TPC Benchmark™ C
Full Disclosure Report
for
IBM @server xSeries 360
using
Microsoft SQL Server 2000 Standard Edition
and
Windows 2000 Server

TPC-C Version 5.0

Submitted for Review
March 11, 2002

First Edition - March 2002

Trademarks

Notes

[1] MHz only measures microprocessor internal clock speed, not application performance. Many factors affect application performance.
[2] When referring to hard disk capacity, GB, or gigabyte, means one thousand million bytes. Total user-accessible capacity may be less.

Abstract

IBM Corporation conducted the TPC Benchmark™ C on the IBM @server xSeries 360 configured as a client/server system. This report documents the full disclosure information required by the TPC Benchmark™ C Standard Specification, Revision 5.0, including the methodology used to achieve the reported results. All testing fully complied with this revision level.

The software used on the xSeries 360 system includes Microsoft** Windows** 2000 Server operating system and Microsoft SQL Server 2000 Standard Edition database.

Two standard metrics, transactions per minute-C (tpmC) and price per tpmC ($/tpmC), are reported as required by the TPC Benchmark C Standard Specification.

The benchmark results are summarized in the following table.

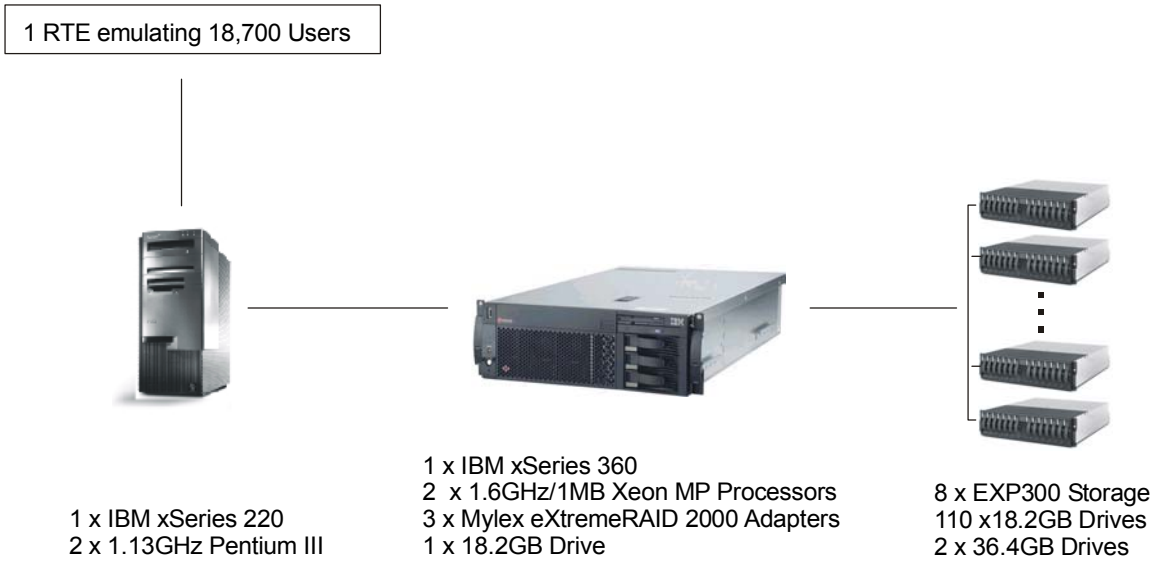
Hardware	Software	Total System Cost	tpmC	$/tpmC	Total Solution Availability Date
IBM @server xSeries 360	Microsoft SQL Server 2000 Standard Edition Microsoft Windows 2000 Server	$101,450	23,027.66	$4.41	Sept. 10, 2002

The results of the benchmark and test methodology used were audited by Bradley J. Askins of InfoSizing, Inc. The auditor's attestation letter is contained in Section 9 of this report.

IBM	**IBM @server xSeries 360 c/s with Microsoft SQL Server 2000**	TPC-C Rev. 5.0 Report Date: March 11, 2002

Total System Cost	TPC-C Throughput	Price/Performance	Availability Date
$101,450	**23,027.66 tpmC**	**$4.41 / tpmC**	**Sept. 10, 2002**

Processors	Database Manager	Operating System	Other Software	Number of Users
2 Xeon MP 1.6GHz - Server **2 Pentium III 1.13GHz - Client**	**Microsoft® SQL Server 2000 Standard Edition**	**Microsoft Windows® 2000 Server**	**Microsoft Visual C++ 6.0 Win32** **Microsoft COM+**	**18,700**



System Component	Qty	Server	Qty	Client
Processors	**2**	**1.6GHz Xeon MP w/1MB L3 Cache**	**2**	**1.13GHz Pentium III w/512KB L2 Cache**
Memory	**4** **2**	**512MB ECC SDRAM** **256MB ECC SDRAM**	**2** **2**	**128MB** **256MB**
Disk Controllers	**3**	**Mylex eXtremeRAID 2000 Adapter**	**1**	**Ultra160 SCSI Interface**
Disk Drives	**111** **2**	**18.2GB (10000 rpm)** **36.4GB (10000 rpm)**	**1**	**18.2GB Hard Disk**
Total Storage		**1879.23GB**		
Tape Drive	**1**	**20/40GB SCSI Tape Drive**		

IBM Corporation	IBM @server xSeries 360 c/s with Microsoft SQL Server 2000	TPC-C Rev. 5.0
		Report Date: March 11, 2002

Description	Order Number	Third-Party Brand	Third-Party Pricing	Unit Price	Qty	Ext. Price	3-Yr. Maint.*
Server Hardware							
IBM @server xSeries 360 Two 1.6GHz/1MB Xeon MP Processor Four 512MB ECC SDRAM RDIMMs Two 36.4GB 10K Ultra160 SCSI Drives	8686-3RX	IBM	1	$20,999	1	$20,999	$1,495
256MB ECC DDR SDRAM RDIMM	33L3281	IBM	1	285	2	570	0
Mylex eXtremeRAID 2000 Adapter	08P3834		3	1,302	5	6,510	0
Netfinity 4.2M Ultra2 SCSI Cable	03K9311	IBM	1	105	10	1,050	0
IBM UPS 500	33L3477	IBM	1	99	2	198	0
E54 14" (13.8" Viewable) Color Monitor*	633147N	IBM	1	149	1	149	90
20/40GB Internal SCSI Tape Drive	00N7991	IBM	1	769	1	769	0
NetBAY42 Standard Rack Cabinet	9306421	IBM	1	1,610	1	1,610	300
Storage Hardware							
Netfinity EXP300 Rack Storage Enclosure*	35311RU	IBM	1	3,179	8	25,432	1,600
18.2GB 10K Ultra160 SCSI Drive	06P5754	IBM	1	275	111	30,525	0
					Subtotal	$87,812	$3,485
Server Software							
Microsoft SQL Server 2000 Standard Edition	228-01079	Microsoft	2	4,999	2	$9,998	$0
Microsoft Windows 2000 Server	C11-00821	Microsoft	2	738	1	738	0
Three-Year Maintenance for Software		Microsoft	2	2,095	3		6,285
					Subtotal	$10,736	$6,285
Client Hardware							
IBM @server xSeries 220 * One 128MB 133MHz ECC SDRAM RDIMM	8646-31X	IBM	1	949	1	$949	$748
1.13GHz/512KB Pentium III Processor	32P0651	IBM	1	799	1	799	0
128MB 133MHz ECC SDRAM RDIMM	10K0018	IBM	1	109	1	109	0
256MB 133MHz ECC SDRAM RDIMM	10K0020	IBM	1	245	2	490	0
18.2GB 10K Ultra160 SCSI Drive	06P5754	IBM	1	275	1	275	0
E54 15" (13.8" Viewable) Color Monitor*	633147N	IBM	1	149	1	149	90
					Subtotal	$2,771	$838
Client Software							
Microsoft Windows 2000 Server with COM+	C11-00821	Microsoft	2	738	1	738	0
Microsoft Visual C++ Professional 6.0 Win32	048-00317	Microsoft	2	549	1	549	0
					Subtotal	$1,287	$0
User Connectivity							
Cross-Over Cable (7 ft.) incl. 2 spares	CBLC57		4	2	3	6	0
					Subtotal	$6	$0
					Total	$102,612	$10,608
Large volume discount of 14% on IBM Hardware; prices will vary if purchased separately.			1			(11,770)	$0

Notes: * The standard 3-year warranties on IBM hardware have been upgraded to 7x24, 4-hour response time coverage.
** Five-year warranty. *** 10% or minimum 2 spares are added in place of on-site service (products have a 5-year return-to-vendor-warranty)
Pricing: 1 - IBM Corp.; 2 - Microsoft Corp.; 3 - Computer Giants; 4 - LanAdapters.com
Audited by Bradley J. Askins of InfoSizing, Inc.

Three-Year Cost of Ownership:	$101,450
tpmC Rating:	23,027.66
$ / tpmC:	$4.41

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 specification. If you find that stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.

Numerical Quantities Summary

MQTh, Computed Maximum Qualified Throughput:	23,027.66 tpmC

Response Times (in seconds)	Average	Maximum	90 %-tile
New-Order	0.54	4.69	0.78
Payment	0.36	1.69	0.59
Delivery	0.30	1.12	0.52
Stock Level	2.52	5.79	3.72
Order Status	0.40	4.64	0.63
Delivery (Deferred)	0.64	2.00	0.91
Menu	0.31	1.14	0.53

Transaction Mix (in percent of total transactions)	Total Occurrences	Percent
New-Order	2,763,319	44.88
Payment	2,649,178	43.03
Delivery	248,843	4.04
Stock-Level	248,177	4.03
Order Status	247,717	4.02

Emulation Delay (in seconds)		Response Time	Menu
New-Order		0.1	0.1
Payment		0.1	0.1
Delivery		0.1	0.1
Stock-Level		0.1	0.1
Order Status		0.1	0.1

Keying/Think Times (in seconds)	Average	Minimum	Maximum
New Order	18.01 / 12.05	18.00 / 0.00	18.08 / 120.51
Payment	3.01 / 12.05	3.00 / 0.00	3.08 / 120.51
Delivery	2.01 / 5.05	2.00 / 0.00	2.07 / 50.51
Stock Level	2.01 / 5.04	2.00 / 0.00	2.07 / 50.50
Order Status	2.01 / 10.05	2.00 / 0.00	2.05 / 100.50

Test Duration	
Ramp-up time	26 minutes
Measurement interval	120 minutes
Number of transactions (all types) completed in measurement interval	6,406,081
Ramp-down time	5 minutes
Number of checkpoints in measurement interval	4
Checkpoint interval	30 minutes

Table of Contents

Preface

The TPC Benchmark™ C was developed by the Transaction Processing Performance Council (TPC). The TPC was founded to define transaction processing benchmarks and to disseminate objective, verifiable performance data to the industry. This full disclosure report is based on the TPC Benchmark C Standard Specification Version 5.0.

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

TPC Benchmark C is an On Line Transaction Processing (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 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.

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.

General Items

Benchmark Sponsor

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

This benchmark was sponsored by International Business Machines Corporation.

Application Code Disclosure 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 and 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 that have been changed from the defaults found in actual products, including but not limited to:

- *Database tuning options*
- *Recovery/commit options*
- *Consistency/locking options*
- *Operating system and application configuration parameters.*
- *Compilation and linkage options and run-time optimizations used to create/install applications, OS, and/or databases.*

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

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

Configuration Diagrams

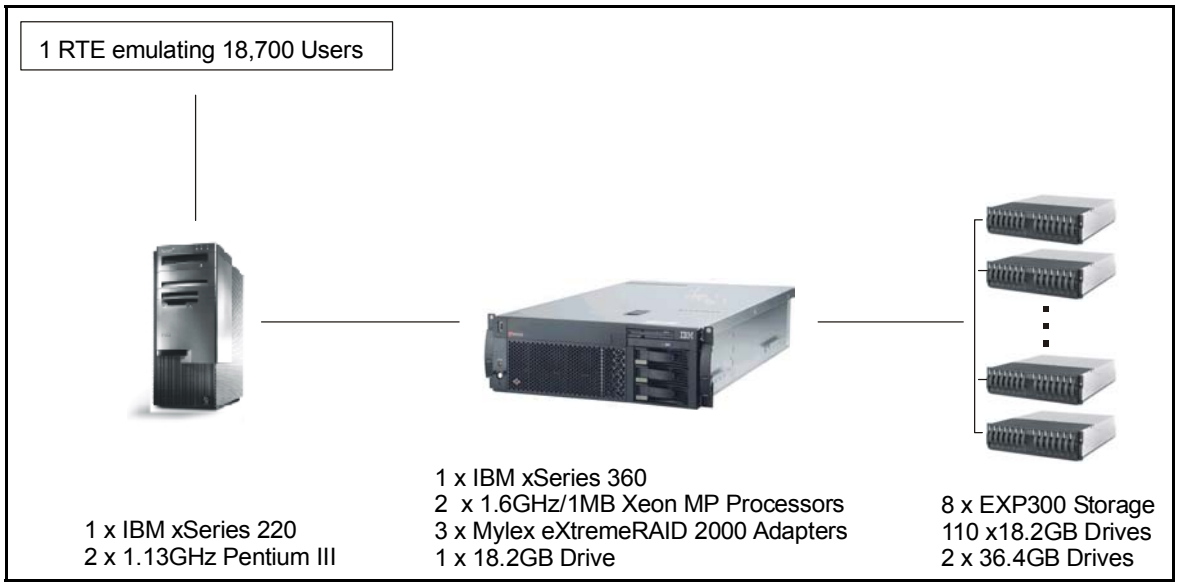
Diagrams of both measured and priced configurations must be provided, accompanied by a description of the differences.

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

The Remote Terminal Emulator (RTE) used for these TPC Benchmark C tests is the Microsoft BenchCraft RTE. Under Version 5.0, the components of the configuration being emulated by the RTE are the workstations and the Ethernet hubs. Appendix C contains a listing of the RTE scripts and inputs used in the benchmark testing.

The benchmarked configuration used an IBM xSeries 220 system as the client, which executed the terminal I/O and submitted transactions to COM+ servers, which were also running on the clients. These COM+ servers forwarded the transaction requests to the server, and returned the results to the RTE. Microsoft SQL Server 2000 Standard Edition was the DBMS executing on the server

Measured Configuration



Priced Configuration

See the Executive Summary for the priced configuration.

Clause 1: Logical Database Design Related Items

Table Definitions

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

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

Physical Organization of the Database

The physical organization of tables and indexes within the database must be disclosed.

Physical space was allocated to Microsoft SQL Server on the server disks as detailed in Figure 4-2.

Insert and Delete Operations

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

All insert and delete functions were fully operational during the running of the benchmark. The space required for an additional 5 percent of the initial table cardinality was allocated to Microsoft SQL Server 2000 and priced as static space.

Horizontal or Vertical Partitioning

While there are few restrictions placed upon horizontal or vertical partitioning of tables and rows in the TPC-C benchmark (see Clause 1.6), any such partitioning must be disclosed.

Partitioning was not used in this benchmark.

Replication

Replication tables, if used, must be disclosed (see Clause 1.4.6).

Replication was not used in this benchmark.

Table Attributes

Additional and/or duplicated attributes in any table must be disclosed, along with a statement on the impact on performance (see Clause 1.4.7).

No additional attributes were used in this benchmark.

Clause 2: Transaction and Terminal Profiles Related Items

Random Number Generation

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

The seeds and offsets for the random number generator were collected and verified to be different for each driver. The auditor selected samples of the generated numbers from the database. The samples were verified to have no discernible patterns.

Screen Layout

The actual layouts of the terminal input/out screens must be disclosed.

All screen layouts followed the TPC Benchmark C Standard Specification. .

Terminal 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 must for the demonstration in 8.1.3.3 must be disclosed and commercially available (including supporting software and maintenance).

The auditor verified terminal features by direct experimentation. The benchmarked configuration uses Microsoft Internet Explorer 5.0 and HTML scripts as the terminal interface.

Intelligent Terminals

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

The terminals emulated in the priced configuration are IBM PC desktop computer systems. All processing of the input/output screens was handled by the xSeries 220 client. The screen input/output was managed via HTML strings that comply with the HTML Version 2.0 specification. A listing of the code used to implement the intelligent terminals is provided in Appendix A. All data manipulation was handled by the xSeries 360 database server.

Transaction Profiles

The percentage of home and remote order-lines in the New-Order transactions must be disclosed.
The percentage of New-Order transactions that were rolled back as a result of an unused item number must be disclosed.

The number of items per orders entered by New-Order transactions must be disclosed. The percentage of home and remote Payment transactions must be disclosed. The percentage of Payment and Order-Status transactions that used non-primary key (C_LAST) access to the database must be disclosed.

The percentage of Delivery transactions that were skipped as a result of an insufficient number of rows in the NEW-ORDER table must be disclosed.

The mix (i.e., percentages) of transaction types seen by the SUT must be disclosed.

Table 2-1. Transaction Statistics

New Order	Value (%)
Home warehouse order lines	99.00
Remote warehouse order lines	1.00
Rolled back transactions	1.00
Average number of items per order	10.00
Payment	
Home warehouse payment transactions	85.02
Remote warehouse payment transactions	14.98
Non-Primary Key Access	
Payment transactions using C_LAST	60.01
Order-Status transactions using C_LAST	60.13
Delivery	
Delivery transactions skipped	0
Transaction Mix	
New-Order	44.88
Payment	43.03
Delivery	4.04
Stock Level	4.03
Order Status	4.02

Deferred Delivery Mechanism

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

The deferred delivery operation is queued by making an entry in an array within the application process (tpcc.dll) running on the client. Background threads within the application asynchronously process the queued delivery transactions.

The source code is listed in Appendix A.

Clause 3: Transaction and System Properties Related Items

The results of the ACID test 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.

Atomicity Requirements

The system under test must guarantee that 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.

All ACID tests were conducted according to specification.

Completed Transactions

The following steps were performed to verify the Atomicity of completed transactions.

1. The balance was retrieved from the CUSTOMER table for a random Customer, District and Warehouse, giving BALANCE_1.
2. The Payment transaction was executed for the Customer, District and Warehouse used in step 1.
3. The balance was retrieved again for the Customer used in step 1 and step 2, giving BALANCE_2. It was verified that BALANCE_1 was greater than BALANCE_2 by AMT.

Aborted Transactions

The following steps were performed to verify the Atomicity of the aborted Payment transaction:

1. The Payment application code was changed to execute a rollback of the transaction instead of performing the commit.
2. Using the balance, BALANCE_2, from the CUSTOMER table retrieved for the completed transaction, the Payment transaction was executed for the Customer, District and Warehouse used in step 1 of section 3.1.1. The transaction rolled back due to the change in the application code from step 1.
3. The balance was retrieved again for the Customer used for step 2, giving BALANCE_3. It was verified that BALANCE_2 was equal to BALANCE_3.

Consistency Requirements

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 bat file to issue queries to the database.The results of the queries demonstrated that the database was consistent for all four tests.

Isolation Requirements

Sufficient conditions must be enabled at either the system or the application level to ensure that the required isolation defined in Clause 3.4.1 is obtained.

Isolation tests one through seven were run using the bat files to issue queries to the database. Each file included timestamps to demonstrate the concurrency of operations. The results of the queries were captured and placed in files. The auditor reviewed the results and verified that the isolation requirements had been met.

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

Case A was followed for Isolation test seven.

Durability Requirements

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

- *Permanent irrecoverable failure of any single durable medium containing TPC-C database tables or recovery log data (this test includes failure of all or part of memory)*
- *Instantaneous interruption (system crash/system hang) in processing that requires system reboot to recover*
- *Failure of all or part of memory (loss of contents)*

Loss of Data Test

The following steps were successfully performed to pass the Durability test of failure of a disk unit with database tables:

1. The contents of the database were backed up to several database dump devices during the initial database load. There were no dump devices on the disk array from which a drive was removed as part of this test.
2. The current count of the total number of orders was determined by the sum of D_NEXT_O_ID for all rows in the district table giving SUM1.
3. A test was started with 150 users submitting transactions.
4. A disk containing a portion of each of the tables in the tpcc database was removed causing SQL Server to report errors accessing that device.
5. The run was aborted and SQL Server was restarted. Upon restart, the database tpcc reported numerous errors relating to the failed database device.
6. The transaction log was dumped to disk and the failed disk was replaced with a spare disk and was recovered.
7. The database was recovered and restored from the backup dump devices. Afterwards, the transaction log was applied to the database.
8. Step 2 was repeated to obtain the current count of the total number of orders giving SUM2.
9. It was verified that the sum of D_NEXT _O_ID after the database is recovered is greater than or equal to the sum of D_NEXT_O_ID before the run, plus all new order transactions completed during the run minus any rollback transactions.
10. Consistency Condition 3 was verified.

Loss of System (Instantaneous Interruption and Loss of Memory)

1. The current count of the total number of orders was determined by the sum of D_NEXT_O_ID for all rows in the district table gving SUM1.
2. A test was started under full load with all users submitting transactions.
3. The test continued with a checkpoint issued, and the system continued to run for another 5 minutes after the checkpoint completed.
4. The server under test was powered off, which removed power from the system and the memory.
5. The server was powered on again.

6. SQL Server was started to initiate automatic recovery from its log.
7. Step 1 was repeated to obtain the current count of the total number of orders giving SUM2.
8. It was verified that the sum of D_NEXT_O_ID after the database is recovered is greater than or equal to the sum of D_NEXT_O_ID before the run, plus all new order transactions completed during the run minus any rollback transactions.

Loss of Log

1. The current count of the total number of orders was determined by the sum of D_NEXT_O_ID for all rows in the district table gving SUM1.
2. A test was started with 50 percent of total users submitting transactions.
3. The test continued with a checkpoint issued and completed.
4. One disk from the log array was removed. Since the disk was RAID-1 mirrored, SQL Server continued to process transactions without interruption.
5. The test continued to run for another 5 minutes.
6. Step 1 was repeated to obtain the current count of the total number of orders giving SUM2.
7. It was verified that the sum of D_NEXT_O_ID after the database is stopped is greater than or equal to the sum of D_NEXT_O_ID before the run, plus all new order transactions completed during the run minus any rollback transactions.

Clause 4: Scaling and Database Population Related Items

Cardinality of Tables

The cardinality (e.g., the number of rows) of each table, as it existed at the start of the benchmark run (see Clause 4.2), must be disclosed. If the database was over-scaled and inactive rows of the WAREHOUSE table were deleted (see Clause 4.2.2), the cardinality of the WAREHOUSE table as initially configured and the number of rows deleted must be disclosed.

The database was originally built with 1,870 warehouses, and the audited run used all 1,870 warehouses.

Table 4-1. Initial Cardinality of Tables

Table Name	Rows
Warehouse	1,870
District	18,700
Item	100,000
New Order	16,830,000
History	56,100,000
Orders	56,100,000
Customer	56,100,000
Order Line	560,998,691
Stock	187,000,000
Inactive Warehouses	0

Distribution of Tables and Logs

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

Figure 4-2 depicts the database configuration of the tested system to meet the 8-hour steady state requirement.

Figure 4-2. Data Distribution for the Benchmarked Configuration

Controller	Drives	Partition	Size	Use
1	42 - 18.2GB	F: Y:	60000MB 200000MB (NTFS)	Customer and Stock Backup 1
2	42 - 18.2GB	G: Z:	60000MB 200000MB (NTFS)	Customer and Stock Backup 2
3	22 - 18.2GB	H:	60000MB	Misc.
3	2 - 36.4GB 4 - 18.2GB	I:	50000MB	Logfile

Database Model Implemented

A statement must be provided that describes:

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

Microsoft SQL Server 2000 Standard Edition is a relational database. The interface used was Microsoft SQL Server stored procedures accessed with Remote Procedure Calls embedded in C code using the Microsoft ODBC interface.

Partitions/Replications Mapping

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

The database was neither partitioned nor replicated.

60-Day Space Requirement

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 (see Clause 4.2.3).

See Appendix D for details about how the 60-day space requirements were calculated.

Clause 5: Performance Metrics and Response Time Related Items

Measured tpmC

Measured tpmC must be reported.

Measured tpmC: 23,027.66 tpmC
Price per tpmC: $4.41 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.

The TPC-C requirements for the average response time and the 90th percentile were met. Table 5-1 provides the response times for each of the transaction types and the menu for the measured system.

Table 5-1. Response Times in Seconds

Transaction Type	Average	Maximum	90 %-tile
New-Order	0.54	4.69	0.78
Payment	0.36	1.69	0.59
Delivery	0.30	1.12	0.52
Stock Level	2.52	5.79	3.72
Order Status	0.40	4.64	0.63
Delivery (Deferred)	0.64	2.00	0.91
Menu	0.31	1.14	0.53

Keying/Think Times

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

Table 5-2 lists the keying/think times for the measured system.

Table 5-2. Keying/Think Times

Transaction Type	Average	Minimum	Maximum
New-Order	18.01 / 12.05	18.00 / 0.00	18.08 / 120.51
Payment	3.01 / 12.05	3.00 / 0.00	3.08 / 120.51
Delivery	2.01 / 5.05	2.00 / 0.00	2.07 / 50.51
Stock Level	2.01 / 5.04	2.00 / 0.00	2.07 / 50.50
Order Status	2.01 / 10.05	2.00 / 0.00	2.05 / 100.50

Response Time Frequency Distribution Curves

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

Figure 5-1. New-Order Transaction - Response Time Frequency Distribution

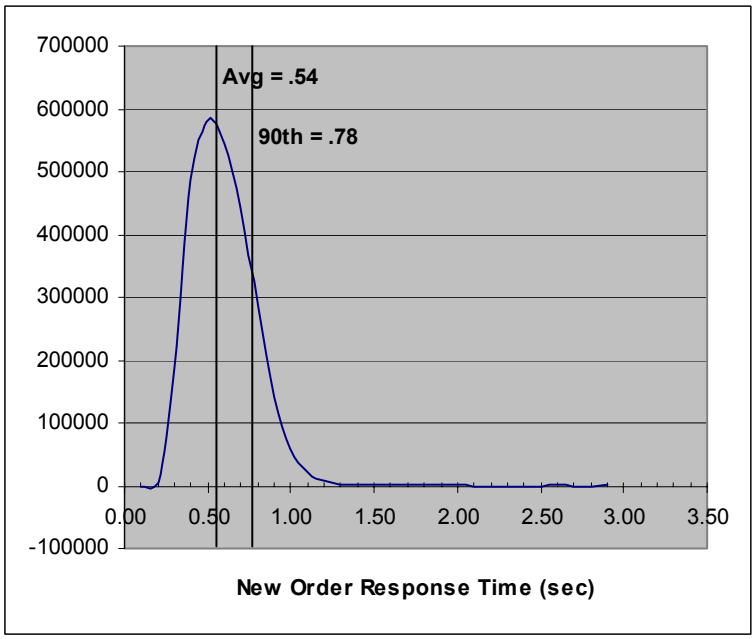


Figure 5-2. Payment Transaction - Response Time Frequency Distribution

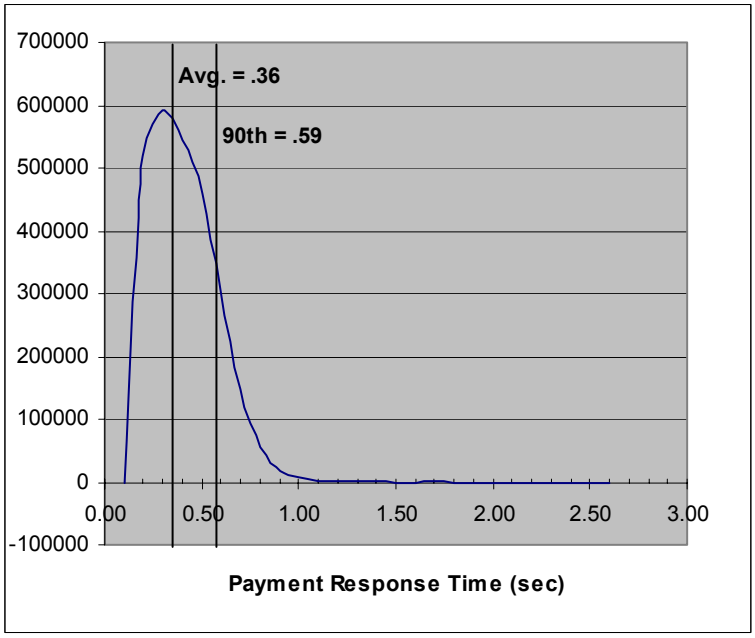


Figure 5-3. Order-Status Transaction - Response Time Frequency Distribution

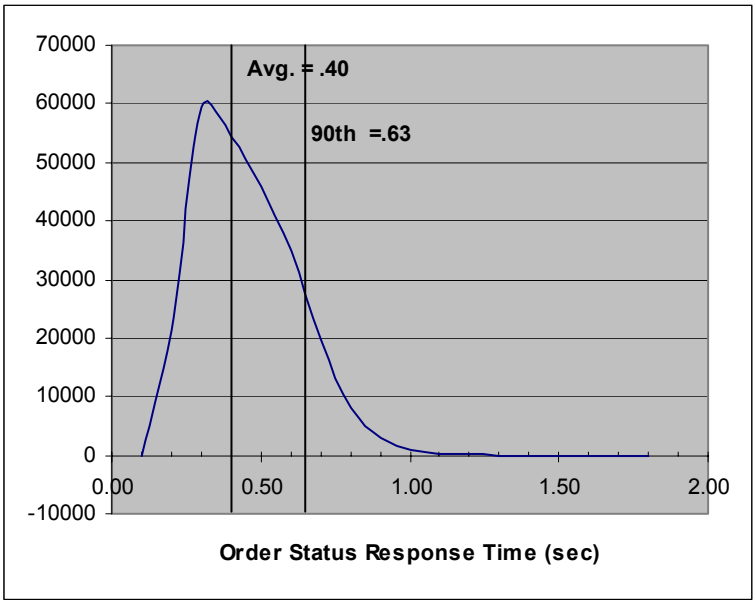
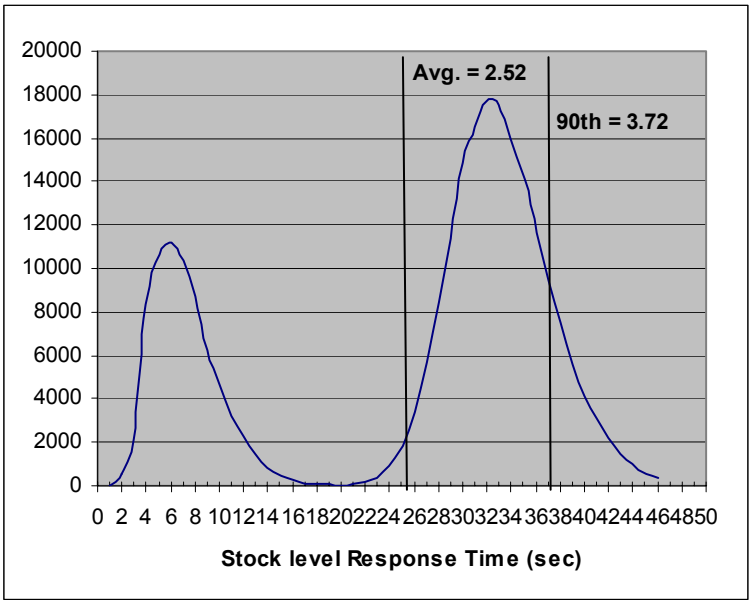


Figure 5-4. Delivery Transaction - Response Time Frequency Distribution

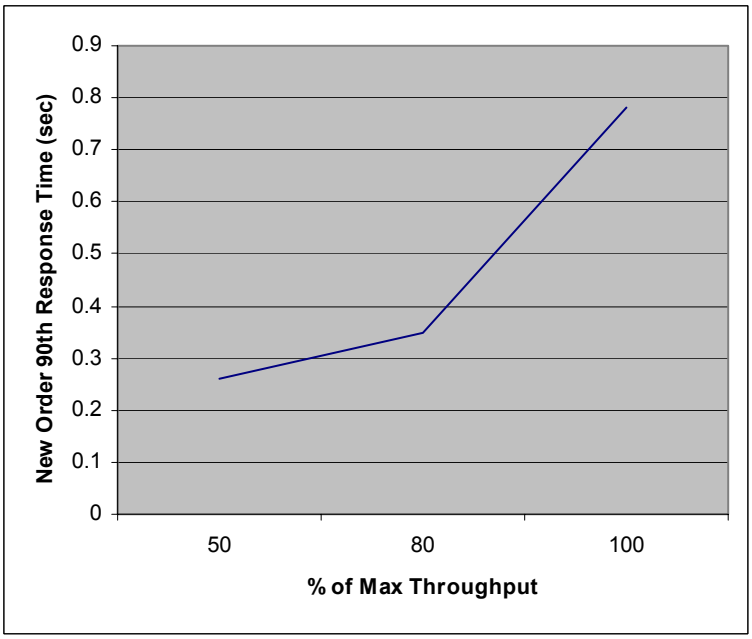
Figure 5-5. Stock-Level Transaction - Response Time Frequency Distribution



Performance Curve for Response Time vs. Throughput

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

Figure 5-6. New-Order Response Time vs. Throughput



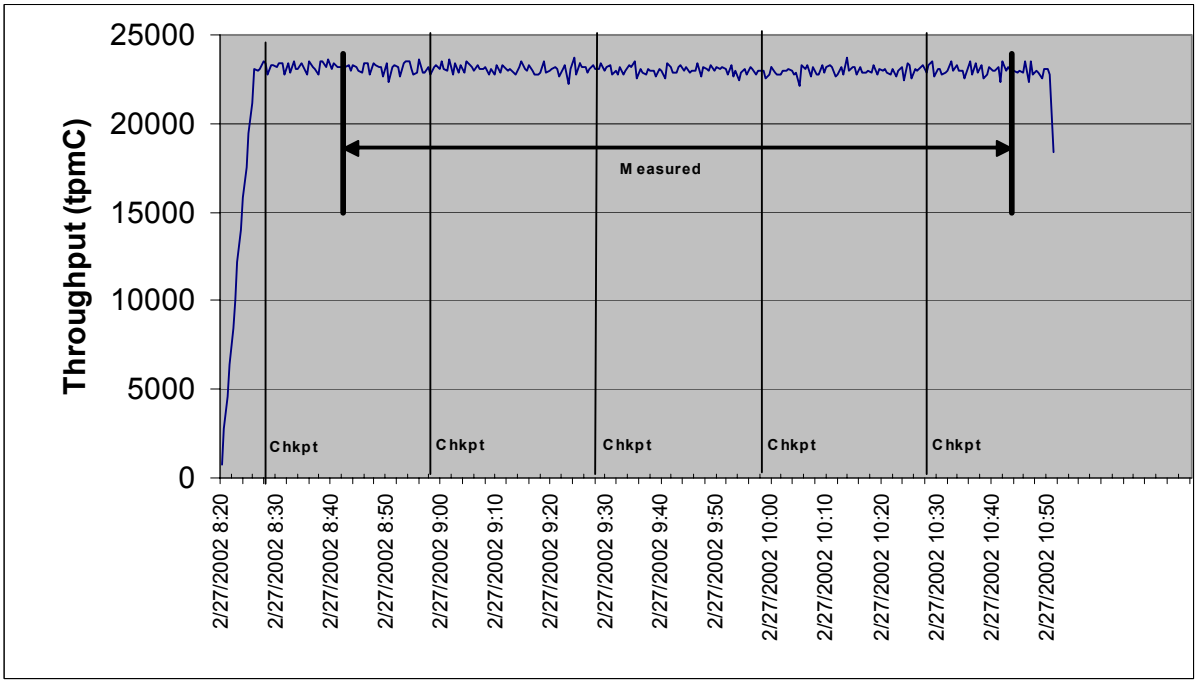
New Order Think Time Distribution

Figure 5-7. New-Order Think Time Distribution

Throughput vs. Elapsed Time

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

Figure 5-8. New-Order Throughput vs. Elapsed Time



Steady State Methodology

The method used to determine that the SUT had reached a steady state prior to commencing the measurement interval (see Clause 5.5) must be described.

Figure 5-8 shows that the system was in steady state at the beginning of the measurement interval.

Work Performed during Steady State

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

Transaction Flow

The RTE generated the required input data to choose a transaction from the menu. This data was time-stamped. The response for the requested transaction was verified and time-stamped in the RTE log files.

The RTE generated the required input data for the chosen transaction. It waited to complete the minimum required key time before transmitting the input screen. The transmission was time-stamped. The return of the screen with the required response data was time-stamped. The difference between these two time-stamps was the response time for that transaction and was logged in the RTE log. The RTE then waited the required think time interval before repeating the process starting at selecting another 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 another Ethernet LAN using Microsoft SQL Server ODBC library and RPC calls.

Checkpoints

Checkpoints were executed on the server during the ramp-up phase and at 30-minute intervals. The measured run contained four checkpoints. SQL Server was started with trace flag 3502, which caused it to log the occurrence of the checkpoint. This information was used to verify that the checkpoints occurred at the appropriate times during the test run.

During a checkpoint, SQL Server flushes all dirty pages from its cache to disk. It places a record in the database transaction log indicating that the checkpoint has completed and that all transactions, which were committed prior to the checkpoint have been written to disk.

Measurement Interval

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

The measurement interval was 120 minutes.

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. (8.1.6.13)

See Table 5-3.

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

Percentage of Total Mix

The percentage of the total mix for each transaction type must be disclosed.

See Table 5-3.

Table 5-3. Transaction Statistics and Transaction Mix

New Order	Value (%)
Home warehouse order lines	99.00
Remote warehouse order lines	1.00
Rolled back transactions	1.00
Average number of items per order	10.00
Payment	
Home warehouse payment transactions	85.02
Remote warehouse payment transactions	14.98
Non-Primary Key Access	
Payment transactions using C_LAST	60.01
Order-Status transactions using C_LAST	60.13
Delivery	
Delivery transactions skipped	0
Transaction Mix	
New-Order	44.88
Payment	43.03
Delivery	4.04
Stock Level	4.03
Order-Status	4.02

Number of Checkpoints

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.

