12/16/2002
Hewlett-Packard oem0.inf Not Available
PCI\VEN_0E11&DEV_0046&SUBSYS_409B0E11&REV_0
1\3&172E68DD&0&08
Smart Array Logical Volume No DISKDRIVE
5.5.56.32 12/16/2002 Hewlett-
Packard oeml.inf Not Available
HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\4&B
339166&0&0000004000000000
Smart Array Logical Volume No DISKDRIVE
5.5.56.32 12/16/2002 Hewlett-
Packard oeml.inf Not Available
HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\4&B
339166&0&0100004000000000
Smart Array Logical Volume No DISKDRIVE
5.5.56.32 12/16/2002 Hewlett-
Packard oeml.inf Not Available
HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\4&B
339166&0&0200004000000000
Smart Array 642 Controller (Non-Miniport) No
SCSIADAPTER 5.5.59.32 12/16/2002
Hewlett-Packard oem0.inf Not Available
PCI\VEN_0E11&DEV_0046&SUBSYS_409B0E11&REV_0
1\3&172E68DD&0&10
Smart Array Logical Volume No DISKDRIVE
5.5.56.32 12/16/2002 Hewlett-
Packard oeml.inf Not Available
HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\4&2
A3C9417&0&0000004000000000
Smart Array Logical Volume No DISKDRIVE
5.5.56.32 12/16/2002 Hewlett-
Packard oeml.inf Not Available
HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\4&2
A3C9417&0&0100004000000000
Smart Array Logical Volume No DISKDRIVE
5.5.56.32 12/16/2002 Hewlett-
Packard oeml.inf Not Available
HPQCISS\DISK&VEN_HP&PROD_LOGICAL_VOLUME\4&2
A3C9417&0&0200004000000000
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

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| | | | |
|--|---------------------------|---------------------------|---------------|
| Logical Disk Manager | Yes | SYSTEM | |
| 5.2.3790.0 | 10/1/2002 | (Standard system devices) | machine.inf |
| Volume Manager | Yes | SYSTEM | 5.2.3790.0 |
| 10/1/2002 | (Standard system devices) | machine.inf | Not Available |
| Generic volume | Yes | VOLUME | 5.2.3790.0 |
| 10/1/2002 | Microsoft | volume.inf | Not Available |
| Available | | | |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE6E3AEF120FFSET7E00LENGT7CFC9E000 | | | |
| Generic volume | Yes | VOLUME | 5.2.3790.0 |
| 10/1/2002 | Microsoft | volume.inf | Not Available |
| Available | | | |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE6E3AEF110FFSET7E00LENGT3E7A5F000 | | | |
| Generic volume | Yes | VOLUME | 5.2.3790.0 |
| 10/1/2002 | Microsoft | volume.inf | Not Available |
| Available | | | |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURED9F35A700FFSET7E00LENGT10F4CDAE00 | | | |
| Generic volume | Yes | VOLUME | 5.2.3790.0 |
| 10/1/2002 | Microsoft | volume.inf | Not Available |
| Available | | | |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE4311A050FFSET7E00LENGT7CFC9E000 | | | |
| Generic volume | Yes | VOLUME | 5.2.3790.0 |
| 10/1/2002 | Microsoft | volume.inf | Not Available |
| Available | | | |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE4311A070FFSET7E00LENGT3E7A5F000 | | | |
| Generic volume | Yes | VOLUME | 5.2.3790.0 |
| 10/1/2002 | Microsoft | volume.inf | Not Available |
| Available | | | |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE8EB9D1960FFSET7E00LENGT7CFC9E000 | | | |
| Generic volume | Yes | VOLUME | 5.2.3790.0 |
| 10/1/2002 | Microsoft | volume.inf | Not Available |
| Available | | | |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE8EB9D1940FFSET7E00LENGT3E7A5F000 | | | |
| Generic volume | Yes | VOLUME | 5.2.3790.0 |
| 10/1/2002 | Microsoft | volume.inf | Not Available |
| Available | | | |
| STORAGE\VOLUME\1&30A96598&0&SIGNATUREA6D014450FFSET7E00LENGT7D0400 | | | |
| Generic volume | Yes | VOLUME | 5.2.3790.0 |
| 10/1/2002 | Microsoft | volume.inf | Not Available |
| Available | | | |
| STORAGE\VOLUME\1&30A96598&0&SIGNATUREA6D014450FFSET7D820LENGT43BF9C600 | | | |
| AFD Networking Support Environment | | | Not Available |
| LEGACYDRIVER | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| Beep | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| cpqcissm | | | Not Available |
| Available | | | Not Available |

| | | | |
|--------------------------------|---------------|--|---------------|
| Available | Not Available | | |
| ROOT\LEGACY_CPQCISSM\0000 | | | |
| CRC Disk Filter Driver | | | Not Available |
| LEGACYDRIVER | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| dmboot | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| dmload | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| Fips | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| Generic Packet Classifier | | | Not Available |
| LEGACYDRIVER | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| IPSEC driver | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| ksecdd | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| mnmdd | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| mountmgr | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| ROOT\LEGACY_MOUNTMGR\0000 | | | |
| NDIS System Driver | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| ROOT\LEGACY_NDIS\0000 | | | |
| Remote Access NDIS TAPI Driver | | | Not Available |
| LEGACYDRIVER | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| ROOT\LEGACY_NDIS_TAPI\0000 | | | |
| NDIS Usermode I/O Protocol | | | Not Available |
| LEGACYDRIVER | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| ROOT\LEGACY_NDISUIO\0000 | | | |
| NDProxy | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| ROOT\LEGACY_NDPROXY\0000 | | | |
| NetBios over Tcpip | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| ROOT\LEGACY_NETBT\0000 | | | |
| Null | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |

| | | | |
|--------------------------------------|--|--|---------------------------|
| Partition Manager | | | Not Available |
| LEGACYDRIVER | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| ROOT\LEGACY_PARTMGR\0000 | | | |
| Parvdm | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| Remote Access Auto Connection Driver | | | Not Available |
| LEGACYDRIVER | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| ROOT\LEGACY_RASACD\0000 | | | |
| RDPcdd | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| TCP/IP Protocol Driver | | | Not Available |
| LEGACYDRIVER | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| ROOT\LEGACY_TCPIP\0000 | | | |
| volsnap | | | Not Available |
| Available | | | Not Available |
| Available | | | Not Available |
| ROOT\LEGACY_VOLSNAP\0000 | | | |
| Remote Access IP ARP Driver | | | Not Available |
| LEGACYDRIVER | | | Not Available |
| Available | | | Not Available |
| 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_MMCM | | | |
| 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_MMCMI | | | |
| 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 |
| Available | | | Not Available |
| ROOT\MS_L2TPMINIPORT\0000 | | | |
| WAN Miniport (IP) | | | Yes |
| NET | | | 5.2.3790.0 |
| 10/1/2002 | | | Microsoft netrasa.inf |
| Available | | | Not Available |
| ROOT\MS_NDISWANIP\0000 | | | |
| WAN Miniport (PPPOE) | | | Yes |
| NET | | | 5.2.3790.0 |
| 10/1/2002 | | | Microsoft netrasa.inf |
| Available | | | Not Available |
| ROOT\MS_PPPOEMINIPORT\0000 | | | |
| WAN Miniport (PPTP) | | | Yes |
| NET | | | 5.2.3790.0 |
| 10/1/2002 | | | Microsoft netrasa.inf |
| Available | | | Not Available |
| ROOT\MS_PPTPMINIPORT\0000 | | | |

```

Direct Parallel Yes NET 5.2.3790.0
10/1/2002 Microsoft netrasa.inf Not
Available ROOT\MS_PTIMEIMPORT\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
ComSpec %SystemRoot%\system32\cmd.exe <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 5, GenuineIntel <SYSTEM>
PROCESSOR_REVISION 0205 <SYSTEM>
NUMBER_OF_PROCESSORS 2 <SYSTEM>
ClusterLog C:\WINDOWS\Cluster\cluster.log
<SYSTEM>
PATHEXT
.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF
;.WSH <SYSTEM>
TEMP %SystemRoot%\TEMP <SYSTEM>
TMP %SystemRoot%\TEMP <SYSTEM>
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
LILO\Administrator
TMP %USERPROFILE%\Local Settings\Temp
LILO\Administrator