Checkpoints were performed during the ramp-up period and during each measured run interval. The first measurement interval checkpoint started 13 minutes and 15 seconds after the start of the measurement interval. The four checkpoints in the measured interval are shown in Table 5-4.

Table 5-4. Checkpoint Start Time and Duration

Checkpoint	Start Time	Duration
1	08:58:45 a.m.	8 minutes 0 seconds
2	09:28:43 a.m.	8 minutes 32 seconds
3	09:58:41 a.m.	9 minutes 1 seconds
4	10:28:39 a.m.	9 minutes 15 seconds

The checkpoints were verified to be clear of the protected zones around the beginning and end of the measurement intervals. The checkpoint interval was 30 minutes.

Clause 6: SUT, Driver and Communication Definition Related Items

Description of RTE

The RTE input parameters, code fragments, functions, etc., used to generate each transaction input field must be disclosed.

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

Emulated Components

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

No components were emulated.

Benchmarked and Targeted System Configuration Diagrams

A complete functional diagram of both the benchmarked configuration and the configuration of the proposed (target) system must be disclosed. A detailed list of all software and hardware functionality being performed on the Driver System, and its interface to the SUT must be disclosed (see Clause 6.6.3.6).

The driver RTE generated the transaction input data and transmitted it to the client in HTML format. The driver RTE received the output from the System under Test, time-stamped it, and forwarded it to the Master RTE for post-test processing. No other functionality was included on the driver RTE.

Detailed diagrams of the benchmarked and priced configurations are provided in the section called “General Items” at the beginning of this document.

Network Configuration

The network configurations of both the tested services and the proposed (target) services which are being represented and a thorough explanation of exactly which parts of the proposed configuration are being replaced with the Driver System must be disclosed (see Clause 6.6.4).

See the measured and priced configuration diagrams for details about the network configuration.

Network Bandwidth

The bandwidth of the network(s) used in the tested/priced configuration must be disclosed.

The Ethernet used in the LAN complies with the IEEE.802.3 standard. The LANs that connected the driver RTEs to the clients had a bandwidth of 10Mbps. The LAN that connected the client to the server had a bandwidth of 100Mbps.

Operator Intervention

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

The configuration did not require any operator intervention to sustain the reported throughput.

Clause 7: Pricing Related Items

Hardware and Software Components

A detailed list of the hardware and software used in the priced system must be reported. Each separately orderable item must have a vendor part number, description and release/revision level, and either general availability status or committed delivery date. 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(s) and effective date(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.

A detailed list of all hardware and software, including the 3-year price, is provided in the Executive Summary at the front of this report. All third-party quotations are included in Appendix E at the end of this document.

Availability Date

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

The operating system and database software used in this benchmark are generally available. The 1.6GHz model of the xSeries 360 server is generally available. The Mylex device drivers and firmware will be generally available on ServerGuide (available on ibm.com) on September 10, 2002. The total solution availability date is September 10, 2002.

Measured tpmC

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: 23,027.66 tpmC
- Price per tpmC: $4.41 per tpmC
- Three-year cost of ownership: $101,450

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.

The configuration is priced for the United States of America.

Usage Pricing

For any usage pricing, the sponsor must disclose:

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

The component pricing based on usage is shown below:

- 2 Microsoft Windows 2000 Server
- 2 Microsoft SQL Server 2000 Standard Edition (based on per-processor price)

- 3-year support for hardware components (except for components for which 10 percent spares are provided)

System Pricing

System pricing should include subtotals for the following components: Server Hardware, Server Software, Client Hardware, Client Software, and Network Components used for terminal connection (see Clause 7.2.2.3).
System pricing must include line item indication where non-sponsoring companies' brands are used. System pricing must also include line item indication of third-party pricing.

A detailed list of all hardware and software, including the 3-year price, is provided in the Executive Summary at the front of this report. All third-party quotations are included in Appendix E at the end of this document.

Clause 9: Audit Related Items

Auditor

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-C benchmark was audited by Bradley J. Askins of InfoSizing, Inc. The auditor's attestation letter is provided in this section.

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 the TPC Benchmark C Full Disclosure Report should be sent to:

InfoSizing, Inc.
1373 North Franklin Street
Colorado Springs, CO 80903
Phone: 719-473-7555
Fax: 719-473-7554

INFO SIZING

TPC TRANSACTION PROCESSING PERFORMANCE COUNCIL CERTIFIED AUDITOR

Benchmark Sponsor: Richard Laviano
Manager., xSeries Performance
IBM Server Group
3039 Cornwallis Road
Research Triangle Park, NC 27709

March 4, 2002

I verified the TPC Benchmark™ C performance for the following Client/Server configuration:

Platform: **IBM @server xSeries 360 c/s**
Operating system: **Microsoft Windows 2000 Server**
Database Manager: **Microsoft SQL Server 2000 Standard Edition**
Transaction Manager: **Microsoft COM+**

The results were:

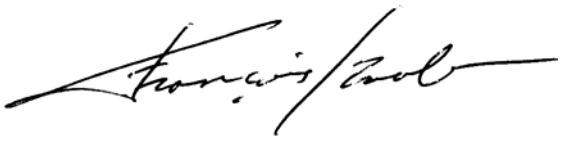
CPU's Speed	Memory	Disks	NewOrder 90% Response Time	**tpmC**
Server: IBM @server xSeries 360				
2 x Xeon MP (1.6GHz)	2.5 GB Main (1MB L3 Cache per processor)	2 x 36.4 GB 111 x 18.2 GB	0.78 Seconds	**23,027.66**
IBM @server xSeries 220 (Specification for each)				
2 x Pentium III (1.13 GHz)	768 MB Main (512KB L2 Cache per processor	1 x 18.2 GB	n/a	n/a

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

- The database records were the proper size
- The database was properly scaled and populated

- The required ACID properties were met
- The transactions were correctly implemented
- Input data was generated according to the specified percentages
- The transaction cycle times included the required keying and think times
- The reported response times were correctly measured.
- All 90% response times were under the specified maximums
- At least 90% of all delivery transactions met the 80 Second completion time limit
- The reported measurement interval was 120 minutes (7200 seconds)
- The reported measurement interval was representative of steady state conditions
- Four checkpoints were taken during the reported measurement interval
- The 60 day storage requirement was correctly computed
- The system pricing was verified for major components and maintenance

Respectfully Yours,



François Raab, President

Bradley J. Askins, Auditor

1373 North Franklin Street • Colorado Springs, CO 80903-2527 • Office: 719/473-7555 • Fax: 719/473-7554

Appendix A: Source Code

client_utils.c

```
/* client_utils.c
*/

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

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

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

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


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

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

   va_start(ap, format);

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

   get_prefix(line_prefix);

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

   va_end(ap);
}


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

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

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

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

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

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

   return(t_diff);
}

/*
```

```
 * perfClntDataInit:
 *    Initialization for the shared file mapping.
 *
 * return: pointer to the shared memory space
 *
 * This routine creates a named mapped memory section that is used
 * to communicate the TPCC performance data to the extensible
 * counter DLL for NT perfmon.
 */
total_tran_count_t  *perfClntDataInit()
{
   HANDLE hMappedObject;
   total_tran_count_t  *pClntInfo = NULL;
   TCHAR  szMappedObjectName[] =
TEXT("TPCC_CLNT_COUNTER_BLOCK");

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

   return(pClntInfo);
}
```

client_utils.h

```
#ifndef TPCC_CLIENT_UTILS_H
#define TPCC_CLIENT_UTILS_H

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

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

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

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

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

#define FALSE 0
#define TRUE  1

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


#define CHECK_ENVIRON(str,var)  if (str == NULL) { fprintf(ERROUT, \
                        "%s environment variable is not defined.\n",var);  }

#define CHK_STATUS(st, val, _errMsg)                    \
    if(st) {                                    \
       enc_status.status=val;                       \
       strcpy(enc_status.file, __FILE__);           \
       enc_status.line= __LINE__;                   \
       enc_status.encinaError = st;                 \
       if(_errMsg)strcpy(enc_status.errorMsg, _errMsg);     \
       if(st!=1) return;                            \
     }

#define UTIL_IDENT(a)          a

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

/*  ENCINA_CALL:  Make fail-fast calls on the various services.  */
#define ENCINA_CALL(proc_name,call)           \
```

```
{                                       \
   unsigned long _status;                \
   ENCINA_CALL_RC(proc_name,call,_status);    \
   if (_status) exit_program(_status);        \
}


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

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

#endif /*  TPCC_CLIENT_UTILS_H  */
```

dlldata.c

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

      DO NOT ALTER THIS FILE

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

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

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


#include <rpcproxy.h>

#ifdef __cplusplus
extern "C"   {
#endif

EXTERN_PROXY_FILE( tpcc_com_ps )


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


DLLDATA_ROUTINES( aProxyFileList, GET_DLL_CLSID )

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

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

error.h

```
/*          FILE:                   ERROR.H
 *                                          Microsoft TPC-C Kit Ver.
4.20.000
 *                                          Copyright Microsoft, 1999
 *          All Rights Reserved
 *
 *                                          Version 4.10.000 audited by
Richard Gimarc, Performance Metrics, 3/17/99
 *
 *          PURPOSE:                Header file for error exception classes.
 *
 *  Change history:
 *                      4.20.000 - updated rev number to match kit
 *                      4.21.000 - fixed bug: ~CBaseErr needed to be declared
virtual
 */

#pragma once

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

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

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

#define ERR_FATAL_LEVEL                         1
#define ERR_WARNING_LEVEL                       2
#define ERR_INFORMATION_LEVEL     3


#define ERR_TYPE_LOGIC
            -1                      //logic error in program; internal error
#define ERR_SUCCESS
                        0                   //success (a non-error error)
#define ERR_BAD_ITEM_ID
            1                       //expected abort record in txnRecord
#define ERR_TYPE_DELIVERY_POST
2                       //expected delivery post failed
#define     ERR_TYPE_WEBDLL
                        3                   //tpcc web generated error
#define     ERR_TYPE_SQL
            4                       //sql server generated error
#define     ERR_TYPE_DBLIB
            5                       //dblib generated error
#define     ERR_TYPE_ODBC
            6                       //odbc generated error
```

```
#define ERR_TYPE_SOCKET
	7			//error on communication socket client rte
only
#define ERR_TYPE_DEADLOCK
	8			//dblib and odbc only deadlock condition
#define ERR_TYPE_COM
	9			//error from COM call
#define ERR_TYPE_TUXEDO
	10			//tuxedo error
#define ERR_TYPE_OS
		11			//operating system error
#define ERR_TYPE_MEMORY
	12			//memory allocation error
#define ERR_TYPE_TPCC_ODBC
	13			//error from tpcc odbc txn module
#define ERR_TYPE_TPCC_DBLIB
	14			//error from tpcc dblib txn module
#define ERR_TYPE_DELISRV
15			//delivery server error
#define ERR_TYPE_TXNLOG
	16			//txn log error
#define ERR_TYPE_BCCONN
	17			//Benchcraft connection class
#define ERR_TYPE_TPCC_CONN
	18			//Benchcraft connection class
#define ERR_TYPE_ENCINA
	19			//Encina error
#define ERR_TYPE_COMPONENT
	20			//error from COM component
#define ERR_TYPE_RTE
	21			//Benchcraft rte
#define ERR_TYPE_AUTOMATION
	22			//Benchcraft automation errors


class CBaseErr
{
public:
	char	*m_szApp;
	char	*m_szMsg;
	char	*m_szLoc;// code location where the error occurred
	int		m_idMsg;

	CBaseErr(void)
	{
		m_idMsg		= 0;
		m_szMsg		= new char[m_szMsg_size];
		m_szApp		= new char[m_szApp_size];
		m_szLoc		= NULL;

		m_szMsg[0]	= 0;
		m_szApp[0]	= 0;

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

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

	CBaseErr(int idMsg)
	{
		m_idMsg		= idMsg;
		m_szApp		= new char[m_szApp_size];
		m_szMsg		= new char[m_szMsg_size];
		m_szLoc		= NULL;

		GetModuleFileName(GetModuleHandle(NULL),
m_szApp, m_szApp_size);
		LoadString(GetModuleHandle(NULL), idMsg,
m_szMsg, m_szMsg_size);
	}

	CBaseErr(LPCTSTR szMsg)
	{
		m_idMsg		= 0;
		m_szApp		= new char[m_szApp_size];
		m_szMsg		= new char[m_szMsg_size];
		m_szLoc		= NULL;

		GetModuleFileName(GetModuleHandle(NULL),
m_szApp, m_szApp_size);
		strcpy(m_szMsg, szMsg);
	}

	void SetError(char *szMsg, LPCTSTR szLocation)
	{
		if (szMsg != NULL)
			strcpy(m_szMsg, szMsg);
		else
			m_szMsg[0] = 0;

		if (szLocation != NULL)
		{
			delete [] m_szLoc;
			m_szLoc = new char[strlen(szLocation)+1];
			strcpy(m_szLoc, szLocation);
		}
		else
		{
			delete [] m_szLoc;
			m_szLoc = NULL;
		}
	}

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

		if (szStr)
			j = wsprintf(szTmp, "%s\n",szStr);
		if (m_szLoc)
			j += wsprintf(szTmp+j,
"Location=%s\n",m_szLoc);
		if (m_szMsg)
			j += wsprintf(szTmp+j, "%s\n", m_szMsg);

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

	char *GetApp(void) { return m_szApp; }
	char *GetMsg(void) { return m_szMsg; }
	char *GetLocation(void) { return m_szLoc; }

	virtual int ErrorType() = 0;	// a value which distinguishes the
kind of error that occurred
	virtual int ErrorNum() = 0;		// an error value
specific to the error type
```

```
        virtual char *ErrorText() = 0;      // a string (i.e., human readable)
representation of the error

};

class CSocketErr : public CBaseErr
{
public:
        enum Action
        {
                eNone,
                eSend,
                eSocket,
                eConnect
        };

        CSocketErr(Action eAction, LPCTSTR szLocation);
        CSocketErr(int iError) { m_errId = iError; };
        int             m_errId;
        Action      m_eAction;

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

class CSystemErr : public CBaseErr
{
public:
        enum Action
        {
                eNone,
                eTransactNamedPipe,
                eWaitNamedPipe,
                eSetNamedPipeHandleState,
                eCreateFile,
                eCreateProcess,
                eCallNamedPipe,
                eCreateEvent,
                eCreateThread,
                eVirtualAlloc,
                eReadFile,
                eWriteFile,
                eMapViewOfFile,
                eCreateFileMapping,
                eInitializeSecurityDescriptor,
                eSetSecurityDescriptorDacl,
                eCreateNamedPipe,
                eConnectNamedPipe,
                eWaitForSingleObject,
                eRegOpenKeyEx,
                eRegQueryValueEx,
        };

        CSystemErr(Action eAction, LPCTSTR szLocation);

        void Draw(HWND hwnd, LPCTSTR szStr = NULL);

        int             m_errId;
        Action      m_eAction;

        int ErrorType() { return ERR_TYPE_OS;}
        int ErrorNum() { return m_errId;}
        char *ErrorText() { return m_szMsg; }
};

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

        int ErrorType() { return ERR_TYPE_MEMORY;}
        int ErrorNum() { return 0;}
        char *ErrorText() { return "Insufficient Memory to continue.";}
};
```

install.c

```
/*      FILE:           INSTALL.C
 *                              Microsoft TPC-C Kit Ver.
4.20.000
 *                              Copyright Microsoft, 1999
 *      All Rights Reserved
 *
 *                              not audited
 *
 *      PURPOSE:        Automated installation application for TPC-C
Web Kit
 *      Contact:    Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *              4.20.000 - added COM installation steps
 */

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

#include "resource.h"

#define     WM_INITTEXT             WM_USER+100

HICON           hIcon;
HINSTANCE       hInst;

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

// TPC-C registry settings
TPCCREGISTRYDATA        Reg;

static      int             iPoolThreadLimit;
static      int             iThreadTimeout;
static      int             iListenBackLog;
static      int             iAcceptExOutstanding;

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


BOOL    CALLBACK        LicenseDlgProc(HWND hwnd, UINT uMsg,
WPARAM wParam, LPARAM lParam);
BOOL    CALLBACK        UpdatedDlgProc(HWND hwnd, UINT uMsg,
WPARAM wParam, LPARAM lParam);
BOOL    CALLBACK        MainDlgProc(HWND hwnd, UINT uMsg,
WPARAM wParam, LPARAM lParam);
```

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

BOOL install_com(char *szDllPath);

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

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

	hInst = hInstance;

	InitCommonControls();

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

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

	DestroyIcon(hIcon);
	return 0;
}

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

	switch(uMsg)
	{
		case WM_INITDIALOG:
			hFont = CreateFont(-12, 0, 0, 0, 400, 0, 0, 0,
0, 0, 0, 0, 0, "Arial");
			SendMessage( GetDlgItem(hwnd,
IDR_LICENSE1), WM_SETFONT, (WPARAM)hFont, MAKELPARAM(0, 0)
);
			PostMessage(hwnd, WM_INITTEXT,
(WPARAM)0, (LPARAM)0);
			return TRUE;
		case WM_INITTEXT:
			hResInfo = FindResource(hInst,
MAKEINTRESOURCE(IDR_LICENSE1), "LICENSE");
			dwSize = SizeofResource(hInst, hResInfo);
			hRes = LoadResource(hInst, hResInfo );
			pSrc = (BYTE *)LockResource(hRes);
			pDst = (unsigned char *)malloc(dwSize+1);
			if ( pDst )
			{
				memcpy(pDst, pSrc, dwSize);
				pDst[dwSize] = 0;
				SetDlgItemText(hwnd,
IDC_LICENSE, (const char *)pDst);
				free(pDst);
			}
			else
				SetDlgItemText(hwnd,
IDC_LICENSE, (const char *)pSrc);
			return TRUE;
		case WM_DESTROY:
			DeleteObject(hFont);
			return TRUE;
		case WM_COMMAND:
			if ( wParam == IDOK )
				EndDialog(hwnd, TRUE);
			if ( wParam == IDCANCEL )
				EndDialog(hwnd, FALSE);
		default:
			break;
	}
	return FALSE;
}

BOOL CALLBACK UpdatedDlgProc(HWND hwnd, UINT uMsg, WPARAM
wParam, LPARAM lParam)
{
	switch(uMsg)
	{
		case WM_INITDIALOG:
			switch(lParam)
			{
				case 1:
				case 2:
					SetDlgItemText(hwnd,
IDC_RESULTS, "TPC-C Web Client Installed");
					break;
			}
			return TRUE;
		case WM_COMMAND:
			if ( wParam == IDOK )
				EndDialog(hwnd, TRUE);
			break;
		default:
			break;
	}
	return FALSE;
}

BOOL CALLBACK MainDlgProc(HWND hwnd, UINT uMsg, WPARAM
wParam, LPARAM lParam)
{
	PAINTSTRUCT		ps;
```

```
	MEMORYSTATUS	memoryStatus;
	OSVERSIONINFO	VI;
	char			szTmp[256];
	static char		szDllPath[256];
	static char		szExePath[256];

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

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

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

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

			ReadTPCCRegistrySettings( &Reg );
			ReadRegistrySettings();

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

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

			SetDlgItemText(hwnd, IDC_PATH,
szDllPath);

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

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

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

			// check OS version level for COM.  Must be
at least Windows 2000
			VI.dwOSVersionInfoSize = sizeof(VI);
			GetVersionEx( &VI );
			if (VI.dwMajorVersion < 5)
			{
				HWND hDlg = GetDlgItem(
hwnd, IDC_TM_MTS );
				EnableWindow( hDlg, 0 );	//
disable COM option
				if (Reg.eTxnMon == COM)
					Reg.eTxnMon = None;
			}

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

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

```
                                        BeginPaint(hwnd, &ps);
                                        DrawIcon(ps.hdc, 0, 0, hIcon);
                                        EndPaint(hwnd, &ps);
                                        return TRUE;
                                }
                                break;
                        case WM_COMMAND:
                                if ( HIWORD(wParam) == BN_CLICKED )
                                {
                                        switch( LOWORD(wParam) )
                                        {
                                                case IDC_DBLIB:
                                                        return
TRUE;
                                                case IDC_ODBC:
                                                        return
TRUE;
                                                case IDOK:

ProcessOK(hwnd, szDllPath);
                                                        return
TRUE;
                                                case IDCANCEL:

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

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

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

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

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

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

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

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


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


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

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

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

```
	}

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

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

	Sleep(100);

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

	EndDialog(hwnd, rc);
	return;
}

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

	if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\Inetinfo\\Parameters", 0,
KEY_READ, &hKey) == ERROR_SUCCESS )
	{
		size = sizeof(iPoolThreadLimit);
		if ( RegQueryValueEx(hKey, "PoolThreadLimit", 0,
&type, (char *)&iPoolThreadLimit, &size) == ERROR_SUCCESS )
			if ( !iPoolThreadLimit )
				iPoolThreadLimit =
iMaxPhysicalMemory * 2;

		size = sizeof(iThreadTimeout);
		if ( RegQueryValueEx(hKey, "ThreadTimeout", 0,
&type, (char *)&iThreadTimeout, &size) == ERROR_SUCCESS )
			if ( !iThreadTimeout )
				iThreadTimeout = 86400;

		size = sizeof(iListenBackLog);
		if ( RegQueryValueEx(hKey, "ListenBackLog", 0,
&type, (char *)&iListenBackLog, &size) == ERROR_SUCCESS )
			if ( !iListenBackLog )
				iListenBackLog = 15;

		RegCloseKey(hKey);
	}

	if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\W3SVC\\Parameters", 0,
KEY_READ, &hKey) == ERROR_SUCCESS )
	{
		size = sizeof(iAcceptExOutstanding);
		if ( RegQueryValueEx(hKey, "AcceptExOutstanding", 0,
&type, (char *)&iAcceptExOutstanding, &size) == ERROR_SUCCESS )
			if ( !iAcceptExOutstanding )
				iAcceptExOutstanding = 40;

		RegCloseKey(hKey);
	}
}

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

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

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

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

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

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

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

		RegFlushKey(hKey);
		RegCloseKey(hKey);
	}

	if ( (iRc=RegCreateKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\Inetinfo\\Parameters", 0, NULL,
REG_OPTION_NON_VOLATILE, KEY_ALL_ACCESS, NULL, &hKey,
&dwDisposition)) == ERROR_SUCCESS )
```

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

		RegFlushKey(hKey);
		RegCloseKey(hKey);
	}

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

		RegFlushKey(hKey);
		RegCloseKey(hKey);
	}

	return;
}

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

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

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

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

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

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

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

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

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

	CloseHandle(hFile);

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

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

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

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

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

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

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

```
		UpdateDialog(hDlg);

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

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

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

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

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

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

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

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

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

		return 1;
}

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

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

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

			RegCloseKey(hKey);
		}

		return bRc;
}

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

		versionDllMS = 0;
		versionDllLS = 0;
```

```
	if ( _access(szDLLPath, 00) == 0 )
	{
		dwSize = GetFileVersionInfoSize(szDLLPath, &d);
		if ( dwSize )
		{
			ptr = (char *)malloc(dwSize);
			GetFileVersionInfo(szDLLPath, 0, dwSize,
ptr);
			VerQueryValue(ptr, "\\",&vs, &dwBytes);
			versionDllMS = vs->dwProductVersionMS;
			versionDllLS = vs->dwProductVersionLS;
			free(ptr);
		}
	}

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

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

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

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

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

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

	CloseServiceHandle(schService);
	return TRUE;

ServiceNotRunning:

	CloseServiceHandle(schService);
	return FALSE;
}

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

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

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

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

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

	CloseServiceHandle(schService);
	return TRUE;

StartWWWebErr:
	CloseServiceHandle(schService);
	return FALSE;
}

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

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

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

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

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

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

        CloseServiceHandle(schService);
        return TRUE;

StopWWWebErr:
        CloseServiceHandle(schService);
        return FALSE;
}

static void UpdateDialog(HWND hDlg)
{
        MSG msg;

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

install.h

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

#define IDD_DIALOG1                     101
#define IDI_ICON1                       102
#define IDR_TPCCDLL                     103
#define IDD_DIALOG2                     105
#define IDI_ICON2                       106
#define IDR_DELIVERY                    107
#define IDD_DIALOG3                     108

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

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

install.rc

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

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

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

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

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

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

IDD_DIALOG1 DIALOGEX 0, 0, 219, 351
STYLE DS_MODALFRAME | DS_CENTER | WS_MINIMIZEBOX |
WS_POPUP | WS_CAPTION |
    WS_SYSMENU
CAPTION "TPC-C Web Client Installation Utility"
FONT 8, "MS Sans Serif"
BEGIN
    EDITTEXT        ED_THREADS,164,45,34,12,ES_RIGHT | ES_NUMBER,
                    WS_EX_RTLREADING
    EDITTEXT        ED_MAXDELIVERIES,164,59,34,12,ES_RIGHT |
ES_NUMBER,
                    WS_EX_RTLREADING
    EDITTEXT        ED_MAXCONNECTION,164,73,34,12,ES_RIGHT |
ES_NUMBER,
                    WS_EX_RTLREADING
    CONTROL
"None",IDC_TM_NONE,"Button",BS_AUTORADIOBUTTON |
                    WS_GROUP | WS_TABSTOP,43,100,33,10
    CONTROL
"COM",IDC_TM_MTS,"Button",BS_AUTORADIOBUTTON |
                    WS_TABSTOP,43,113,32,10
    CONTROL
"TUXEDO",IDC_TM_TUXEDO,"Button",BS_AUTORADIOBUTTON |
                    WS_TABSTOP,106,100,46,10
    CONTROL
"ENCINA",IDC_TM_ENCINA,"Button",BS_AUTORADIOBUTTON |
```

```
            WS_DISABLED | WS_TABSTOP,106,113,43,10
    EDITTEXT       ED_DB_SERVER,131,152,67,12,ES_AUTOHSCROLL
    EDITTEXT       ED_DB_USER_ID,131,165,67,12,ES_AUTOHSCROLL
    EDITTEXT       ED_DB_PASSWORD,131,178,67,12,ES_AUTOHSCROLL
    EDITTEXT       ED_DB_NAME,131,191,67,12,ES_AUTOHSCROLL
    CONTROL
"DBLIB",IDC_DBLIB,"Button",BS_AUTORADIOBUTTON | WS_GROUP |
            WS_TABSTOP,45,219,39,12
    CONTROL
"ODBC",IDC_ODBC,"Button",BS_AUTORADIOBUTTON | WS_TABSTOP,
            91,219,39,12
    EDITTEXT
ED_IIS_MAX_THEAD_POOL_LIMIT,164,263,34,12,ES_RIGHT |
            ES_NUMBER,WS_EX_RTLREADING
    EDITTEXT
ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE,164,277,34,12,ES_RIGHT |
            ES_NUMBER,WS_EX_RTLREADING
    EDITTEXT       ED_IIS_THREAD_TIMEOUT,164,291,34,12,ES_RIGHT |
ES_NUMBER,
            WS_EX_RTLREADING
    EDITTEXT       ED_IIS_LISTEN_BACKLOG,164,305,34,12,ES_RIGHT |
ES_NUMBER,
            WS_EX_RTLREADING
    DEFPUSHBUTTON   "OK",IDOK,53,331,50,14
    PUSHBUTTON      "Cancel",IDCANCEL,119,331,50,14
    EDITTEXT       IDC_PATH,106,26,91,13,ES_AUTOHSCROLL |
ES_READONLY
    LTEXT          "Number of Delivery Threads:",IDC_STATIC,35,45,115,12
    LTEXT          "Max Number of Connections:",IDC_STATIC,35,73,115,12
    RTEXT          "Version 4.11",IDC_VERSION,120,4,89,9
    LTEXT          "IIS Max Thread Pool Limit:",IDC_STATIC,36,263,115,12
    LTEXT          "Web Service Backlog Queue
Size:",IDC_STATIC,36,277,115,
            12
    LTEXT          "IIS Thread Timeout (seconds):",IDC_STATIC,36,291,115,12
    LTEXT          "IIS Listen Backlog:",IDC_STATIC,36,307,115,10
    GROUPBOX       "Database
Interface",IDC_STATIC,35,208,163,27,WS_GROUP
    LTEXT          "Installation directory:",IDC_STATIC,35,29,71,10
    GROUPBOX       "Transaction Monitor",IDC_STATIC,33,90,165,37
    LTEXT          "Server Name:",IDC_STATIC,35,155,56,8
    LTEXT          "User ID:",IDC_STATIC,35,168,60,8
    LTEXT          "User Password:",IDC_STATIC,35,181,83,8
    LTEXT          "Database Name:",IDC_STATIC,35,194,54,8
    GROUPBOX       "SQL Server Connection
Properties",IDC_STATIC,22,139,187,
            102
    GROUPBOX       "Web Client Properties",IDC_STATIC,22,15,187,118
    GROUPBOX       "IIS Settings",IDC_STATIC,22,247,187,79
    LTEXT          "Max Pending Deliveries:",IDC_STATIC,35,59,115,12
END

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

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

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


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

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

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

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

    IDD_DIALOG4, DIALOG
    BEGIN
        LEFTMARGIN, 7
        RIGHTMARGIN, 278
        TOPMARGIN, 7
        BOTTOMMARGIN, 195
    END
END
```

```
#endif    // APSTUDIO_INVOKED


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

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

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

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

#endif    // APSTUDIO_INVOKED


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

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

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

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

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

VS_VERSION_INFO VERSIONINFO
 FILEVERSION 0,4,20,0
 PRODUCTVERSION 0,4,20,0
 FILEFLAGSMASK 0x3fL
#ifdef _DEBUG
 FILEFLAGS 0x1L
#else
 FILEFLAGS 0x0L
#endif
 FILEOS 0x40004L
 FILETYPE 0x1L
 FILESUBTYPE 0x0L
BEGIN
   BLOCK "StringFileInfo"
   BEGIN
      BLOCK "040904b0"
      BEGIN
         VALUE "Comments", "TPC-C Web Client Installer\0"
         VALUE "CompanyName", "Microsoft\0"
         VALUE "FileDescription", "install\0"
         VALUE "FileVersion", "0, 4, 20, 0\0"
         VALUE "InternalName", "install\0"
         VALUE "LegalCopyright", "Copyright © 1999\0"
         VALUE "OriginalFilename", "install.exe\0"
         VALUE "ProductName", "Microsoft install\0"
         VALUE "ProductVersion", "0, 4, 20, 0\0"
      END
   END
   BLOCK "VarFileInfo"
   BEGIN
      VALUE "Translation", 0x409, 1200
   END
END

#endif    // !_MAC


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

IDR_LICENSE1            LICENSE DISCARDABLE     "license.txt"

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

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

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

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

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

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

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

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

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

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

```
//////////////////////////////////////////////////////////////////////////////
//
// COM_PS_DLL
//

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

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

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

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

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

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



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


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

install_com.cpp

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

#define _WIN32_WINNT 0x0500

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

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

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

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

          _bstr_t                                   bstrTemp, bstrTemp2,
bstrTemp3, bstrTemp4;
          _bstr_t                                   bstrDllPath =
szDllPath;
          _variant_t                      vTmp, vKey;
          long                                      lActProp, lCount,
lCountCo, lCountItf, lCountMethod;
          bool                                      bTmp;


          CoInitializeEx(NULL, COINIT_MULTITHREADED);

          HRESULT hr = CoCreateInstance(CLSID_COMAdminCatalog,

          NULL,

          CLSCTX_INPROC_SERVER,

          IID_ICOMAdminCatalog,

          (void**) &pCOMAdminCat);

          if (!SUCCEEDED(hr)) goto Error;

          bstrTemp = "Applications";

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

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

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

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

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

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

                    if (wcscmp(vTmp.bstrVal, L"TPC-C"))
                    {
```

```
                        lCount--;
                        continue;
                }
                else
                {
                        hr = pCatalogCollectionApp->Remove(lCount
- 1);
                        if (!SUCCEEDED(hr)) goto Error;
                        break;
                }
        }

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

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

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

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

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

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

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

        pCatalogObjectApp->Release();
        pCatalogObjectApp = NULL;

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

        hr = pCOMAdminCat->InstallComponent(bstrTemp,
                        bstrTemp2,
                        bstrTemp3,
                        bstrTemp4);
        if (!SUCCEEDED(hr)) goto Error;

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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


pCatalogObjectMethod->Release();
                                pCatalogObjectMethod = NULL;

                                lCountMethod--;
                        }

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

                        pCatalogObjectItf->Release();
                        pCatalogObjectItf = NULL;

                        lCountItf--;

                }


                pCatalogObjectCo->Release();
                pCatalogObjectCo = NULL;

                lCountCo--;
        }


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

        pCatalogCollectionApp->Release();
        pCatalogCollectionApp = NULL;

        pCatalogCollectionCo->Release();
        pCatalogCollectionCo = NULL;

        pCatalogCollectionItf->Release();
        pCatalogCollectionItf = NULL;

        pCatalogCollectionMethod->Release();
        pCatalogCollectionMethod = NULL;


Error:
        CoUninitialize();

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

        NULL,

        hr,

        MAKELANGID(LANG_NEUTRAL, SUBLANG_DEFAULT),

        (LPTSTR) &lpBuf,

        0,

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

license.txt

```
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mon_client.c

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

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

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

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

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


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

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

/*  CALTPCC
 *  Macro to sends 1 RPC and then handles any errors.
 *
 *  The macro takes the name of the RPC (e.g., NewOrder)
 *  and makes the RPC by calling the appropriate function
 *  (e.g., impTPCCNewOrder).
 */
#define CALLTPCC(name,length,dataP,header,trpcStatusP)            \
{                                                                 \
 UTIL_CONCAT(impTPCC,name)(length,dataP,&header,trpcStatusP);       \
 if (*(trpcStatusP)) {                                            \
   char msg[100];                                                 \
   sprintf(msg, "TRPC error during impTPCC%s", UTIL_STRING(name));    \
   header.returncode = TRPC_ERROR;                                \
   encina_error_message(msg, *(trpcStatusP));                     \
 } else if ((header.returncode != TPCC_SUCCESS) &&                \
         (header.returncode != INVALID_NEWO)) {                   \
   char msg[100];                                                 \
   sprintf(msg, "App error during impTPCC%s: ", UTIL_STRING(name));   \
   encina_error_message(msg, header.returncode);                  \
 }                                                                \
}

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

```
                        headerP->srv_start.sec = 0;   /* initialize the server time
*/
                        headerP->srv_start.usec = 0;
                        headerP->srv_end.sec = 0;
                        headerP->srv_end.usec = 0;
                        }
    }
}

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

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

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

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

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

    }
}

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

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

    PRE_RPC_WORK(&header, NEWO_TRANS, 0);
    CALLTPCC(NewOrder,length,dataP,header,&trpcStatus)
    POST_RPC_WORK(&header, NEWO_TRANS);
    if (header.returncode == INVALID_NEWO)
                return TPCC_SUCCESS;
    else
                return header.returncode;
}

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

    PRE_RPC_WORK(&header, PAYMENT_TRANS, 0);
    CALLTPCC(Payment,length,dataP,header,&trpcStatus);
    POST_RPC_WORK(&header, PAYMENT_TRANS);
    return header.returncode;
}

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

    PRE_RPC_WORK(&header, ORDER_STAT_TRANS, 0);
    CALLTPCC(OrderStatus,length,dataP,header,&trpcStatus);
    POST_RPC_WORK(&header, ORDER_STAT_TRANS);
    return header.returncode;
}

/*
 *  send_delivery
 *              Send a delivery request to the server
 */
int send_delivery(long length, unsigned char *dataP)
{
```

```
    trpc_status_t trpcStatus;
    data_header  header;

    PRE_RPC_WORK(&header, DELIVERY_TRANS, 0);
    CALLTPCC(Delivery,length,dataP,header,&trpcStatus);
    POST_RPC_WORK(&header, DELIVERY_TRANS);
    return header.returncode;
}

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

    PRE_RPC_WORK(&header, STOCK_TRANS, 0);
    CALLTPCC(StockLevel,length,dataP,header,&trpcStatus);
    POST_RPC_WORK(&header, STOCK_TRANS);
    return header.returncode;
}



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

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

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

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

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

    read_mon_environment();

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

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

    if (envRetrieval == 0) {

ENCINA_CALL_RC("mon_RetrieveEnable",mon_RetrieveEnable(FALSE),sta
tus);
       CHK_STATUS(status, MON_RETRIEVEENABLE_FAILED,
             "mon_RetrieveEnable failed");
    }

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

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

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

mon_SecuritySetDefaults(client_authnLevel,client_authzSvc),
            status);
    CHK_STATUS(status, MON_SECURITYSET_FAILED,
            "mon_SecuritySetDefaults failed");

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

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

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


/*---------------------------------------------------------------*/
```

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

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

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

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

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

   RegCloseKey(hKey);
}
```

mon_client.h

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

#ifndef MON_CLIENT_H
#define MON_CLIENT_H

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

/*initialization status */
#define INIT_SUCCESS 0
#define INIT_FAILED  1
#define CELL_NAME_UNAVAILABLE 2
#define MON_RETRIEVEENABLE_FAILED 3
#define MON_INITCLIENT_FAILED 4
#define MON_SECURITYSET_FAILED 5
#define MON_SETREFRESHINTERVAL_FAILED 6
#define NOINFO_TRPC_ERROR 7
#define ENROLL_CLIENT_EXCEPTION 8
#define ERROUT_FILE_NOT_FOUND 9
#define LOG_FILE_NOT_FOUND 10
#define TPCC_KEY_NOT_FOUND 11
#define TERM_ALLOC_FAILED 12

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

#endif  /*  MON_CLIENT_H  */
```

readme.txt

ReadRegistry.cpp

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


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

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

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

```
                else if ( !stricmp(szTmp, szDBNames[DBLIB]) )
                        pReg->eDB_Protocol = DBLIB;
        }

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

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

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

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

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

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

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

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

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

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

        RegCloseKey(hKey);

        return FALSE;
}
```

ReadRegistry.h

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

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

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

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

BOOL ReadTPCCRegistrySettings( TPCCREGISTRYDATA *pReg );
```

Resource.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 IDR_LICENSE1                112
#define IDD_DIALOG4                 113
#define IDR_TPCCOBJ1                117
#define IDR_TPCCSTUB1               118
#define IDR_DBLIB_DLL               122
#define IDR_ODBC_DLL                123
#define IDR_TUXEDO_APP              124
#define IDR_TUXEDO_DLL              125
#define IDR_COM_DLL                 126
#define IDR_COMPS_DLL               127
#define IDR_COMALL_DLL              128
#define IDR_COMTYPLIB_DLL           129
#define BN_LOG                      1001
#define ED_KEEP                     1002
#define ED_THREADS                  1003
#define ED_THREADS2                 1004
#define IDC_PATH                    1007
#define IDC_VERSION                 1009
#define IDC_RESULTS                 1010
#define IDC_PROGRESS1               1011
#define IDC_STATUS                  1012
#define IDC_BUTTON1                 1013
#define ED_MAXCONNECTION            1014
#define ED_IIS_MAX_THEAD_POOL_LIMIT 1015
#define ED_MAXDELIVERIES            1016
#define ED_WEB_SERVICE_BACKLOG_QUEUE_SIZE 1017
#define ED_IIS_THREAD_TIMEOUT       1018
#define ED_IIS_LISTEN_BACKLOG       1019
#define IDC_DBLIB                   1021
#define IDC_LICENSE                 1022
#define IDC_ODBC                    1022
#define IDC_CONNECT_POOL            1023
#define ED_DB_SERVER                1023
#define ED_USER_CONNECT_DELAY_TIME  1024
#define ED_DB_USER_ID               1024
#define IDC_MTS                     1025
#define IDC_TM_MTS                  1025
#define IDC_TM_TUXEDO               1026
#define IDC_TM_NONE                 1027
#define ED_DB_PASSWORD              1028
#define ED_DB_NAME                  1029
#define IDC_TM_ENCINA               1030

// Next default values for new objects
//
#ifdef APSTUDIO_INVOKED
#ifndef APSTUDIO_READONLY_SYMBOLS
#define _APS_NEXT_RESOURCE_VALUE    130
#define _APS_NEXT_COMMAND_VALUE     40001
#define _APS_NEXT_CONTROL_VALUE     1031
#define _APS_NEXT_SYMED_VALUE       101
#endif
#endif
```

Resource_tpcc_rc.h

```
//{{NO_DEPENDENCIES}}
// Microsoft Developer Studio generated include file.
// Used by tpcc.rc
//
#define IDD_DIALOG1                 101

// Next default values for new objects
//
#ifdef APSTUDIO_INVOKED
#ifndef APSTUDIO_READONLY_SYMBOLS
#define _APS_NEXT_RESOURCE_VALUE    102
#define _APS_NEXT_COMMAND_VALUE     40001
#define _APS_NEXT_CONTROL_VALUE     1000
#define _APS_NEXT_SYMED_VALUE       101
#endif
#endif
```

rtetime.h

```
/* FILE: rtetime.h : header file
 * Copyright 1997 Microsoft Corp., All rights reserved.
 *
 * Authors: Charles Levine, Philip Durr
 *                                  Microsoft Corp.
 */

#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.
 *
 * Authors: Mike Parkes, Charles Levine, Philip Durr
 *                                  Microsoft Corp.
 */

#ifndef _INC_Spinlock

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


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

```
************************************************************/

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

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

                public:
                        // Public functions.