```

[Print Jobs]

```

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

```

[Network Connections]

```

Local Name Remote Name Type
Status User Name

```

[Running Tasks]

```

Name Path Process ID Priority Min
Working Set Max Working Set Start Time
Version Size File Date
system idle process Not Available 0 0
Not Available Not Available Not
Available Not Available Not Available Not
Available
system Not Available 4 8 0
1413120 Not Available Not Available
Not Available Not Available
smss.exe Not Available 344 11
204800 1413120 7/10/2003 6:06 PM Not
Available Not Available Not Available
csrss.exe Not Available 468 13 Not
Available Not Available 7/10/2003 6:06 PM Not
Available Not Available Not Available
winlogon.exe c:\windows.0\system32\winlogon.exe 492
13 204800 1413120 7/10/2003
6:06 PM 5.2.3790.0 (srv03_rtm.030324-2048)
536.50 KB (549,376 bytes) 3/25/2003
12:00 AM
services.exe c:\windows.0\system32\services.exe 536
9 204800 1413120 7/10/2003
6:06 PM 5.2.3790.0 (srv03_rtm.030324-2048)
102.00 KB (104,448 bytes) 3/25/2003
12:00 AM
lsass.exe c:\windows.0\system32\lsass.exe 548
9 204800 1413120 7/10/2003
6:06 PM 5.2.3790.0 (srv03_rtm.030324-2048)
13.00 KB (13,312 bytes) 3/25/2003
12:00 AM
svchost.exe c:\windows.0\system32\svchost.exe
760 8 204800 1413120
7/10/2003 6:06 PM 5.2.3790.0
(srv03_rtm.030324-2048) 13.00 KB (13,312 bytes)
3/25/2003 12:00 AM
svchost.exe Not Available 836 8
Not Available Not Available
7/10/2003 6:06 PM Not Available Not
Available Not Available
svchost.exe Not Available 884 8
7/10/2003 6:06 PM Not Available Not
Available Not Available

```

```

svchost.exe c:\windows.0\system32\svchost.exe
900 8 204800 1413120
7/10/2003 6:06 PM 5.2.3790.0
(srv03_rtm.030324-2048) 13.00 KB (13,312 bytes)
3/25/2003 12:00 AM
spoolsv.exe c:\windows.0\system32\spoolsv.exe
1068 8 204800 1413120
7/10/2003 6:06 PM 5.2.3790.0
(srv03_rtm.030324-2048) 55.00 KB (56,320 bytes)
3/25/2003 12:00 AM
msdtc.exe Not Available 1104 8 Not
Available Not Available 7/10/2003 6:06 PM Not
Available Not Available Not Available
svchost.exe c:\windows.0\system32\svchost.exe
1232 8 204800 1413120
7/10/2003 6:06 PM 5.2.3790.0
(srv03_rtm.030324-2048) 13.00 KB (13,312 bytes)
3/25/2003 12:00 AM
svchost.exe Not Available 1268 8
Not Available Not Available
7/10/2003 6:06 PM Not Available Not
Available Not Available
mssearch.exe c:\program files\common
files\system\mssearch\bin\mssearch.exe 1304 8
204800 1413120 7/10/2003 6:06 PM
9,107,8320.0 68.00 KB (69,632 bytes)
1/21/2003 9:30 AM
explorer.exe c:\windows.0\explorer.exe
1636 8 204800 1413120
7/10/2003 6:06 PM 6.00.3790.0
(srv03_rtm.030324-2048) 1,008.50 KB (1,032,704
bytes) 3/25/2003 12:00 AM
dfssvc.exe c:\windows.0\system32\dfssvc.exe
1728 8 204800 1413120
7/10/2003 6:06 PM 5.2.3790.0
(srv03_rtm.030324-2048) 130.50 KB (133,632
bytes) 3/25/2003 12:00 AM
sqlmangr.exe c:\program files\microsoft sql
server\80\tools\bin\sqlmangr.exe 1796 8
204800 1413120 7/10/2003 6:06 PM
2000.080.0760.00 72.57 KB (74,308 bytes)
2/28/2003 10:56 AM
helpctr.exe c:\windows.0\pchealth\helpctr\binaries\help
ctr.exe 1944 8 204800 1413120
7/10/2003 6:07 PM 5.2.3790.0
(srv03_rtm.030324-2048) 764.00 KB (782,336
bytes) 5/14/2003 5:00 PM
helpsvc.exe c:\windows.0\pchealth\helpctr\binaries\help
svc.exe 2000 8 204800 1413120
7/10/2003 6:07 PM 5.2.3790.0
(srv03_rtm.030324-2048) 720.00 KB (737,280
bytes) 5/14/2003 5:00 PM
wmiprvse.exe Not Available 2024 8
Not Available Not Available
7/10/2003 6:07 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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\system32\nddeapi.dll

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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\system32\imagehlp.dll

comctl32 6.0 (srv03_rtm.030324-2048) 907.00 KB (928,768 bytes) 5/14/2003 11:44 AM Microsoft Corporation
c:\windows.0\winsxs\x86_microsoft.windows.c

ommon-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.0\system32\wincard.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.0\system32\wtsapi32.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.0\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.0\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.0\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.0\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.0\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.0\system32\wlnotify.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.0\system32\winmm.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.0\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.0\system32\mpr.dll

comctl32 5.82 (srv03_rtm.030324-2048) 561.00 KB (574,464 bytes) 5/14/2003 11:44 AM Microsoft Corporation
c:\windows.0\winsxs\x86_microsoft.windows.c

ommon-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.0\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.0\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.0\system32\cscui.dll
oleaut32 5.2.3790.0 486.00 KB (497,664 bytes) 3/25/2003 12:00 AM Microsoft Corporation
c:\windows.0\system32\oleaut32.dll
clbcatq 2001.12.4720.0 (srv03_rtm.030324-2048) 481.00 KB (492,544 bytes) 5/14/2003
4:57 PM Microsoft Corporation
c:\windows.0\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.0\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.0\system32\ntmarta.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.0\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.0\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.0\system32\authz.dll
umpnpgmgr 5.2.3790.0 (srv03_rtm.030324-2048) 121.50 KB (124,416 bytes) 3/25/2003
12:00 AM Microsoft Corporation
c:\windows.0\system32\umpnpgmgr.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.0\system32\ncobjapi.dll
msvcp60 6.05.2144.0 388.00 KB (397,312 bytes) 3/25/2003 12:00 AM Microsoft Corporation
c:\windows.0\system32\msvcp60.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.0\system32\eventlog.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.0\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.0\system32\lsasrv.dll
samsvr 5.2.3790.0 (srv03_rtm.030324-2048) 452.00 KB (462,848 bytes) 3/25/2003
12:00 AM Microsoft Corporation
c:\windows.0\system32\samsvr.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.0\system32\cryptdll.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.0\system32\dnsapi.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.0\system32\ntdsapi.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.0\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.0\system32\kerberos.dll
msvl_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.0\system32\msvl_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.0\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.0\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.0\system32\iphlpapi.dll
schannel 5.2.3790.0 (srv03_rtm.030324-2048) 149.50 KB (153,088 bytes) 3/25/2003
12:00 AM Microsoft Corporation
c:\windows.0\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.0\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.0\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.0\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.0\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.0\system32\ntdsatq.dll
mwssock 5.2.3790.0 (srv03_rtm.030324-2048) 254.00 KB (260,096 bytes) 3/25/2003
12:00 AM Microsoft Corporation
c:\windows.0\system32\mwssock.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.0\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.0\system32\scecli.dll
wshtccpip 5.2.3790.0 (srv03_rtm.030324-2048) 18.00 KB (18,432 bytes) 3/25/2003
12:00 AM Microsoft Corporation
c:\windows.0\system32\wshtccpip.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.0\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.0\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.0\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.0\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.0\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.0\system32\dssenh.dll
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.0\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.0\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.0\system32\rpcss.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.0\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.0\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.0\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.0\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.0\system32\rastls.dll
atl 3.05.2283 83.00 KB (84,992 bytes)
3/25/2003 12:00 AM Microsoft Corporation
c:\windows.0\system32\atl.dll
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.0\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.0\system32\mprapi.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.0\system32\activeds.dll
adslfdc 5.2.3790.0 (srv03_rtm.030324-2048)
142.50 KB (145,920 bytes) 3/25/2003
12:00 AM Microsoft Corporation
c:\windows.0\system32\adslfdc.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.0\system32\credui.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.0\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.0\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.0\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.0\system32\raschap.dll
schedsvc 5.2.3790.0 (srv03_rtm.030324-2048)
176.00 KB (180,224 bytes) 5/14/2003
5:00 PM Microsoft Corporation
c:\windows.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\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.0\system32\dmserver.dll
es 2001.12.4720.0 (srv03_rtm.030324-2048)
221.50 KB (226,816 bytes) 3/25/2003
12:00 AM Microsoft Corporation
c:\windows.0\system32\es.dll
pchsvc 5.2.3790.0 (srv03_rtm.030324-2048)
31.50 KB (32,256 bytes) 5/14/2003
5:00 PM Microsoft Corporation
c:\windows.0\pchealth\helpctr\binaries\pch
vc.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.0\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.0\system32\seclogon.dll
trkwns 5.2.3790.0 (srv03_rtm.030324-2048)
85.00 KB (87,040 bytes) 3/25/2003
12:00 AM Microsoft Corporation
c:\windows.0\system32\trkwns.dll
wmisvc 5.2.3790.0 (srv03_rtm.030324-2048)
131.00 KB (134,144 bytes) 5/14/2003
4:57 PM Microsoft Corporation
c:\windows.0\system32\wmisvc.dll
wuauerv 5.4.3790.0 (srv03_rtm.030324-2048)
10.50 KB (10,752 bytes) 5/14/2003
4:57 PM Microsoft Corporation
c:\windows.0\system32\wuauerv.dll
wuaueng 5.4.3790.0 (srv03_rtm.030324-2048)
188.50 KB (193,024 bytes) 5/14/2003
4:57 PM Microsoft Corporation
c:\windows.0\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.0\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.0\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.0\system32\sens.dll
winnr 5.2.3790.0 (srv03_rtm.030324-2048)
15.00 KB (15,360 bytes) 3/25/2003
12:00 AM Microsoft Corporation
c:\windows.0\system32\winnr.dll

comsvcs 2001.12.4720.0 (srv03_rtm.030324-2048)
1.14 MB (1,199,616 bytes) 5/14/2003
4:57 PM Microsoft Corporation
c:\windows.0\system32\comsvcs.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.0\system32\actxprxy.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.0\system32\browser.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.0\system32\rasadhlp.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.0\system32\netrap.dll
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.0\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.0\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.0\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.0\system32\clusapi.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.0\system32\netcfgx.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.0\system32\hnetcfg.dll
wbemprox 5.2.3790.0 (srv03_rtm.030324-2048)
17.50 KB (17,920 bytes) 5/14/2003
4:57 PM Microsoft Corporation
c:\windows.0\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.0\system32\wbem\wbemcomn.dll
wbemcore 5.2.3790.0 (srv03_rtm.030324-2048)
457.00 KB (467,968 bytes) 5/14/2003
4:57 PM Microsoft Corporation
c:\windows.0\system32\wbem\wbemcore.dll
esscli 5.2.3790.0 (srv03_rtm.030324-2048)
235.50 KB (241,152 bytes) 5/14/2003
4:57 PM Microsoft Corporation
c:\windows.0\system32\wbem\esscli.dll
fastprox 5.2.3790.0 (srv03_rtm.030324-2048)
443.00 KB (453,632 bytes) 5/14/2003

4:57 PM Microsoft Corporation
 c:\windows.0\system32\wbem\fastprox.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 42.50 KB (43,520 bytes) 5/14/2003

4:57 PM Microsoft Corporation
 c:\windows.0\system32\wbem\wbemsvc.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 90.50 KB (92,672 bytes) 5/14/2003

4:57 PM Microsoft Corporation
 c:\windows.0\system32\wbem\wmiutils.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 165.00 KB (168,960 bytes) 5/14/2003

4:57 PM Microsoft Corporation
 c:\windows.0\system32\wbem\repdrvfs.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 405.50 KB (415,232 bytes) 5/14/2003

4:57 PM Microsoft Corporation
 c:\windows.0\system32\wbem\wmiutils.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 256.50 KB (262,656 bytes) 5/14/2003

4:57 PM Microsoft Corporation
 c:\windows.0\system32\wbem\wbemess.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 642.00 KB (657,408 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\rasdlg.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 55.00 KB (56,320 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\spoolsv.exe
 5.2.3790.0 (srv03_rtm.030324-2048)
 79.00 KB (80,896 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\spoolss.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 304.50 KB (311,808 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\localspl.dll
 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.0\system32\cnbjmon.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 15.00 KB (15,360 bytes) 3/24/2003

7:49 PM Microsoft Corporation
 c:\windows.0\system32\pjlmon.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 44.00 KB (45,056 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\tcpmon.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 14.00 KB (14,336 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\mgmtapi.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 17.50 KB (17,920 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\snmpapi.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 39.50 KB (40,448 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\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.0\system32\usbmon.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 23.00 KB (23,552 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\wshqos.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 94.50 KB (96,768 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\win32spl.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 71.50 KB (73,216 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\inetpp.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 4.50 KB (4,608 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\icmp.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 22.00 KB (22,528 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\ersvc.dll
 9.107.8320.0 68.00 KB (69,632 bytes)
 1/21/2003 9:30 AM Microsoft Corporation
 c:\program files\common
 files\system\mssearch\bin\mssearch.exe
 mssws 9.107.8320.0 32.00 KB (32,768 bytes)
 1/21/2003 9:30 AM Microsoft Corporation
 c:\program files\common
 files\system\mssearch\bin\mssws.dll
 mssrch 9.107.8320.0 1.24 MB (1,302,528
 bytes) 1/21/2003 9:30 AM Microsoft Corporation
 srch.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.0\system32\security.dll
 tquery 9.107.8320.0 1.46 MB (1,536,000
 bytes) 1/21/2003 9:30 AM Microsoft Corporation
 c:\program files\common
 files\system\mssearch\bin\tquery.dll
 propdefs 9.107.8320.0 136.00 KB (139,264
 bytes) 1/21/2003 9:30 AM Microsoft Corporation
 c:\progra-1\common-1\system\mssearch\bin\pr
 opdefs.dll
 srchidx 9.107.8320.0 384.00 KB (393,216
 bytes) 1/21/2003 9:30 AM Microsoft Corporation
 c:\progra-1\common-1\system\mssearch\bin\sr

chidx.dll
 iprop 5.2.3790.0 (srv03_rtm.030324-2048)
 3.50 KB (3,584 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\iprop.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.0\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.0\system32\browseui.dll
 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.0\system32\shdocvw.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 122.00 KB (124,928 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\apphelp.dll
 6.00.3790.0 (srv03_rtm.030324-2048)
 360.50 KB (369,152 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\themeui.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 4.50 KB (4,608 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\msimg32.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 16.50 KB (16,896 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\linkinfo.dll
 6.00.3790.0 (srv03_rtm.030324-2048)
 136.00 KB (139,264 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\ntshrui.dll
 6.00.3790.0 (srv03_rtm.030324-2048)
 501.50 KB (513,536 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\urlmon.dll
 6.00.3790.0 (srv03_rtm.030324-2048)
 261.50 KB (267,776 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\webcheck.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 22.00 KB (22,528 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\wsock32.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 117.50 KB (120,320 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\stobject.dll
 6.00.3790.0 (srv03_rtm.030324-2048)
 28.50 KB (29,184 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\batmeter.dll
 6.00.3790.0 (srv03_rtm.030324-2048)
 14.50 KB (14,848 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\powrprof.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 536.50 KB (549,376 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\printui.dll
 5.2.3790.0 (srv03_rtm.030324-2048)
 17.50 KB (17,920 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\cfgmgr32.dll
 6.00.3790.0 (srv03_rtm.030324-2048)
 62.00 KB (63,488 bytes) 3/25/2003

12:00 AM Microsoft Corporation
 c:\windows.0\system32\browseui.dll