                        Spinlock( void );

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

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


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

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

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

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

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


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

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

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

        #define _INC_Spinlock

#endif
```

tpcc.cpp

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

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

#include <sqltypes.h>
```

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

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

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

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

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

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


#define     LEN_ERR_STRING  256

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

char
szMyComputerName[MAX_COMPUTERNAME_LENGTH+1];

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

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

static      CRITICAL_SECTION                   TermCriticalSection;

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

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

// For deferred Delivery txns:

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

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

// configuration settings from registry
TPCCREGISTRYDATA                   Reg;


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

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

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

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

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

        try
        {
                switch( ul_reason_for_call )
                {
                        case DLL_PROCESS_ATTACH:
                                {
```

```
                                        DWORD dwSize =
MAX_COMPUTERNAME_LENGTH+1;

GetComputerName(szMyComputerName, &dwSize);

szMyComputerName[dwSize] = 0;
                                }


DisableThreadLibraryCalls((HMODULE)hModule);

InitializeCriticalSection(&TermCriticalSection);

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

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

                                TermInit();

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

                                        // get function pointer
to wrapper for class constructor

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

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

pCTPCC_ENCINA_post_init = (TYPE_CTPCC_ENCINA*)
GetProcAddress(hLibInstanceTm,"CTPCC_ENCINA_post_init");
                                        if
(pCTPCC_ENCINA_new == NULL)
                                                throw new
CWEBCLNT_ERR( ERR_GETPROCADDR_FAILED, szDllName,
GetLastError() );
                                }
                                else if (Reg.eTxnMon == COM)
                                {
                                        strcpy( szDllName,
Reg.szPath );
                                        strcat( szDllName,
"tpcc_com.dll");
                                        hLibInstanceTm =
LoadLibrary( szDllName );
                                        if (hLibInstanceTm ==
NULL)
                                                throw new
CWEBCLNT_ERR( ERR_LOADDLL_FAILED, szDllName, GetLastError() );

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

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

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

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

                                                // get
function pointer to wrapper for class constructor

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

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

```
                                        else if
(Reg.eDB_Protocol == ODBC)
                                        {
                                                strcpy(
szDllName, Reg.szPath );
                                                strcat(
szDllName, "tpcc_odbc.dll");

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

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

                                                // get
function pointer to wrapper for class constructor

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

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

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

InitializeCriticalSection(&DelBuffCriticalSection);
                                        hWorkerSemaphore =
CreateSemaphore( NULL, 0, dwDelBuffSize, NULL );
                                        dwDelBuffFreeCount =
dwDelBuffSize;

                                        InitJulianTime(NULL);

                                        // create unique log file
name based on delilog-yymmdd-hhmm.log
                                        SYSTEMTIME Time;
                                        GetLocalTime( &Time
);
                                        wsprintf( szLogFile,
"%sdelivery-%2.2d%2.2d%2.2d-%2.2d%2.2d.log",

Reg.szPath, Time.wYear % 100, Time.wMonth, Time.wDay, Time.wHour,
Time.wMinute );
                                        txnDelilog = new
CTxnLog(szLogFile, TXN_LOG_WRITE);

                                        //write event into txn
log for START

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

                                        // allocate structures for
delivery buffers and thread mgmt
                                        pDeliHandles = new
HANDLE[dwNumDeliveryThreads];
                                        pDelBuff = new
DELIVERY_TRANSACTION[dwDelBuffSize];
                                        // launch
DeliveryWorkerThread to perform actual delivery txns
                                        for(i=0;
i<dwNumDeliveryThreads; i++)
                                        {

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

throw new CWEBCLNT_ERR( ERR_DELIVERY_THREAD_FAILED );
                                        }
                                }

                                break;

                        case DLL_PROCESS_DETACH:
                                if (dwNumDeliveryThreads)
                                {
                                        if (txnDelilog !=
NULL)
                                        {
                                                //write event
into txn log for STOP

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

                                                // This will
do a clean shutdown of the delivery log file
                                                CTxnLog
*txnDelilogLocal = txnDelilog;
                                                txnDelilog=
NULL;
                                                delete
txnDelilogLocal;
                                        }

                                        delete [] pDeliHandles;
                                        delete [] pDelBuff;

                                        CloseHandle(
hWorkerSemaphore );
                                        CloseHandle(
hDoneEvent );

DeleteCriticalSection(&DelBuffCriticalSection);
                                }


DeleteCriticalSection(&TermCriticalSection);

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

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

                                Sleep(500);
                                break;
```

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

                return TRUE;
}


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

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

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

        return TRUE;
}

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

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


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

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

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


#ifdef ICECAP
        StartCAP();
#endif

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

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

                                throw new CWEBCLNT_ERR(
ERR_INVALID_TERMID );
                        }

                        //must have a valid syncid here since termid is
valid
```

```
                        if (iSyncId !=
Term.pClientData[TermId].iSyncId)
                                throw new CWEBCLNT_ERR(
ERR_INVALID_SYNC_CONNECTION );

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


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

ProcessNewOrderForm(pECB, TermId, szBuffer);
                                        break;
                                case PAYMENT_FORM:

ProcessPaymentForm(pECB, TermId, szBuffer);
                                        break;
                                case DELIVERY_FORM:

ProcessDeliveryForm(pECB, TermId, szBuffer);
                                        break;
                                case ORDER_STATUS_FORM:

ProcessOrderStatusForm(pECB, TermId, szBuffer);
                                        break;
                                case STOCK_LEVEL_FORM:

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

#ifdef ICECAP
        StopCAP();
#endif


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

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

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


void WriteMessageToEventLog(LPTSTR lpszMsg)
{
```

```
    TCHAR   szMsg[256];
    HANDLE  hEventSource;
    LPTSTR  lpszStrings[2];

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

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

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

       (VOID) DeregisterEventSource(hEventSource);
    }
}


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

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

            DELIVERY_TRANSACTION                delivery;
            PDELIVERY_DATA
pDeliveryData;
            TXN_RECORD_TPCC_DELIV_DEF       txnDeliRec;

            DWORD                                       index;
            HANDLE                                      handles[2];

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

            assert(txnDelilog != NULL);

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

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

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

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

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


LeaveCriticalSection(&DelBuffCriticalSection);
```

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

                                        txnDeliRec.w_id =
pDeliveryData->w_id;
                                        txnDeliRec.o_carrier_id =
pDeliveryData->o_carrier_id;
                                        txnDeliRec.TxnStartT0 =
Get64BitTime(&delivery.queue);

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

                                        //log txn
                                        txnDeliRec.TxnStatus =
ERR_SUCCESS;
                                        for (int i=0; i<10; i++)
                                                txnDeliRec.o_id[i] =
pDeliveryData->o_id[i];
                                        txnDeliRec.DeltaT4 =
(int)(Get64BitTime(&trans_end) - txnDeliRec.TxnStartT0);
                                        txnDeliRec.DeltaTxnExec =
(int)(Get64BitTime(&trans_end) - Get64BitTime(&trans_start));

                                        if (txnDelilog != NULL)

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

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

txnDelilog->WriteToLog(&txnDeliRec);

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

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

ErrorExit:
                delete pTxn;
                _endthread();
}

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

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

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

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

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

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

                return bError;
}

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

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

                //allowable client command strings i.e. CMD=command
                static char *szCmds[] =
                {
```

```
                        "Process", "..NewOrder..", "..Payment..", "..Delivery..",
"..Order-Status..", "..Stock-Level..",
                        "..Exit..", "Submit", "Menu", "Clear", "Stats", ""
        };

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

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

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

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

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

/* FUNCTION: void WelcomeForm
 *
 */

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

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

"<B><BIG>Microsoft TPC-C Web Client (ver 4.20)</BIG></B> <BR> <BR>"
                                                        "<font
face=\"Courier New\"><PRE>"
                                                        "Compiled:
"__DATE__", "__TIME__" <BR>"
                                                        "Source:
"__FILE__" ("__TIMESTAMP__") <BR>"

"</PRE></font>"
                                                        "<FORM
ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                                                        "<INPUT
TYPE=\"hidden\" NAME=\"STATUSID\" VALUE=\"0\">"
                                                        "<INPUT
TYPE=\"hidden\" NAME=\"ERROR\" VALUE=\"0\">"
                                                        "<INPUT
TYPE=\"hidden\" NAME=\"FORMID\" VALUE=\"1\">"
                                                        "<INPUT
TYPE=\"hidden\" NAME=\"TERMID\" VALUE=\"0\">"
                                                        "<INPUT
TYPE=\"hidden\" NAME=\"SYNCID\" VALUE=\"0\">"
                                                        "<INPUT
TYPE=\"hidden\" NAME=\"VERSION\" VALUE=\""
WEBCLIENT_VERSION "\">"
                                        );

        sprintf( szTmp,         "Configuration Settings: <BR><font
face=\"Courier New\" color=\"blue\"><PRE>"
                                                        "Txn Monitor        =
<B>%s</B><BR>"
                                                        "Database protocol
= <B>%s</B><BR>"
                                                        "Max Connections
= <B>%d</B><BR>"
                                                        "# of Delivery Threads
= <B>%d</B><BR>"
                                                        "Max Pending
Deliveries = <B>%d</B><BR>"
                                        , szTxnMonNames[Reg.eTxnMon],
szDBNames[Reg.eDB_Protocol],
                                        Reg.dwMaxConnections,
dwNumDeliveryThreads, dwDelBuffSize );
        strcat( szBuffer, szTmp);

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

        if (Reg.eTxnMon == None)
                // connection options may be specified when not using a
txn monitor
                sprintf( szTmp,         "Please enter your database options
for this connection:<BR>"
                                                        "<font
face=\"Courier New\" color=\"blue\"><PRE>"
                                                        "DB Server
 = <INPUT NAME=\"db_server\" SIZE=20 VALUE=\"%s\"><BR>"
                                                        "DB User
ID   = <INPUT NAME=\"db_user\" SIZE=20 VALUE=\"%s\"><BR>"
                                                        "DB
Password  = <INPUT NAME=\"db_passwd\" SIZE=20
VALUE=\"%s\"><BR>"
                                                        "DB Name
  = <INPUT NAME=\"db_name\" SIZE=20 VALUE=\"%s\"><BR>"

"</PRE></font>"
                                        , Reg.szDbServer, Reg.szDbUser,
Reg.szDbPassword, Reg.szDbName );
        else
                // if using a txn monitor, connection options are
determined from registry; can't
                // set per user.  show options fyi
                sprintf( szTmp,         "Database options which will be
used by the transaction monitor:<BR>"
                                                        "<font
face=\"Courier New\" color=\"blue\"><PRE>"
                                                        "DB Server
        = <B>%s</B><BR>"
```

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

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

        sprintf( szTmp,         "Please enter your Warehouse and District for
this session:<BR>"
                                                                "<font face=\"Courier
New\" color=\"blue\"><PRE>" );
        strcat( szBuffer, szTmp);
        strcat( szBuffer,       "Warehouse ID = <INPUT NAME=\"w_id\"
SIZE=4><BR>"
                                                                "District ID
= <INPUT NAME=\"d_id\" SIZE=2><BR>"

"</PRE></font><HR>"
                                                                "<INPUT
TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Submit\">"

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

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

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

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

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

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

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

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


        iNewTerm = TermAdd();

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

        try
        {
                if (Reg.eTxnMon == TUXEDO)
                        Term.pClientData[iNewTerm].pTxn =
pCTPCC_TUXEDO_new();
                else if (Reg.eTxnMon == ENCINA)
                        Term.pClientData[iNewTerm].pTxn =
pCTPCC_ENCINA_new();
                else if (Reg.eTxnMon == COM)
                        Term.pClientData[iNewTerm].pTxn =
pCTPCC_COM_new( Reg.bCOM_SinglePool );
                else if (Reg.eDB_Protocol == ODBC)
                        Term.pClientData[iNewTerm].pTxn =
pCTPCC_ODBC_new( szServer, szUser, szPassword, szMyComputerName,
szDatabase );
                else if (Reg.eDB_Protocol == DBLIB)
                        Term.pClientData[iNewTerm].pTxn =
pCTPCC_DBLIB_new( szServer, szUser, szPassword, szMyComputerName,
szDatabase );
        }
        catch (...)
        {
                TermDelete(iNewTerm);
                throw;                  // pass exception upward
        }

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

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

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

```
	EnterCriticalSection(&TermCriticalSection);

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

	LeaveCriticalSection(&TermCriticalSection);

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

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

		},
		{	ERR_D_ID_INVALID,
			"Invalid District ID Must be 1 to 10."
								},
		{	ERR_DELIVERY_CARRIER_ID_RANGE,
	"Delivery Carrier ID out of range must be 1 - 10."
		},
		{	ERR_DELIVERY_CARRIER_INVALID,
	"Delivery Carrier ID invalid must be numeric 1 - 10."
	},
		{	ERR_DELIVERY_MISSING_OCD_KEY,
	"Delivery missing Carrier ID key \"OCD*\"."
				},
		{	ERR_DELIVERY_THREAD_FAILED,
		"Could not start delivery worker thread."
				},
		{	ERR_GETPROCADDR_FAILED,
			"Could not map proc in DLL.  GetProcAddr
error.  DLL="				},
		{	ERR_HTML_ILL_FORMED,
		"Required key field is missing from HTML string."
			},
		{	ERR_INVALID_SYNC_CONNECTION,
	"Invalid Terminal Sync ID."
								},
		{	ERR_INVALID_TERMID,
			"Invalid Terminal ID."

		},
		{	ERR_LOADDLL_FAILED,
			"Load of DLL failed.  DLL="

},
		{	ERR_MAX_CONNECTIONS_EXCEEDED,
		"No connections available.  Max Connections is probably
too low."	},
		{	ERR_MISSING_REGISTRY_ENTRIES,
	"Required registry entries are missing.  Rerun INSTALL to correct."
},
		{
ERR_NEWORDER_CUSTOMER_INVALID,
"New Order customer id invalid data type, range = 1 to 3000."
},
		{	ERR_NEWORDER_CUSTOMER_KEY,
		"New Order missing Customer key \"CID*\"."
				},
		{	ERR_NEWORDER_DISTRICT_INVALID,
	"New Order District ID Invalid range 1 - 10."
			},
		{	ERR_NEWORDER_FORM_MISSING_DID,
		"New Order missing District key \"DID*\"."
				},
		{	ERR_NEWORDER_ITEMID_INVALID,
	"New Order Item Id is wrong data type, must be numeric."
	},
		{	ERR_NEWORDER_ITEMID_RANGE,
		"New Order Item Id is out of range. Range = 1 to
999999."		},
		{
ERR_NEWORDER_ITEMID_WITHOUT_SUPPW,		"New Order
Item_Id field entered without a corresponding Supp_W."		},
		{	ERR_NEWORDER_MISSING_IID_KEY,
	"New Order missing Item Id key \"IID*\"."
			},
		{	ERR_NEWORDER_MISSING_QTY_KEY,
		"New Order Missing Qty key \"Qty##*\"."
				},
		{
ERR_NEWORDER_MISSING_SUPPW_KEY,
"New Order missing Supp_W key \"SP##*\"."
			},
		{	ERR_NEWORDER_NOITEMS_ENTERED,
		"New Order No order lines entered."
				},
		{	ERR_NEWORDER_QTY_INVALID,
		"New Order Qty invalid must be numeric range 1 - 99."
		},
		{	ERR_NEWORDER_QTY_RANGE,
			"New Order Qty is out of range. Range = 1 to
99."				},
		{
ERR_NEWORDER_QTY_WITHOUT_SUPPW,
"New Order Qty field entered without a corresponding Supp_W."
},
		{	ERR_NEWORDER_SUPPW_INVALID,
		"New Order Supp_W invalid data type must be numeric."
			},
		{	ERR_NO_SERVER_SPECIFIED,
		"No Server name specified."

},
		{	ERR_ORDERSTATUS_CID_AND_CLT,
	"Order Status Only Customer ID or Last Name may be entered, not
both."	},
		{	ERR_ORDERSTATUS_CID_INVALID,
	"Order Status Customer ID invalid, range must be numeric 1 -
3000."	},
		{	ERR_ORDERSTATUS_CLT_RANGE,
		"Order Status Customer last name longer than 16
characters."		},
		{	ERR_ORDERSTATUS_DID_INVALID,
	"Order Status District invalid, value must be numeric 1 - 10."
},
		{
ERR_ORDERSTATUS_MISSING_CID_CLT,		"Order
Status Either Customer ID or Last Name must be entered."
},
		{
ERR_ORDERSTATUS_MISSING_CID_KEY,		"Order
```

```
Status missing Customer key \"CID*\"."
        },
                {
ERR_ORDERSTATUS_MISSING_CLT_KEY,                "Order
Status missing Customer Last Name key \"CLT*\"."
},
                {
ERR_ORDERSTATUS_MISSING_DID_KEY,                "Order
Status missing District key \"DID*\"."
        },
                {       ERR_PAYMENT_CDI_INVALID,
                "Payment Customer district invalid must be numeric."
                },
                {       ERR_PAYMENT_CID_AND_CLT,
                "Payment Only Customer ID or Last Name may be
entered, not both."     },
                {       ERR_PAYMENT_CUSTOMER_INVALID,
                "Payment Customer data type invalid, must be numeric."
                        },
                {       ERR_PAYMENT_CWI_INVALID,
                "Payment Customer Warehouse invalid, must be
numeric."                       },
                {       ERR_PAYMENT_DISTRICT_INVALID,
        "Payment District ID is invalid, must be 1 - 10."
                },
                {       ERR_PAYMENT_HAM_INVALID,
                "Payment Amount invalid data type must be numeric."
                        },
                {       ERR_PAYMENT_HAM_RANGE,
                        "Payment Amount out of range, 0 - 9999.99."
                                                        },
                {
ERR_PAYMENT_LAST_NAME_TO_LONG,
"Payment Customer last name longer than 16 characters."
        },
                {       ERR_PAYMENT_MISSING_CDI_KEY,
        "Payment missing Customer district key \"CDI*\"."
                },
                {       ERR_PAYMENT_MISSING_CID_CLT,
        "Payment Either Customer ID or Last Name must be entered."
        },
                {       ERR_PAYMENT_MISSING_CID_KEY,
        "Payment missing Customer Key \"CID*\"."
                        },
                {       ERR_PAYMENT_MISSING_CLT_KEY,
        "Payment missing Customer Last Name key \"CLT*\"."
                },
                {       ERR_PAYMENT_MISSING_CWI_KEY,
        "Payment missing Customer Warehouse key \"CWI*\"."
                },
                {       ERR_PAYMENT_MISSING_DID_KEY,
        "Payment missing District Key \"DID*\"."
                        },
                {       ERR_PAYMENT_MISSING_HAM_KEY,
        "Payment missing Amount key \"HAM*\"."
                                },
                {
ERR_STOCKLEVEL_MISSING_THRESHOLD_KEY,           "Stock
Level; missing Threshold key \"TT*\"."
        },
                {
ERR_STOCKLEVEL_THRESHOLD_INVALID,               "Stock
Level; Threshold value must be in the range = 1 - 99."          },
                {
ERR_STOCKLEVEL_THRESHOLD_RANGE,
"Stock Level Threshold out of range, range must be 1 - 99."
},
                {       ERR_VERSION_MISMATCH,
                "Invalid version field.  RTE and Web Client are probably
out of sync." },
                {       ERR_W_ID_INVALID,
                "Invalid Warehouse ID."

        },
                {       0,
                                                        ""

                                                                }
        };

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

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

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

}

/* FUNCTION: GetKeyValue
 *
 * PURPOSE:         This function parses a http formatted string for specific
key values.
 *
 * ARGUMENTS:     char                            *pQueryString
http string from client browser
 *                                      char
*pKey                           key value to look for
 *                                      char
*pValue                         character array into which to place key's value
 *                                      int
iMax                            maximum length of key value array.
 *                                      WEBERROR
err                             error value to throw
 *
 * RETURNS:                     nothing.
 *
 * ERROR:                       if (the pKey value is not found) then
 *                                              if (err == 0)
 *                                                      return
(empty string)
 *                                              else
 *                                                      throw
CWEBCLNT_ERR(err)
 *
```

```
 * COMMENTS:       http keys are formatted either KEY=value& or
KEY=value\0. This DLL formats
 *                                       TPC-C input fields in such a
manner that the keys can be extracted in the
 *                                       above manner.
 */

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

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

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

        *pQueryString = ptr;
        return;

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

/* FUNCTION: GetIntKeyValue
 *
 * PURPOSE:          This function parses a http formatted string for a specific
key value.
 *
 * ARGUMENTS:     char                    *pQueryString
http string from client browser
 *                                       char
*pKey                   key value to look for
 *                                       WEBERROR
NoKeyErr                error value to throw if key not found
 *                                       WEBERROR
NotIntErr               error value to throw if value not numeric
 *
 * RETURNS:                integer
 *
 * ERROR:                  if (the pKey value is not found) then
 *                                               if (NoKeyErr !=
NO_ERR)
 *                                                       throw
CWEBCLNT_ERR(err)
 *                                               else
 *                                                       return 0
 *                                       else if (non-numeric char found)
then
 *                                               if (NotIntErr !=
NO_ERR) then
 *                                                       throw
CWEBCLNT_ERR(err)
 *                                               else
 *                                                       return 0
 *
```

```
 * COMMENTS:       http keys are formatted either KEY=value& or
KEY=value\0. This DLL formats
 *                                       TPC-C input fields in such a
manner that the keys can be extracted in the
 *                                       above manner.
 */

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

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

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

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

        *pQueryString = ptr;
        return atoi(ptr0);

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

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

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

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

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

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

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

	LeaveCriticalSection(&TermCriticalSection);
}

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

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

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

	Term.iFreeList			= 0;
	Term.iNumEntries	= 0;
	if ( Term.pClientData )
		free(Term.pClientData);
	Term.pClientData	= NULL;

	LeaveCriticalSection(&TermCriticalSection);
}

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

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

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

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

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

	LeaveCriticalSection(&TermCriticalSection);
	return iNewTerm;
}

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

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

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

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

		LeaveCriticalSection(&TermCriticalSection);
	}
}
```

```
/* FUNCTION: MakeErrorForm
 */

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

/* FUNCTION: MakeMainMenuForm
 */

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

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

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

        c = wsprintf(szForm,
                "<HTML><HEAD><TITLE>TPC-C Stock
Level</TITLE></HEAD><FORM ACTION=\"tpcc.dll\"
METHOD=\"GET\">"
                "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\"
VALUE=\"0\">"
                "<INPUT TYPE=\"hidden\" NAME=\"ERROR\"
VALUE=\"0\">"
                "<INPUT TYPE=\"hidden\" NAME=\"FORMID\"
VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"TERMID\"
VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\"
VALUE=\"%d\">"
                "<PRE><font face=\"Courier\">
Stock-Level<BR>"
                "Warehouse: %4.4d   District: %2.2d<BR> <BR>",
                STOCK_LEVEL_FORM, iTermId,
Term.pClientData[iTermId].iSyncId,
                Term.pClientData[iTermId].w_id,
Term.pClientData[iTermId].d_id);

        if ( bInput )
        {
                strcpy(szForm+c,
                        "Stock Level Threshold: <INPUT
NAME=\"TT*\" SIZE=2><BR> <BR>"
                        "low stock:    </font><BR> <BR> <BR>
<BR> <BR> <BR> <BR> <BR> <BR> <BR>"
                        " <BR> <BR> <BR> <BR> <BR> <BR>
<BR></PRE><HR>"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"Process\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"Menu\">"
                        "</FORM></HTML>" );
        }
        else
        {
                wsprintf(szForm+c,
                        "Stock Level Threshold: %2.2d<BR> <BR>"
                        "low stock: %3.3d</font> <BR> <BR> <BR>
<BR> <BR> <BR> <BR> <BR> <BR>"
```

```
                                " <BR> <BR> <BR> <BR> <BR> <BR>
<BR> <BR></PRE><HR>"
                                "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..NewOrder..\">"
                                "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Payment..\">"
                                "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Delivery..\">"
                                "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Order-Status..\">"
                                "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Stock-Level..\">"
                                "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Exit..\">"
                                "</FORM></HTML>"
                                , pStockLevelData->threshold,
pStockLevelData->low_stock);
        }
}

/* FUNCTION: MakeNewOrderForm
 *
 * COMMENTS:    The internal client buffer is created when the terminal id
is assigned and should not
 *                                      be freed except when the client
terminal id is no longer needed.
 */

void MakeNewOrderForm(int iTermId, NEW_ORDER_DATA
*pNewOrderData, BOOL bInput, char *szForm)
{
        int                     i, c;
        BOOL    bValid;
        static  char szBR[] = " <BR> <BR> <BR> <BR> <BR> <BR>
<BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR>";

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

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

        c = wsprintf(szForm,
                "<HTML><HEAD><TITLE>TPC-C New
Order</TITLE></HEAD><BODY>"
                "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\"
VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"ERROR\"
VALUE=\"0\">"
                "<INPUT TYPE=\"hidden\" NAME=\"FORMID\"
VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"TERMID\"
VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\"
VALUE=\"%d\">"
                "<PRE><font face=\"Courier\">
New Order<BR>"
                , bValid ? 0 : ERR_BAD_ITEM_ID,
NEW_ORDER_FORM, iTermId, Term.pClientData[iTermId].iSyncId);

        if ( bInput )
        {
                c += wsprintf(szForm+c, "Warehouse: %4.4d   ",
Term.pClientData[iTermId].w_id );

                strcpy( szForm+c,
                                "District: <INPUT NAME=\"DID*\"
SIZE=1>                 Date:<BR>"
                                "Customer:  <INPUT NAME=\"CID*\"
SIZE=4>   Name:                 Credit:     %Disc:<BR>"
                                "Order Number:          Number of Lines:
 W_tax:        D_tax:<BR> <BR>"
                                " Supp_W  Item_Id  Item Name                Qty
Stock  B/G  Price    Amount<BR>"
                                "  <INPUT NAME=\"SP00*\" SIZE=4>
<INPUT NAME=\"IID00*\" SIZE=6>                  <INPUT
NAME=\"Qty00*\" SIZE=1><BR>"
                                "  <INPUT NAME=\"SP01*\" SIZE=4>
<INPUT NAME=\"IID01*\" SIZE=6>                  <INPUT
NAME=\"Qty01*\" SIZE=1><BR>"
                                "  <INPUT NAME=\"SP02*\" SIZE=4>
<INPUT NAME=\"IID02*\" SIZE=6>                  <INPUT
NAME=\"Qty02*\" SIZE=1><BR>"
                                "  <INPUT NAME=\"SP03*\" SIZE=4>
<INPUT NAME=\"IID03*\" SIZE=6>                  <INPUT
NAME=\"Qty03*\" SIZE=1><BR>"
                                "  <INPUT NAME=\"SP04*\" SIZE=4>
<INPUT NAME=\"IID04*\" SIZE=6>                  <INPUT
NAME=\"Qty04*\" SIZE=1><BR>"
                                "  <INPUT NAME=\"SP05*\" SIZE=4>
<INPUT NAME=\"IID05*\" SIZE=6>                  <INPUT
NAME=\"Qty05*\" SIZE=1><BR>"
                                "  <INPUT NAME=\"SP06*\" SIZE=4>
<INPUT NAME=\"IID06*\" SIZE=6>                  <INPUT
NAME=\"Qty06*\" SIZE=1><BR>"
                                "  <INPUT NAME=\"SP07*\" SIZE=4>
<INPUT NAME=\"IID07*\" SIZE=6>                  <INPUT
NAME=\"Qty07*\" SIZE=1><BR>"
                                "  <INPUT NAME=\"SP08*\" SIZE=4>
<INPUT NAME=\"IID08*\" SIZE=6>                  <INPUT
NAME=\"Qty08*\" SIZE=1><BR>"
                                "  <INPUT NAME=\"SP09*\" SIZE=4>
<INPUT NAME=\"IID09*\" SIZE=6>                  <INPUT
NAME=\"Qty09*\" SIZE=1><BR>"
                                "  <INPUT NAME=\"SP10*\" SIZE=4>
<INPUT NAME=\"IID10*\" SIZE=6>                  <INPUT
NAME=\"Qty10*\" SIZE=1><BR>"
                                "  <INPUT NAME=\"SP11*\" SIZE=4>
<INPUT NAME=\"IID11*\" SIZE=6>                  <INPUT
NAME=\"Qty11*\" SIZE=1><BR>"
                                "  <INPUT NAME=\"SP12*\" SIZE=4>
<INPUT NAME=\"IID12*\" SIZE=6>                  <INPUT
NAME=\"Qty12*\" SIZE=1><BR>"
                                "  <INPUT NAME=\"SP13*\" SIZE=4>
<INPUT NAME=\"IID13*\" SIZE=6>                  <INPUT
NAME=\"Qty13*\" SIZE=1><BR>"
                                "  <INPUT NAME=\"SP14*\" SIZE=4>
<INPUT NAME=\"IID14*\" SIZE=6>                  <INPUT
NAME=\"Qty14*\" SIZE=1><BR>"
                                "Execution Status:
Total:<BR>"
                                "</font></PRE><HR>"
                                "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"Process\">"
                                "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"Menu\">"
                                "</FORM></HTML>"
                                );
        }
        else
        {
                 c += wsprintf(szForm+c, "Warehouse: %4.4d   District:
%2.2d                   Date: ",
                                pNewOrderData->w_id,
```

```
                                pNewOrderData->d_id);

                        if ( bValid )
                        {
                                c += wsprintf(szForm+c,
"%2.2d-%2.2d-%4.4d %2.2d:%2.2d:%2.2d",
                                        pNewOrderData->o_entry_d.day,
pNewOrderData->o_entry_d.month,
                                        pNewOrderData->o_entry_d.year,
                                        pNewOrderData->o_entry_d.hour,
pNewOrderData->o_entry_d.minute,
pNewOrderData->o_entry_d.second);
                        }

                        c += wsprintf(szForm+c, "<BR>Customer:  %4.4d
Name: %-16s   Credit: %-2s   ",
                                pNewOrderData->c_id,
pNewOrderData->c_last, pNewOrderData->c_credit);

                        if ( bValid )
                        {
                                c += sprintf(szForm+c,
                                                        "%%Disc:
%5.2f          <BR>"
                                                        "Order
Number: %8.8d  Number of Lines: %2.2d       W_tax: %5.2f   D_tax: %5.2f
<BR> <BR>"
                                                        " Supp_W
Item_Id  Item Name              Qty  Stock  B/G  Price    Amount<BR>",
100.0*pNewOrderData->c_discount,
                                        pNewOrderData->o_id,
                                        pNewOrderData->o_ol_cnt,
                                        100.0 * pNewOrderData->w_tax,
                                        100.0 * pNewOrderData->d_tax);

                                for(i=0; i<pNewOrderData->o_ol_cnt; i++)
                                {
                                        c += sprintf(szForm+c, "  %4.4d
%6.6d   %-24s  %2.2d    %3.3d    %1.1s   $%6.2f  $%7.2f  <BR>",
pNewOrderData->OL[i].ol_supply_w_id,
pNewOrderData->OL[i].ol_i_id,
pNewOrderData->OL[i].ol_i_name,
pNewOrderData->OL[i].ol_quantity,
pNewOrderData->OL[i].ol_stock,
pNewOrderData->OL[i].ol_brand_generic,
pNewOrderData->OL[i].ol_i_price,
pNewOrderData->OL[i].ol_amount );
                                }
                        }
                        else
                        {
                                c += wsprintf(szForm+c,
                                        "%Disc:<BR>"
                                        "Order Number: %8.8d  Number
of Lines:          W_tax:       D_tax:<BR> <BR>"
                                                        " Supp_W  Item_Id  Item Name
        Qty  Stock  B/G  Price    Amount<BR>"
                                        , pNewOrderData->o_id);

                                i = 0;
                        }

                        strncpy( szForm+c, szBR, (15-i)*5 );
                        c += (15-i)*5;

                        if ( bValid )
                                c += sprintf(szForm+c, "Execution Status:
Transaction commited.              Total:  $%8.2f  ",
                                        pNewOrderData->total_amount);
                        else
                                c += wsprintf(szForm+c, "Execution Status:
Item number is not valid.          Total:");

                        strcpy(szForm+c,
                                " <BR></font></PRE><HR>"
                                "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..NewOrder..\">"
                                "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Payment..\">"
                                "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Delivery..\">"
                                "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Order-Status..\">"
                                "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Stock-Level..\">"
                                "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Exit..\">"
                                "</FORM></HTML>"
                                );
                }
}

/* FUNCTION: MakePaymentForm
 *
 * COMMENTS:        The internal client buffer is created when the terminal id
is assigned and should not
 *                                      be freed except when the client
terminal id is no longer needed.
 */

void MakePaymentForm(int iTermId, PAYMENT_DATA *pPaymentData,
BOOL bInput, char *szForm)
{
                int c;

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

```
                , PAYMENT_FORM, iTermId,
Term.pClientData[iTermId].iSyncId);

        if ( !bInput )
        {
                c += wsprintf(szForm+c, "%2.2d-%2.2d-%4.4d
%2.2d:%2.2d:%2.2d",
                        pPaymentData->h_date.day,
                        pPaymentData->h_date.month,
                        pPaymentData->h_date.year,
                        pPaymentData->h_date.hour,
                        pPaymentData->h_date.minute,
                        pPaymentData->h_date.second);
        }

        if ( bInput )
        {
                c += wsprintf(szForm+c,
                        "<BR> <BR>Warehouse: %4.4d"
                        "                District: <INPUT
NAME=\"DID*\" SIZE=1><BR> <BR> <BR> <BR> <BR>"
                        "Customer: <INPUT NAME=\"CID*\"
SIZE=4>"
                        "Cust-Warehouse: <INPUT NAME=\"CWI*\"
SIZE=4>  "
                        "Cust-District: <INPUT NAME=\"CDI*\"
SIZE=1><BR>"
                        "Name:                <INPUT
NAME=\"CLT*\" SIZE=16>          Since:<BR>"
                        "                                Credit:<BR>"
                        "                                Disc:<BR>"
                        "                                Phone:<BR>
<BR>"
                        "Amount Paid:          $<INPUT
NAME=\"HAM*\" SIZE=7>      New Cust-Balance:<BR>"
                        "Credit Limit:<BR> <BR>Cust-Data: <BR>
<BR> <BR> <BR> <BR></font></PRE><HR>"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"Process\"><INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"Menu\">"
                        "</BODY></FORM></HTML>"
                        , Term.pClientData[iTermId].w_id);
        }
        else
        {
                c += wsprintf(szForm+c,
                        "<BR> <BR>Warehouse: %4.4d
  District: %2.2d<BR>"
                        "%-20s                %-20s<BR>"
                        "%-20s                %-20s<BR>"
                        "%-20s %-2s %5.5s-%4.4s       %-20s %-2s
%5.5s-%4.4s<BR> <BR>"
                        "Customer: %4.4d  Cust-Warehouse: %4.4d
Cust-District: %2.2d<BR>"
                        "Name:   %-16s %-2s %-16s     Since:
%2.2d-%2.2d-%4.4d<BR>"
                        "       %-20s                 Credit: %-2s<BR>"

                        , Term.pClientData[iTermId].w_id,
pPaymentData->d_id
                        , pPaymentData->w_street_1,
pPaymentData->d_street_1
                        , pPaymentData->w_street_2,
pPaymentData->d_street_2
                        , pPaymentData->w_city,
pPaymentData->w_state, pPaymentData->w_zip, pPaymentData->w_zip+5
                        , pPaymentData->d_city,
pPaymentData->d_state, pPaymentData->d_zip, pPaymentData->d_zip+5
                        , pPaymentData->c_id,
pPaymentData->c_w_id,           pPaymentData->c_d_id
                        , pPaymentData->c_first,
pPaymentData->c_middle, pPaymentData->c_last
                        , pPaymentData->c_since.day,
pPaymentData->c_since.month,   pPaymentData->c_since.year
                        , pPaymentData->c_street_1,
pPaymentData->c_credit
                        );

        c += sprintf(szForm+c,
                        "       %-20s                 %%Disc:
%5.2f<BR>",
                        pPaymentData->c_street_2,
100.0*pPaymentData->c_discount);

                c += wsprintf(szForm+c,
                        "       %-20s %-2s %5.5s-%4.4s       Phone:
%6.6s-%3.3s-%3.3s-%4.4s<BR> <BR>",
                        pPaymentData->c_city,
pPaymentData->c_state, pPaymentData->c_zip, pPaymentData->c_zip+5,
                        pPaymentData->c_phone,
pPaymentData->c_phone+6, pPaymentData->c_phone+9,
pPaymentData->c_phone+12 );

                c += sprintf(szForm+c,
                        "Amount Paid:          $%7.2f      New
Cust-Balance: $%14.2f<BR>"
                        "Credit Limit:   $%13.2f<BR> <BR>"
                        , pPaymentData->h_amount,
pPaymentData->c_balance
                        , pPaymentData->c_credit_lim
                        );

                if ( pPaymentData->c_credit[0] == 'B' &&
pPaymentData->c_credit[1] == 'C' )
                        c += wsprintf(szForm+c,
                                        "Cust-Data:
%-50.50s<BR>          %-50.50s<BR>          %-50.50s<BR>
%-50.50s<BR>",
                                        pPaymentData->c_data,
pPaymentData->c_data+50, pPaymentData->c_data+100,
pPaymentData->c_data+150 );
                else
                        strcpy(szForm+c, "Cust-Data: <BR> <BR>
<BR> <BR>");

                strcat(szForm,          " <BR></font></PRE><HR>"
                                                "<INPUT
TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                                                "<INPUT
TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Payment..\">"
                                                "<INPUT
TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Delivery..\">"
                                                "<INPUT
TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Order-Status..\">"
                                                "<INPUT
TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Stock-Level..\">"
                                                "<INPUT
TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Exit..\">"

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

}

/* FUNCTION: MakeOrderStatusForm
 *
```

```
 * COMMENTS:        The internal client buffer is created when the terminal id is assigned and should not
 *                                                      be freed except when the client terminal id is no longer needed.
 */

void MakeOrderStatusForm(int iTermId, ORDER_STATUS_DATA *pOrderStatusData, BOOL bInput, char *szForm)
{
        int                     i, c;
        static char szBR[] = " <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR>";

        c = wsprintf(szForm,
                "<HTML><HEAD><TITLE>TPC-C Order-Status</TITLE></HEAD><BODY>"
                "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\" VALUE=\"0\">"
                "<INPUT TYPE=\"hidden\" NAME=\"ERROR\" VALUE=\"0\">"
                "<INPUT TYPE=\"hidden\" NAME=\"FORMID\" VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"TERMID\" VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\" VALUE=\"%d\">"
                "<PRE><font face=\"Courier\">
Order-Status<BR>"
                "Warehouse: %4.4d   ",
                ORDER_STATUS_FORM, iTermId, Term.pClientData[iTermId].iSyncId, Term.pClientData[iTermId].w_id);

        if ( bInput )
        {
                strcpy(szForm+c,
                        "District: <INPUT NAME=\"DID*\" SIZE=1><BR>"
                        "Customer: <INPUT NAME=\"CID*\" SIZE=4>   Name:                 <INPUT NAME=\"CLT*\" SIZE=23><BR>"
                        "Cust-Balance:<BR> <BR>"
                        "Order-Number:          Entry-Date:
    Carrier-Number:<BR>"
                        "Supply-W     Item-Id    Qty     Amount          Delivery-Date<BR> <BR> <BR> <BR> <BR>"
                        " <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR></font></PRE>"
                        "<HR><INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Process\"><INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Menu\">"
                        "</BODY></FORM></HTML>" );
        }
        else
        {
                c += wsprintf(szForm+c,
                        "District: %2.2d<BR>"
                        "Customer: %4.4d   Name: %-16s %-2s %-16s<BR>",
                        pOrderStatusData->d_id, pOrderStatusData->c_id,
                        pOrderStatusData->c_first, pOrderStatusData->c_middle, pOrderStatusData->c_last);

                c += sprintf(szForm+c, "Cust-Balance: $%9.2f<BR><BR>",
                        pOrderStatusData->c_balance);

                c += wsprintf(szForm+c,
                        "Order-Number: %8.8d   Entry-Date: %2.2d-%2.2d-%4.4d %2.2d:%2.2d:%2.2d   Carrier-Number: %2.2d<BR>"
                        "Supply-W     Item-Id    Qty     Amount          Delivery-Date<BR>",
                        pOrderStatusData->o_id,
                        pOrderStatusData->o_entry_d.day,
                        pOrderStatusData->o_entry_d.month,
                        pOrderStatusData->o_entry_d.year,
                        pOrderStatusData->o_entry_d.hour,
                        pOrderStatusData->o_entry_d.minute,
                        pOrderStatusData->o_entry_d.second,
                        pOrderStatusData->o_carrier_id);

                for(i=0; i< pOrderStatusData->o_ol_cnt; i++)
                {
                        c += sprintf(szForm+c, "  %4.4d       %6.6d      %2.2d     $%8.2f     %2.2d-%2.2d-%4.4d<BR>",
                                pOrderStatusData->OL[i].ol_supply_w_id,
                                pOrderStatusData->OL[i].ol_i_id,
                                pOrderStatusData->OL[i].ol_quantity,
                                pOrderStatusData->OL[i].ol_amount,
                                pOrderStatusData->OL[i].ol_delivery_d.day,
                                pOrderStatusData->OL[i].ol_delivery_d.month,
                                pOrderStatusData->OL[i].ol_delivery_d.year);
                }

                strncpy( szForm+c, szBR, (15-i)*5 );
                c += (15-i)*5;

                strcpy(szForm+c,
                        "</font></PRE><HR><INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Payment..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Delivery..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Order-Status..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Stock-Level..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"..Exit..\">"
                        "</BODY></FORM></HTML>" );
        }
}

/* FUNCTION: MakeDeliveryForm
 *
 * COMMENTS:        The internal client buffer is created when the terminal id is assigned and should not
 *                                                      be freed except when the client terminal id is no longer needed.
 */

void MakeDeliveryForm(int iTermId, DELIVERY_DATA *pDeliveryData, BOOL bInput, char *szForm)
{
        int             c;

        c = wsprintf(szForm,
                "<HTML><HEAD><TITLE>TPC-C Delivery</TITLE></HEAD><BODY>"
```

```
                        "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"ERROR\"
VALUE=\"0\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"FORMID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"TERMID\"
VALUE=\"%d\">"
                        "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\"
VALUE=\"%d\">"
                        "<PRE><font face=\"Courier\">
Delivery<BR>"
                        "Warehouse: %4.4d<BR> <BR>",
                        (!bInput && (pDeliveryData->exec_status_code !=
eOK)) ? ERR_TYPE_DELIVERY_POST : 0,
                        DELIVERY_FORM, iTermId,
Term.pClientData[iTermId].iSyncId, Term.pClientData[iTermId].w_id);

        if ( bInput )
        {
                strcpy( szForm+c,
                        "Carrier Number: <INPUT NAME=\"OCD*\"
SIZE=1><BR> <BR>"
                        "Execution Status: <BR> <BR> <BR> <BR>
<BR> <BR> <BR> <BR>"
                        " <BR> <BR> <BR> <BR> <BR> <BR>
<BR> <BR> </font></PRE><HR>"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"Process\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"Menu\">"
                        "</BODY></FORM></HTML>" );
        }
        else
        {
                wsprintf( szForm+c,
                        "Carrier Number: %2.2d<BR> <BR>"
                        "Execution Status: %s <BR> <BR> <BR>
<BR> <BR> <BR> <BR> <BR>"
                        " <BR> <BR> <BR> <BR> <BR> <BR>
<BR> <BR> </font></PRE>"
                        "<HR><INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"..NewOrder..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Payment..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Delivery..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Order-Status..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Stock-Level..\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"..Exit..\">"
                        "</BODY></FORM></HTML>"

                        , pDeliveryData->o_carrier_id,
                        (pDeliveryData->exec_status_code == eOK) ?
"Delivery has been queued." : "Delivery Post Failed     "
                        );
        }
}

/* FUNCTION: ProcessNewOrderForm
 *
 * PURPOSE:             This function gets and validates the input data from the
new order form
 *                              filling in the required input variables. it then
calls the SQLNewOrder
 *                              transaction, constructs the output form and
writes it back to client
 *                              browser.
 */

void ProcessNewOrderForm(EXTENSION_CONTROL_BLOCK  *pECB, int
iTermId, char *szBuffer)
{
        PNEW_ORDER_DATA                 pNewOrder;

        pNewOrder =
Term.pClientData[iTermId].pTxn->BuffAddr_NewOrder();

        ZeroMemory(pNewOrder, sizeof(NEW_ORDER_DATA));
        pNewOrder->w_id = Term.pClientData[iTermId].w_id;
        GetNewOrderData(pECB->lpszQueryString, pNewOrder);

        Term.pClientData[iTermId].pTxn->NewOrder();

        pNewOrder =
Term.pClientData[iTermId].pTxn->BuffAddr_NewOrder();
        MakeNewOrderForm(iTermId, pNewOrder, OUTPUT_FORM,
szBuffer );
}

/* FUNCTION: void ProcessPaymentForm
 *
 * PURPOSE:             This function gets and validates the input data from the
payment form
 *                              filling in the required input variables. It then
calls the SQLPayment
 *                              transaction, constructs the output form and
writes it back to client
 *                              browser.
 *
 * ARGUMENTS:   EXTENSION_CONTROL_BLOCK         *pECB
passed in structure pointer from inetsrv.
 *                                      int
 *                      iTermId     client browser terminal id
 *
 */

void ProcessPaymentForm(EXTENSION_CONTROL_BLOCK *pECB, int
iTermId, char *szBuffer)
{
        PPAYMENT_DATA pPayment;

        pPayment =
Term.pClientData[iTermId].pTxn->BuffAddr_Payment();
        ZeroMemory(pPayment, sizeof(PAYMENT_DATA));
        pPayment->w_id = Term.pClientData[iTermId].w_id;
        GetPaymentData(pECB->lpszQueryString, pPayment);

        Term.pClientData[iTermId].pTxn->Payment();

        pPayment =
Term.pClientData[iTermId].pTxn->BuffAddr_Payment();
        MakePaymentForm(iTermId, pPayment, OUTPUT_FORM,
szBuffer);
}

/* FUNCTION: ProcessOrderStatusForm
 *
 * PURPOSE:             This function gets and validates the input data from the
Order Status
```

```
 *                                form filling in the required input variables. It
then calls the
 *                                SQLOrderStatus transaction, constructs the
output form and writes it
 *                                back to client browser.
 *
 * ARGUMENTS:     EXTENSION_CONTROL_BLOCK          *pECB
passed in structure pointer from inetsrv.
 *                                        int
                        iTermId     client browser terminal id
 *
 */

void ProcessOrderStatusForm(EXTENSION_CONTROL_BLOCK *pECB, int
iTermId, char *szBuffer)
{
        PORDER_STATUS_DATA      pOrderStatus;

        pOrderStatus =
Term.pClientData[iTermId].pTxn->BuffAddr_OrderStatus();
        ZeroMemory(pOrderStatus, sizeof(ORDER_STATUS_DATA));
        pOrderStatus->w_id = Term.pClientData[iTermId].w_id;
        GetOrderStatusData(pECB->lpszQueryString, pOrderStatus);

        Term.pClientData[iTermId].pTxn->OrderStatus();

        pOrderStatus =
Term.pClientData[iTermId].pTxn->BuffAddr_OrderStatus();
        MakeOrderStatusForm(iTermId, pOrderStatus, OUTPUT_FORM,
szBuffer);
}

/* FUNCTION: ProcessDeliveryForm
 *
 * PURPOSE:          This function gets and validates the input data from the
delivery form
 *                                filling in the required input variables. It then
calls the PostDeliveryInfo
 *                                Api, The client is then informed that the
transaction has been posted.
 *
 * ARGUMENTS:     EXTENSION_CONTROL_BLOCK          *pECB
passed in structure pointer from inetsrv.
 *                                        int
                        iTermId     client browser terminal id
 *
 */

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

        PDELIVERY_DATA pDelivery;

        pDelivery =
Term.pClientData[iTermId].pTxn->BuffAddr_Delivery();
        ZeroMemory(pDelivery, sizeof(DELIVERY_DATA));
        pDelivery->w_id = Term.pClientData[iTermId].w_id;

        pDelivery->o_carrier_id             = GetIntKeyValue(&ptr, "OCD*",
ERR_DELIVERY_MISSING_OCD_KEY,
ERR_DELIVERY_CARRIER_INVALID);
        if ( pDelivery->o_carrier_id > 10 || pDelivery->o_carrier_id < 1 )
                throw new CWEBCLNT_ERR(
ERR_DELIVERY_CARRIER_ID_RANGE );

        if (dwNumDeliveryThreads)
        {
                //post delivery info
                if ( PostDeliveryInfo(pDelivery->w_id,
pDelivery->o_carrier_id) )
                        pDelivery->exec_status_code =
eDeliveryFailed;
                else
                        pDelivery->exec_status_code = eOK;
        }
        else // delivery is done synchronously if no delivery threads
configured
                Term.pClientData[iTermId].pTxn->Delivery();

        pDelivery =
Term.pClientData[iTermId].pTxn->BuffAddr_Delivery();
        MakeDeliveryForm(iTermId, pDelivery, OUTPUT_FORM,
szBuffer);
}

/* FUNCTION: ProcessStockLevelForm
 *
 * PURPOSE:          This function gets and validates the input data from the
Stock Level
 *                                form filling in the required input variables. It
then calls the
 *                                SQLStockLevel transaction, constructs the
output form and writes it
 *                                back to client browser.
 *
 * ARGUMENTS:     EXTENSION_CONTROL_BLOCK          *pECB
passed in structure pointer from inetsrv.
 *                                        int
                        iTermId     client browser terminal id
 *
 */

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

        PSTOCK_LEVEL_DATA       pStockLevel;

        pStockLevel =
Term.pClientData[iTermId].pTxn->BuffAddr_StockLevel();
        ZeroMemory( pStockLevel, sizeof(STOCK_LEVEL_DATA) );

        pStockLevel->w_id = Term.pClientData[iTermId].w_id;
        pStockLevel->d_id = Term.pClientData[iTermId].d_id;

        pStockLevel->threshold = GetIntKeyValue(&ptr, "TT*",
ERR_STOCKLEVEL_MISSING_THRESHOLD_KEY,
ERR_STOCKLEVEL_THRESHOLD_INVALID);
        if ( pStockLevel->threshold >= 100 || pStockLevel->threshold < 0 )
                throw new CWEBCLNT_ERR(
ERR_STOCKLEVEL_THRESHOLD_RANGE );

        Term.pClientData[iTermId].pTxn->StockLevel();

        pStockLevel =
Term.pClientData[iTermId].pTxn->BuffAddr_StockLevel();
        MakeStockLevelForm(iTermId, pStockLevel, OUTPUT_FORM,
szBuffer);
}

/* FUNCTION: GetNewOrderData
 *
```

```
 * PURPOSE:          This function extracts and validates the new order form
data from an http command string.
 *
 * ARGUMENTS:     LPSTR                          lpszQueryString
client browser http command string
 *                                               NEW_ORDER_DATA
*pNewOrderData                pointer to new order data structure
 *
 */

void GetNewOrderData(LPSTR lpszQueryString, NEW_ORDER_DATA
*pNewOrderData)
{
        char    szTmp[26];
        int             i;
        short   items;
        int             ol_i_id, ol_quantity;
        char    *ptr = lpszQueryString;

        static char szSP[MAX_OL_NEW_ORDER_ITEMS][6] =
                { "SP00*", "SP01*", "SP02*", "SP03*", "SP04*",
                  "SP05*", "SP06*", "SP07*", "SP08*", "SP09*",
                  "SP10*", "SP11*", "SP12*", "SP13*", "SP14*" };
        static char szIID[MAX_OL_NEW_ORDER_ITEMS][7] =
                { "IID00*", "IID01*", "IID02*", "IID03*", "IID04*",
                  "IID05*", "IID06*", "IID07*", "IID08*", "IID09*",
                  "IID10*", "IID11*", "IID12*", "IID13*", "IID14*" };
        static char szQty[MAX_OL_NEW_ORDER_ITEMS][7] =
                { "Qty00*", "Qty01*", "Qty02*", "Qty03*", "Qty04*",
                  "Qty05*", "Qty06*", "Qty07*", "Qty08*", "Qty09*",
                  "Qty10*", "Qty11*", "Qty12*", "Qty13*", "Qty14*" };

        pNewOrderData->d_id = GetIntKeyValue(&ptr, "DID*",
ERR_NEWORDER_FORM_MISSING_DID,
ERR_NEWORDER_DISTRICT_INVALID);
        pNewOrderData->c_id = GetIntKeyValue(&ptr, "CID*",
ERR_NEWORDER_CUSTOMER_KEY,
ERR_NEWORDER_CUSTOMER_INVALID);

        for(i=0, items=0; i<MAX_OL_NEW_ORDER_ITEMS; i++)
        {
                GetKeyValue(&ptr, szSP[i], szTmp, sizeof(szTmp),
ERR_NEWORDER_MISSING_SUPPW_KEY);
                if ( szTmp[0] )
                {
                        if ( !IsNumeric(szTmp) )
                                throw new CWEBCLNT_ERR(
ERR_NEWORDER_SUPPW_INVALID );
                        pNewOrderData->OL[items].ol_supply_w_id
= (short)atoi(szTmp);

                        ol_i_id = pNewOrderData->OL[items].ol_i_id
=
                                GetIntKeyValue(&ptr, szIID[i],
ERR_NEWORDER_MISSING_IID_KEY,
ERR_NEWORDER_ITEMID_INVALID);
                        if ( ol_i_id > 999999 || ol_i_id < 1 )
                                throw new CWEBCLNT_ERR(
ERR_NEWORDER_ITEMID_RANGE );

                        ol_quantity =
pNewOrderData->OL[items].ol_quantity =
                                GetIntKeyValue(&ptr, szQty[i],
ERR_NEWORDER_MISSING_QTY_KEY,
ERR_NEWORDER_QTY_INVALID);
                        if ( ol_quantity > 99 || ol_quantity < 1 )
                                throw new CWEBCLNT_ERR(
ERR_NEWORDER_QTY_RANGE );
                        items++;
                }
                else
                {       // nothing entered for supply warehouse, so
item id and qty must also be blank
                        GetKeyValue(&ptr, szIID[i], szTmp,
sizeof(szTmp), ERR_NEWORDER_MISSING_IID_KEY);
                        if ( szTmp[0] )
                                throw new CWEBCLNT_ERR(
ERR_NEWORDER_ITEMID_WITHOUT_SUPPW );

                        GetKeyValue(&ptr, szQty[i], szTmp,
sizeof(szTmp), ERR_NEWORDER_MISSING_QTY_KEY);
                        if ( szTmp[0] )
                                throw new CWEBCLNT_ERR(
ERR_NEWORDER_QTY_WITHOUT_SUPPW );
                }
        }
        if ( items == 0 )
                throw new CWEBCLNT_ERR(
ERR_NEWORDER_NOITEMS_ENTERED );

        pNewOrderData->o_ol_cnt = items;
}

/* FUNCTION: GetPaymentData
 *
 * PURPOSE:          This function extracts and validates the payment form
data from an http command string.
 *
 * ARGUMENTS:     LPSTR                          lpszQueryString
client browser http command string
 *                                               PAYMENT_DATA
*pPaymentData                 pointer to payment data structure
 */

void GetPaymentData(LPSTR lpszQueryString, PAYMENT_DATA
*pPaymentData)
{
        char    szTmp[26];
        char    *ptr = lpszQueryString;
        BOOL    bCustIdBlank;

        pPaymentData->d_id = GetIntKeyValue(&ptr, "DID*",
ERR_PAYMENT_MISSING_DID_KEY,
ERR_PAYMENT_DISTRICT_INVALID);

        GetKeyValue(&ptr, "CID*", szTmp, sizeof(szTmp),
ERR_PAYMENT_MISSING_CID_KEY);
        if ( szTmp[0] == 0 )
        {
                bCustIdBlank = TRUE;
                pPaymentData->c_id = 0;
        }
        else
        {       // parse customer id and verify that last name was NOT
entered
                bCustIdBlank = FALSE;
                if ( !IsNumeric(szTmp) )
                        throw new CWEBCLNT_ERR(
ERR_PAYMENT_CUSTOMER_INVALID );
                pPaymentData->c_id = atoi(szTmp);
        }

        pPaymentData->c_w_id = GetIntKeyValue(&ptr, "CWI*",
ERR_PAYMENT_MISSING_CWI_KEY,
ERR_PAYMENT_CWI_INVALID);
```

```
	pPaymentData->c_d_id = GetIntKeyValue(&ptr, "CDI*",
ERR_PAYMENT_MISSING_CDI_KEY, ERR_PAYMENT_CDI_INVALID);

	if ( bCustIdBlank )
	{	// customer id is blank, so last name must be entered
		GetKeyValue(&ptr, "CLT*", szTmp, sizeof(szTmp),
ERR_PAYMENT_MISSING_CLT_KEY);
		if ( szTmp[0] == 0 )
			throw new CWEBCLNT_ERR(
ERR_PAYMENT_MISSING_CID_CLT );

		_strupr( szTmp );
		if ( strlen(pPaymentData->c_last) > LAST_NAME_LEN
)
			throw new CWEBCLNT_ERR(
ERR_PAYMENT_LAST_NAME_TO_LONG );
		strcpy(pPaymentData->c_last, szTmp);
	}
	else
	{	// parse customer id and verify that last name was NOT
entered
		GetKeyValue(&ptr, "CLT*", szTmp, sizeof(szTmp),
ERR_PAYMENT_MISSING_CLT_KEY);
		if ( szTmp[0] != 0 )
			throw new CWEBCLNT_ERR(
ERR_PAYMENT_CID_AND_CLT );
	}

	GetKeyValue(&ptr, "HAM*", szTmp, sizeof(szTmp),
ERR_PAYMENT_MISSING_HAM_KEY);
	if (!IsDecimal(szTmp))
		throw new CWEBCLNT_ERR(
ERR_PAYMENT_HAM_INVALID );
	pPaymentData->h_amount = atof(szTmp);
	if ( pPaymentData->h_amount >= 10000.00 ||
pPaymentData->h_amount < 0 )
		throw new CWEBCLNT_ERR(
ERR_PAYMENT_HAM_RANGE );
}

/* FUNCTION: GetOrderStatusData
 *
 * PURPOSE:		This function extracts and validates the payment form
data from an http command string.
 *
 */
void GetOrderStatusData(LPSTR lpszQueryString, ORDER_STATUS_DATA
*pOrderStatusData)
{
	char	szTmp[26];
	char	*ptr = lpszQueryString;

	pOrderStatusData->d_id = GetIntKeyValue(&ptr, "DID*",
ERR_ORDERSTATUS_MISSING_DID_KEY,
ERR_ORDERSTATUS_DID_INVALID);

	GetKeyValue(&ptr, "CID*", szTmp, sizeof(szTmp),
ERR_ORDERSTATUS_MISSING_CID_KEY);
	if ( szTmp[0] == 0 )
	{	// customer id is blank, so last name must be entered
		pOrderStatusData->c_id = 0;
		GetKeyValue(&ptr, "CLT*", szTmp, sizeof(szTmp),
ERR_ORDERSTATUS_MISSING_CLT_KEY);
		if ( szTmp[0] == 0 )
			throw new CWEBCLNT_ERR(
ERR_ORDERSTATUS_MISSING_CID_CLT );

		_strupr( szTmp );
		if ( strlen(pOrderStatusData->c_last) >
LAST_NAME_LEN )
			throw new CWEBCLNT_ERR(
ERR_ORDERSTATUS_CLT_RANGE );
		strcpy(pOrderStatusData->c_last, szTmp);
	}
	else
	{	// parse customer id and verify that last name was NOT
entered
		if ( !IsNumeric(szTmp) )
			throw new CWEBCLNT_ERR(
ERR_ORDERSTATUS_CID_INVALID );
		pOrderStatusData->c_id = atoi(szTmp);
		GetKeyValue(&ptr, "CLT*", szTmp, sizeof(szTmp),
ERR_ORDERSTATUS_MISSING_CLT_KEY);
		if ( szTmp[0] != 0 )
			throw new CWEBCLNT_ERR(
ERR_ORDERSTATUS_CID_AND_CLT );
	}

}

/* FUNCTION: BOOL IsNumeric(char *ptr)
 *
 * PURPOSE:		This function determines if a string is numeric. It fails if
any characters other
 *			than numeric and null terminator are present.
 *
 * ARGUMENTS:	char		*ptr		pointer to
string to check.
 *
 * RETURNS:		BOOL	FALSE	if string is not all
numeric
 *						TRUE	if
string contains only numeric characters i.e. '0' - '9'
 */

BOOL IsNumeric(char *ptr)
{
	if ( *ptr == 0 )
		return FALSE;

	while( *ptr && isdigit(*ptr) )
		ptr++;
	return ( !*ptr );
}

/* FUNCTION: BOOL IsDecimal(char *ptr)
 *
 * PURPOSE:		This function determines if a string is a non-negative
decimal value.
 *		It fails if any characters other than a series of numbers followed by
 *			a decimal point, another series of numbers,
and a null terminator are present.
 *
 * ARGUMENTS:	char		*ptr		pointer to
string to check.
 *
 * RETURNS:		BOOL	FALSE	if string is not a valid
non-negative decimal value
 *						TRUE	if
string is OK
 */

BOOL IsDecimal(char *ptr)
{
	char *dotptr;
	BOOL  bValid;
```

```
        if ( *ptr == 0 )
                return FALSE;

        // find decimal point
        dotptr = strchr( ptr, '.' );
        if (dotptr == NULL)
                // no decimal point, so just check for numeric
                return IsNumeric(ptr);
        *dotptr = 0;  // temporarily replace decimal with a terminator

        if ( *ptr != 0 )
                bValid = IsNumeric(ptr);
        // string starts with decimal point
        else if (*(dotptr+1) == 0)
                return FALSE;  // nothing but a decimal point is bad
        else
                bValid = TRUE;

        if (*(dotptr+1) != 0)
                // check text after decimal point
                bValid &= IsNumeric(dotptr+1);

        *dotptr = '.';  // replace decimal point
        return bValid;
}
```

tpcc.def

```
LIBRARY TPCC.DLL

EXPORTS

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

tpcc.h

```
/*      FILE:                   TPCC.H
 *                                      Microsoft TPC-C Kit Ver.
4.20.000
 *                                      Copyright Microsoft, 1999
 *      All Rights Reserved
 *
 *                                      Version 4.10.000 audited by
Richard Gimarc, Performance Metrics, 3/17/99
 *
 *      PURPOSE:                Header file for ISAPI TPCC.DLL, defines
structures and functions used in the isapi tpcc.dll.
 *
 */

//VERSION RESOURCE DEFINES
#define _APS_NEXT_RESOURCE_VALUE
101
#define _APS_NEXT_COMMAND_VALUE
        40001
#define _APS_NEXT_CONTROL_VALUE
1000
#define _APS_NEXT_SYMED_VALUE
101
#define TP_MAX_RETRIES
        50


//note that the welcome form must be processed first as terminal ids assigned
here, once the
//terminal id is assigned then the forms can be processed in any order.
#define WELCOME_FORM
1               //beginning form no term id assigned, form id
#define MAIN_MENU_FORM
2               //term id assigned main menu form id
#define NEW_ORDER_FORM
3               //new order form id
#define PAYMENT_FORM
4               //payment form id
#define DELIVERY_FORM
5               //delivery form id
#define ORDER_STATUS_FORM
6               //order status id
#define STOCK_LEVEL_FORM
7               //stock level form id

//This macro is used to prevent the compiler error unused formal parameter
#define UNUSEDPARAM(x) (x = x)


//This structure defines the data necessary to keep distinct for each terminal or
client connection.
typedef struct _CLIENTDATA
{
        int                             iNextFree;
//index of next free element or -1 if this entry in use.
        int                             w_id;
        //warehouse id assigned at welcome form
        int                             d_id;
        //district id assigned at welcome form

        int                             iSyncId;
//syncronization id
        int                             iTickCount;
        //time of last access;

        CTPCC_BASE      *pTxn;

} CLIENTDATA, *PCLIENTDATA;


//This structure is used to define the operational interface for terminal id support
typedef struct _TERM
{
        int                             iNumEntries;
                //total allocated terminal array entries
        int                             iFreeList;
                //next available terminal array element or -1 if none
        int                             iMasterSyncId;
                //syncronization id
        CLIENTDATA      *pClientData;
        //pointer to allocated client data
} TERM;

typedef TERM *PTERM;
        //pointer to terminal structure type


        enum WEBERROR
        {
                NO_ERR,
                ERR_COMMAND_UNDEFINED,
```

```
                ERR_D_ID_INVALID,
                ERR_DELIVERY_CARRIER_ID_RANGE,
                ERR_DELIVERY_CARRIER_INVALID,
                ERR_DELIVERY_MISSING_OCD_KEY,
                ERR_DELIVERY_THREAD_FAILED,
                ERR_GETPROCADDR_FAILED,
                ERR_HTML_ILL_FORMED,
                ERR_INVALID_SYNC_CONNECTION,
                ERR_INVALID_TERMID,
                ERR_LOADDLL_FAILED,
                ERR_MAX_CONNECTIONS_EXCEEDED,
                ERR_MEM_ALLOC_FAILED,
                ERR_MISSING_REGISTRY_ENTRIES,
                ERR_NEWORDER_CUSTOMER_INVALID,
                ERR_NEWORDER_CUSTOMER_KEY,
                ERR_NEWORDER_DISTRICT_INVALID,
                ERR_NEWORDER_FORM_MISSING_DID,
                ERR_NEWORDER_ITEMID_INVALID,
                ERR_NEWORDER_ITEMID_RANGE,
                ERR_NEWORDER_ITEMID_WITHOUT_SUPPW,
                ERR_NEWORDER_MISSING_IID_KEY,
                ERR_NEWORDER_MISSING_QTY_KEY,
                ERR_NEWORDER_MISSING_SUPPW_KEY,
                ERR_NEWORDER_NOITEMS_ENTERED,
                ERR_NEWORDER_QTY_INVALID,
                ERR_NEWORDER_QTY_RANGE,
                ERR_NEWORDER_QTY_WITHOUT_SUPPW,
                ERR_NEWORDER_SUPPW_INVALID,
                ERR_NO_SERVER_SPECIFIED,
                ERR_ORDERSTATUS_CID_AND_CLT,
                ERR_ORDERSTATUS_CID_INVALID,
                ERR_ORDERSTATUS_CLT_RANGE,
                ERR_ORDERSTATUS_DID_INVALID,
                ERR_ORDERSTATUS_MISSING_CID_CLT,
                ERR_ORDERSTATUS_MISSING_CID_KEY,
                ERR_ORDERSTATUS_MISSING_CLT_KEY,
                ERR_ORDERSTATUS_MISSING_DID_KEY,
                ERR_PAYMENT_CDI_INVALID,
                ERR_PAYMENT_CID_AND_CLT,
                ERR_PAYMENT_CUSTOMER_INVALID,
                ERR_PAYMENT_CWI_INVALID,
                ERR_PAYMENT_DISTRICT_INVALID,
                ERR_PAYMENT_HAM_INVALID,
                ERR_PAYMENT_HAM_RANGE,
                ERR_PAYMENT_LAST_NAME_TO_LONG,
                ERR_PAYMENT_MISSING_CDI_KEY,
                ERR_PAYMENT_MISSING_CID_CLT,
                ERR_PAYMENT_MISSING_CID_KEY,
                ERR_PAYMENT_MISSING_CLT,
                ERR_PAYMENT_MISSING_CLT_KEY,
                ERR_PAYMENT_MISSING_CWI_KEY,
                ERR_PAYMENT_MISSING_DID_KEY,
                ERR_PAYMENT_MISSING_HAM_KEY,
                ERR_STOCKLEVEL_MISSING_THRESHOLD_KEY,
                ERR_STOCKLEVEL_THRESHOLD_INVALID,
                ERR_STOCKLEVEL_THRESHOLD_RANGE,
                ERR_VERSION_MISMATCH,
                ERR_W_ID_INVALID
        };

class CWEBCLNT_ERR : public CBaseErr
{
        public:

                CWEBCLNT_ERR(WEBERROR Err)
                {
                        m_Error = Err;
                        m_szTextDetail = NULL;
                        m_SystemErr = 0;
                        m_szErrorText = NULL;
                };

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

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

                WEBERROR        m_Error;
                char            *m_szTextDetail;      //
                char            *m_szErrorText;
                DWORD           m_SystemErr;

                int ErrorType() {return ERR_TYPE_WEBDLL;};
                int ErrorNum() {return m_Error;};
                char *ErrorText();

};

//These constants have already been defined in engstut.h, but since we do
//not want to include it in the delisrv executable
#define     TXN_EVENT_START                 2
#define     TXN_EVENT_STOP          4
#define TXN_EVENT_WARNING           6                   //used to
record a warning into the log

//function prototypes

BOOL APIENTRY DllMain(HANDLE hModule, DWORD ul_reason_for_call,
LPVOID lpReserved);
void WriteMessageToEventLog(LPTSTR lpszMsg);
void ProcessQueryString(EXTENSION_CONTROL_BLOCK *pECB, int
*pCmd, int *pFormId, int *pTermId, int *pSyncId);
void WelcomeForm(EXTENSION_CONTROL_BLOCK *pECB, char
*szBuffer);
void SubmitCmd(EXTENSION_CONTROL_BLOCK *pECB, char *szBuffer);
void BeginCmd(EXTENSION_CONTROL_BLOCK *pECB, int iFormId, int
iTermId);
void ProcessCmd(EXTENSION_CONTROL_BLOCK *pECB, int iFormId, int
iTermId);
void StatsCmd(EXTENSION_CONTROL_BLOCK *pECB, char *szBuffer);
void ErrorMessage(EXTENSION_CONTROL_BLOCK *pECB, int iError, int
iErrorType, char *szMsg, int iTermId);
void GetKeyValue(char **pQueryString, char *pKey, char *pValue, int iMax,
WEBERROR err);
int  GetIntKeyValue(char **pQueryString, char *pKey, WEBERROR
NoKeyErr, WEBERROR NotIntErr);
void TermInit(void);
void TermDeleteAll(void);
int  TermAdd(void);
void TermDelete(int id);
void ErrorForm(EXTENSION_CONTROL_BLOCK *pECB, int iType, int
iErrorNum, int iTermId, int iSyncId, char *szErrorText, char *szBuffer );
```

```
void MakeMainMenuForm(int iTermId, int iSyncId, char *szForm);
void MakeStockLevelForm(int iTermId, STOCK_LEVEL_DATA
*pStockLevelData, BOOL bInput, char *szForm);
void MakeNewOrderForm(int iTermId, NEW_ORDER_DATA
*pNewOrderData, BOOL bInput, char *szForm);
void MakePaymentForm(int iTermId, PAYMENT_DATA *pPaymentData,
BOOL bInput, char *szForm);
void MakeOrderStatusForm(int iTermId, ORDER_STATUS_DATA
*pOrderStatusData, BOOL bInput, char *szForm);
void MakeDeliveryForm(int iTermId, DELIVERY_DATA *pDeliveryData,
BOOL bInput, char *szForm);
void ProcessNewOrderForm(EXTENSION_CONTROL_BLOCK  *pECB, int
iTermId, char *szBuffer);
void ProcessPaymentForm(EXTENSION_CONTROL_BLOCK *pECB, int
iTermId, char *szBuffer);
void ProcessOrderStatusForm(EXTENSION_CONTROL_BLOCK *pECB, int
iTermId, char *szBuffer);
void ProcessDeliveryForm(EXTENSION_CONTROL_BLOCK *pECB, int
iTermId, char *szBuffer);
void ProcessStockLevelForm(EXTENSION_CONTROL_BLOCK *pECB, int
iTermId, char *szBuffer);
void GetNewOrderData(LPSTR lpszQueryString, NEW_ORDER_DATA
*pNewOrderData);
void GetPaymentData(LPSTR lpszQueryString, PAYMENT_DATA
*pPaymentData);
void GetOrderStatusData(LPSTR lpszQueryString, ORDER_STATUS_DATA
*pOrderStatusData);
BOOL PostDeliveryInfo(short w_id, short o_carrier_id);
BOOL IsNumeric(char *ptr);
BOOL IsDecimal(char *ptr);
void DeliveryWorkerThread(void *ptr);
```

tpcc.rc

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

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

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

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

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

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

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

#endif    // !_MAC


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

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

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

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

#endif    // APSTUDIO_INVOKED


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

IDD_DIALOG1 DIALOG DISCARDABLE  0, 0, 186, 95
STYLE DS_MODALFRAME | WS_POPUP | WS_CAPTION |
WS_SYSMENU
CAPTION "Dialog"
```