```

shdoclc 6.00.3790.0 (srv03_rtm.030324-2048)
588.50 KB (602,624 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\shdoclc.dll
mprui 5.2.3790.0 (srv03_rtm.030324-2048)
49.00 KB (50,176 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\mprui.dll
netui0 5.2.3790.0 (srv03_rtm.030324-2048)
75.50 KB (77,312 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\netui0.dll
netui2 5.2.3790.0 (srv03_rtm.030324-2048)
309.50 KB (316,928 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\netui2.dll
netui1 5.2.3790.0 (srv03_rtm.030324-2048)
184.00 KB (188,416 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\netui1.dll
comdlg32 6.00.3790.0 (srv03_rtm.030324-2048)
261.00 KB (267,264 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\comdlg32.dll
netmsg 5.2.3790.0 (srv03_rtm.030324-2048)
178.00 KB (182,272 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\netmsg.dll
netplwiz 5.2.3790.0 (srv03_rtm.030324-2048)
843.00 KB (863,232 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\netplwiz.dll
dfssvc 5.2.3790.0 (srv03_rtm.030324-2048)
130.50 KB (133,632 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\dfssvc.exe
resutils 5.2.3790.0 (srv03_rtm.030324-2048)
59.00 KB (60,416 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\resutils.dll
mfc42u 6.05.3014.0 960.00 KB (983,040
bytes) 3/25/2003 12:00 AM Microsoft Corporation
c:\windows.0\system32\mfc42u.dll
sqlmangr 2000.080.0760.00 72.57 KB (74,308 bytes)
2/28/2003 10:56 AM Microsoft Corporation
c:\program files\microsoft sql
server\80\tools\bin\sqlmangr.exe
sqlunirl 2000.080.0728.00 176.56 KB (180,800
bytes) 3/25/2003 12:00 AM Microsoft Corporation
c:\windows.0\system32\sqlunirl.dll
w95scm 2000.080.0760.00 48.56 KB (49,728 bytes)
2/28/2003 10:56 AM Microsoft Corporation
c:\program files\microsoft sql
server\80\tools\bin\w95scm.dll
odbc32 3.525.1022.0 (srv03_rtm.030324-2048)
232.00 KB (237,568 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\odbc32.dll
sqlsvc 2000.080.0760.00 92.56 KB (94,784 bytes)
2/28/2003 10:56 AM Microsoft Corporation
c:\program files\microsoft sql
server\80\tools\bin\sqlsvc.dll

```

```

odbcbcnp 2000.085.1022.00 (srv03_rtm.030324-2048)
24.00 KB (24,576 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\odbcbcnp.dll
sqlresld 2000.080.0382.00 28.56 KB (29,248 bytes)
2/28/2003 10:56 AM Microsoft Corporation
c:\program files\microsoft sql
server\80\tools\bin\sqlresld.dll
odbcint 3.525.1022.0 (srv03_rtm.030324-2048)
92.00 KB (94,208 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\odbcint.dll
sqlsvc 2000.080.0194.00 24.00 KB (24,576 bytes)
2/28/2003 10:56 AM Microsoft Corporation
c:\program files\microsoft sql
server\80\tools\bin\resources\1033\sqlsvc.rll
sqlmangr 2000.080.0194.00 96.00 KB (98,304 bytes)
2/28/2003 10:56 AM Microsoft Corporation
c:\program files\microsoft sql
server\80\tools\bin\resources\1033\sqlmangr.rll
helpctr 5.2.3790.0 (srv03_rtm.030324-2048)
764.00 KB (782,336 bytes) 5/14/2003
Microsoft Corporation
5:00 PM c:\windows.0\pchealth\helpctr\binaries\help
ctr.exe
hcappres 5.2.3790.0 (srv03_rtm.030324-2048)
6.50 KB (6,656 bytes) 5/14/2003
Microsoft Corporation
5:00 PM c:\windows.0\pchealth\helpctr\binaries\hcapp
pres.dll
itss 5.2.3790.0 (srv03_rtm.030324-2048)
119.50 KB (122,368 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\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.0\system32\msxml3.dll
pchshell 5.2.3790.0 (srv03_rtm.030324-2048)
100.50 KB (102,912 bytes) 5/14/2003
Microsoft Corporation
5:00 PM c:\windows.0\pchealth\helpctr\binaries\pch
hell.dll
mlang 6.00.3790.0 (srv03_rtm.030324-2048)
570.00 KB (583,680 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\mlang.dll
mshtml 6.00.3790.0 (srv03_rtm.030324-2048)
2.78 MB (2,916,352 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\mshtml.dll
msimtf 5.2.3790.0 (srv03_rtm.030324-2048)
149.00 KB (152,576 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\msimtf.dll
msctf 5.2.3790.0 (srv03_rtm.030324-2048)
287.00 KB (293,888 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\msctf.dll
jscript 5.6.0.8515 436.00 KB (446,464
bytes) 3/25/2003 12:00 AM Microsoft Corporation
c:\windows.0\system32\jscript.dll

```