```
FONT 8, "MS Sans Serif"
BEGIN
    DEFPUSHBUTTON   "OK",IDOK,129,7,50,14
    PUSHBUTTON      "Cancel",IDCANCEL,129,24,50,14
END


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

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

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



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


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

tpcc_com.cpp

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

// needed for CoinitializeEx
#define _WIN32_WINNT 0x0400

#include <windows.h>

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

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

#include "..\..\tpcc_com_ps\src\tpcc_com_ps_i.c"
#include "..\..\tpcc_com_all\src\tpcc_com_all_i.c"

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

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

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

            m_bSinglePool       = bSinglePool;

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

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

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

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

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

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

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

```
                        throw new CCOMERR(hr);

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

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

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

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

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

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

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

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

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

void CTPCC_COM::NewOrder()
{
        VARIANT   vTxn_out;

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

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

void CTPCC_COM::Payment()
{
        VARIANT   vTxn_out;

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

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

void CTPCC_COM::StockLevel()
{
        VARIANT   vTxn_out;

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

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

void CTPCC_COM::OrderStatus()
{
        VARIANT   vTxn_out;

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

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

tpcc_com.h

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

```
 */

#pragma once

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

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

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

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

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

                int             m_hr;
                int             m_iErrorType;
                int             m_iError;

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

                int ErrorNum() {return m_hr;}

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

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

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

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

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

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

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


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


// wrapper routine for class constructor
extern "C" __declspec(dllexport) CTPCC_COM* CTPCC_COM_new(BOOL);

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

tpcc_com_all.dsp

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

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

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

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

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

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

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

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

!ENDIF

# Begin Target

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

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

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

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

SOURCE=.\src\tpcc_com_all.idl

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

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

BuildCmds= \
```

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

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

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

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

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

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

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

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

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

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

!ENDIF

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

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

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

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

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

tpcc_com_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.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 Sat Apr 08 16:40:10 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), ms_ext, c_ext
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )


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

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

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

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

#ifndef __tpcc_com_ps_h__
#define __tpcc_com_ps_h__

/* Forward Declarations */

#ifndef __ITPCC_FWD_DEFINED__
#define __ITPCC_FWD_DEFINED__
typedef interface ITPCC ITPCC;
#endif       /* __ITPCC_FWD_DEFINED__ */


/* header files for imported files */
#include "oaidl.h"
#include "ocidl.h"

#ifdef __cplusplus
extern "C"{
#endif

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

/* interface __MIDL_itf_tpcc_com_ps_0000 */
/* [local] */
```

```
extern RPC_IF_HANDLE __MIDL_itf_tpcc_com_ps_0000_v0_0_c_ifspec;
extern RPC_IF_HANDLE __MIDL_itf_tpcc_com_ps_0000_v0_0_s_ifspec;

#ifndef __ITPCC_INTERFACE_DEFINED__
#define __ITPCC_INTERFACE_DEFINED__

/* interface ITPCC */
/* [unique][helpstring][uuid][oleautomation][object] */


EXTERN_C const IID IID_ITPCC;

#if defined(__cplusplus) && !defined(CINTERFACE)

    MIDL_INTERFACE("FEEE6AA2-84B1-11d2-BA47-00C04FBFE08B")
    ITPCC : public IUnknown
    {
    public:
        virtual HRESULT __stdcall NewOrder(
            /* [in] */ VARIANT txn_in,
            /* [out] */ VARIANT __RPC_FAR *txn_out) = 0;

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

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

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

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

        virtual HRESULT __stdcall CallSetComplete( void) = 0;

    };

#else       /* C style interface */

    typedef struct ITPCCVtbl
    {
        BEGIN_INTERFACE

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

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

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

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

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

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

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

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

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

        END_INTERFACE
    } ITPCCVtbl;

    interface ITPCC
    {
        CONST_VTBL struct ITPCCVtbl __RPC_FAR *lpVtbl;
    };



#ifdef COBJMACROS


#define ITPCC_QueryInterface(This,riid,ppvObject)     \
    (This)->lpVtbl -> QueryInterface(This,riid,ppvObject)

#define ITPCC_AddRef(This)     \
    (This)->lpVtbl -> AddRef(This)

#define ITPCC_Release(This)     \
    (This)->lpVtbl -> Release(This)


#define ITPCC_NewOrder(This,txn_in,txn_out)           \
    (This)->lpVtbl -> NewOrder(This,txn_in,txn_out)

#define ITPCC_Payment(This,txn_in,txn_out)            \
    (This)->lpVtbl -> Payment(This,txn_in,txn_out)

#define ITPCC_Delivery(This,txn_in,txn_out)           \
    (This)->lpVtbl -> Delivery(This,txn_in,txn_out)

#define ITPCC_StockLevel(This,txn_in,txn_out)         \
    (This)->lpVtbl -> StockLevel(This,txn_in,txn_out)

#define ITPCC_OrderStatus(This,txn_in,txn_out)        \
    (This)->lpVtbl -> OrderStatus(This,txn_in,txn_out)

#define ITPCC_CallSetComplete(This)       \
    (This)->lpVtbl -> CallSetComplete(This)

#endif /* COBJMACROS */


#endif      /* C style interface */
```

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


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


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


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


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


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


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


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


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


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


HRESULT __stdcall ITPCC_CallSetComplete_Proxy(
    ITPCC __RPC_FAR * This);


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



#endif      /* __ITPCC_INTERFACE_DEFINED__ */


/* Additional Prototypes for ALL interfaces */

unsigned long             __RPC_USER  VARIANT_UserSize(     unsigned long
__RPC_FAR *, unsigned long           , VARIANT __RPC_FAR * );
unsigned char __RPC_FAR * __RPC_USER  VARIANT_UserMarshal(
unsigned long __RPC_FAR *, unsigned char __RPC_FAR *, VARIANT
__RPC_FAR * );
unsigned char __RPC_FAR * __RPC_USER
VARIANT_UserUnmarshal(unsigned long __RPC_FAR *, unsigned char
__RPC_FAR *, VARIANT __RPC_FAR * );
void                      __RPC_USER  VARIANT_UserFree(     unsigned long
__RPC_FAR *, VARIANT __RPC_FAR * );

/* end of Additional Prototypes */

#ifdef __cplusplus
}
#endif

#endif
```

tpcc_com_ps.idl

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

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

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

```
        HRESULT _stdcall NewOrder
                                                        (
                                                        [in]
VARIANT  txn_in,
                                                        [out]
VARIANT *txn_out
                                                        );

        HRESULT _stdcall Payment
                                                        (
                                                        [in]
VARIANT txn_in,
                                                        [out]
VARIANT *txn_out
                                                        );

        HRESULT _stdcall Delivery
                                                        (
                                                        [in]
VARIANT txn_in,
                                                        [out]
VARIANT *txn_out
                                                        );

        HRESULT _stdcall StockLevel
                                                        (
                                                        [in]
VARIANT txn_in,
                                                        [out]
VARIANT *txn_out
                                                        );

        HRESULT _stdcall OrderStatus
                                                        (
                                                        [in]
VARIANT txn_in,
                                                        [out]
VARIANT *txn_out
                                                        );

        HRESULT _stdcall CallSetComplete
                                                        (
                                                        );


    };          // interface ITPCC
```

tpcc_com_ps_i.c

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

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

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


 /* File created by MIDL compiler version 5.03.0280 */
/* at Sat Apr 08 16:40:10 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), ms_ext, c_ext
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if !defined(_M_IA64) && !defined(_M_AXP64)

#ifdef __cplusplus
extern "C"{
#endif


#include <rpc.h>
#include <rpcndr.h>

#ifdef _MIDL_USE_GUIDDEF_

#ifndef INITGUID
#define INITGUID
#include <guiddef.h>
#undef INITGUID
#else
#include <guiddef.h>
#endif

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8) \
        DEFINE_GUID(name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)

#else // !_MIDL_USE_GUIDDEF_

#ifndef __IID_DEFINED__
#define __IID_DEFINED__

typedef struct _IID
{
    unsigned long x;
    unsigned short s1;
    unsigned short s2;
    unsigned char  c[8];
} IID;

#endif // __IID_DEFINED__

#ifndef CLSID_DEFINED
#define CLSID_DEFINED
typedef IID CLSID;
#endif // CLSID_DEFINED

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8) \
        const type name = {l,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}

#endif !_MIDL_USE_GUIDDEF_

MIDL_DEFINE_GUID(IID,
IID_ITPCC,0xFEEE6AA2,0x84B1,0x11d2,0xBA,0x47,0x00,0xC0,0x4F,0xBF,
0xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



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


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

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

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


 /* File created by MIDL compiler version 5.03.0280 */
/* at Sat Apr 08 16:40:10 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win64 (32b run,appending), ms_ext, c_ext,
robust
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if defined(_M_IA64) || defined(_M_AXP64)

#ifdef __cplusplus
extern "C"{
#endif


#include <rpc.h>
#include <rpcndr.h>

#ifdef _MIDL_USE_GUIDDEF_

#ifndef INITGUID
#define INITGUID
#include <guiddef.h>
#undef INITGUID
#else
#include <guiddef.h>
#endif

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8) \
        DEFINE_GUID(name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)

#else // !_MIDL_USE_GUIDDEF_

#ifndef __IID_DEFINED__
#define __IID_DEFINED__

typedef struct _IID
{
    unsigned long x;
    unsigned short s1;
    unsigned short s2;
    unsigned char  c[8];
} IID;

#endif // __IID_DEFINED__

#ifndef CLSID_DEFINED
#define CLSID_DEFINED
typedef IID CLSID;
#endif // CLSID_DEFINED

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8) \
        const type name = {l,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}

#endif !_MIDL_USE_GUIDDEF_

MIDL_DEFINE_GUID(IID,
IID_ITPCC,0xFEEE6AA2,0x84B1,0x11d2,0xBA,0x47,0x00,0xC0,0x4F,0xBF,
0xE0,0x8B);

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



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

tpcc_com_ps_p.c

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

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


 /* File created by MIDL compiler version 5.03.0280 */
/* at Sat Apr 08 16:40:10 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), ms_ext, c_ext
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if !defined(_M_IA64) && !defined(_M_AXP64)
#define USE_STUBLESS_PROXY


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


#include "rpcproxy.h"
#ifndef __RPCPROXY_H_VERSION__
#error this stub requires an updated version of <rpcproxy.h>
#endif // __RPCPROXY_H_VERSION__


#include "tpcc_com_ps.h"

#define TYPE_FORMAT_STRING_SIZE   997
#define PROC_FORMAT_STRING_SIZE   193
#define TRANSMIT_AS_TABLE_SIZE    0
#define WIRE_MARSHAL_TABLE_SIZE   1

typedef struct _MIDL_TYPE_FORMAT_STRING
    {
    short          Pad;
    unsigned char  Format[ TYPE_FORMAT_STRING_SIZE ];
    } MIDL_TYPE_FORMAT_STRING;

typedef struct _MIDL_PROC_FORMAT_STRING
    {
    short          Pad;
    unsigned char  Format[ PROC_FORMAT_STRING_SIZE ];
    } MIDL_PROC_FORMAT_STRING;


extern const MIDL_TYPE_FORMAT_STRING __MIDL_TypeFormatString;
```

```
extern const MIDL_PROC_FORMAT_STRING __MIDL_ProcFormatString;


/* Standard interface: __MIDL_itf_tpcc_com_ps_0000, ver. 0.0,

GUID={0x00000000,0x0000,0x0000,{0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0
x00}} */


/* Object interface: IUnknown, ver. 0.0,

GUID={0x00000000,0x0000,0x0000,{0xC0,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x46}} */


/* Object interface: ITPCC, ver. 0.0,

GUID={0xFEEE6AA2,0x84B1,0x11d2,{0xBA,0x47,0x00,0xC0,0x4F,0xBF,0x
E0,0x8B}} */


extern const MIDL_STUB_DESC Object_StubDesc;


extern const MIDL_SERVER_INFO ITPCC_ServerInfo;

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

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

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

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

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

extern const USER_MARSHAL_ROUTINE_QUADRUPLE
UserMarshalRoutines[ WIRE_MARSHAL_TABLE_SIZE ];

static const MIDL_STUB_DESC Object_StubDesc =
    {
    0,
    NdrOleAllocate,
    NdrOleFree,
    0,
    0,
    0,
    0,
    0,
    __MIDL_TypeFormatString.Format,
    1, /* -error bounds_check flag */
    0x20000, /* Ndr library version */
    0,
    0x5030118, /* MIDL Version 5.3.280 */
    0,
    UserMarshalRoutines,
    0,  /* notify & notify_flag routine table */
    0x1, /* MIDL flag */
    0,  /* Reserved3 */
    0,  /* Reserved4 */
    0   /* Reserved5 */
    };

#pragma data_seg(".rdata")

static const USER_MARSHAL_ROUTINE_QUADRUPLE
UserMarshalRoutines[ WIRE_MARSHAL_TABLE_SIZE ] =
        {

            {
            VARIANT_UserSize
            ,VARIANT_UserMarshal
            ,VARIANT_UserUnmarshal
            ,VARIANT_UserFree
            }

        };


#if !defined(__RPC_WIN32__)
#error  Invalid build platform for this stub.
#endif

#if !(TARGET_IS_NT40_OR_LATER)
#error You need a Windows NT 4.0 or later to run this stub because it uses
these features:
#error   -Oif or -Oicf, [wire_marshal] or [user_marshal] attribute.
#error However, your C/C++ compilation flags indicate you intend to run this
app on earlier systems.
```

```
#error This app will die there with the RPC_X_WRONG_STUB_VERSION
error.
#endif


static const MIDL_PROC_FORMAT_STRING __MIDL_ProcFormatString =
    {
        0,
        {

            /* Procedure NewOrder */

                                0x33,               /*
FC_AUTO_HANDLE */
                                0x6c,               /* Old Flags:  object,
Oi2 */
/*  2 */    NdrFcLong( 0x0 ),   /* 0 */
/*  6 */    NdrFcShort( 0x3 ),  /* 3 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/*  8 */    NdrFcShort( 0x1c ), /* x86 Stack size/offset = 28 */
#else
                                NdrFcShort( 0x20 ), /*  MIPS Stack
size/offset = 32 */
#endif
#else
                                NdrFcShort( 0x20 ), /* PPC Stack size/offset
= 32 */
#endif
#else
                                NdrFcShort( 0x28 ), /* Alpha Stack
size/offset = 40 */
#endif
/* 10 */    NdrFcShort( 0x0 ),  /* 0 */
/* 12 */    NdrFcShort( 0x8 ),  /* 8 */
/* 14 */    0x7,                /* Oi2 Flags:  srv must size, clt must size, has
return, */
                                0x3,                /* 3 */

            /* Parameter txn_in */

/* 16 */    NdrFcShort( 0x8b ), /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 18 */    NdrFcShort( 0x4 ),  /* x86 Stack size/offset = 4 */
#else
                                NdrFcShort( 0x8 ),  /*  MIPS Stack
size/offset = 8 */
#endif
#else
                                NdrFcShort( 0x8 ),  /* PPC Stack size/offset
= 8 */
#endif
#else
                                NdrFcShort( 0x8 ),  /* Alpha Stack
size/offset = 8 */
#endif
/* 20 */    NdrFcShort( 0x3c8 ), /* Type Offset=968 */

            /* Parameter txn_out */

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

            /* Return value */

/* 28 */    NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 30 */    NdrFcShort( 0x18 ), /* x86 Stack size/offset = 24 */
#else
                                NdrFcShort( 0x1c ), /*  MIPS Stack
size/offset = 28 */
#endif
#else
                                NdrFcShort( 0x1c ), /* PPC Stack size/offset
= 28 */
#endif
#else
                                NdrFcShort( 0x20 ), /* Alpha Stack
size/offset = 32 */
#endif
/* 32 */    0x8,                /* FC_LONG */
                                0x0,                /* 0 */

            /* Procedure Payment */

/* 34 */    0x33,               /* FC_AUTO_HANDLE */
                                0x6c,               /* Old Flags:  object,
Oi2 */
/* 36 */    NdrFcLong( 0x0 ),   /* 0 */
/* 40 */    NdrFcShort( 0x4 ),  /* 4 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 42 */    NdrFcShort( 0x1c ), /* x86 Stack size/offset = 28 */
#else
                                NdrFcShort( 0x20 ), /*  MIPS Stack
size/offset = 32 */
#endif
#else
                                NdrFcShort( 0x20 ), /* PPC Stack size/offset
= 32 */
#endif
#else
                                NdrFcShort( 0x28 ), /* Alpha Stack
size/offset = 40 */
#endif
/* 44 */    NdrFcShort( 0x0 ),  /* 0 */
/* 46 */    NdrFcShort( 0x8 ),  /* 8 */
/* 48 */    0x7,                /* Oi2 Flags:  srv must size, clt must size, has
return, */
                                0x3,                /* 3 */

            /* Parameter txn_in */
```

```
/* 50 */    NdrFcShort( 0x8b ),   /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 52 */    NdrFcShort( 0x4 ),    /* x86 Stack size/offset = 4 */
#else
                                  NdrFcShort( 0x8 ),    /*  MIPS Stack
size/offset = 8 */
#endif
#else
                                  NdrFcShort( 0x8 ),    /* PPC Stack size/offset
= 8 */
#endif
#else
                                  NdrFcShort( 0x8 ),    /* Alpha Stack
size/offset = 8 */
#endif
/* 54 */    NdrFcShort( 0x3c8 ), /* Type Offset=968 */

            /* Parameter txn_out */

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

            /* Return value */

/* 62 */    NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 64 */    NdrFcShort( 0x18 ),   /* x86 Stack size/offset = 24 */
#else
                                  NdrFcShort( 0x1c ),   /*  MIPS Stack
size/offset = 28 */
#endif
#else
                                  NdrFcShort( 0x1c ),   /* PPC Stack size/offset
= 28 */
#endif
#else
                                  NdrFcShort( 0x20 ),   /* Alpha Stack
size/offset = 32 */
#endif
/* 66 */    0x8,                  /* FC_LONG */
                                  0x0,                  /* 0 */

            /* Procedure Delivery */

/* 68 */    0x33,                 /* FC_AUTO_HANDLE */
                                  0x6c,                 /* Old Flags:  object,
Oi2 */
/* 70 */    NdrFcLong( 0x0 ),     /* 0 */
/* 74 */    NdrFcShort( 0x5 ),    /* 5 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 76 */    NdrFcShort( 0x1c ),   /* x86 Stack size/offset = 28 */
#else
                                  NdrFcShort( 0x20 ),   /*  MIPS Stack
size/offset = 32 */
#endif
#else
                                  NdrFcShort( 0x20 ),   /* PPC Stack size/offset
= 32 */
#endif
#else
                                  NdrFcShort( 0x28 ),   /* Alpha Stack
size/offset = 40 */
#endif
/* 78 */    NdrFcShort( 0x0 ),    /* 0 */
/* 80 */    NdrFcShort( 0x8 ),    /* 8 */
/* 82 */    0x7,                  /* Oi2 Flags:  srv must size, clt must size, has
return, */
                                  0x3,                  /* 3 */

            /* Parameter txn_in */

/* 84 */    NdrFcShort( 0x8b ),   /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 86 */    NdrFcShort( 0x4 ),    /* x86 Stack size/offset = 4 */
#else
                                  NdrFcShort( 0x8 ),    /*  MIPS Stack
size/offset = 8 */
#endif
#else
                                  NdrFcShort( 0x8 ),    /* PPC Stack size/offset
= 8 */
#endif
#else
                                  NdrFcShort( 0x8 ),    /* Alpha Stack
size/offset = 8 */
#endif
/* 88 */    NdrFcShort( 0x3c8 ), /* Type Offset=968 */

            /* Parameter txn_out */

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

            /* Return value */
```

```
/* 96 */    NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 98 */    NdrFcShort( 0x18 ),   /* x86 Stack size/offset = 24 */
#else
                                  NdrFcShort( 0x1c ),   /*  MIPS Stack
size/offset = 28 */
#endif
#else
                                  NdrFcShort( 0x1c ),   /* PPC Stack size/offset
= 28 */
#endif
#else
                                  NdrFcShort( 0x20 ),   /* Alpha Stack
size/offset = 32 */
#endif
/* 100 */   0x8,                  /* FC_LONG */
                                  0x0,                  /* 0 */

            /* Procedure StockLevel */

/* 102 */   0x33,                 /* FC_AUTO_HANDLE */
                                  0x6c,                 /* Old Flags:  object,
Oi2 */
/* 104 */   NdrFcLong( 0x0 ),     /* 0 */
/* 108 */   NdrFcShort( 0x6 ),    /* 6 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 110 */   NdrFcShort( 0x1c ),   /* x86 Stack size/offset = 28 */
#else
                                  NdrFcShort( 0x20 ),   /*  MIPS Stack
size/offset = 32 */
#endif
#else
                                  NdrFcShort( 0x20 ),   /* PPC Stack size/offset
= 32 */
#endif
#else
                                  NdrFcShort( 0x28 ),   /* Alpha Stack
size/offset = 40 */
#endif
/* 112 */   NdrFcShort( 0x0 ),    /* 0 */
/* 114 */   NdrFcShort( 0x8 ),    /* 8 */
/* 116 */   0x7,                  /* Oi2 Flags:  srv must size, clt must size, has
return, */
                                  0x3,                  /* 3 */

            /* Parameter txn_in */

/* 118 */   NdrFcShort( 0x8b ),   /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 120 */   NdrFcShort( 0x4 ),    /* x86 Stack size/offset = 4 */
#else
                                  NdrFcShort( 0x8 ),    /*  MIPS Stack
size/offset = 8 */
#endif
#else
                                  NdrFcShort( 0x8 ),    /* PPC Stack size/offset
= 8 */
#endif
#else
                                  NdrFcShort( 0x8 ),    /* Alpha Stack
size/offset = 8 */
#endif
/* 122 */   NdrFcShort( 0x3c8 ),  /* Type Offset=968 */

            /* Parameter txn_out */

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

            /* Return value */

/* 130 */   NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 132 */   NdrFcShort( 0x18 ),   /* x86 Stack size/offset = 24 */
#else
                                  NdrFcShort( 0x1c ),   /*  MIPS Stack
size/offset = 28 */
#endif
#else
                                  NdrFcShort( 0x1c ),   /* PPC Stack size/offset
= 28 */
#endif
#else
                                  NdrFcShort( 0x20 ),   /* Alpha Stack
size/offset = 32 */
#endif
/* 134 */   0x8,                  /* FC_LONG */
                                  0x0,                  /* 0 */

            /* Procedure OrderStatus */

/* 136 */   0x33,                 /* FC_AUTO_HANDLE */
                                  0x6c,                 /* Old Flags:  object,
Oi2 */
/* 138 */   NdrFcLong( 0x0 ),     /* 0 */
/* 142 */   NdrFcShort( 0x7 ),    /* 7 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 144 */   NdrFcShort( 0x1c ),   /* x86 Stack size/offset = 28 */
#else
                                  NdrFcShort( 0x20 ),   /*  MIPS Stack
size/offset = 32 */
#endif
#else
                                  NdrFcShort( 0x20 ),   /* PPC Stack size/offset
= 32 */
#endif
#else
```

```
                                NdrFcShort( 0x28 ),   /* Alpha Stack
size/offset = 40 */
#endif
/* 146 */   NdrFcShort( 0x0 ),    /* 0 */
/* 148 */   NdrFcShort( 0x8 ),    /* 8 */
/* 150 */   0x7,                  /* Oi2 Flags:  srv must size, clt must size, has
return, */
                                0x3,                  /* 3 */

            /* Parameter txn_in */

/* 152 */   NdrFcShort( 0x8b ),   /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 154 */   NdrFcShort( 0x4 ),    /* x86 Stack size/offset = 4 */
#else
                                NdrFcShort( 0x8 ),    /*  MIPS Stack
size/offset = 8 */
#endif
#else
                                NdrFcShort( 0x8 ),    /* PPC Stack size/offset
= 8 */
#endif
#else
                                NdrFcShort( 0x8 ),    /* Alpha Stack
size/offset = 8 */
#endif
/* 156 */   NdrFcShort( 0x3c8 ), /* Type Offset=968 */

            /* Parameter txn_out */

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

            /* Return value */

/* 164 */   NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 166 */   NdrFcShort( 0x18 ),   /* x86 Stack size/offset = 24 */
#else
                                NdrFcShort( 0x1c ),   /*  MIPS Stack
size/offset = 28 */
#endif
#else
                                NdrFcShort( 0x1c ),   /* PPC Stack size/offset
= 28 */
#endif
#else
                                NdrFcShort( 0x20 ),   /* Alpha Stack
size/offset = 32 */
#endif
/* 168 */   0x8,                  /* FC_LONG */
                                0x0,                  /* 0 */

            /* Procedure CallSetComplete */

/* 170 */   0x33,                 /* FC_AUTO_HANDLE */
                                0x6c,                 /* Old Flags:  object,
Oi2 */
/* 172 */   NdrFcLong( 0x0 ),     /* 0 */
/* 176 */   NdrFcShort( 0x8 ),    /* 8 */
#ifndef _ALPHA_
/* 178 */   NdrFcShort( 0x8 ),    /* x86, MIPS, PPC Stack size/offset = 8 */
#else
                                NdrFcShort( 0x10 ),   /* Alpha Stack
size/offset = 16 */
#endif
/* 180 */   NdrFcShort( 0x0 ),    /* 0 */
/* 182 */   NdrFcShort( 0x8 ),    /* 8 */
/* 184 */   0x4,                  /* Oi2 Flags:  has return, */
                                0x1,                  /* 1 */

            /* Return value */

/* 186 */   NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 188 */   NdrFcShort( 0x4 ),    /* x86, MIPS, PPC Stack size/offset = 4 */
#else
                                NdrFcShort( 0x8 ),    /* Alpha Stack
size/offset = 8 */
#endif
/* 190 */   0x8,                  /* FC_LONG */
                                0x0,                  /* 0 */

                                0x0
    }
  };

static const MIDL_TYPE_FORMAT_STRING __MIDL_TypeFormatString =
  {
    0,
    {
                                NdrFcShort( 0x0 ),    /* 0 */
/*  2 */
                                0x12, 0x0, /* FC_UP */
/*  4 */    NdrFcShort( 0x3b0 ), /* Offset= 944 (948) */
/*  6 */
                                0x2b,                 /*
FC_NON_ENCAPSULATED_UNION */
                                0x9,                  /* FC_ULONG */
/*  8 */    0x7,                  /* Corr desc: FC_USHORT */
                                0x0,                  /*  */
/* 10 */    NdrFcShort( 0xfff8 ), /* -8 */
/* 12 */    NdrFcShort( 0x2 ),    /* Offset= 2 (14) */
/* 14 */    NdrFcShort( 0x10 ),   /* 16 */
/* 16 */    NdrFcShort( 0x2b ),   /* 43 */
/* 18 */    NdrFcLong( 0x3 ),     /* 3 */
/* 22 */    NdrFcShort( 0x8008 ),             /* Simple arm type: FC_LONG */
/* 24 */    NdrFcLong( 0x11 ),    /* 17 */
/* 28 */    NdrFcShort( 0x8001 ),             /* Simple arm type: FC_BYTE */
/* 30 */    NdrFcLong( 0x2 ),     /* 2 */
/* 34 */    NdrFcShort( 0x8006 ),             /* Simple arm type: FC_SHORT */
/* 36 */    NdrFcLong( 0x4 ),     /* 4 */
/* 40 */    NdrFcShort( 0x800a ),             /* Simple arm type: FC_FLOAT */
/* 42 */    NdrFcLong( 0x5 ),     /* 5 */
```

```
/* 46 */    NdrFcShort( 0x800c ),               /* Simple arm type: FC_DOUBLE
*/
/* 48 */    NdrFcLong( 0xb ),    /* 11 */
/* 52 */    NdrFcShort( 0x8006 ),               /* Simple arm type: FC_SHORT */
/* 54 */    NdrFcLong( 0xa ),    /* 10 */
/* 58 */    NdrFcShort( 0x8008 ),               /* Simple arm type: FC_LONG */
/* 60 */    NdrFcLong( 0x6 ),    /* 6 */
/* 64 */    NdrFcShort( 0xd6 ),  /* Offset= 214 (278) */
/* 66 */    NdrFcLong( 0x7 ),    /* 7 */
/* 70 */    NdrFcShort( 0x800c ),               /* Simple arm type: FC_DOUBLE
*/
/* 72 */    NdrFcLong( 0x8 ),    /* 8 */
/* 76 */    NdrFcShort( 0xd0 ),  /* Offset= 208 (284) */
/* 78 */    NdrFcLong( 0xd ),    /* 13 */
/* 82 */    NdrFcShort( 0xe2 ),  /* Offset= 226 (308) */
/* 84 */    NdrFcLong( 0x9 ),    /* 9 */
/* 88 */    NdrFcShort( 0xee ),  /* Offset= 238 (326) */
/* 90 */    NdrFcLong( 0x2000 ),                /* 8192 */
/* 94 */    NdrFcShort( 0xfa ),  /* Offset= 250 (344) */
/* 96 */    NdrFcLong( 0x24 ),   /* 36 */
/* 100 */   NdrFcShort( 0x308 ), /* Offset= 776 (876) */
/* 102 */   NdrFcLong( 0x4024 ),                /* 16420 */
/* 106 */   NdrFcShort( 0x302 ), /* Offset= 770 (876) */
/* 108 */   NdrFcLong( 0x4011 ),                /* 16401 */
/* 112 */   NdrFcShort( 0x300 ), /* Offset= 768 (880) */
/* 114 */   NdrFcLong( 0x4002 ),                /* 16386 */
/* 118 */   NdrFcShort( 0x2fe ), /* Offset= 766 (884) */
/* 120 */   NdrFcLong( 0x4003 ),                /* 16387 */
/* 124 */   NdrFcShort( 0x2fc ), /* Offset= 764 (888) */
/* 126 */   NdrFcLong( 0x4004 ),                /* 16388 */
/* 130 */   NdrFcShort( 0x2fa ), /* Offset= 762 (892) */
/* 132 */   NdrFcLong( 0x4005 ),                /* 16389 */
/* 136 */   NdrFcShort( 0x2f8 ), /* Offset= 760 (896) */
/* 138 */   NdrFcLong( 0x400b ),                /* 16395 */
/* 142 */   NdrFcShort( 0x2e6 ), /* Offset= 742 (884) */
/* 144 */   NdrFcLong( 0x400a ),                /* 16394 */
/* 148 */   NdrFcShort( 0x2e4 ), /* Offset= 740 (888) */
/* 150 */   NdrFcLong( 0x4006 ),                /* 16390 */
/* 154 */   NdrFcShort( 0x2ea ), /* Offset= 746 (900) */
/* 156 */   NdrFcLong( 0x4007 ),                /* 16391 */
/* 160 */   NdrFcShort( 0x2e0 ), /* Offset= 736 (896) */
/* 162 */   NdrFcLong( 0x4008 ),                /* 16392 */
/* 166 */   NdrFcShort( 0x2e2 ), /* Offset= 738 (904) */
/* 168 */   NdrFcLong( 0x400d ),                /* 16397 */
/* 172 */   NdrFcShort( 0x2e0 ), /* Offset= 736 (908) */
/* 174 */   NdrFcLong( 0x4009 ),                /* 16393 */
/* 178 */   NdrFcShort( 0x2de ), /* Offset= 734 (912) */
/* 180 */   NdrFcLong( 0x6000 ),                /* 24576 */
/* 184 */   NdrFcShort( 0x2dc ), /* Offset= 732 (916) */
/* 186 */   NdrFcLong( 0x400c ),                /* 16396 */
/* 190 */   NdrFcShort( 0x2da ), /* Offset= 730 (920) */
/* 192 */   NdrFcLong( 0x10 ),   /* 16 */
/* 196 */   NdrFcShort( 0x8002 ),               /* Simple arm type: FC_CHAR */
/* 198 */   NdrFcLong( 0x12 ),   /* 18 */
/* 202 */   NdrFcShort( 0x8006 ),               /* Simple arm type: FC_SHORT */
/* 204 */   NdrFcLong( 0x13 ),   /* 19 */
/* 208 */   NdrFcShort( 0x8008 ),               /* Simple arm type: FC_LONG */
/* 210 */   NdrFcLong( 0x16 ),   /* 22 */
/* 214 */   NdrFcShort( 0x8008 ),               /* Simple arm type: FC_LONG */
/* 216 */   NdrFcLong( 0x17 ),   /* 23 */
/* 220 */   NdrFcShort( 0x8008 ),               /* Simple arm type: FC_LONG */
/* 222 */   NdrFcLong( 0xe ),    /* 14 */
/* 226 */   NdrFcShort( 0x2be ), /* Offset= 702 (928) */
/* 228 */   NdrFcLong( 0x400e ),                /* 16398 */
/* 232 */   NdrFcShort( 0x2c4 ), /* Offset= 708 (940) */
/* 234 */   NdrFcLong( 0x4010 ),                /* 16400 */
/* 238 */   NdrFcShort( 0x2c2 ), /* Offset= 706 (944) */
/* 240 */   NdrFcLong( 0x4012 ),                /* 16402 */
/* 244 */   NdrFcShort( 0x280 ), /* Offset= 640 (884) */
/* 246 */   NdrFcLong( 0x4013 ),                /* 16403 */
/* 250 */   NdrFcShort( 0x27e ), /* Offset= 638 (888) */
/* 252 */   NdrFcLong( 0x4016 ),                /* 16406 */
/* 256 */   NdrFcShort( 0x278 ), /* Offset= 632 (888) */
/* 258 */   NdrFcLong( 0x4017 ),                /* 16407 */
/* 262 */   NdrFcShort( 0x272 ), /* Offset= 626 (888) */
/* 264 */   NdrFcLong( 0x0 ),    /* 0 */
/* 268 */   NdrFcShort( 0x0 ),   /* Offset= 0 (268) */
/* 270 */   NdrFcLong( 0x1 ),    /* 1 */
/* 274 */   NdrFcShort( 0x0 ),   /* Offset= 0 (274) */
/* 276 */   NdrFcShort( 0xffffffff ),           /* Offset= -1 (275) */
/* 278 */
                                    0x15,               /* FC_STRUCT */
                                    0x7,                /* 7 */
/* 280 */   NdrFcShort( 0x8 ),   /* 8 */
/* 282 */   0xb,                /* FC_HYPER */
                                    0x5b,               /* FC_END */
/* 284 */
                                    0x12, 0x0, /* FC_UP */
/* 286 */   NdrFcShort( 0xc ),   /* Offset= 12 (298) */
/* 288 */
                                    0x1b,               /* FC_CARRAY */
                                    0x1,                /* 1 */
/* 290 */   NdrFcShort( 0x2 ),   /* 2 */
/* 292 */   0x9,                /* Corr desc: FC_ULONG */
                                    0x0,                /*  */
/* 294 */   NdrFcShort( 0xfffc ), /* -4 */
/* 296 */   0x6,                /* FC_SHORT */
                                    0x5b,               /* FC_END */
/* 298 */
                                    0x17,               /* FC_CSTRUCT */
                                    0x3,                /* 3 */
/* 300 */   NdrFcShort( 0x8 ),   /* 8 */
/* 302 */   NdrFcShort( 0xfffffff2 ),           /* Offset= -14 (288) */
/* 304 */   0x8,                /* FC_LONG */
                                    0x8,                /* FC_LONG */
/* 306 */   0x5c,               /* FC_PAD */
                                    0x5b,               /* FC_END */
/* 308 */
                                    0x2f,               /* FC_IP */
                                    0x5a,               /*
FC_CONSTANT_IID */
/* 310 */   NdrFcLong( 0x0 ),    /* 0 */
/* 314 */   NdrFcShort( 0x0 ),   /* 0 */
/* 316 */   NdrFcShort( 0x0 ),   /* 0 */
/* 318 */   0xc0,               /* 192 */
                                    0x0,                /* 0 */
/* 320 */   0x0,                /* 0 */
                                    0x0,                /* 0 */
/* 322 */   0x0,                /* 0 */
                                    0x0,                /* 0 */
/* 324 */   0x0,                /* 0 */
                                    0x46,               /* 70 */
/* 326 */
                                    0x2f,               /* FC_IP */
                                    0x5a,               /*
FC_CONSTANT_IID */
/* 328 */   NdrFcLong( 0x20400 ),               /* 132096 */
/* 332 */   NdrFcShort( 0x0 ),   /* 0 */
/* 334 */   NdrFcShort( 0x0 ),   /* 0 */
/* 336 */   0xc0,               /* 192 */
                                    0x0,                /* 0 */
/* 338 */   0x0,                /* 0 */
                                    0x0,                /* 0 */
/* 340 */   0x0,                /* 0 */
                                    0x0,                /* 0 */
/* 342 */   0x0,                /* 0 */
```

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

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

                                0x8,                    /* FC_LONG */
/* 468 */   0x8,                /* FC_LONG */
                                0x5b,                   /* FC_END */
/* 470 */
                                0x21,                   /*
FC_BOGUS_ARRAY */
                                0x3,                    /* 3 */
/* 472 */   NdrFcShort( 0x0 ),  /* 0 */
/* 474 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                    /*  */
/* 476 */   NdrFcShort( 0x0 ),  /* 0 */
/* 478 */   NdrFcLong( 0xffffffff ),        /* -1 */
/* 482 */   0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                    /* 0 */
/* 484 */   NdrFcShort( 0xffffff50 ),       /* Offset= -176 (308) */
/* 486 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 488 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x3,                    /* 3 */
/* 490 */   NdrFcShort( 0x8 ),  /* 8 */
/* 492 */   NdrFcShort( 0x0 ),  /* 0 */
/* 494 */   NdrFcShort( 0x6 ),  /* Offset= 6 (500) */
/* 496 */   0x8,                /* FC_LONG */
                                0x36,                   /* FC_POINTER */
/* 498 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 500 */
                                0x11, 0x0, /* FC_RP */
/* 502 */   NdrFcShort( 0xffffffe0 ),       /* Offset= -32 (470) */
/* 504 */
                                0x21,                   /*
FC_BOGUS_ARRAY */
                                0x3,                    /* 3 */
/* 506 */   NdrFcShort( 0x0 ),  /* 0 */
/* 508 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                    /*  */
/* 510 */   NdrFcShort( 0x0 ),  /* 0 */
/* 512 */   NdrFcLong( 0xffffffff ),        /* -1 */
/* 516 */   0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                    /* 0 */
/* 518 */   NdrFcShort( 0xffffff40 ),       /* Offset= -192 (326) */
/* 520 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 522 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x3,                    /* 3 */
/* 524 */   NdrFcShort( 0x8 ),  /* 8 */
/* 526 */   NdrFcShort( 0x0 ),  /* 0 */
/* 528 */   NdrFcShort( 0x6 ),  /* Offset= 6 (534) */
/* 530 */   0x8,                /* FC_LONG */
                                0x36,                   /* FC_POINTER */
/* 532 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
```

```
/* 534 */
                                0x11, 0x0, /* FC_RP */
/* 536 */   NdrFcShort( 0xffffffe0 ),           /* Offset= -32 (504) */
/* 538 */
                                0x1b,                   /* FC_CARRAY */
                                0x3,                    /* 3 */
/* 540 */   NdrFcShort( 0x4 ),  /* 4 */
/* 542 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                    /*  */
/* 544 */   NdrFcShort( 0x0 ),  /* 0 */
/* 546 */
                                0x4b,                   /* FC_PP */
                                0x5c,                   /* FC_PAD */
/* 548 */
                                0x48,                   /*
FC_VARIABLE_REPEAT */
                                0x49,                   /*
FC_FIXED_OFFSET */
/* 550 */   NdrFcShort( 0x4 ),  /* 4 */
/* 552 */   NdrFcShort( 0x0 ),  /* 0 */
/* 554 */   NdrFcShort( 0x1 ),  /* 1 */
/* 556 */   NdrFcShort( 0x0 ),  /* 0 */
/* 558 */   NdrFcShort( 0x0 ),  /* 0 */
/* 560 */   0x12, 0x0, /* FC_UP */
/* 562 */   NdrFcShort( 0x182 ), /* Offset= 386 (948) */
/* 564 */
                                0x5b,                   /* FC_END */

                                0x8,                    /* FC_LONG */
/* 566 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 568 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x3,                    /* 3 */
/* 570 */   NdrFcShort( 0x8 ),  /* 8 */
/* 572 */   NdrFcShort( 0x0 ),  /* 0 */
/* 574 */   NdrFcShort( 0x6 ),  /* Offset= 6 (580) */
/* 576 */   0x8,                /* FC_LONG */
                                0x36,                   /* FC_POINTER */
/* 578 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 580 */
                                0x11, 0x0, /* FC_RP */
/* 582 */   NdrFcShort( 0xffffffd4 ),           /* Offset= -44 (538) */
/* 584 */
                                0x2f,                   /* FC_IP */
                                0x5a,                   /*
FC_CONSTANT_IID */
/* 586 */   NdrFcLong( 0x2f ),  /* 47 */
/* 590 */   NdrFcShort( 0x0 ),  /* 0 */
/* 592 */   NdrFcShort( 0x0 ),  /* 0 */
/* 594 */   0xc0,               /* 192 */
                                0x0,                    /* 0 */
/* 596 */   0x0,                /* 0 */
                                0x0,                    /* 0 */
/* 598 */   0x0,                /* 0 */
                                0x0,                    /* 0 */
/* 600 */   0x0,                /* 0 */
                                0x46,                   /* 70 */
/* 602 */
                                0x1b,                   /* FC_CARRAY */
                                0x0,                    /* 0 */
/* 604 */   NdrFcShort( 0x1 ),  /* 1 */
/* 606 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                    /*  */
/* 608 */   NdrFcShort( 0x4 ),  /* 4 */
/* 610 */   0x1,                /* FC_BYTE */
                                0x5b,                   /* FC_END */
/* 612 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x3,                    /* 3 */
/* 614 */   NdrFcShort( 0x10 ), /* 16 */
/* 616 */   NdrFcShort( 0x0 ),  /* 0 */
/* 618 */   NdrFcShort( 0xa ),  /* Offset= 10 (628) */
/* 620 */   0x8,                /* FC_LONG */
                                0x8,                    /* FC_LONG */
/* 622 */   0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                    /* 0 */
/* 624 */   NdrFcShort( 0xffffffd8 ),           /* Offset= -40 (584) */
/* 626 */   0x36,               /* FC_POINTER */
                                0x5b,                   /* FC_END */
/* 628 */
                                0x12, 0x0, /* FC_UP */
/* 630 */   NdrFcShort( 0xffffffe4 ),           /* Offset= -28 (602) */
/* 632 */
                                0x1b,                   /* FC_CARRAY */
                                0x3,                    /* 3 */
/* 634 */   NdrFcShort( 0x4 ),  /* 4 */
/* 636 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                    /*  */
/* 638 */   NdrFcShort( 0x0 ),  /* 0 */
/* 640 */
                                0x4b,                   /* FC_PP */
                                0x5c,                   /* FC_PAD */
/* 642 */
                                0x48,                   /*
FC_VARIABLE_REPEAT */
                                0x49,                   /*
FC_FIXED_OFFSET */
/* 644 */   NdrFcShort( 0x4 ),  /* 4 */
/* 646 */   NdrFcShort( 0x0 ),  /* 0 */
/* 648 */   NdrFcShort( 0x1 ),  /* 1 */
/* 650 */   NdrFcShort( 0x0 ),  /* 0 */
/* 652 */   NdrFcShort( 0x0 ),  /* 0 */
/* 654 */   0x12, 0x0, /* FC_UP */
/* 656 */   NdrFcShort( 0xffffffd4 ),           /* Offset= -44 (612) */
/* 658 */
                                0x5b,                   /* FC_END */

                                0x8,                    /* FC_LONG */
/* 660 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 662 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x3,                    /* 3 */
/* 664 */   NdrFcShort( 0x8 ),  /* 8 */
/* 666 */   NdrFcShort( 0x0 ),  /* 0 */
/* 668 */   NdrFcShort( 0x6 ),  /* Offset= 6 (674) */
/* 670 */   0x8,                /* FC_LONG */
                                0x36,                   /* FC_POINTER */
/* 672 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 674 */
                                0x11, 0x0, /* FC_RP */
/* 676 */   NdrFcShort( 0xffffffd4 ),           /* Offset= -44 (632) */
/* 678 */
                                0x1d,                   /* FC_SMFARRAY */
                                0x0,                    /* 0 */
/* 680 */   NdrFcShort( 0x8 ),  /* 8 */
/* 682 */   0x2,                /* FC_CHAR */
                                0x5b,                   /* FC_END */
/* 684 */
                                0x15,                   /* FC_STRUCT */
```

```
                                0x3,                    /* 3 */
/* 686 */   NdrFcShort( 0x10 ), /* 16 */
/* 688 */   0x8,                /* FC_LONG */
                                0x6,                    /* FC_SHORT */
/* 690 */   0x6,                /* FC_SHORT */
                                0x4c,                   /*
FC_EMBEDDED_COMPLEX */
/* 692 */   0x0,                /* 0 */
                                NdrFcShort( 0xfffffff1 ),       /* Offset=
-15 (678) */
                                0x5b,                   /* FC_END */
/* 696 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x3,                    /* 3 */
/* 698 */   NdrFcShort( 0x18 ), /* 24 */
/* 700 */   NdrFcShort( 0x0 ),  /* 0 */
/* 702 */   NdrFcShort( 0xa ),  /* Offset= 10 (712) */
/* 704 */   0x8,                /* FC_LONG */
                                0x36,                   /* FC_POINTER */
/* 706 */   0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                    /* 0 */
/* 708 */   NdrFcShort( 0xffffffe8 ),       /* Offset= -24 (684) */
/* 710 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 712 */
                                0x11, 0x0, /* FC_RP */
/* 714 */   NdrFcShort( 0xfffffe0c ),       /* 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( 0xffffffee ),           /* Offset= -18 (836) */
/* 856 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 858 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x3,                    /* 3 */
/* 860 */   NdrFcShort( 0x28 ), /* 40 */
/* 862 */   NdrFcShort( 0xffffffee ),           /* Offset= -18 (844) */
/* 864 */   NdrFcShort( 0x0 ),  /* Offset= 0 (864) */
/* 866 */   0x6,                /* FC_SHORT */
                                0x6,                    /* FC_SHORT */
/* 868 */   0x38,               /* FC_ALIGNM4 */
                                0x8,                    /* FC_LONG */
/* 870 */   0x8,                /* FC_LONG */
                                0x4c,                   /*
FC_EMBEDDED_COMPLEX */
/* 872 */   0x0,                /* 0 */
                                NdrFcShort( 0xfffffdf7 ),           /* Offset=
-521 (352) */
                                0x5b,                   /* FC_END */
/* 876 */
                                0x12, 0x0, /* FC_UP */
/* 878 */   NdrFcShort( 0xfffffef6 ),           /* Offset= -266 (612) */
/* 880 */
                                0x12, 0x8, /* FC_UP [simple_pointer] */
/* 882 */   0x1,                /* FC_BYTE */
                                0x5c,                   /* FC_PAD */
/* 884 */
                                0x12, 0x8, /* FC_UP [simple_pointer] */
/* 886 */   0x6,                /* FC_SHORT */
                                0x5c,                   /* FC_PAD */
/* 888 */
                                0x12, 0x8, /* FC_UP [simple_pointer] */
/* 890 */   0x8,                /* FC_LONG */
                                0x5c,                   /* FC_PAD */
/* 892 */
                                0x12, 0x8, /* FC_UP [simple_pointer] */
/* 894 */   0xa,                /* FC_FLOAT */
                                0x5c,                   /* FC_PAD */
/* 896 */
                                0x12, 0x8, /* FC_UP [simple_pointer] */
/* 898 */   0xc,                /* FC_DOUBLE */
                                0x5c,                   /* FC_PAD */
/* 900 */
                                0x12, 0x0, /* FC_UP */
/* 902 */   NdrFcShort( 0xfffffd90 ),           /* Offset= -624 (278) */
/* 904 */
                                0x12, 0x10,             /* FC_UP
[pointer_deref] */
/* 906 */   NdrFcShort( 0xfffffd92 ),           /* Offset= -622 (284) */
/* 908 */
                                0x12, 0x10,             /* FC_UP
[pointer_deref] */
/* 910 */   NdrFcShort( 0xfffffda6 ),           /* Offset= -602 (308) */
/* 912 */
                                0x12, 0x10,             /* FC_UP
[pointer_deref] */
/* 914 */   NdrFcShort( 0xfffffdb4 ),           /* Offset= -588 (326) */
/* 916 */
                                0x12, 0x10,             /* FC_UP
[pointer_deref] */
/* 918 */   NdrFcShort( 0xfffffdc2 ),           /* Offset= -574 (344) */
/* 920 */
                                0x12, 0x10,             /* FC_UP
[pointer_deref] */
/* 922 */   NdrFcShort( 0x2 ),  /* Offset= 2 (924) */
/* 924 */
                                0x12, 0x0, /* FC_UP */
/* 926 */   NdrFcShort( 0x16 ), /* Offset= 22 (948) */
/* 928 */
                                0x15,                   /* FC_STRUCT */
                                0x7,                    /* 7 */
/* 930 */   NdrFcShort( 0x10 ), /* 16 */
/* 932 */   0x6,                /* FC_SHORT */
                                0x1,                    /* FC_BYTE */
/* 934 */   0x1,                /* FC_BYTE */
                                0x38,                   /* FC_ALIGNM4 */
/* 936 */   0x8,                /* FC_LONG */
                                0x39,                   /* FC_ALIGNM8 */
/* 938 */   0xb,                /* FC_HYPER */
                                0x5b,                   /* FC_END */
/* 940 */
                                0x12, 0x0, /* FC_UP */
/* 942 */   NdrFcShort( 0xfffffff2 ),           /* Offset= -14 (928) */
/* 944 */
                                0x12, 0x8, /* FC_UP [simple_pointer] */
/* 946 */   0x2,                /* FC_CHAR */
                                0x5c,                   /* FC_PAD */
/* 948 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x7,                    /* 7 */
/* 950 */   NdrFcShort( 0x20 ), /* 32 */
/* 952 */   NdrFcShort( 0x0 ),  /* 0 */
/* 954 */   NdrFcShort( 0x0 ),  /* Offset= 0 (954) */
/* 956 */   0x8,                /* FC_LONG */
                                0x8,                    /* FC_LONG */
/* 958 */   0x6,                /* FC_SHORT */
                                0x6,                    /* FC_SHORT */
/* 960 */   0x6,                /* FC_SHORT */
                                0x6,                    /* FC_SHORT */
/* 962 */   0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                    /* 0 */
/* 964 */   NdrFcShort( 0xfffffc42 ),           /* Offset= -958 (6) */
/* 966 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 968 */   0xb4,               /* FC_USER_MARSHAL */
                                0x83,                   /* 131 */
/* 970 */   NdrFcShort( 0x0 ),  /* 0 */
/* 972 */   NdrFcShort( 0x10 ), /* 16 */
```

```
/* 974 */   NdrFcShort( 0x0 ),     /* 0 */
/* 976 */   NdrFcShort( 0xfffffc32 ),          /* Offset= -974 (2) */
/* 978 */
                                   0x11, 0x4, /* FC_RP [alloced_on_stack] */
/* 980 */   NdrFcShort( 0x6 ),     /* Offset= 6 (986) */
/* 982 */
                                   0x13, 0x0, /* FC_OP */
/* 984 */   NdrFcShort( 0xfffffffdc ),         /* 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 Sat Apr 08 16:40:10 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win64 (32b run,appending), ms_ext, c_ext,
robust
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if defined(_M_IA64) || defined(_M_AXP64)
#define USE_STUBLESS_PROXY


/* verify that the <rpcproxy.h> version is high enough to compile this file*/
#ifndef __REDQ_RPCPROXY_H_VERSION__
#define __REQUIRED_RPCPROXY_H_VERSION__ 475
#endif


#include "rpcproxy.h"
#ifndef __RPCPROXY_H_VERSION__
#error this stub requires an updated version of <rpcproxy.h>
#endif // __RPCPROXY_H_VERSION__


#include "tpcc_com_ps.h"

#define TYPE_FORMAT_STRING_SIZE   979
#define PROC_FORMAT_STRING_SIZE   253
#define TRANSMIT_AS_TABLE_SIZE    0
#define WIRE_MARSHAL_TABLE_SIZE   1

typedef struct _MIDL_TYPE_FORMAT_STRING
    {
    short          Pad;
    unsigned char  Format[ TYPE_FORMAT_STRING_SIZE ];
    } MIDL_TYPE_FORMAT_STRING;

typedef struct _MIDL_PROC_FORMAT_STRING
    {
    short          Pad;
    unsigned char  Format[ PROC_FORMAT_STRING_SIZE ];
    } MIDL_PROC_FORMAT_STRING;


extern const MIDL_TYPE_FORMAT_STRING __MIDL_TypeFormatString;
extern const MIDL_PROC_FORMAT_STRING __MIDL_ProcFormatString;


/* Standard interface: __MIDL_itf_tpcc_com_ps_0000, ver. 0.0,

GUID={0x00000000,0x0000,0x0000,{0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0
x00}} */
```

```
/* Object interface: IUnknown, ver. 0.0,

GUID={0x00000000,0x0000,0x0000,{0xC0,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x46}} */


/* Object interface: ITPCC, ver. 0.0,

GUID={0xFEEE6AA2,0x84B1,0x11d2,{0xBA,0x47,0x00,0xC0,0x4F,0xBF,0x
E0,0x8B}} */


extern const MIDL_STUB_DESC Object_StubDesc;


extern const MIDL_SERVER_INFO ITPCC_ServerInfo;

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

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

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

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

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

extern const USER_MARSHAL_ROUTINE_QUADRUPLE
UserMarshalRoutines[ WIRE_MARSHAL_TABLE_SIZE ];

static const MIDL_STUB_DESC Object_StubDesc =
    {
    0,
    NdrOleAllocate,
    NdrOleFree,
    0,
    0,
    0,
    0,
    0,
    __MIDL_TypeFormatString.Format,
    1, /* -error bounds_check flag */
    0x50002, /* Ndr library version */
    0,
    0x5030118, /* MIDL Version 5.3.280 */
    0,
    UserMarshalRoutines,
    0,  /* notify & notify_flag routine table */
    0x1, /* MIDL flag */
    0,  /* Reserved3 */
    0,  /* Reserved4 */
    0   /* Reserved5 */
    };

#pragma data_seg(".rdata")

static const USER_MARSHAL_ROUTINE_QUADRUPLE
UserMarshalRoutines[ WIRE_MARSHAL_TABLE_SIZE ] =
        {

            {
            VARIANT_UserSize
            ,VARIANT_UserMarshal
            ,VARIANT_UserUnmarshal
            ,VARIANT_UserFree
            }

        };


#if !defined(__RPC_WIN64__)
#error  Invalid build platform for this stub.
#endif

static const MIDL_PROC_FORMAT_STRING __MIDL_ProcFormatString =
    {
        0,
        {

                /* Procedure NewOrder */

                                        0x33,               /*
FC_AUTO_HANDLE */
                                        0x6c,               /* Old Flags:  object,
Oi2 */
/*  2 */    NdrFcLong( 0x0 ),   /* 0 */
/*  6 */    NdrFcShort( 0x3 ),  /* 3 */
#ifndef _ALPHA_
/*  8 */    NdrFcShort( 0x38 ),   /* ia64 Stack size/offset = 56 */
```

```
#else
                                NdrFcShort( 0x30 ),   /* axp64 Stack
size/offset = 48 */
#endif
/* 10 */    NdrFcShort( 0x0 ),    /* 0 */
/* 12 */    NdrFcShort( 0x8 ),    /* 8 */
/* 14 */    0x47,                 /* Oi2 Flags:  srv must size, clt must size, has
return, has ext, */
                                0x3,                  /* 3 */
/* 16 */    0xa,                  /* 10 */
                                0x7,                  /* Ext Flags:  new corr
desc, clt corr check, srv corr check, */
/* 18 */    NdrFcShort( 0x20 ),   /* 32 */
/* 20 */    NdrFcShort( 0x20 ),   /* 32 */
/* 22 */    NdrFcShort( 0x0 ),    /* 0 */
/* 24 */    NdrFcShort( 0x0 ),    /* 0 */

            /* Parameter txn_in */

/* 26 */    NdrFcShort( 0x8b ),   /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
/* 28 */    NdrFcShort( 0x10 ),   /* ia64 Stack size/offset = 16 */
#else
                                NdrFcShort( 0x8 ),    /* axp64 Stack
size/offset = 8 */
#endif
/* 30 */    NdrFcShort( 0x3b6 ), /* Type Offset=950 */

            /* Parameter txn_out */

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

            /* Return value */

/* 38 */    NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 40 */    NdrFcShort( 0x30 ),   /* ia64 Stack size/offset = 48 */
#else
                                NdrFcShort( 0x28 ),   /* axp64 Stack
size/offset = 40 */
#endif
/* 42 */    0x8,                  /* FC_LONG */
                                0x0,                  /* 0 */

            /* Procedure Payment */

/* 44 */    0x33,                 /* FC_AUTO_HANDLE */
                                0x6c,                 /* Old Flags:  object,
Oi2 */
/* 46 */    NdrFcLong( 0x0 ),     /* 0 */
/* 50 */    NdrFcShort( 0x4 ),    /* 4 */
#ifndef _ALPHA_
/* 52 */    NdrFcShort( 0x38 ),   /* ia64 Stack size/offset = 56 */
#else
                                NdrFcShort( 0x30 ),   /* axp64 Stack
size/offset = 48 */
#endif
/* 54 */    NdrFcShort( 0x0 ),    /* 0 */
/* 56 */    NdrFcShort( 0x8 ),    /* 8 */
/* 58 */    0x47,                 /* Oi2 Flags:  srv must size, clt must size, has
return, has ext, */
                                0x3,                  /* 3 */
/* 60 */    0xa,                  /* 10 */
                                0x7,                  /* Ext Flags:  new corr
desc, clt corr check, srv corr check, */
/* 62 */    NdrFcShort( 0x20 ),   /* 32 */
/* 64 */    NdrFcShort( 0x20 ),   /* 32 */
/* 66 */    NdrFcShort( 0x0 ),    /* 0 */
/* 68 */    NdrFcShort( 0x0 ),    /* 0 */

            /* Parameter txn_in */

/* 70 */    NdrFcShort( 0x8b ),   /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
/* 72 */    NdrFcShort( 0x10 ),   /* ia64 Stack size/offset = 16 */
#else
                                NdrFcShort( 0x8 ),    /* axp64 Stack
size/offset = 8 */
#endif
/* 74 */    NdrFcShort( 0x3b6 ), /* Type Offset=950 */

            /* Parameter txn_out */

/* 76 */    NdrFcShort( 0x6113 ),             /* Flags:  must size, must free, out,
simple ref, srv alloc size=24 */
#ifndef _ALPHA_
/* 78 */    NdrFcShort( 0x28 ),   /* ia64 Stack size/offset = 40 */
#else
                                NdrFcShort( 0x20 ),   /* axp64 Stack
size/offset = 32 */
#endif
/* 80 */    NdrFcShort( 0x3c8 ), /* Type Offset=968 */

            /* Return value */

/* 82 */    NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 84 */    NdrFcShort( 0x30 ),   /* ia64 Stack size/offset = 48 */
#else
                                NdrFcShort( 0x28 ),   /* axp64 Stack
size/offset = 40 */
#endif
/* 86 */    0x8,                  /* FC_LONG */
                                0x0,                  /* 0 */

            /* Procedure Delivery */

/* 88 */    0x33,                 /* FC_AUTO_HANDLE */
                                0x6c,                 /* Old Flags:  object,
Oi2 */
/* 90 */    NdrFcLong( 0x0 ),     /* 0 */
/* 94 */    NdrFcShort( 0x5 ),    /* 5 */
#ifndef _ALPHA_
/* 96 */    NdrFcShort( 0x38 ),   /* ia64 Stack size/offset = 56 */
#else
                                NdrFcShort( 0x30 ),   /* axp64 Stack
size/offset = 48 */
#endif
/* 98 */    NdrFcShort( 0x0 ),    /* 0 */
/* 100 */   NdrFcShort( 0x8 ),    /* 8 */
/* 102 */   0x47,                 /* Oi2 Flags:  srv must size, clt must size, has
return, has ext, */
                                0x3,                  /* 3 */
/* 104 */   0xa,                  /* 10 */
                                0x7,                  /* Ext Flags:  new corr
desc, clt corr check, srv corr check, */
/* 106 */   NdrFcShort( 0x20 ),   /* 32 */
```

```
/* 108 */   NdrFcShort( 0x20 ),   /* 32 */
/* 110 */   NdrFcShort( 0x0 ),    /* 0 */
/* 112 */   NdrFcShort( 0x0 ),    /* 0 */

            /* Parameter txn_in */

/* 114 */   NdrFcShort( 0x8b ),   /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
/* 116 */   NdrFcShort( 0x10 ),   /* ia64 Stack size/offset = 16 */
#else
                                  NdrFcShort( 0x8 ),    /* axp64 Stack
size/offset = 8 */
#endif
/* 118 */   NdrFcShort( 0x3b6 ), /* Type Offset=950 */

            /* Parameter txn_out */

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

            /* Return value */

/* 126 */   NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 128 */   NdrFcShort( 0x30 ),   /* ia64 Stack size/offset = 48 */
#else
                                  NdrFcShort( 0x28 ),   /* axp64 Stack
size/offset = 40 */
#endif
/* 130 */   0x8,                  /* FC_LONG */
                                  0x0,                  /* 0 */

            /* Procedure StockLevel */

/* 132 */   0x33,                 /* FC_AUTO_HANDLE */
                                  0x6c,                 /* Old Flags:  object,
Oi2 */
/* 134 */   NdrFcLong( 0x0 ),     /* 0 */
/* 138 */   NdrFcShort( 0x6 ),    /* 6 */
#ifndef _ALPHA_
/* 140 */   NdrFcShort( 0x38 ),   /* ia64 Stack size/offset = 56 */
#else
                                  NdrFcShort( 0x30 ),   /* axp64 Stack
size/offset = 48 */
#endif
/* 142 */   NdrFcShort( 0x0 ),    /* 0 */
/* 144 */   NdrFcShort( 0x8 ),    /* 8 */
/* 146 */   0x47,                 /* Oi2 Flags:  srv must size, clt must size, has
return, has ext, */
                                  0x3,                  /* 3 */
/* 148 */   0xa,                  /* 10 */
                                  0x7,                  /* Ext Flags:  new corr
desc, clt corr check, srv corr check, */
/* 150 */   NdrFcShort( 0x20 ),   /* 32 */
/* 152 */   NdrFcShort( 0x20 ),   /* 32 */
/* 154 */   NdrFcShort( 0x0 ),    /* 0 */
/* 156 */   NdrFcShort( 0x0 ),    /* 0 */

            /* Parameter txn_in */

/* 158 */   NdrFcShort( 0x8b ),   /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
/* 160 */   NdrFcShort( 0x10 ),   /* ia64 Stack size/offset = 16 */
#else
                                  NdrFcShort( 0x8 ),    /* axp64 Stack
size/offset = 8 */
#endif
/* 162 */   NdrFcShort( 0x3b6 ), /* Type Offset=950 */

            /* Parameter txn_out */

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

            /* Return value */

/* 170 */   NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 172 */   NdrFcShort( 0x30 ),   /* ia64 Stack size/offset = 48 */
#else
                                  NdrFcShort( 0x28 ),   /* axp64 Stack
size/offset = 40 */
#endif
/* 174 */   0x8,                  /* FC_LONG */
                                  0x0,                  /* 0 */

            /* Procedure OrderStatus */

/* 176 */   0x33,                 /* FC_AUTO_HANDLE */
                                  0x6c,                 /* Old Flags:  object,
Oi2 */
/* 178 */   NdrFcLong( 0x0 ),     /* 0 */
/* 182 */   NdrFcShort( 0x7 ),    /* 7 */
#ifndef _ALPHA_
/* 184 */   NdrFcShort( 0x38 ),   /* ia64 Stack size/offset = 56 */
#else
                                  NdrFcShort( 0x30 ),   /* axp64 Stack
size/offset = 48 */
#endif
/* 186 */   NdrFcShort( 0x0 ),    /* 0 */
/* 188 */   NdrFcShort( 0x8 ),    /* 8 */
/* 190 */   0x47,                 /* Oi2 Flags:  srv must size, clt must size, has
return, has ext, */
                                  0x3,                  /* 3 */
/* 192 */   0xa,                  /* 10 */
                                  0x7,                  /* Ext Flags:  new corr
desc, clt corr check, srv corr check, */
/* 194 */   NdrFcShort( 0x20 ),   /* 32 */
/* 196 */   NdrFcShort( 0x20 ),   /* 32 */
/* 198 */   NdrFcShort( 0x0 ),    /* 0 */
/* 200 */   NdrFcShort( 0x0 ),    /* 0 */

            /* Parameter txn_in */

/* 202 */   NdrFcShort( 0x8b ),   /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
/* 204 */   NdrFcShort( 0x10 ),   /* ia64 Stack size/offset = 16 */
#else
                                  NdrFcShort( 0x8 ),    /* axp64 Stack
size/offset = 8 */
#endif
/* 206 */   NdrFcShort( 0x3b6 ), /* Type Offset=950 */
```

```
            /* Parameter txn_out */

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

            /* Return value */

/* 214 */   NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 216 */   NdrFcShort( 0x30 ),   /* ia64 Stack size/offset = 48 */
#else
                                  NdrFcShort( 0x28 ),   /* axp64 Stack
size/offset = 40 */
#endif
/* 218 */   0x8,                  /* FC_LONG */
                                  0x0,                  /* 0 */

            /* Procedure CallSetComplete */

/* 220 */   0x33,                 /* FC_AUTO_HANDLE */
                                  0x6c,                 /* Old Flags:  object,
Oi2 */
/* 222 */   NdrFcLong( 0x0 ),     /* 0 */
/* 226 */   NdrFcShort( 0x8 ),    /* 8 */
/* 228 */   NdrFcShort( 0x10 ),   /* ia64, axp64 Stack size/offset = 16 */
/* 230 */   NdrFcShort( 0x0 ),    /* 0 */
/* 232 */   NdrFcShort( 0x8 ),    /* 8 */
/* 234 */   0x44,                 /* Oi2 Flags:  has return, has ext, */
                                  0x1,                  /* 1 */
/* 236 */   0xa,                  /* 10 */
                                  0x1,                  /* Ext Flags:  new corr
desc, */
/* 238 */   NdrFcShort( 0x0 ),    /* 0 */
/* 240 */   NdrFcShort( 0x0 ),    /* 0 */
/* 242 */   NdrFcShort( 0x0 ),    /* 0 */
/* 244 */   NdrFcShort( 0x0 ),    /* 0 */

            /* Return value */

/* 246 */   NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
/* 248 */   NdrFcShort( 0x8 ),    /* ia64, axp64 Stack size/offset = 8 */
/* 250 */   0x8,                  /* FC_LONG */
                                  0x0,                  /* 0 */

                                  0x0
        }
    };

static const MIDL_TYPE_FORMAT_STRING __MIDL_TypeFormatString =
    {
        0,
        {
                                  NdrFcShort( 0x0 ),    /* 0 */
/*  2 */
                                  0x12, 0x0, /* FC_UP */
/*  4 */    NdrFcShort( 0x39e ), /* Offset= 926 (930) */
/*  6 */
                                  0x2b,                 /*
FC_NON_ENCAPSULATED_UNION */
                                  0x9,                  /* FC_ULONG */
/*  8 */    0x7,                  /* Corr desc: FC_USHORT */
                                  0x0,                  /*  */
/* 10 */    NdrFcShort( 0xfff8 ), /* -8 */
/* 12 */    NdrFcShort( 0x1 ),    /* Corr flags:  early, */
/* 14 */    NdrFcShort( 0x2 ),    /* Offset= 2 (16) */
/* 16 */    NdrFcShort( 0x10 ),   /* 16 */
/* 18 */    NdrFcShort( 0x2b ),   /* 43 */
/* 20 */    NdrFcLong( 0x3 ),     /* 3 */
/* 24 */    NdrFcShort( 0x8008 ),           /* Simple arm type: FC_LONG */
/* 26 */    NdrFcLong( 0x11 ),    /* 17 */
/* 30 */    NdrFcShort( 0x8001 ),           /* Simple arm type: FC_BYTE */
/* 32 */    NdrFcLong( 0x2 ),     /* 2 */
/* 36 */    NdrFcShort( 0x8006 ),           /* Simple arm type: FC_SHORT */
/* 38 */    NdrFcLong( 0x4 ),     /* 4 */
/* 42 */    NdrFcShort( 0x800a ),           /* Simple arm type: FC_FLOAT */
/* 44 */    NdrFcLong( 0x5 ),     /* 5 */
/* 48 */    NdrFcShort( 0x800c ),           /* Simple arm type: FC_DOUBLE
*/
/* 50 */    NdrFcLong( 0xb ),     /* 11 */
/* 54 */    NdrFcShort( 0x8006 ),           /* Simple arm type: FC_SHORT */
/* 56 */    NdrFcLong( 0xa ),     /* 10 */
/* 60 */    NdrFcShort( 0x8008 ),           /* Simple arm type: FC_LONG */
/* 62 */    NdrFcLong( 0x6 ),     /* 6 */
/* 66 */    NdrFcShort( 0xd6 ),   /* Offset= 214 (280) */
/* 68 */    NdrFcLong( 0x7 ),     /* 7 */
/* 72 */    NdrFcShort( 0x800c ),           /* Simple arm type: FC_DOUBLE
*/
/* 74 */    NdrFcLong( 0x8 ),     /* 8 */
/* 78 */    NdrFcShort( 0xd0 ),   /* Offset= 208 (286) */
/* 80 */    NdrFcLong( 0xd ),     /* 13 */
/* 84 */    NdrFcShort( 0xe4 ),   /* Offset= 228 (312) */
/* 86 */    NdrFcLong( 0x9 ),     /* 9 */
/* 90 */    NdrFcShort( 0xf0 ),   /* Offset= 240 (330) */
/* 92 */    NdrFcLong( 0x2000 ),            /* 8192 */
/* 96 */    NdrFcShort( 0xfc ),   /* Offset= 252 (348) */
/* 98 */    NdrFcLong( 0x24 ),    /* 36 */
/* 102 */   NdrFcShort( 0x2f4 ),  /* Offset= 756 (858) */
/* 104 */   NdrFcLong( 0x4024 ),            /* 16420 */
/* 108 */   NdrFcShort( 0x2ee ),  /* Offset= 750 (858) */
/* 110 */   NdrFcLong( 0x4011 ),            /* 16401 */
/* 114 */   NdrFcShort( 0x2ec ),  /* Offset= 748 (862) */
/* 116 */   NdrFcLong( 0x4002 ),            /* 16386 */
/* 120 */   NdrFcShort( 0x2ea ),  /* Offset= 746 (866) */
/* 122 */   NdrFcLong( 0x4003 ),            /* 16387 */
/* 126 */   NdrFcShort( 0x2e8 ),  /* Offset= 744 (870) */
/* 128 */   NdrFcLong( 0x4004 ),            /* 16388 */
/* 132 */   NdrFcShort( 0x2e6 ),  /* Offset= 742 (874) */
/* 134 */   NdrFcLong( 0x4005 ),            /* 16389 */
/* 138 */   NdrFcShort( 0x2e4 ),  /* Offset= 740 (878) */
/* 140 */   NdrFcLong( 0x400b ),            /* 16395 */
/* 144 */   NdrFcShort( 0x2d2 ),  /* Offset= 722 (866) */
/* 146 */   NdrFcLong( 0x400a ),            /* 16394 */
/* 150 */   NdrFcShort( 0x2d0 ),  /* Offset= 720 (870) */
/* 152 */   NdrFcLong( 0x4006 ),            /* 16390 */
/* 156 */   NdrFcShort( 0x2d6 ),  /* Offset= 726 (882) */
/* 158 */   NdrFcLong( 0x4007 ),            /* 16391 */
/* 162 */   NdrFcShort( 0x2cc ),  /* Offset= 716 (878) */
/* 164 */   NdrFcLong( 0x4008 ),            /* 16392 */
/* 168 */   NdrFcShort( 0x2ce ),  /* Offset= 718 (886) */
/* 170 */   NdrFcLong( 0x400d ),            /* 16397 */
/* 174 */   NdrFcShort( 0x2cc ),  /* Offset= 716 (890) */
/* 176 */   NdrFcLong( 0x4009 ),            /* 16393 */
/* 180 */   NdrFcShort( 0x2ca ),  /* Offset= 714 (894) */
/* 182 */   NdrFcLong( 0x6000 ),            /* 24576 */
/* 186 */   NdrFcShort( 0x2c8 ),  /* Offset= 712 (898) */
/* 188 */   NdrFcLong( 0x400c ),            /* 16396 */
/* 192 */   NdrFcShort( 0x2c6 ),  /* Offset= 710 (902) */
/* 194 */   NdrFcLong( 0x10 ),    /* 16 */
```