```

msls31 3.10.349.0 147.00 KB (150,528
bytes) 3/25/2003 12:00 AM Microsoft Corporation
c:\windows.0\system32\msls31.dll
imm32 5.2.3790.0 (srv03_rtm.030324-2048)
105.50 KB (108,032 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\imm32.dll
mshtml 6.00.3790.0 (srv03_rtm.030324-2048)
443.50 KB (454,144 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\mshtml.dll
vbscript 5.6.0.8515 404.00 KB (413,696
bytes) 3/25/2003 12:00 AM Microsoft Corporation
c:\windows.0\system32\vbscript.dll
mfc42 6.05.3014.0 960.00 KB (983,040
bytes) 3/25/2003 12:00 AM Microsoft Corporation
c:\windows.0\system32\mfc42.dll
msinfo 5.2.3790.0 (srv03_rtm.030324-2048)
358.50 KB (367,104 bytes) 5/14/2003
Microsoft Corporation
5:00 PM c:\windows.0\pchealth\helpctr\binaries\msin
fo.dll
riched32 5.2.3790.0 (srv03_rtm.030324-2048)
3.50 KB (3,584 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\riched32.dll
riched20 5.31.23.1218 406.00 KB (415,744
bytes) 3/25/2003 12:00 AM Microsoft Corporation
c:\windows.0\system32\riched20.dll
drprov 5.2.3790.0 (srv03_rtm.030324-2048)
12.50 KB (12,800 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\drprov.dll
ntlanman 5.2.3790.0 (srv03_rtm.030324-2048)
41.00 KB (41,984 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\ntlanman.dll
davclnt 5.2.3790.0 (srv03_rtm.030324-2048)
23.50 KB (24,064 bytes) 3/25/2003
Microsoft Corporation
12:00 AM c:\windows.0\system32\davclnt.dll
helpsvc 5.2.3790.0 (srv03_rtm.030324-2048)
720.00 KB (737,280 bytes) 5/14/2003
Microsoft Corporation
5:00 PM c:\windows.0\pchealth\helpctr\binaries\help
svc.exe

[Services]

Display Name Name State Start Mode
Service Type Path Error Control
Start Name Tag ID
Alerter Alerter Stopped Disabled Share Process
c:\windows.0\system32\svchost.exe -k
localservice Normal NT
AUTHORITY\LocalService 0
Application Layer Gateway Service ALG
Stopped Manual Own Process
c:\windows.0\system32\alg.exe Normal NT
AUTHORITY\LocalService 0
Application Management AppMgmt Stopped
Manual Share Process

```



```

c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Windows Audio AudioSrv Running Auto
Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Background Intelligent Transfer Service BITS
Stopped Manual Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Computer Browser Browser Running Auto
Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Indexing Service CiSvc Stopped Disabled
Share Process
c:\windows.0\system32\cisvc.exe
Normal LocalSystem 0
ClipBook ClipSrv Stopped Disabled Own Process
c:\windows.0\system32\cliprv.exe
Normal LocalSystem 0
COM+ System Application COMSysApp Stopped
Manual Own Process
c:\windows.0\system32\dllhost.exe
/processid:{02d4b3f1-fd88-11d1-960d-00805fc79235}
Normal LocalSystem 0
Cryptographic Services CryptSvc Running
Auto Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Distributed File System Dfs Running
Auto Own Process
c:\windows.0\system32\dfssvc.exe
Normal LocalSystem 0
DHCP Client Dhcp Running Auto
Share Process
c:\windows.0\system32\svchost.exe -k
networkservice Normal NT
AUTHORITY\NetworkService 0
Logical Disk Manager Administrative Service
dmdadmin Stopped Manual Share Process
c:\windows.0\system32\dmdadmin.exe /com
Normal LocalSystem 0
Logical Disk Manager dmserver Running
Auto Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
DNS Client Dnscache Running Auto
Share Process
c:\windows.0\system32\svchost.exe -k
networkservice Normal NT
AUTHORITY\NetworkService 0
Error Reporting Service ERSvc Running
Auto Share Process
c:\windows.0\system32\svchost.exe -k winerr
Ignore LocalSystem 0
Event Log Eventlog Running Auto Share Process
c:\windows.0\system32\services.exe
Normal LocalSystem 0
COM+ Event System EventSystem Running
Manual Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0

```

```

Help and Support helpsvc Running Auto
Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Human Interface Device Access HidServ Stopped
Disabled Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
HTTP SSL HTTPFilter Stopped Manual
Share Process
c:\windows.0\system32\lsass.exe
Normal LocalSystem 0
IMAPI CD-Burning COM Service ImapiService
Stopped Disabled Own Process
c:\windows.0\system32\imapi.exe
Normal LocalSystem 0
Intersite Messaging IamSrv Stopped Disabled Own
Process c:\windows.0\system32\ismerv.exe
Normal LocalSystem 0
Kerberos Key Distribution Center kdc
Stopped Disabled Share Process
c:\windows.0\system32\lsass.exe
Normal LocalSystem 0
Server lanmanserver Running Auto
Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Workstation lanmanworkstation Running
Auto Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
License Logging LicenseService Stopped
Disabled Own Process
c:\windows.0\system32\llssrv.exe
Normal NT AUTHORITY\NetworkService 0
TCP/IP NetBIOS Helper LmHosts Running
Auto Share Process
c:\windows.0\system32\svchost.exe -k
localservice Normal NT
AUTHORITY\LocalService 0
Messenger Messenger Stopped Disabled Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
NetMeeting Remote Desktop Sharing mnmsrvc
Stopped Disabled Own Process
c:\windows.0\system32\mnmsrvc.exe
Normal LocalSystem 0
Distributed Transaction Coordinator MSDTC
Running Auto Own Process
c:\windows.0\system32\msdtc.exe
Normal NT AUTHORITY\NetworkService 0
Windows Installer MSIServer Stopped Manual
Share Process
c:\windows.0\system32\msiexec.exe /v
Normal LocalSystem 0
Microsoft Search MSSEARCH Running Auto
Share Process "c:\program
files\common files\system\mssearch\bin\mssearch.exe"
Normal LocalSystem 0
MSSQLSERVER MSSQLSERVER Stopped
Manual Own Process

```

```

c:\sql2k\mssql\bin\sqlservr.exe
Normal LocalSystem 0
Network DDE NetDDE Stopped Disabled
Share Process
c:\windows.0\system32\netdde.exe
Normal LocalSystem 0
Network DDE DSDM NetDDEdsdm Stopped
Disabled Share Process
c:\windows.0\system32\netdde.exe
Normal LocalSystem 0
Net Logon Netlogon Stopped Manual Share Process
c:\windows.0\system32\lsass.exe
Normal LocalSystem 0
Network Connections Netman Running Manual
Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Network Location Awareness (NLA) Nla
Running Manual Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
File Replication NtFrs Stopped Manual Own
Process c:\windows.0\system32\ntfrs.exe
Ignore LocalSystem 0
NT LM Security Support Provider NtLmSsp
Running Manual Share Process
c:\windows.0\system32\lsass.exe
Normal LocalSystem 0
Removable Storage NtmsSvc Stopped Manual
Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Plug and Play PlugPlay Running Auto
Share Process
c:\windows.0\system32\services.exe
Normal LocalSystem 0
IPSEC Services PolicyAgent Running
Auto Share Process
c:\windows.0\system32\lsass.exe
Normal LocalSystem 0
Protected Storage ProtectedStorage Running
Auto Share Process
c:\windows.0\system32\lsass.exe
Normal LocalSystem 0
Remote Access Auto Connection Manager RasAuto
Stopped Manual Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Remote Access Connection Manager RasMan
Stopped Manual Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Remote Desktop Help Session Manager RDSessMgr
Stopped Manual Own Process
c:\windows.0\system32\sessmgr.exe
Normal LocalSystem 0
Routing and Remote Access RemoteAccess
Stopped Disabled Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Remote Registry RemoteRegistry Running
Auto Share Process
c:\windows.0\system32\svchost.exe -k regsvc

```

```

Normal NT AUTHORITY\LocalService 0
Remote Procedure Call (RPC) Locator RpcLocator
Stopped Manual Own Process
c:\windows.0\system32\locator.exe
Normal NT AUTHORITY\NetworkService 0
Remote Procedure Call (RPC) RpcSs Running
Auto Share Process
c:\windows.0\system32\svchost -k rpcss
Normal LocalSystem 0
Resultant Set of Policy Provider RSoPProv
Stopped Manual Share Process
c:\windows.0\system32\rsopprov.exe
Normal LocalSystem 0
Special Administration Console Helper sacsvr
Stopped Manual Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Security Accounts Manager SamSs Running
Auto Share Process
c:\windows.0\system32\lsass.exe
Normal LocalSystem 0
Smart Card SCardSvr Stopped Manual
Share Process
c:\windows.0\system32\scardsvr.exe
Ignore NT AUTHORITY\LocalService 0
Task Scheduler Schedule Running Auto
Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Secondary Logon seclogon Running Auto
Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Ignore LocalSystem 0
System Event Notification SENS Running
Auto Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Internet Connection Firewall (ICF) / Internet
Connection Sharing (ICS) SharedAccess
Stopped Disabled Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Shell Hardware Detection ShellHWDetection
Running Auto Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Ignore LocalSystem 0
Print Spooler Spooler Running Auto Own
Process c:\windows.0\system32\spoolsv.exe
Normal LocalSystem 0
SQLSERVERAGENT SQLSERVERAGENT Stopped
Manual Own Process
c:\sql2k\mssql\bin\sqlagent.exe
Normal LocalSystem 0
Windows Image Acquisition (WIA) stisvc
Stopped Disabled Share Process
c:\windows.0\system32\svchost.exe -k imgsvc
Normal NT AUTHORITY\LocalService 0
Microsoft Software Shadow Copy Provider swprv
Stopped Manual Own Process

```

```

c:\windows.0\system32\svchost.exe -k swprv
Normal LocalSystem 0
Performance Logs and Alerts SysmonLog Stopped
Manual Own Process
c:\windows.0\system32\smlogsvc.exe
Normal NT Authority\NetworkService 0
Telephony TapiSrv Stopped Manual Share Process
c:\windows.0\system32\svchost.exe -k
tapisrv Normal LocalSystem 0
Terminal Services TermService Stopped
Disabled Share Process
c:\windows.0\system32\svchost.exe -k
termsvcs Normal LocalSystem 0
Themes Themes Stopped Disabled Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Telnet TlntSvr Stopped Disabled Own Process
c:\windows.0\system32\tlntsvr.exe
Normal NT AUTHORITY\LocalService 0
Distributed Link Tracking Server TrkSvr
Stopped Disabled Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Distributed Link Tracking Client TrkWks
Running Auto Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Terminal Services Session Directory Tssdis
Stopped Disabled Own Process
c:\windows.0\system32\tssdis.exe
Normal LocalSystem 0
Upload Manager uploadmgr Stopped Manual
Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Uninterruptible Power Supply UPS Stopped
Manual Own Process
c:\windows.0\system32\ups.exe Normal NT
AUTHORITY\LocalService 0
Virtual Disk Service vds Stopped
Manual Own Process
c:\windows.0\system32\vds.exe Normal
LocalSystem 0
Volume Shadow Copy VSS Stopped Manual Own
Process c:\windows.0\system32\vssvc.exe
Normal LocalSystem 0
Windows Time W32Time Running Auto
Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
WebClient WebClient Stopped Disabled Share Process
c:\windows.0\system32\svchost.exe -k
localservice Normal NT
AUTHORITY\LocalService 0
WinHTTP Web Proxy Auto-Discovery Service
WinHttpAutoProxySvc Stopped Manual
Share Process
c:\windows.0\system32\svchost.exe -k
localservice Normal NT
AUTHORITY\LocalService 0

```