```
/* 198 */   NdrFcShort( 0x8002 ),           /* Simple arm type: FC_CHAR */
/* 200 */   NdrFcLong( 0x12 ),   /* 18 */
/* 204 */   NdrFcShort( 0x8006 ),           /* Simple arm type: FC_SHORT */
/* 206 */   NdrFcLong( 0x13 ),   /* 19 */
/* 210 */   NdrFcShort( 0x8008 ),           /* Simple arm type: FC_LONG */
/* 212 */   NdrFcLong( 0x16 ),   /* 22 */
/* 216 */   NdrFcShort( 0x8008 ),           /* Simple arm type: FC_LONG */
/* 218 */   NdrFcLong( 0x17 ),   /* 23 */
/* 222 */   NdrFcShort( 0x8008 ),           /* Simple arm type: FC_LONG */
/* 224 */   NdrFcLong( 0xe ),    /* 14 */
/* 228 */   NdrFcShort( 0x2aa ), /* Offset= 682 (910) */
/* 230 */   NdrFcLong( 0x400e ),            /* 16398 */
/* 234 */   NdrFcShort( 0x2b0 ), /* Offset= 688 (922) */
/* 236 */   NdrFcLong( 0x4010 ),            /* 16400 */
/* 240 */   NdrFcShort( 0x2ae ), /* Offset= 686 (926) */
/* 242 */   NdrFcLong( 0x4012 ),            /* 16402 */
/* 246 */   NdrFcShort( 0x26c ), /* Offset= 620 (866) */
/* 248 */   NdrFcLong( 0x4013 ),            /* 16403 */
/* 252 */   NdrFcShort( 0x26a ), /* Offset= 618 (870) */
/* 254 */   NdrFcLong( 0x4016 ),            /* 16406 */
/* 258 */   NdrFcShort( 0x264 ), /* Offset= 612 (870) */
/* 260 */   NdrFcLong( 0x4017 ),            /* 16407 */
/* 264 */   NdrFcShort( 0x25e ), /* Offset= 606 (870) */
/* 266 */   NdrFcLong( 0x0 ),    /* 0 */
/* 270 */   NdrFcShort( 0x0 ),   /* Offset= 0 (270) */
/* 272 */   NdrFcLong( 0x1 ),    /* 1 */
/* 276 */   NdrFcShort( 0x0 ),   /* Offset= 0 (276) */
/* 278 */   NdrFcShort( 0xffffffff ),       /* Offset= -1 (277) */
/* 280 */
                                0x15,               /* FC_STRUCT */
                                0x7,                /* 7 */
/* 282 */   NdrFcShort( 0x8 ),  /* 8 */
/* 284 */   0xb,                /* FC_HYPER */
                                0x5b,               /* FC_END */
/* 286 */
                                0x12, 0x0, /* FC_UP */
/* 288 */   NdrFcShort( 0xe ),  /* Offset= 14 (302) */
/* 290 */
                                0x1b,               /* FC_CARRAY */
                                0x1,                /* 1 */
/* 292 */   NdrFcShort( 0x2 ),  /* 2 */
/* 294 */   0x9,                /* Corr desc: FC_ULONG */
                                0x0,                /*  */
/* 296 */   NdrFcShort( 0xfffc ), /* -4 */
/* 298 */   NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 300 */   0x6,                /* FC_SHORT */
                                0x5b,               /* FC_END */
/* 302 */
                                0x17,               /* FC_CSTRUCT */
                                0x3,                /* 3 */
/* 304 */   NdrFcShort( 0x8 ),  /* 8 */
/* 306 */   NdrFcShort( 0xfffffff0 ),       /* Offset= -16 (290) */
/* 308 */   0x8,                /* FC_LONG */
                                0x8,                /* FC_LONG */
/* 310 */   0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 312 */
                                0x2f,               /* FC_IP */
                                0x5a,               /*
FC_CONSTANT_IID */
/* 314 */   NdrFcLong( 0x0 ),   /* 0 */
/* 318 */   NdrFcShort( 0x0 ),  /* 0 */
/* 320 */   NdrFcShort( 0x0 ),  /* 0 */
/* 322 */   0xc0,               /* 192 */
                                0x0,                /* 0 */
/* 324 */   0x0,                /* 0 */
                                0x0,                /* 0 */
/* 326 */   0x0,                /* 0 */
                                0x0,                /* 0 */
/* 328 */   0x0,                /* 0 */
                                0x46,               /* 70 */
/* 330 */
                                0x2f,               /* FC_IP */
                                0x5a,               /*
FC_CONSTANT_IID */
/* 332 */   NdrFcLong( 0x20400 ),           /* 132096 */
/* 336 */   NdrFcShort( 0x0 ),  /* 0 */
/* 338 */   NdrFcShort( 0x0 ),  /* 0 */
/* 340 */   0xc0,               /* 192 */
                                0x0,                /* 0 */
/* 342 */   0x0,                /* 0 */
                                0x0,                /* 0 */
/* 344 */   0x0,                /* 0 */
                                0x0,                /* 0 */
/* 346 */   0x0,                /* 0 */
                                0x46,               /* 70 */
/* 348 */
                                0x12, 0x10,         /* FC_UP
[pointer_deref] */
/* 350 */   NdrFcShort( 0x2 ),  /* Offset= 2 (352) */
/* 352 */
                                0x12, 0x0, /* FC_UP */
/* 354 */   NdrFcShort( 0x1e6 ), /* Offset= 486 (840) */
/* 356 */
                                0x2a,               /*
FC_ENCAPSULATED_UNION */
                                0x89,               /* 137 */
/* 358 */   NdrFcShort( 0x20 ), /* 32 */
/* 360 */   NdrFcShort( 0xa ),  /* 10 */
/* 362 */   NdrFcLong( 0x8 ),   /* 8 */
/* 366 */   NdrFcShort( 0x50 ), /* Offset= 80 (446) */
/* 368 */   NdrFcLong( 0xd ),   /* 13 */
/* 372 */   NdrFcShort( 0x70 ), /* Offset= 112 (484) */
/* 374 */   NdrFcLong( 0x9 ),   /* 9 */
/* 378 */   NdrFcShort( 0x90 ), /* Offset= 144 (522) */
/* 380 */   NdrFcLong( 0xc ),   /* 12 */
/* 384 */   NdrFcShort( 0xb0 ), /* Offset= 176 (560) */
/* 386 */   NdrFcLong( 0x24 ),  /* 36 */
/* 390 */   NdrFcShort( 0x104 ), /* Offset= 260 (650) */
/* 392 */   NdrFcLong( 0x800d ),            /* 32781 */
/* 396 */   NdrFcShort( 0x120 ), /* Offset= 288 (684) */
/* 398 */   NdrFcLong( 0x10 ),  /* 16 */
/* 402 */   NdrFcShort( 0x13a ), /* Offset= 314 (716) */
/* 404 */   NdrFcLong( 0x2 ),   /* 2 */
/* 408 */   NdrFcShort( 0x150 ), /* Offset= 336 (744) */
/* 410 */   NdrFcLong( 0x3 ),   /* 3 */
/* 414 */   NdrFcShort( 0x166 ), /* Offset= 358 (772) */
/* 416 */   NdrFcLong( 0x14 ),  /* 20 */
/* 420 */   NdrFcShort( 0x17c ), /* Offset= 380 (800) */
/* 422 */   NdrFcShort( 0xffffffff ),       /* Offset= -1 (421) */
/* 424 */
                                0x21,               /*
FC_BOGUS_ARRAY */
                                0x3,                /* 3 */
/* 426 */   NdrFcShort( 0x0 ),  /* 0 */
/* 428 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 430 */   NdrFcShort( 0x0 ),  /* 0 */
/* 432 */   NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 434 */   NdrFcLong( 0xffffffff ),        /* -1 */
/* 438 */   NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 440 */
                                0x12, 0x0, /* FC_UP */
/* 442 */   NdrFcShort( 0xffffff74 ),       /* Offset= -140 (302) */
/* 444 */   0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
```

```
/* 446 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x3,                    /* 3 */
/* 448 */   NdrFcShort( 0x10 ), /* 16 */
/* 450 */   NdrFcShort( 0x0 ),  /* 0 */
/* 452 */   NdrFcShort( 0x6 ),  /* Offset= 6 (458) */
/* 454 */   0x8,                /* FC_LONG */
                                0x39,                   /* FC_ALIGNM8 */
/* 456 */   0x36,               /* FC_POINTER */
                                0x5b,                   /* FC_END */
/* 458 */
                                0x11, 0x0, /* FC_RP */
/* 460 */   NdrFcShort( 0xffffffdc ),           /* Offset= -36 (424) */
/* 462 */
                                0x21,                   /*
FC_BOGUS_ARRAY */
                                0x3,                    /* 3 */
/* 464 */   NdrFcShort( 0x0 ),  /* 0 */
/* 466 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                    /*  */
/* 468 */   NdrFcShort( 0x0 ),  /* 0 */
/* 470 */   NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 472 */   NdrFcLong( 0xffffffff ),            /* -1 */
/* 476 */   NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 478 */   0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                    /* 0 */
/* 480 */   NdrFcShort( 0xffffff58 ),           /* Offset= -168 (312) */
/* 482 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 484 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x3,                    /* 3 */
/* 486 */   NdrFcShort( 0x10 ), /* 16 */
/* 488 */   NdrFcShort( 0x0 ),  /* 0 */
/* 490 */   NdrFcShort( 0x6 ),  /* Offset= 6 (496) */
/* 492 */   0x8,                /* FC_LONG */
                                0x39,                   /* FC_ALIGNM8 */
/* 494 */   0x36,               /* FC_POINTER */
                                0x5b,                   /* FC_END */
/* 496 */
                                0x11, 0x0, /* FC_RP */
/* 498 */   NdrFcShort( 0xffffffdc ),           /* Offset= -36 (462) */
/* 500 */
                                0x21,                   /*
FC_BOGUS_ARRAY */
                                0x3,                    /* 3 */
/* 502 */   NdrFcShort( 0x0 ),  /* 0 */
/* 504 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                    /*  */
/* 506 */   NdrFcShort( 0x0 ),  /* 0 */
/* 508 */   NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 510 */   NdrFcLong( 0xffffffff ),            /* -1 */
/* 514 */   NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 516 */   0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                    /* 0 */
/* 518 */   NdrFcShort( 0xffffff44 ),           /* Offset= -188 (330) */
/* 520 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 522 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x3,                    /* 3 */
/* 524 */   NdrFcShort( 0x10 ), /* 16 */
/* 526 */   NdrFcShort( 0x0 ),  /* 0 */
/* 528 */   NdrFcShort( 0x6 ),  /* Offset= 6 (534) */
/* 530 */   0x8,                /* FC_LONG */
                                0x39,                   /* FC_ALIGNM8 */
/* 532 */   0x36,               /* FC_POINTER */
                                0x5b,                   /* FC_END */
/* 534 */
                                0x11, 0x0, /* FC_RP */
/* 536 */   NdrFcShort( 0xffffffdc ),           /* Offset= -36 (500) */
/* 538 */
                                0x21,                   /*
FC_BOGUS_ARRAY */
                                0x3,                    /* 3 */
/* 540 */   NdrFcShort( 0x0 ),  /* 0 */
/* 542 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                    /*  */
/* 544 */   NdrFcShort( 0x0 ),  /* 0 */
/* 546 */   NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 548 */   NdrFcLong( 0xffffffff ),            /* -1 */
/* 552 */   NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 554 */
                                0x12, 0x0, /* FC_UP */
/* 556 */   NdrFcShort( 0x176 ), /* Offset= 374 (930) */
/* 558 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 560 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x3,                    /* 3 */
/* 562 */   NdrFcShort( 0x10 ), /* 16 */
/* 564 */   NdrFcShort( 0x0 ),  /* 0 */
/* 566 */   NdrFcShort( 0x6 ),  /* Offset= 6 (572) */
/* 568 */   0x8,                /* FC_LONG */
                                0x39,                   /* FC_ALIGNM8 */
/* 570 */   0x36,               /* FC_POINTER */
                                0x5b,                   /* FC_END */
/* 572 */
                                0x11, 0x0, /* FC_RP */
/* 574 */   NdrFcShort( 0xffffffdc ),           /* Offset= -36 (538) */
/* 576 */
                                0x2f,                   /* FC_IP */
                                0x5a,                   /*
FC_CONSTANT_IID */
/* 578 */   NdrFcLong( 0x2f ),  /* 47 */
/* 582 */   NdrFcShort( 0x0 ),  /* 0 */
/* 584 */   NdrFcShort( 0x0 ),  /* 0 */
/* 586 */   0xc0,               /* 192 */
                                0x0,                    /* 0 */
/* 588 */   0x0,                /* 0 */
                                0x0,                    /* 0 */
/* 590 */   0x0,                /* 0 */
                                0x0,                    /* 0 */
/* 592 */   0x0,                /* 0 */
                                0x46,                   /* 70 */
/* 594 */
                                0x1b,                   /* FC_CARRAY */
                                0x0,                    /* 0 */
/* 596 */   NdrFcShort( 0x1 ),  /* 1 */
/* 598 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                    /*  */
/* 600 */   NdrFcShort( 0x4 ),  /* 4 */
/* 602 */   NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 604 */   0x1,                /* FC_BYTE */
                                0x5b,                   /* FC_END */
/* 606 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x3,                    /* 3 */
/* 608 */   NdrFcShort( 0x18 ), /* 24 */
/* 610 */   NdrFcShort( 0x0 ),  /* 0 */
/* 612 */   NdrFcShort( 0xc ),  /* Offset= 12 (624) */
```

```
/* 614 */   0x8,                /* FC_LONG */
                                0x8,                /* FC_LONG */
/* 616 */   0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                /* 0 */
/* 618 */   NdrFcShort( 0xffffffd6 ),           /* Offset= -42 (576) */
/* 620 */   0x39,               /* FC_ALIGNM8 */
                                0x36,               /* FC_POINTER */
/* 622 */   0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 624 */
                                0x12, 0x0, /* FC_UP */
/* 626 */   NdrFcShort( 0xffffffe0 ),           /* Offset= -32 (594) */
/* 628 */
                                0x21,               /*
FC_BOGUS_ARRAY */
                                0x3,                /* 3 */
/* 630 */   NdrFcShort( 0x0 ),  /* 0 */
/* 632 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 634 */   NdrFcShort( 0x0 ),  /* 0 */
/* 636 */   NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 638 */   NdrFcLong( 0xffffffff ),            /* -1 */
/* 642 */   NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 644 */
                                0x12, 0x0, /* FC_UP */
/* 646 */   NdrFcShort( 0xffffffd8 ),           /* Offset= -40 (606) */
/* 648 */   0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 650 */
                                0x1a,               /*
FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 652 */   NdrFcShort( 0x10 ), /* 16 */
/* 654 */   NdrFcShort( 0x0 ),  /* 0 */
/* 656 */   NdrFcShort( 0x6 ),  /* Offset= 6 (662) */
/* 658 */   0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 660 */   0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 662 */
                                0x11, 0x0, /* FC_RP */
/* 664 */   NdrFcShort( 0xffffffdc ),           /* Offset= -36 (628) */
/* 666 */
                                0x1d,               /* FC_SMFARRAY */
                                0x0,                /* 0 */
/* 668 */   NdrFcShort( 0x8 ),  /* 8 */
/* 670 */   0x2,                /* FC_CHAR */
                                0x5b,               /* FC_END */
/* 672 */
                                0x15,               /* FC_STRUCT */
                                0x3,                /* 3 */
/* 674 */   NdrFcShort( 0x10 ), /* 16 */
/* 676 */   0x8,                /* FC_LONG */
                                0x6,                /* FC_SHORT */
/* 678 */   0x6,                /* FC_SHORT */
                                0x4c,               /*
FC_EMBEDDED_COMPLEX */
/* 680 */   0x0,                /* 0 */
                                NdrFcShort( 0xfffffff1 ),           /* Offset=
-15 (666) */
                                0x5b,               /* FC_END */
/* 684 */
                                0x1a,               /*
FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 686 */   NdrFcShort( 0x20 ), /* 32 */
/* 688 */   NdrFcShort( 0x0 ),  /* 0 */
/* 690 */   NdrFcShort( 0xa ),  /* Offset= 10 (700) */
/* 692 */   0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 694 */   0x36,               /* FC_POINTER */
                                0x4c,               /*
FC_EMBEDDED_COMPLEX */
/* 696 */   0x0,                /* 0 */
                                NdrFcShort( 0xffffffe7 ),           /* Offset=
-25 (672) */
                                0x5b,               /* FC_END */
/* 700 */
                                0x11, 0x0, /* FC_RP */
/* 702 */   NdrFcShort( 0xffffff10 ),           /* Offset= -240 (462) */
/* 704 */
                                0x1b,               /* FC_CARRAY */
                                0x0,                /* 0 */
/* 706 */   NdrFcShort( 0x1 ),  /* 1 */
/* 708 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 710 */   NdrFcShort( 0x0 ),  /* 0 */
/* 712 */   NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 714 */   0x1,                /* FC_BYTE */
                                0x5b,               /* FC_END */
/* 716 */
                                0x1a,               /*
FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 718 */   NdrFcShort( 0x10 ), /* 16 */
/* 720 */   NdrFcShort( 0x0 ),  /* 0 */
/* 722 */   NdrFcShort( 0x6 ),  /* Offset= 6 (728) */
/* 724 */   0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 726 */   0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 728 */
                                0x12, 0x0, /* FC_UP */
/* 730 */   NdrFcShort( 0xffffffe6 ),           /* Offset= -26 (704) */
/* 732 */
                                0x1b,               /* FC_CARRAY */
                                0x1,                /* 1 */
/* 734 */   NdrFcShort( 0x2 ),  /* 2 */
/* 736 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 738 */   NdrFcShort( 0x0 ),  /* 0 */
/* 740 */   NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 742 */   0x6,                /* FC_SHORT */
                                0x5b,               /* FC_END */
/* 744 */
                                0x1a,               /*
FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 746 */   NdrFcShort( 0x10 ), /* 16 */
/* 748 */   NdrFcShort( 0x0 ),  /* 0 */
/* 750 */   NdrFcShort( 0x6 ),  /* Offset= 6 (756) */
/* 752 */   0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 754 */   0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 756 */
                                0x12, 0x0, /* FC_UP */
/* 758 */   NdrFcShort( 0xffffffe6 ),           /* Offset= -26 (732) */
/* 760 */
                                0x1b,               /* FC_CARRAY */
                                0x3,                /* 3 */
/* 762 */   NdrFcShort( 0x4 ),  /* 4 */
/* 764 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 766 */   NdrFcShort( 0x0 ),  /* 0 */
/* 768 */   NdrFcShort( 0x1 ),  /* Corr flags:  early, */
```

```
/* 770 */   0x8,                /* FC_LONG */
                                0x5b,               /* FC_END */
/* 772 */
                                0x1a,               /*
FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 774 */   NdrFcShort( 0x10 ), /* 16 */
/* 776 */   NdrFcShort( 0x0 ),  /* 0 */
/* 778 */   NdrFcShort( 0x6 ),  /* Offset= 6 (784) */
/* 780 */   0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 782 */   0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 784 */
                                0x12, 0x0, /* FC_UP */
/* 786 */   NdrFcShort( 0xfffffffe6 ),          /* Offset= -26 (760) */
/* 788 */
                                0x1b,               /* FC_CARRAY */
                                0x7,                /* 7 */
/* 790 */   NdrFcShort( 0x8 ),  /* 8 */
/* 792 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 794 */   NdrFcShort( 0x0 ),  /* 0 */
/* 796 */   NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 798 */   0xb,                /* FC_HYPER */
                                0x5b,               /* FC_END */
/* 800 */
                                0x1a,               /*
FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 802 */   NdrFcShort( 0x10 ), /* 16 */
/* 804 */   NdrFcShort( 0x0 ),  /* 0 */
/* 806 */   NdrFcShort( 0x6 ),  /* Offset= 6 (812) */
/* 808 */   0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 810 */   0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 812 */
                                0x12, 0x0, /* FC_UP */
/* 814 */   NdrFcShort( 0xfffffffe6 ),          /* Offset= -26 (788) */
/* 816 */
                                0x15,               /* FC_STRUCT */
                                0x3,                /* 3 */
/* 818 */   NdrFcShort( 0x8 ),  /* 8 */
/* 820 */   0x8,                /* FC_LONG */
                                0x8,                /* FC_LONG */
/* 822 */   0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 824 */
                                0x1b,               /* FC_CARRAY */
                                0x3,                /* 3 */
/* 826 */   NdrFcShort( 0x8 ),  /* 8 */
/* 828 */   0x7,                /* Corr desc: FC_USHORT */
                                0x0,                /*  */
/* 830 */   NdrFcShort( 0xffc8 ), /* -56 */
/* 832 */   NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 834 */   0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                /* 0 */
/* 836 */   NdrFcShort( 0xffffffec ),           /* Offset= -20 (816) */
/* 838 */   0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 840 */
                                0x1a,               /*
FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 842 */   NdrFcShort( 0x38 ), /* 56 */
/* 844 */   NdrFcShort( 0xffffffec ),           /* Offset= -20 (824) */
/* 846 */   NdrFcShort( 0x0 ),  /* Offset= 0 (846) */
/* 848 */   0x6,                /* FC_SHORT */
                                0x6,                /* FC_SHORT */
/* 850 */   0x38,               /* FC_ALIGNM4 */
                                0x8,                /* FC_LONG */
/* 852 */   0x8,                /* FC_LONG */
                                0x4c,               /*
FC_EMBEDDED_COMPLEX */
/* 854 */   0x4,                /* 4 */
                                NdrFcShort( 0xfffffe0d ),           /* Offset=
-499 (356) */
                                0x5b,               /* FC_END */
/* 858 */
                                0x12, 0x0, /* FC_UP */
/* 860 */   NdrFcShort( 0xffffff02 ),           /* Offset= -254 (606) */
/* 862 */
                                0x12, 0x8, /* FC_UP [simple_pointer] */
/* 864 */   0x1,                /* FC_BYTE */
                                0x5c,               /* FC_PAD */
/* 866 */
                                0x12, 0x8, /* FC_UP [simple_pointer] */
/* 868 */   0x6,                /* FC_SHORT */
                                0x5c,               /* FC_PAD */
/* 870 */
                                0x12, 0x8, /* FC_UP [simple_pointer] */
/* 872 */   0x8,                /* FC_LONG */
                                0x5c,               /* FC_PAD */
/* 874 */
                                0x12, 0x8, /* FC_UP [simple_pointer] */
/* 876 */   0xa,                /* FC_FLOAT */
                                0x5c,               /* FC_PAD */
/* 878 */
                                0x12, 0x8, /* FC_UP [simple_pointer] */
/* 880 */   0xc,                /* FC_DOUBLE */
                                0x5c,               /* FC_PAD */
/* 882 */
                                0x12, 0x0, /* FC_UP */
/* 884 */   NdrFcShort( 0xfffffda4 ),           /* Offset= -604 (280) */
/* 886 */
                                0x12, 0x10,         /* FC_UP
[pointer_deref] */
/* 888 */   NdrFcShort( 0xfffffda6 ),           /* Offset= -602 (286) */
/* 890 */
                                0x12, 0x10,         /* FC_UP
[pointer_deref] */
/* 892 */   NdrFcShort( 0xfffffdbc ),           /* Offset= -580 (312) */
/* 894 */
                                0x12, 0x10,         /* FC_UP
[pointer_deref] */
/* 896 */   NdrFcShort( 0xfffffdca ),           /* Offset= -566 (330) */
/* 898 */
                                0x12, 0x10,         /* FC_UP
[pointer_deref] */
/* 900 */   NdrFcShort( 0xfffffdd8 ),           /* Offset= -552 (348) */
/* 902 */
                                0x12, 0x10,         /* FC_UP
[pointer_deref] */
/* 904 */   NdrFcShort( 0x2 ),  /* Offset= 2 (906) */
/* 906 */
                                0x12, 0x0, /* FC_UP */
/* 908 */   NdrFcShort( 0x16 ), /* Offset= 22 (930) */
/* 910 */
                                0x15,               /* FC_STRUCT */
                                0x7,                /* 7 */
/* 912 */   NdrFcShort( 0x10 ), /* 16 */
/* 914 */   0x6,                /* FC_SHORT */
                                0x1,                /* FC_BYTE */
/* 916 */   0x1,                /* FC_BYTE */
                                0x38,               /* FC_ALIGNM4 */
```

```
/* 918 */   0x8,                    /* FC_LONG */
                                    0x39,                   /* FC_ALIGNM8 */
/* 920 */   0xb,                    /* FC_HYPER */
                                    0x5b,                   /* FC_END */
/* 922 */
                                    0x12, 0x0, /* FC_UP */
/* 924 */   NdrFcShort( 0xfffffff2 ),           /* Offset= -14 (910) */
/* 926 */
                                    0x12, 0x8, /* FC_UP [simple_pointer] */
/* 928 */   0x2,                    /* FC_CHAR */
                                    0x5c,                   /* FC_PAD */
/* 930 */
                                    0x1a,                   /*
FC_BOGUS_STRUCT */
                                    0x7,                    /* 7 */
/* 932 */   NdrFcShort( 0x20 ),     /* 32 */
/* 934 */   NdrFcShort( 0x0 ),      /* 0 */
/* 936 */   NdrFcShort( 0x0 ),      /* Offset= 0 (936) */
/* 938 */   0x8,                    /* FC_LONG */
                                    0x8,                    /* FC_LONG */
/* 940 */   0x6,                    /* FC_SHORT */
                                    0x6,                    /* FC_SHORT */
/* 942 */   0x6,                    /* FC_SHORT */
                                    0x6,                    /* FC_SHORT */
/* 944 */   0x4c,                   /* FC_EMBEDDED_COMPLEX */
                                    0x0,                    /* 0 */
/* 946 */   NdrFcShort( 0xfffffc54 ),           /* Offset= -940 (6) */
/* 948 */   0x5c,                   /* FC_PAD */
                                    0x5b,                   /* FC_END */
/* 950 */   0xb4,                   /* FC_USER_MARSHAL */
                                    0x83,                   /* 131 */
/* 952 */   NdrFcShort( 0x0 ),      /* 0 */
/* 954 */   NdrFcShort( 0x18 ),     /* 24 */
/* 956 */   NdrFcShort( 0x0 ),      /* 0 */
/* 958 */   NdrFcShort( 0xfffffc44 ),           /* Offset= -956 (2) */
/* 960 */
                                    0x11, 0x4, /* FC_RP [alloced_on_stack] */
/* 962 */   NdrFcShort( 0x6 ),      /* Offset= 6 (968) */
/* 964 */
                                    0x13, 0x0, /* FC_OP */
/* 966 */   NdrFcShort( 0xffffffdc ),           /* Offset= -36 (930) */
/* 968 */   0xb4,                   /* FC_USER_MARSHAL */
                                    0x83,                   /* 131 */
/* 970 */   NdrFcShort( 0x0 ),      /* 0 */
/* 972 */   NdrFcShort( 0x18 ),     /* 24 */
/* 974 */   NdrFcShort( 0x0 ),      /* 0 */
/* 976 */   NdrFcShort( 0xfffffff4 ),           /* Offset= -12 (964) */

                                    0x0

    }
  };

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

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

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


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

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

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

  return 0;
}

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


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

tpcc_dblib.cpp

```
/*          FILE:                   TPCC_DBLIB.CPP
 *                                          Microsoft TPC-C Kit Ver.
4.20.000
 *                                          Copyright Microsoft, 1999
 *          All Rights Reserved
 *
 *                                          Version 4.10.000 audited by
Richard Gimarc, Performance Metrics, 3/17/99
 *
 *          PURPOSE:            Implements dblib calls for TPC-C txns.
 *          Contact:    Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *                      4.20.000 - updated rev number to match kit
 *                      4.10.001 - not deleting error class in catch handler on
deadlock retry;
 *                                          not a functional bug, but a
memory leak
 *                                          - had to tweak some declarations
to compile with latest SDK; no functional change
 */

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

#define DBNTWIN32
#include <sqlfront.h>
#include <sqldb.h>
```

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

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

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

#define     DEFCLPACKSIZE                   4096

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

const                   iMaxRetries = 10;           // how many
retries on deadlock
static      long        iConnectionCount = 0;  // number of current dblib
connections

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

BOOL APIENTRY DllMain(HMODULE hModule, DWORD
ul_reason_for_call, LPVOID lpReserved)
{
        switch( ul_reason_for_call )
        {
                case DLL_PROCESS_ATTACH:
                        DisableThreadLibraryCalls(hModule);
                        dbinit();           // initialize dblib
                        break;

                case DLL_PROCESS_DETACH:
                        dbexit();           // close all dblib
structures/connections
                        break;

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


int err_handler(DBPROCESS *dbproc, int severity, int dberr, int oserr,
LPCSTR dberrstr, LPCSTR oserrstr)
{
        CTPCC_DBLIB                     *pConn;

        assert(dbproc != NULL);
        pConn = (CTPCC_DBLIB*)dbgetuserdata(dbproc);

        if (pConn != NULL)
        {
                pConn->SetDbLibError( severity, dberr, oserr, dberrstr,
oserrstr );
        }
        return INT_CANCEL;
}

/* FUNCTION: int msg_handler(DBPROCESS *dbproc, DBINT msgno, int
msgstate, int severity, char *msgtext)
 *
 * PURPOSE:         This function handles DB-Library SQL Server error
messages
 *
 * ARGUMENTS:     DBPROCESS                   *dbproc
DBPROCESS id pointer
 *                                          DBINT
msgno                   message number
 *                                          int
msgstate                message state
 *                                          int
severity                message severity
 *                                          char
*msgtext                printable message description
 *
 * RETURNS:                 int
INT_CONTINUE    continue if error is SQLETIME else INT_CANCEL
action
 *
INT_CANCEL                  cancel operation
 *
 * COMMENTS:       This function also sets the dead lock dbproc variable if
necessary.
 *
 */

// typedef INT (SQLAPI *DBMSGHANDLE_PROC)(PDBPROCESS, DBINT,
INT, INT, LPCSTR, LPCSTR, LPCSTR, DBUSMALLINT);

int msg_handler(DBPROCESS *dbproc, DBINT msgno, int msgstate, int
severity,
                                        LPCSTR msgtext, LPCSTR
srvname, LPCSTR procname, DBUSMALLINT line)
{
        CTPCC_DBLIB                     *pConn;

        assert(dbproc != NULL);
        pConn = (CTPCC_DBLIB*)dbgetuserdata(dbproc);

        if (pConn != NULL)
        {
                pConn->SetSqlError( msgno, msgstate, severity, msgtext
);
        }

        return 0;
}

/* FUNCTION: void UtilStrCpy(char * pDest, char * pSrc, int n)
 *
 * PURPOSE:         This function copies n characters from string pSrc to pDst
and places a
 *                  null character at the end of the destination
string.
 *
 * ARGUMENTS:     char                        *pDest      destination
string pointer
 *                                          char
*pSrc       source string pointer
 *                                          int
n                       number of characters to copy
 *
 * RETURNS:                 None
 *
 * COMMENTS:       Unlike strncpy this function ensures that the result string
is
 *                                          always null terminated.
 *
 */
```

```
inline static void UtilStrCpy(char * pDest, const BYTE * pSrc, int n)
{
   strncpy(pDest, (char *)pSrc, n);
   pDest[n] = '\0';

        return;
}

/* FUNCTION: CTPCC_DBLIB_ERR::ErrorText
 *
 */

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

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

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

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

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_DBLIB* CTPCC_DBLIB_new(
        LPCSTR szServer,                // name of SQL server
        LPCSTR szUser,                          // user name for login
        LPCSTR szPassword,              // password for login
        LPCSTR szHost,                          // workstation name;
shows up in sp_who; max 30 chars, only first 10 kept by SQL Server
        LPCSTR szDatabase )             // name of database to use
{
        return new CTPCC_DBLIB( szServer, szUser, szPassword, szHost,
szDatabase );
}


CTPCC_DBLIB::CTPCC_DBLIB (
        LPCSTR szServer,                // name of SQL server
        LPCSTR szUser,                          // user name for login
        LPCSTR szPassword,              // password for login
        LPCSTR szHost,                          // workstation name;
shows up in sp_who; max 30 chars, only first 10 kept by SQL Server
        LPCSTR szDatabase )             // name of database to use
{
        LOGINREC        *login;
        const BYTE      *pData;

        // initialization
        m_dbproc = NULL;
        m_DbLibErr = (CDBLIBERR*)NULL;
        m_SqlErr = (CSQLERR*)NULL;

        m_MaxRetries = 10;              // how many retries on deadlock

        // increase max number of connections if getting close
        if ( dbgetmaxprocs() < (iConnectionCount+5) )
        {
                if ( dbsetmaxprocs(iConnectionCount+10) == FAIL )

ThrowError(CDBLIBERR::eDbSetMaxProcs);
        }

        // allocate a login structure
        login = dblogin();
        if (login == NULL)
                ThrowError(CDBLIBERR::eLogin);
        InterlockedIncrement( &iConnectionCount );

        // register error and message handler functions
        if (dbprocerrhandle(login, err_handler) == NULL)
                ThrowError(CDBLIBERR::eDbProcHandler);

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


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

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

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

        m_dbproc = dbopen(login, szServer);

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

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

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

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

        dbcmd(m_dbproc, "set nocount on ");                     //
do not return row counts
```

```
	dbcmd(m_dbproc, "set XACT_ABORT ON");                    //
rollback transaction on abort

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

	DiscardNextResults(2);

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

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

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

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

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


	DiscardNextRows(0);
	DiscardNextResults(0);
}


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

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

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

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

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

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

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

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

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

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

	throw pDbLibErr;
}

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

	while (TRUE)
```

```
	{
		rc = dbnextrow(m_dbproc);
		if (rc == NO_MORE_ROWS)
			break;
		if (rc == FAIL)
		{
			if (iExpectedCount >= 0)

ThrowError(CDBLIBERR::eDbNextRow);
			else
				break;
		}
		iRowsRead++;
	}

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

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

	while (TRUE)
	{
		rc = dbresults(m_dbproc);
		if (rc == NO_MORE_RESULTS)
			break;
		if (rc == FAIL)
		{
			if (iExpectedCount >= 0)

ThrowError(CDBLIBERR::eDbResults);
			else
				break;
		}

		DiscardNextRows(-1);
		iResultsRead++;
	}

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

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

	ResetError();

	while (TRUE)
	{
		try
		{
			dbrpcinit(m_dbproc, "tpcc_stocklevel", 0);
			dbrpcparam(m_dbproc, NULL, 0, SQLINT2,
-1, -1, (BYTE *) &m_txn.StockLevel.w_id);		// @w_id smallint
			dbrpcparam(m_dbproc, NULL, 0, SQLINT1,
-1, -1, (BYTE *) &m_txn.StockLevel.d_id);		// @d_id tinyint
			dbrpcparam(m_dbproc, NULL, 0, SQLINT2,
-1, -1, (BYTE *) &m_txn.StockLevel.threshold);	// @threshhold smallint

			if (dbrpcexec(m_dbproc) == FAIL)

ThrowError(CDBLIBERR::eDbRpcExec);

			if (dbresults(m_dbproc) != SUCCEED)

ThrowError(CDBLIBERR::eDbResults);

			if (dbnextrow(m_dbproc) != REG_ROW)

ThrowError(CDBLIBERR::eDbNextRow);

			if (pData=dbdata(m_dbproc, 1))
				m_txn.StockLevel.low_stock =
*((long *) pData);

			DiscardNextRows(0);
			DiscardNextResults(0);

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

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


void CTPCC_DBLIB::NewOrder()
{
	int				i;
	DBINT			commit_flag;
	DBDATETIME		datetime;
	DBDATEREC		daterec;

	int				iTryCount = 0;
	const BYTE		*pData;

	ResetError();

	while (TRUE)
```

```
	{
		try
		{
			dbrpcinit(m_dbproc, "tpcc_neworder", 0);

			dbrpcparam(m_dbproc, NULL, 0, SQLINT2,
-1, -1, (BYTE *) &m_txn.NewOrder.w_id);
			dbrpcparam(m_dbproc, NULL, 0, SQLINT1,
-1, -1, (BYTE *) &m_txn.NewOrder.d_id);
			dbrpcparam(m_dbproc, NULL, 0, SQLINT4,
-1, -1, (BYTE *) &m_txn.NewOrder.c_id);
			dbrpcparam(m_dbproc, NULL, 0, SQLINT1,
-1, -1, (BYTE *) &m_txn.NewOrder.o_ol_cnt);

			// check whether any order lines are for a
remote warehouse
			m_txn.NewOrder.o_all_local = 1;
			for (i = 0; i < m_txn.NewOrder.o_ol_cnt; i++)
			{
				if
(m_txn.NewOrder.OL[i].ol_supply_w_id != m_txn.NewOrder.w_id)
				{

m_txn.NewOrder.o_all_local = 0;  // at least one remote warehouse
					break;
				}
			}
			dbrpcparam(m_dbproc, NULL, 0, SQLINT1,
-1, -1, (BYTE *) &m_txn.NewOrder.o_all_local);

			for (i = 0; i < m_txn.NewOrder.o_ol_cnt; i++)
			{
				dbrpcparam(m_dbproc, NULL, 0,
SQLINT4, -1, -1, (BYTE *) &m_txn.NewOrder.OL[i].ol_i_id);
				dbrpcparam(m_dbproc, NULL, 0,
SQLINT2, -1, -1, (BYTE *) &m_txn.NewOrder.OL[i].ol_supply_w_id);
				dbrpcparam(m_dbproc, NULL, 0,
SQLINT2, -1, -1, (BYTE *) &m_txn.NewOrder.OL[i].ol_quantity);
			}

			if (dbrpcexec(m_dbproc) == FAIL)

ThrowError(CDBLIBERR::eDbRpcExec);


			// Get order line results
			m_txn.NewOrder.total_amount = 0;

			for (i = 0; i<m_txn.NewOrder.o_ol_cnt; i++)
			{
				if (dbresults(m_dbproc) !=
SUCCEED)

ThrowError(CDBLIBERR::eDbResults);

				if (dbnumcols(m_dbproc) != 5)

ThrowError(CDBLIBERR::eWrongNumCols);

				if (dbnextrow(m_dbproc) !=
REG_ROW)

ThrowError(CDBLIBERR::eDbNextRow);

				if(pData=dbdata(m_dbproc, 1))

UtilStrCpy(m_txn.NewOrder.OL[i].ol_i_name, pData, dbdatlen(m_dbproc, 1));
				if(pData=dbdata(m_dbproc, 2))

m_txn.NewOrder.OL[i].ol_stock = (*(DBSMALLINT *) pData);
				if(pData=dbdata(m_dbproc, 3))

UtilStrCpy(m_txn.NewOrder.OL[i].ol_brand_generic, pData,
dbdatlen(m_dbproc, 3));
				if(pData=dbdata(m_dbproc, 4))
					dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,4),
					SQLFLT8, (BYTE
*)&m_txn.NewOrder.OL[i].ol_i_price, 8);
				if(pData=dbdata(m_dbproc, 5))

					dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,5),
					SQLFLT8, (BYTE
*)&m_txn.NewOrder.OL[i].ol_amount, 8);

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

					DiscardNextRows(0);
			}


			// get remaining values for w_tax, d_tax, o_id,
c_last, c_discount, c_credit, o_entry_d, commit_flag
			if (dbresults(m_dbproc) != SUCCEED)

ThrowError(CDBLIBERR::eDbResults);

			if (dbnextrow(m_dbproc) != REG_ROW)

ThrowError(CDBLIBERR::eDbNextRow);

			if (dbnumcols(m_dbproc) != 8)

ThrowError(CDBLIBERR::eWrongNumCols);

			if (pData=dbdata(m_dbproc, 1))


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

				dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,2), SQLFLT8, (BYTE
*)&m_txn.NewOrder.d_tax, 8);
			if (pData=dbdata(m_dbproc, 3))
				m_txn.NewOrder.o_id =
(*(DBINT *) pData);
			if (pData=dbdata(m_dbproc, 4))

UtilStrCpy(m_txn.NewOrder.c_last, pData, dbdatlen(m_dbproc, 4));
			if (pData=dbdata(m_dbproc, 5))
				dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,5), SQLFLT8, (BYTE
*)&m_txn.NewOrder.c_discount, 8);
			if (pData=dbdata(m_dbproc, 6))

UtilStrCpy(m_txn.NewOrder.c_credit, pData, dbdatlen(m_dbproc, 6));
			if (pData=dbdata(m_dbproc, 7))
			{
				datetime = *((DBDATETIME *)
pData);
```

```
                                        dbdatecrack(m_dbproc, &daterec,
&datetime);
                                        m_txn.NewOrder.o_entry_d.year
= daterec.year;
                                        m_txn.NewOrder.o_entry_d.month
 = daterec.month;
                                        m_txn.NewOrder.o_entry_d.day
= daterec.day;
                                        m_txn.NewOrder.o_entry_d.hour
= daterec.hour;

m_txn.NewOrder.o_entry_d.minute = daterec.minute;

m_txn.NewOrder.o_entry_d.second = daterec.second;
                                }
                                if (pData=dbdata(m_dbproc, 8))
                                        commit_flag = (*(DBTINYINT *)
pData);

                                DiscardNextRows(0);
                                DiscardNextResults(0);


                                if (commit_flag == 1)
                                {
                                        m_txn.NewOrder.total_amount *=
((1 + m_txn.NewOrder.w_tax + m_txn.NewOrder.d_tax) * (1 -
m_txn.NewOrder.c_discount));

m_txn.NewOrder.exec_status_code = eOK;
                                }
                                else

m_txn.NewOrder.exec_status_code = eInvalidItem;

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

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


void CTPCC_DBLIB::Payment()
{
        DBDATETIME      datetime;
        DBDATEREC       daterec;
        int                             iTryCount = 0;
        const BYTE              *pData;

        ResetError();

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

                        dbrpcparam(m_dbproc, NULL, 0, SQLINT2,
-1, -1, (BYTE *) &m_txn.Payment.w_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT2,
-1, -1, (BYTE *) &m_txn.Payment.c_w_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLFLT8,
-1, -1, (BYTE *) &m_txn.Payment.h_amount);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT1,
-1, -1, (BYTE *) &m_txn.Payment.d_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT1,
-1, -1, (BYTE *) &m_txn.Payment.c_d_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT4,
-1, -1, (BYTE *) &m_txn.Payment.c_id);

                        // if customer id is zero, then payment is by
name
                        if (m_txn.Payment.c_id == 0)
                                dbrpcparam(m_dbproc, NULL, 0,
SQLCHAR, -1, strlen(m_txn.Payment.c_last), (unsigned char
*)m_txn.Payment.c_last);

                        if (dbrpcexec(m_dbproc) == FAIL)

ThrowError(CDBLIBERR::eDbRpcExec);

                        if (dbresults(m_dbproc) != SUCCEED)

ThrowError(CDBLIBERR::eDbResults);

                        if (dbnextrow(m_dbproc) != REG_ROW)

ThrowError(CDBLIBERR::eDbNextRow);

                        if (dbnumcols(m_dbproc) != 27)

ThrowError(CDBLIBERR::eWrongNumCols);

                        if (pData=dbdata(m_dbproc, 1))
                                m_txn.Payment.c_id = *((DBINT
*) pData);
                        if (pData=dbdata(m_dbproc, 2))
                                UtilStrCpy(m_txn.Payment.c_last,
pData, dbdatlen(m_dbproc, 2));
                        if (pData=dbdata(m_dbproc, 3))
                        {
                                datetime = *((DBDATETIME *)
pData);
                                dbdatecrack(m_dbproc, &daterec,
&datetime);
                                m_txn.Payment.h_date.year   =
daterec.year;
                                m_txn.Payment.h_date.month  =
daterec.month;
                                m_txn.Payment.h_date.day    =
daterec.day;
                                m_txn.Payment.h_date.hour   =
daterec.hour;
```

```
                                        m_txn.Payment.h_date.minute =
daterec.minute;
                                        m_txn.Payment.h_date.second =
daterec.second;
                                }
                                if (pData=dbdata(m_dbproc, 4))

UtilStrCpy(m_txn.Payment.w_street_1, pData, dbdatlen(m_dbproc, 4));
                                if (pData=dbdata(m_dbproc, 5))

UtilStrCpy(m_txn.Payment.w_street_2, pData, dbdatlen(m_dbproc, 5));
                                if (pData=dbdata(m_dbproc, 6))

UtilStrCpy(m_txn.Payment.w_city, pData, dbdatlen(m_dbproc, 6));
                                if (pData=dbdata(m_dbproc, 7))

UtilStrCpy(m_txn.Payment.w_state, pData, dbdatlen(m_dbproc, 7));
                                if (pData=dbdata(m_dbproc, 8))
                                        UtilStrCpy(m_txn.Payment.w_zip,
pData, dbdatlen(m_dbproc, 8));
                                if (pData=dbdata(m_dbproc, 9))

UtilStrCpy(m_txn.Payment.d_street_1, pData, dbdatlen(m_dbproc, 9));
                                if (pData=dbdata(m_dbproc, 10))

UtilStrCpy(m_txn.Payment.d_street_2, pData, dbdatlen(m_dbproc, 10));
                                if (pData=dbdata(m_dbproc, 11))
                                        UtilStrCpy(m_txn.Payment.d_city,
pData, dbdatlen(m_dbproc, 11));
                                if (pData=dbdata(m_dbproc, 12))

UtilStrCpy(m_txn.Payment.d_state, pData, dbdatlen(m_dbproc, 12));
                                if (pData=dbdata(m_dbproc, 13))
                                        UtilStrCpy(m_txn.Payment.d_zip,
pData, dbdatlen(m_dbproc, 13));
                                if (pData=dbdata(m_dbproc, 14))
                                        UtilStrCpy(m_txn.Payment.c_first,
pData, dbdatlen(m_dbproc, 14));
                                if (pData=dbdata(m_dbproc, 15))

UtilStrCpy(m_txn.Payment.c_middle, pData, dbdatlen(m_dbproc, 15));
                                if (pData=dbdata(m_dbproc, 16))

UtilStrCpy(m_txn.Payment.c_street_1, pData, dbdatlen(m_dbproc, 16));
                                if (pData=dbdata(m_dbproc, 17))

UtilStrCpy(m_txn.Payment.c_street_2, pData, dbdatlen(m_dbproc, 17));
                                if (pData=dbdata(m_dbproc, 18))
                                        UtilStrCpy(m_txn.Payment.c_city,
pData, dbdatlen(m_dbproc, 18));
                                if (pData=dbdata(m_dbproc, 19))

UtilStrCpy(m_txn.Payment.c_state, pData, dbdatlen(m_dbproc, 19));
                                if (pData=dbdata(m_dbproc, 20))
                                        UtilStrCpy(m_txn.Payment.c_zip,
pData, dbdatlen(m_dbproc, 20));
                                if (pData=dbdata(m_dbproc, 21))

UtilStrCpy(m_txn.Payment.c_phone, pData, dbdatlen(m_dbproc, 21));
                                if (pData=dbdata(m_dbproc, 22))
                                {
                                        datetime = *((DBDATETIME *)
pData);
                                        dbdatecrack(m_dbproc, &daterec,
&datetime);
                                        m_txn.Payment.c_since.year   =
daterec.year;
                                        m_txn.Payment.c_since.month  =
daterec.month;
                                        m_txn.Payment.c_since.day    =
daterec.day;
                                        m_txn.Payment.c_since.hour   =
daterec.hour;
                                        m_txn.Payment.c_since.minute =
daterec.minute;
                                        m_txn.Payment.c_since.second =
daterec.second;
                                }
                                if(pData=dbdata(m_dbproc, 23))

UtilStrCpy(m_txn.Payment.c_credit, pData, dbdatlen(m_dbproc, 23));
                                if(pData=dbdata(m_dbproc, 24))
                                        dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,24), SQLFLT8,
(BYTE *)&m_txn.Payment.c_credit_lim, 8);
                                if(pData=dbdata(m_dbproc, 25))
                                        dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,25), SQLFLT8,
(BYTE *)&m_txn.Payment.c_discount, 8);
                                if(pData=dbdata(m_dbproc, 26))
                                        dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,26), SQLFLT8,
(BYTE *)&m_txn.Payment.c_balance, 8);
                                if(pData=dbdata(m_dbproc, 27))
                                        UtilStrCpy(m_txn.Payment.c_data,
pData, dbdatlen(m_dbproc, 27));

                                DiscardNextRows(0);
                                DiscardNextResults(0);


                                if (m_txn.Payment.c_id == 0)
                                        throw new CTPCC_DBLIB_ERR(
CTPCC_DBLIB_ERR::ERR_INVALID_CUST );
                                else
                                        m_txn.Payment.exec_status_code
= eOK;

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

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

```
void CTPCC_DBLIB::OrderStatus()
{
	int			i;
	DBDATETIME	datetime;
	DBDATEREC	daterec;

	int			iTryCount = 0;
	RETCODE			rc;
	const BYTE		*pData;

	ResetError();

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

			dbrpcparam(m_dbproc, NULL, 0, SQLINT2,
-1, -1, (BYTE *) &m_txn.OrderStatus.w_id);
			dbrpcparam(m_dbproc, NULL, 0, SQLINT1,
-1, -1, (BYTE *) &m_txn.OrderStatus.d_id);
			dbrpcparam(m_dbproc, NULL, 0, SQLINT4,
-1, -1, (BYTE *) &m_txn.OrderStatus.c_id);

			// if customer id is zero, then order status is by
name
			if (m_txn.OrderStatus.c_id == 0)
				dbrpcparam(m_dbproc, NULL, 0,
SQLCHAR, -1, strlen(m_txn.OrderStatus.c_last), (unsigned char
*)m_txn.OrderStatus.c_last);


			if (dbrpcexec(m_dbproc) == FAIL)

ThrowError(CDBLIBERR::eDbRpcExec);

			// Get order lines
			if (dbresults(m_dbproc) != SUCCEED)
			{
				if ((m_DbLibErr == NULL) &&
(m_SqlErr == NULL))
					throw new
CTPCC_DBLIB_ERR( CTPCC_DBLIB_ERR::ERR_NO_SUCH_ORDER );
				else

ThrowError(CDBLIBERR::eDbResults);
			}

			if (dbnumcols(m_dbproc) != 5)

ThrowError(CDBLIBERR::eWrongNumCols);

			i = 0;
			while (TRUE)
			{
				rc = dbnextrow(m_dbproc);
				if (rc == NO_MORE_ROWS)
					break;
				if (rc != REG_ROW)

ThrowError(CDBLIBERR::eDbNextRow);

				if(pData=dbdata(m_dbproc, 1))

m_txn.OrderStatus.OL[i].ol_supply_w_id = (*(DBSMALLINT *) pData);
				if(pData=dbdata(m_dbproc, 2))

m_txn.OrderStatus.OL[i].ol_i_id = (*(DBINT *) pData);
				if(pData=dbdata(m_dbproc, 3))

m_txn.OrderStatus.OL[i].ol_quantity = (*(DBSMALLINT *) pData);
				if(pData=dbdata(m_dbproc, 4))
					dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,4),

SQLFLT8, (BYTE *)&m_txn.OrderStatus.OL[i].ol_amount, 8);
				if(pData=dbdata(m_dbproc, 5))
				{
					datetime =
*((DBDATETIME *) pData);
					dbdatecrack(m_dbproc,
&daterec, &datetime);

m_txn.OrderStatus.OL[i].ol_delivery_d.year   = daterec.year;

m_txn.OrderStatus.OL[i].ol_delivery_d.month  = daterec.month;

m_txn.OrderStatus.OL[i].ol_delivery_d.day    = daterec.day;

m_txn.OrderStatus.OL[i].ol_delivery_d.hour   = daterec.hour;

m_txn.OrderStatus.OL[i].ol_delivery_d.minute = daterec.minute;

m_txn.OrderStatus.OL[i].ol_delivery_d.second = daterec.second;
				}
				i++;
			}
			m_txn.OrderStatus.o_ol_cnt = i;


			if (dbresults(m_dbproc) != SUCCEED)

ThrowError(CDBLIBERR::eDbResults);

			if (dbnextrow(m_dbproc) != REG_ROW)

ThrowError(CDBLIBERR::eDbNextRow);

			if (dbnumcols(m_dbproc) != 8)

ThrowError(CDBLIBERR::eWrongNumCols);

			if(pData=dbdata(m_dbproc, 1))
				m_txn.OrderStatus.c_id =
(*(DBINT *) pData);
			if(pData=dbdata(m_dbproc, 2))

UtilStrCpy(m_txn.OrderStatus.c_last, pData, dbdatlen(m_dbproc,2));
			if(pData=dbdata(m_dbproc, 3))

UtilStrCpy(m_txn.OrderStatus.c_first, pData, dbdatlen(m_dbproc,3));
			if(pData=dbdata(m_dbproc, 4))

UtilStrCpy(m_txn.OrderStatus.c_middle, pData, dbdatlen(m_dbproc, 4));

			if(pData=dbdata(m_dbproc, 5))
			{
				datetime = *((DBDATETIME *)
pData);
				dbdatecrack(m_dbproc, &daterec,
&datetime);
				m_txn.OrderStatus.o_entry_d.year
 = daterec.year;
```

```
m_txn.OrderStatus.o_entry_d.month  = daterec.month;
                                        m_txn.OrderStatus.o_entry_d.day
 = daterec.day;
                                        m_txn.OrderStatus.o_entry_d.hour
  = daterec.hour;

m_txn.OrderStatus.o_entry_d.minute = daterec.minute;

m_txn.OrderStatus.o_entry_d.second = daterec.second;
                                }
                                if(pData=dbdata(m_dbproc, 6))

                                        m_txn.OrderStatus.o_carrier_id =
(*(DBSMALLINT *) pData);
                                if(pData=dbdata(m_dbproc, 7))
                                        dbconvert(m_dbproc,
SQLNUMERIC, (LPCBYTE)pData, dbdatlen(m_dbproc,7),
                                                                SQLFLT8,
(BYTE *)&m_txn.OrderStatus.c_balance, 8);
                                if(pData=dbdata(m_dbproc, 8))
                                        m_txn.OrderStatus.o_id =
(*(DBINT *) pData);

                                DiscardNextRows(0);
                                DiscardNextResults(0);


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

m_txn.OrderStatus.exec_status_code = eOK;

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

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


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

                ResetError();

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

                                dbrpcparam(m_dbproc, NULL, 0, SQLINT2,
-1, -1, (BYTE *) &m_txn.Delivery.w_id);
                                dbrpcparam(m_dbproc, NULL, 0, SQLINT1,
-1, -1, (BYTE *) &m_txn.Delivery.o_carrier_id);

                                if (dbrpcexec(m_dbproc) == FAIL)

ThrowError(CDBLIBERR::eDbRpcExec);

                                if (dbresults(m_dbproc) != SUCCEED)

ThrowError(CDBLIBERR::eDbResults);

                                if (dbnextrow(m_dbproc) != REG_ROW)

ThrowError(CDBLIBERR::eDbNextRow);

                                if (dbnumcols(m_dbproc) != 10)

ThrowError(CDBLIBERR::eWrongNumCols);

                                for (i=0; i<10; i++)
                                {
                                        if (pData = dbdata(m_dbproc, i+1))
                                                m_txn.Delivery.o_id[i]
= *((DBINT *)pData);
                                }

                                DiscardNextRows(0);
                                DiscardNextResults(0);

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

//              if (iTryCount)
```

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

void CTPCC_DBLIB::ResetError()
{
        if (m_DbLibErr != NULL)
        {
                delete m_DbLibErr;
                m_DbLibErr = (CDBLIBERR*)NULL;
        }

        if (m_SqlErr != NULL)
        {
                delete m_SqlErr;
                m_SqlErr = (CSQLERR*)NULL;
        }
        return;
}
```

tpcc_dblib.h

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

#ifndef PDBPROCESS
#define DBPROCESS void   // dbprocess structure type
typedef DBPROCESS * PDBPROCESS;
#endif

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

class CSQLERR : public CBaseErr
{
        public:

                CSQLERR(void)
                {
                        m_msgno = 0;
                        m_msgstate = 0;
                        m_severity = 0;
                        m_msgtext = NULL;
                };

                ~CSQLERR()
                {
                        delete [] m_msgtext;
                };

                int             m_msgno;
                int             m_msgstate;
                int             m_severity;
                char   *m_msgtext;

                int ErrorType() {return ERR_TYPE_SQL;};
                int ErrorNum() {return m_msgno;};
                char *ErrorText() {return m_msgtext;};

};

class CDBLIBERR : public CBaseErr
{
        public:
                enum ACTION
                {
                        eNone,
                        eUnknown,
                        eLogin,                                 //
error from dblogin
                        eDbOpen,                        // error from
dbopen
                        eDbUse,                                 //
error from dbuse
                        eDbSqlExec,                             //
error from dbsqlexec
                        eDbSet,                                 //
error from one of the dbset* routines
                        eDbNextRow,                             //
error from dbnextrow
                        eWrongRowCount,         // more or
less rows returned than expected
                        eWrongNumCols,          // more or
less columns returned than expected
                        eDbResults,                             //
error from dbresults
                        eDbRpcExec,                             //
error from dbrpcexec
                        eDbSetMaxProcs,         // error from
dbsetmaxprocs
                        eDbProcHandler          // error from
either dbprocerrhandle or dbprocmsghandle
                };

                CDBLIBERR(ACTION eAction, int severity = 0, int
dberror = 0, int oserr = 0)
                {
                        m_eAction = eAction;
                        m_severity = severity;
                        m_dberror = dberror;
                        m_oserr = oserr;

                        m_dberrstr = NULL;
                        m_oserrstr = NULL;
                };

                ~CDBLIBERR()
                {
                        delete [] m_dberrstr;
                        delete [] m_oserrstr;
                };

                ACTION  m_eAction;
                int             m_severity;
                int             m_dberror;
                int             m_oserr;
                char   *m_dberrstr;
```

```
                char   *m_oserrstr;

                int ErrorType() {return ERR_TYPE_DBLIB;};
                int ErrorNum() {return m_dberror;};
                char *ErrorText() {return m_dberrstr;};

};

class CTPCC_DBLIB_ERR : public CBaseErr
{
        public:
                enum CTPCC_DBLIB_ERRS
                {
                        ERR_WRONG_SP_VERSION = 1,       //
"Wrong version of stored procs on database server"
                        ERR_INVALID_CUST,
// "Invalid Customer id,name."
                        ERR_NO_SUCH_ORDER,
// "No orders found for customer."
                        ERR_RETRIED_TRANS,
// "Retries before transaction succeeded."
                };

                CTPCC_DBLIB_ERR( int iErr ) { m_errno = iErr;
m_iTryCount = 0; };

                CTPCC_DBLIB_ERR( int iErr, int iTryCount ) {
m_errno = iErr; m_iTryCount = iTryCount; };

                int             m_errno;
                int             m_iTryCount;

                int ErrorType() {return ERR_TYPE_TPCC_DBLIB;};
                int ErrorNum() {return m_errno;};

                char *ErrorText();
};

class DllDecl CTPCC_DBLIB : public CTPCC_BASE
{
        private:
                // declare variables and private functions here...
                PDBPROCESS      m_dbproc;
                CDBLIBERR       *m_DbLibErr;            //
not allocated until needed (maybe never)
                CSQLERR         *m_SqlErr;
// not allocated until needed (maybe never)
                int                     m_MaxRetries;
// retry count on deadlock

                void DiscardNextRows(int iExpectedCount);
                void DiscardNextResults(int iExpectedCount);
                void ThrowError( CDBLIBERR::ACTION eAction );
                void ResetError();

                union
                {
                        NEW_ORDER_DATA
NewOrder;
                        PAYMENT_DATA            Payment;
                        DELIVERY_DATA           Delivery;
                        STOCK_LEVEL_DATA        StockLevel;
                        ORDER_STATUS_DATA       OrderStatus;
                }                       m_txn;

        public:
                CTPCC_DBLIB(LPCSTR szServer, LPCSTR szUser,
LPCSTR szPassword, LPCSTR szHost, LPCSTR szDatabase );
                ~CTPCC_DBLIB(void);

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

                void NewOrder           ();
                void Payment            ();
                void Delivery           ();
                void StockLevel         ();
                void OrderStatus        ();


                // these are public because they must be called from the
dblib err_handler and msg_hangler
                // outside of the class
                void SetDbLibError(int severity, int dberr, int oserr,
LPCSTR dberrstr, LPCSTR oserrstr);
                void SetSqlError( int msgno, int msgstate, int severity,
LPCSTR msgtext );

};

extern "C" DllDecl CTPCC_DBLIB* CTPCC_DBLIB_new
        ( LPCSTR szServer, LPCSTR szUser, LPCSTR szPassword,
LPCSTR szHost, LPCSTR szDatabase );

typedef CTPCC_DBLIB* (TYPE_CTPCC_DBLIB)(LPCSTR, LPCSTR,
LPCSTR, LPCSTR, LPCSTR);
```

tpcc_enc.cpp

```
// ctpcc_enc.cpp: implementation of the CTPCC_ENCINA class.
//
//////////////////////////////////////////////////////////////////////

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

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

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

#include "..\..\common\src\trans.h"             //tpckit transaction header contains
definitions of structures specific to TPC-C
#include "..\..\common\src\error.h"
#include "..\..\common\src\txn_base.h"
#include "tpcc_enc.h"
#include "..\include\tpcc_type.h"
```

```
#include "mon_client.h"
#include "client_utils.h"

static CRITICAL_SECTION        TpCriticalSection;
extern "C" char *errFile;

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

      switch( ul_reason_for_call )
      {
            case DLL_PROCESS_ATTACH:

                  DisableThreadLibraryCalls(hModule);
                  InitializeCriticalSection(&TpCriticalSection);
                  break;

            case DLL_PROCESS_DETACH:
                  DeleteCriticalSection(&TpCriticalSection);
                  break;

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

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_ENCINA* CTPCC_ENCINA_new()
{
            return new CTPCC_ENCINA();
}

// wrapper routine for enroll_client
__declspec(dllexport) CTPCC_ENCINA* CTPCC_ENCINA_post_init()
{
            enroll_client();
            return NULL;
}

// constructor and destructor
CTPCC_ENCINA::CTPCC_ENCINA()
{
            //          Add initialization of ENCINA Structures if any
            m_txn = (ENC_DATA *)malloc(sizeof(ENC_DATA));
            if (m_txn == NULL)
                        throw new CENCERR(ERR_TYPE_MEMORY,
ERR_FATAL_LEVEL);
}

CTPCC_ENCINA::~CTPCC_ENCINA()
{
            // free the data structure allocated with tpalloc
            free((char *)m_txn);
}

void CTPCC_ENCINA::NewOrder()
{

            // question: if we need to prepare the data?
   if (send_new_order(sizeof(ENC_DATA), (unsigned char *)m_txn) ==
TRPC_ERROR)
                        throw new CENCERR(TRPC_ERROR);

   if ( m_txn->ErrorType != ERR_SUCCESS )
                        throw new CENCERR( m_txn->ErrorType, m_txn->error
);
}

void CTPCC_ENCINA::Payment()
{
   if (send_payment(sizeof(ENC_DATA), (unsigned char *)m_txn) ==
TRPC_ERROR)
                        throw new CENCERR(TRPC_ERROR);

   if ( m_txn->ErrorType != ERR_SUCCESS )
                        throw new CENCERR( m_txn->ErrorType, m_txn->error
);
}

void CTPCC_ENCINA::Delivery()
{

            // Note: Delivery txn code in the tuxedo server does not implement
logging of the delivery
            //      txn results, so cannot be used as is to run an auditable TPC-C
result.  For that
            //      reason, delivery txns should not be done via Tuxedo.
            //      The code is included for completeness.
            //m_txn->u.Delivery.exec_status_code = eDeliveryFailed;
            //return;

            // Note: If we use the delivery thread in tpcc.dll, it is not possible to
get to this
            //      point for delivery txns. But if we use Encina delivery server,
the code is
            //      needed. It is suggested using the delivery thread in tpcc.dll
since it is
            //      convenient and provides best performance.
            GetLocalTime(&m_txn->u.Delivery.queue_time);

   if (send_delivery(sizeof(ENC_DATA), (unsigned char *)m_txn) ==
TRPC_ERROR)
                        m_txn->u.Delivery.exec_status_code = eDeliveryFailed;
   else
                        m_txn->u.Delivery.exec_status_code = eOK;
}

void CTPCC_ENCINA::StockLevel()
{

   if (send_stock_level(sizeof(ENC_DATA), (unsigned char *)m_txn) ==
TRPC_ERROR)
                        throw new CENCERR(TRPC_ERROR);

   if ( m_txn->ErrorType != ERR_SUCCESS )
                        throw new CENCERR( m_txn->ErrorType, m_txn->error
);
}

void CTPCC_ENCINA::OrderStatus()
{

   if (send_order_status(sizeof(ENC_DATA), (unsigned char *)m_txn) ==
TRPC_ERROR)
                        throw new CENCERR(TRPC_ERROR);

   if ( m_txn->ErrorType != ERR_SUCCESS )
                        throw new CENCERR( m_txn->ErrorType, m_txn->error
);
}

char *CENCERR::ErrorText()
{
            if (m_iErrorType == TRPC_ERROR)
```

```
        {
                sprintf( m_szErrorText, "Error: ENCINA TRPC error
(see log file %s for details)", errFile);
        }
        else
                sprintf( m_szErrorText, "Error: Class %d, error # %d",
m_iErrorType, m_iError );
        return m_szErrorText;
};
```

tpcc_enc.h

```
/*      FILE:           TPCC_ENCINA.H
 *                              Microsoft TPC-C Kit Ver.
4.10.000
 *                              not yet audited
 *
 *      PURPOSE:        Header file for TPC-C Encina class
implementation.
 *                              Copyright Microsoft, 1999
 *      All Rights Reserved
 *
 */

#if !defined(_TPCC_ENCINA_H_)
#define _TPCC_ENCINA_H_

#pragma once

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

class CTPCC_ENCINA : public CTPCC_BASE
{
        private:
                struct ENC_DATA
                {
                        int
ErrorType;
                        int
error;

                        union
                        {
                                NEW_ORDER_DATA
NewOrder;
                                PAYMENT_DATA
Payment;
                                DELIVERY_DATA
Delivery;
                                STOCK_LEVEL_DATA
StockLevel;
                                ORDER_STATUS_DATA
OrderStatus;
                        } u;
                } *m_txn;

        public:

                CTPCC_ENCINA();
                virtual ~CTPCC_ENCINA();

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

                void NewOrder           ();
                void Payment            ();
                void Delivery           ();
                void StockLevel         ();
                void OrderStatus        ();
};


class CENCERR : public CBaseErr
{

        private:
                char    m_szErrorText[64];
        public:
                int             m_errno;        //
                int             m_iErrorType;   // match
ErrorType in CTPCC_ENCINA
                int             m_iError;       // machine
error in CTPCC_ENCINA

                // use this interface for genuine Encina errors
                CENCERR( int iErr )
                {
                        m_errno = iErr;         // ENCINA error
                        m_iErrorType = ERR_TYPE_ENCINA;
                        m_iError = 0;           // only meaningful if
m_errno == TPEOS
                };

                // use this interface to impersonate a non-Encina error
type
                CENCERR( int iErrorType, int iError )
                {
                        m_iErrorType = iErrorType;
                        m_iError = iError;
                        m_errno = iError;   // ???
                }

                // A CENCERR class can impersonate another class,
which happens if the error
                // was not actually a Tuxedo error, but was simply
transmitted back via Tuxedo.
                int ErrorType()
                {
                        return m_iErrorType;
                }

                int ErrorNum() {return m_errno;};
                char *ErrorText();
};

// wrapper routine for class constructor:
extern "C" __declspec(dllexport) CTPCC_ENCINA* CTPCC_ENCINA_new();
extern "C" __declspec(dllexport) CTPCC_ENCINA*
CTPCC_ENCINA_post_init();
```

```
typedef CTPCC_ENCINA* (TYPE_CTPCC_ENCINA)();

#endif // !defined(_TPCC_ENCINA_H_)
```

tpcc_odbc.cpp

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

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

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

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

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

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

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

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

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

static SQLHENV henv = SQL_NULL_HENV;
// ODBC environment handle

BOOL APIENTRY DllMain(HMODULE hModule, DWORD
ul_reason_for_call, LPVOID lpReserved)
{
        switch( ul_reason_for_call )
        {
                case DLL_PROCESS_ATTACH:
                        DisableThreadLibraryCalls(hModule);
                        if (
SQLAllocHandleStd(SQL_HANDLE_ENV, SQL_NULL_HANDLE, &henv)
!= SQL_SUCCESS )
                                return FALSE;
                        break;

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

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

/* FUNCTION: CTPCC_ODBC_ERR::ErrorText
 *
 */

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

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

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

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

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

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

        // initialization
        m_hdbc = SQL_NULL_HDBC;
        m_hstmt = SQL_NULL_HSTMT;

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

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


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

        if ( SQLSetConnectOption(m_hdbc, SQL_PACKET_SIZE, 4096) !=
SQL_SUCCESS )
                ThrowError(CODBCERR::eConnOption);

        {
                char                    szConnectStr[256];
                char                    szOutStr[1024];
                SQLSMALLINT             iOutStrLen;

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

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

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

        if (SQLAllocHandle(SQL_HANDLE_STMT, m_hdbc, &m_hstmt)
!= SQL_SUCCESS)
                ThrowError(CODBCERR::eAllocHandle);

        {
                char                buffer[128];

                // set some options affecting connection behavior
                strcpy(buffer, "set nocount on set XACT_ABORT ON");
                rc = SQLExecDirect(m_hstmt, (unsigned char *)buffer,
SQL_NTS);
                if (rc != SQL_SUCCESS && rc !=
SQL_SUCCESS_WITH_INFO)
                        ThrowError(CODBCERR::eExecDirect);

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

                SQLFreeHandle(SQL_HANDLE_STMT, m_hstmt);
        }

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

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

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

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

        pODBCErr = new CODBCERR();

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

        szTmp[0] = 0;
        while (TRUE)
        {
```

```
                        rc = SQLError(henv, m_hdbc, m_hstmt, (BYTE
*)&szState, &lNativeError,
                                                (BYTE *)&szMsg,
sizeof(szMsg), NULL);
                        if (rc == SQL_NO_DATA)
                                break;

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

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

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

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

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

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

                SQLFreeStmt(m_hstmt, SQL_CLOSE);
                throw pODBCErr;
}

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

                m_hstmt = m_hstmtStockLevel;

                int i = 0;
                if (   SQLBindParameter(m_hstmt, ++i, SQL_PARAM_INPUT,
SQL_C_SSHORT, SQL_SMALLINT, 0, 0, &m_txn.StockLevel.w_id, 0,
NULL) != SQL_SUCCESS
                        || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.StockLevel.d_id, 0, NULL) != SQL_SUCCESS
                        || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SSHORT, SQL_SMALLINT, 0, 0,
&m_txn.StockLevel.threshold, 0, NULL) != SQL_SUCCESS
                        )
                        ThrowError(CODBCERR::eBindParam);
                if ( SQLBindCol(m_hstmt, 1, SQL_C_SLONG,
&m_txn.StockLevel.low_stock, 0, NULL) != SQL_SUCCESS )
                        ThrowError(CODBCERR::eBindCol);
}

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

                m_hstmt = m_hstmtStockLevel;

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

ThrowError(CODBCERR::eExecDirect);

                                if ( SQLFetch(m_hstmt) == SQL_ERROR )

ThrowError(CODBCERR::eFetch);

                                SQLFreeStmt(m_hstmt, SQL_CLOSE);

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

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

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

void CTPCC_ODBC::InitNewOrderParams()
{
                if (   SQLAllocHandle(SQL_HANDLE_STMT, m_hdbc,
&m_hstmtNewOrder) != SQL_SUCCESS
                        || SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc,
&m_descNewOrderCols1) != SQL_SUCCESS
                        || SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc,
&m_descNewOrderCols2) != SQL_SUCCESS
                        )
                        ThrowError(CODBCERR::eAllocHandle);

                m_hstmt = m_hstmtNewOrder;

                if ( SQLSetStmtAttrW( m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descNewOrderCols1, SQL_IS_POINTER ) != SQL_SUCCESS )
                        ThrowError(CODBCERR::eSetStmtAttr);
```

```
	int i = 0;
	if (	SQLBindParameter(m_hstmt, ++i, SQL_PARAM_INPUT,
SQL_C_SSHORT, SQL_SMALLINT, 0, 0, &m_txn.NewOrder.w_id, 0,
NULL) != SQL_SUCCESS
		|| SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.NewOrder.d_id, 0, NULL) != SQL_SUCCESS
		|| SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.NewOrder.c_id, 0, NULL) != SQL_SUCCESS
		|| SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.NewOrder.o_ol_cnt, 0, NULL) != SQL_SUCCESS
		|| SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.NewOrder.o_all_local, 0, NULL) != SQL_SUCCESS
		)
		ThrowError(CODBCERR::eBindParam);

	for (int j=0; j<MAX_OL_NEW_ORDER_ITEMS; j++)
	{
		if (	SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.NewOrder.OL[j].ol_i_id, 0, NULL) != SQL_SUCCESS
			|| SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SSHORT, SQL_SMALLINT, 0, 0,
&m_txn.NewOrder.OL[j].ol_supply_w_id, 0, NULL) != SQL_SUCCESS
			|| SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SSHORT, SQL_SMALLINT, 0, 0,
&m_txn.NewOrder.OL[j].ol_quantity, 0, NULL) != SQL_SUCCESS
			)
			ThrowError(CODBCERR::eBindParam);
	}

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

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

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

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

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

		// 0         1         2

		// 01234567890123456789012345678
	wchar_t			szSqlTemplate[] =
L"{call tpcc_neworder(?,?,?,?,?,"

		L"?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,"

		L"?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,"

		L"?,?,?,?,?,?,?,?,?,?,?,?,?,?,?)}";

	m_hstmt = m_hstmtNewOrder;

	// associate the parameter and column bindings for this transaction
	if ( SQLSetStmtAttrW( m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descNewOrderCols1, SQL_IS_POINTER ) != SQL_SUCCESS )
		ThrowError(CODBCERR::eSetStmtAttr);

	// clip statement buffer based on number of parameters
	// fixed part is 29 chars and variable part is 6 chars per line item
	i = 29 + m_txn.NewOrder.o_ol_cnt*6;
	wcscpy( &szSqlTemplate[i], L")}" );

	// check whether any order lines are for a remote warehouse
	m_txn.NewOrder.o_all_local = 1;
	for (i = 0; i < m_txn.NewOrder.o_ol_cnt; i++)
	{
		if (m_txn.NewOrder.OL[i].ol_supply_w_id !=
m_txn.NewOrder.w_id)
		{
			m_txn.NewOrder.o_all_local = 0;	// at least
one remote warehouse
			break;
		}
	}

	while (TRUE)
	{
		try
		{
			m_BindOffset = 0;
			rc = SQLExecDirectW(m_hstmt,
(SQLWCHAR*)szSqlTemplate, SQL_NTS);
```

```
                                if (rc != SQL_SUCCESS && rc !=
SQL_SUCCESS_WITH_INFO)

ThrowError(CODBCERR::eExecDirect);

                                // Get order line results
                                m_txn.NewOrder.total_amount = 0;
                                for (i = 0; i<m_txn.NewOrder.o_ol_cnt; i++)
                                {
                                        // set the bind offset value...
                                        m_BindOffset = i *
sizeof(m_txn.NewOrder.OL[0]);

                                        if ( SQLFetch(m_hstmt) ==
SQL_ERROR)

ThrowError(CODBCERR::eFetch);

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

ThrowError(CODBCERR::eMoreResults);

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

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

ThrowError(CODBCERR::eSetStmtAttr);

                                if ( SQLFetch(m_hstmt) == SQL_ERROR)

ThrowError(CODBCERR::eFetch);

                                SQLFreeStmt(m_hstmt, SQL_CLOSE);

                                if (m_no_commit_flag == 1)
                                {
                                        m_txn.NewOrder.total_amount *=
((1 + m_txn.NewOrder.w_tax + m_txn.NewOrder.d_tax) * (1 -
m_txn.NewOrder.c_discount));

m_txn.NewOrder.exec_status_code = eOK;
                                }
                                else

m_txn.NewOrder.exec_status_code = eInvalidItem;