```

Windows Management Instrumentation winmgmt
Running Auto Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Ignore LocalSystem 0
Portable Media Serial Number Service WmdmPmsN
Stopped Manual Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Windows Management Instrumentation Driver Extensions
Wmi Stopped Manual Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
WMI Performance Adapter WmiApSrv Stopped
Manual Own Process
c:\windows.0\system32\wbem\wmiapsrv.exe
Normal LocalSystem 0
Automatic Updates wuauverv Running Auto
Share Process
c:\windows.0\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Wireless Configuration WZC SVC Running
Auto Share Process
c:\windows.0\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
Microsoft SQL Server All Users:Microsoft SQL
Server All Users
Startup All Users:Startup All Users
Accessories NT AUTHORITY\SYSTEM:Accessories
NT AUTHORITY\SYSTEM
Accessories\Accessibility NT
AUTHORITY\SYSTEM:Accessories\Accessibility NT
AUTHORITY\SYSTEM
Accessories\Entertainment NT
AUTHORITY\SYSTEM:Accessories\Entertainment NT
AUTHORITY\SYSTEM
Startup NT AUTHORITY\SYSTEM:Startup NT
AUTHORITY\SYSTEM

```

Accessories LILO\Administrator:Accessories
 LILO\Administrator
 Accessories\Accessibility LILO\Administrator:Accessories\Accessibility
 LILO\Administrator
 Accessories\Entertainment LILO\Administrator:Accessories\Entertainment
 LILO\Administrator
 Administrative Tools LILO\Administrator:Administrative Tools
 LILO\Administrator
 Startup LILO\Administrator:Startup
 LILO\Administrator

[Startup Programs]

| Program | Command | User Name | Location |
|-----------------|-------------|------------------|---------------------|
| desktop | desktop.ini | | NT AUTHORITY\SYSTEM |
| desktop | desktop.ini | | LILO\Administrator |
| desktop | desktop.ini | | .DEFAULT Startup |
| desktop | desktop.ini | | All Users Common |
| Startup | | | |
| Service Manager | | | |
| .exe | /n | All Users Common | Startup |

[OLE Registration]

| Object | Local Server |
|---|---|
| Sound (OLE2) | sndrec32.exe |
| Media Clip | mplay32.exe |
| Video Clip | mplay32.exe /avi |
| MIDI Sequence | mplay32.exe /mid |
| Sound | Not Available |
| Media Clip | Not Available |
| 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 |
|-------------------|-------------------|---|
| 7/10/2003 2:43 PM | Application Error | Faulting application vds.exe, version 5.2.3790.0, faulting module vds.exe, version 5.2.3790.0, fault address 0x0001caf0.
6/18/2003 12:09 PM Application Error Faulting application vds.exe, version 5.2.3790.0, faulting module vds.exe, version 5.2.3790.0, fault address 0x0001caf0.
 |

[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 |
|--------------|----------------|---------------|----------------------|-----------------------|
| actxprxy.dll | 6.0.3790.0 | 95 KB | 3/25/2003 1:00:00 AM | C:\WINDOWS.0\system32 |
| advpack.dll | 6.0.3790.0 | 94 KB | 3/25/2003 1:00:00 AM | C:\WINDOWS.0\system32 |
| asctrls.ocx | 6.0.3790.0 | 90 KB | 3/25/2003 1:00:00 AM | C:\WINDOWS.0\system32 |
| browseui.dll | 6.0.3790.0 | 1,033 KB | 3/25/2003 1:00:00 AM | C:\WINDOWS.0\system32 |
| cdfview.dll | 6.0.3790.0 | 144 KB | 3/25/2003 1:00:00 AM | C:\WINDOWS.0\system32 |
| comctl32.dll | 5.82.3790.0 | 561 KB | 3/25/2003 1:00:00 AM | C:\WINDOWS.0\system32 |
| dxtrans.dll | 6.3.3790.0 | 198 KB | 3/25/2003 1:00:00 AM | C:\WINDOWS.0\system32 |
| dxtmsft.dll | 6.3.3790.0 | 344 KB | 3/25/2003 1:00:00 AM | C:\WINDOWS.0\system32 |
| iecont.dll | <File Missing> | Not Available | Not Available | Not Available |
| iecontlc.dll | <File Missing> | Not Available | Not Available | Not Available |
| iedkcs32.dll | 16.0.3790.0 | 300 KB | 3/25/2003 1:00:00 AM | |

| | | | |
|------------------------------------|-----------------------|----------|----------------------|
| C:\WINDOWS.0\system32 | Microsoft Corporation | | |
| iepeers.dll | 6.0.3790.0 | 230 KB | 3/25/2003 1:00:00 AM |
| C:\WINDOWS.0\system32 | Microsoft Corporation | | |
| iesetup.dll | 6.0.3790.0 | 59 KB | 3/25/2003 1:00:00 AM |
| C:\WINDOWS.0\system32 | Microsoft Corporation | | |
| ieuinit.inf | Not Available | 20 KB | 3/25/2003 1:00:00 AM |
| C:\WINDOWS.0\system32 | Not Available | | |
| C:\Program Files\Internet Explorer | Microsoft Corporation | | |
| imgutil.dll | 5.2.3790.0 | 35 KB | 3/25/2003 1:00:00 AM |
| C:\WINDOWS.0\system32 | Microsoft Corporation | | |
| inetcppl.cpl | 6.0.3790.0 | 303 KB | 3/25/2003 1:00:00 AM |
| C:\WINDOWS.0\system32 | Microsoft Corporation | | |
| inetcpplc.dll | 6.0.3790.0 | 109 KB | 3/25/2003 1:00:00 AM |
| C:\WINDOWS.0\system32 | Microsoft Corporation | | |
| inseng.dll | 6.0.3790.0 | 72 KB | 3/25/2003 1:00:00 AM |
| C:\WINDOWS.0\system32 | Microsoft Corporation | | |
| mlang.dll | 6.0.3790.0 | 570 KB | 3/25/2003 1:00:00 AM |
| C:\WINDOWS.0\system32 | Microsoft Corporation | | |
| msencode.dll | 2002.10.4.0 | 112 KB | 3/25/2003 1:00:00 AM |
| C:\WINDOWS.0\system32 | Not Available | | |
| mshta.exe | 6.0.3790.0 | 26 KB | 3/25/2003 1:00:00 AM |
| C:\WINDOWS.0\system32 | Microsoft Corporation | | |
| mshtml.dll | 6.0.3790.0 | 2,848 KB | 3/25/2003 1:00:00 AM |
| C:\WINDOWS.0\system32 | Microsoft Corporation | | |
| mshtml.tlb | 6.0.3790.0 | 1,319 KB | 3/25/2003 1:00:00 AM |
| C:\WINDOWS.0\system32 | Microsoft Corporation | | |
| mshtmlmled.dll | 6.0.3790.0 | 444 KB | 3/25/2003 1:00:00 AM |
| C:\WINDOWS.0\system32 | Microsoft Corporation | | |
| mshtmlmle.dll | 6.0.3790.0 | 55 KB | 3/25/2003 1:00:00 AM |
| C:\WINDOWS.0\system32 | Microsoft Corporation | | |
| msident.dll | 6.0.3790.0 | 47 KB | 3/25/2003 1:00:00 AM |

```

C:\WINDOWS.0\system32      Microsoft
Corporation
msidntld.dll                6.0.3790.0      15 KB
3/25/2003 1:00:00 AM
C:\WINDOWS.0\system32      Microsoft
Corporation
msieftp.dll                 6.0.3790.0      230 KB
3/25/2003 1:00:00 AM
C:\WINDOWS.0\system32      Microsoft
Corporation
msrating.dll                6.0.3790.0      132 KB
3/25/2003 1:00:00 AM
C:\WINDOWS.0\system32      Microsoft
Corporation
mstime.dll                  6.0.3790.0      491 KB
3/25/2003 1:00:00 AM
C:\WINDOWS.0\system32      Microsoft
Corporation
occache.dll                 6.0.3790.0      89 KB
3/25/2003 1:00:00 AM
C:\WINDOWS.0\system32      Microsoft
Corporation
proctexe.ocx                6.3.3790.0      78 KB
3/25/2003 1:00:00 AM
C:\WINDOWS.0\system32      Intel
Corporation
sendmail.dll                6.0.3790.0      52 KB
3/25/2003 1:00:00 AM
C:\WINDOWS.0\system32      Microsoft
Corporation
shdoclc.dll                 6.0.3790.0      589 KB
3/25/2003 1:00:00 AM
C:\WINDOWS.0\system32      Microsoft
Corporation
shdocvw.dll                 6.0.3790.0      1,361 KB
3/25/2003 1:00:00 AM
C:\WINDOWS.0\system32      Microsoft
Corporation
shfolder.dll                6.0.3790.0      23 KB
3/25/2003 1:00:00 AM
C:\WINDOWS.0\system32      Microsoft
Corporation
shlwapi.dll                 6.0.3790.0      281 KB
3/25/2003 1:00:00 AM
C:\WINDOWS.0\system32      Microsoft
Corporation
tdc.ocx                     1.3.0.3130      58 KB      3/25/2003
1:00:00 AM      C:\WINDOWS.0\system32
Microsoft Corporation
url.dll                      6.0.3790.0      36 KB      3/25/2003
1:00:00 AM      C:\WINDOWS.0\system32
Microsoft Corporation
urlmon.dll                   6.0.3790.0      502 KB
3/25/2003 1:00:00 AM
C:\WINDOWS.0\system32      Microsoft
Corporation
webcheck.dll                 6.0.3790.0      262 KB
3/25/2003 1:00:00 AM
C:\WINDOWS.0\system32      Microsoft
Corporation
wininet.dll                  6.0.3790.0      609 KB
3/25/2003 1:00:00 AM

```

```

C:\WINDOWS.0\system32      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.NT AUTHORITY\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 |

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 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 236. 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 | 1,580 | | | | | 19,718.01 |
| Table | Rows | Data KB | Index KB | Extra 5% KB | 8hr Space | Total Space KB |
| Warehouse | 1,580 | 176 | 32 | 10 | | 218 |
| District | 15,800 | 1,760 | 32 | 90 | | 1882 |
| Customer | 47,400,000 | 34,472,728 | 2,055,568 | 1,826,415 | | 38354711 |
| History | 47,400,000 | 2,633,344 | 24 | | 534,552 | 2633368 |
| New_order | 14,220,000 | 224,824 | 528 | 11,268 | | 236620 |
| Orders | 47,400,000 | 1,452,880 | 660,688 | | 5,418,003 | 2113568 |
| Order_line | 474,002,729 | 29,625,176 | 62,720 | | 7,842,033 | 29687896 |
| Item | 100,000 | 9,528 | 48 | 479 | | 10055 |
| Stock | 158,000,000 | 50,560,008 | 94,488 | 2,532,725 | | 53187221 |
| Total | | 118,980,424 | 2,874,128 | 4,370,986 | 13,794,588 | 126,225,538 |
| MB | | | | | | |
| Dynamic Space | 32,921 | Sum of Data for Order, Orderline and History | | | | |
| Static Space | 90,346 | Sum of Data+Index+5%-Dynamic Space | | | | |
| Free Space | na | Total Allocated Spac - (Dynamic + Static Space) | | | | |
| Daily Growth | 6,574 | (Dynamic Space/(W*62.5))*tpmc | | | | |
| 60 Day Space MB | 484,761 | | | | | |
| 60 Day Space GB | 473.40 | | | | | |
| Log Size | 54,999.99 MB | | | | | |
| KB Per New Order | 5.32 KB | | | | | |
| 8 hr log MB | 49,191 MB | | | | | |
| 8 hr log GB | 48.0377 GB | | | | | |
| Space Usage | GB Needed | Disks | GB Priced | Disk Size | Formatted Size | |
| 60 Day Space DB | 473.40 | 42 | 709.80 | 18.2GB | 16.900 | |
| Total DB | | | 709.80 | | | |
| 8-hr log + mirror | 96.0755 | 4 | 135.68 | 36.4GB | 33.92 | |
| OS, Swap | 3 | 1 | 16.90 | 18.2GB | 16.900 | |
| Total Storage | 572.48 GB | | 862.38 GB | | | |

| MSSQL_misc_fg | MSSQL_cs_fg |
|-----------------------|-------------|
| 218 | |
| 1882 | |
| 3167920 | 38354711 |
| 236620 | |
| 7531571 | |
| 37529929 | |
| 10055 | 53187221 |
| 48,478,194 | 91,541,932 |
| files= 3 | 3 |
| size= 16,281,600 | 32,665,600 |
| Total= 48,844,800 | 97,996,800 |
| 8K blocks 390,758,400 | 783,974,400 |

OK OK

| | | | | | | | | | | | | | | | |
|-----------------------------------|-----------------------|------------------------|----------------------|-----------------------|---------------------|----------------------|----------------------|---------------------|-----------------------|-----------------------|--------------|--|--|--|--|
| tpmC | | 19,718.01 | | | | | | | | | | | | | |
| | 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 | 2,633,344 | 24 | 2,711,344 | 80 | 78,000 | 56 | 78,056 | 0.0565 | 534,552.05 | 522.02 | | | | | |
| Order | 1,452,880 | 660,688 | 1,579,272 | 1,325,440 | 126,392 | 664,752 | 791,144 | 0.5724 | 5,418,003.06 | 5,291.02 | | | | | |
| Order-Line | 29,625,176 | 62,720 | 30,707,584 | 125,416 | 1,082,408 | 62,696 | 1,145,104 | 0.8286 | 7,842,032.52 | 7,658.23 | | | | | |
| | sum(*) Before | | sum(*) After | | Num New- | | | | | | | | | | |
| d_next_o_id | 47,415,800 | | 48,797,840 | | 1,382,040 | | | | | | | | | | |
| | Before MB | | After MB | | Grow MB | | | | | | | | | | |
| Log | 609.97 | | 7792.85 | | 7182.88 | | | | | | | | | | |
| | 54999.992 | | 1.1090369 | | 14.168826 | | | | | | | | | | |
| Database tpcc log used (%) | | | | | | | | | | | | | | | |
| | | | | | | | | | 5.3220 | 49,190.64 | 48.04 | | | | |
| | | | | | | | | | 5,449.7690 | bytes | | | | | |

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

July 8, 2003

Hewlett-Packard
Company
Paul Cao
MS150402
20555 SH 249
Houston, TX 77070

Mr. Cao:

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 <i>Per processor licensing No discounts applied</i> | \$4,999 | 1 | \$4,999 |
| C11-00821 | Windows 2000 Server <i>Server license only - No CALs Discount Schedule: Open Program - No Level Unit Price reflects a 8% discount from the retail unit price of \$799.</i> | \$738 | 1 | \$738 |
| P73-00295 | Windows Server 2003, Standard Server <i>Server license only - No CALs Discount Schedule: Open Program - No Level Unit Price reflects a 26% discount from the retail unit price of \$999.</i> | \$738 | 1 | \$738 |
| PRO-PRORS-16U-01 | Database Server Support Package <i>1 Year Term</i> | \$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.

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

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

Microsoft

May 22, 2003

Hewlett-Packard
Company
Paul Cao
MS150402
20555 SH 249
Houston, TX 77070

Mr. Cao:

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 |
|-------------|---|------------|----------|-------|
| 254-00170 | Visual C++ Standard <i>No discounts applied</i> | \$109 | 1 | \$109 |

All products are currently orderable through Microsoft's normal distribution channels.

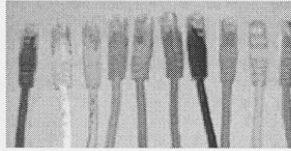
This quote is valid for the next 90 days.

If we can be of any further assistance, please contact Jamie Reding at (425) 703-0510 or jamiere@microsoft.com.

- 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



15FT Cat 5e Network Patch Cables (backwards compatible

15ft Category 5e Network patch cables. (compatible with cat 5) 10/10 DISCOUNT AVAILABLE*

All feature molded compact snagless
NOTE: The purple cable only comes in 14FT length!!!!

Availability: Usually ships the same business day.

CBLC515 \$2.00, 31/\$50.22, 80/\$121.60 Color: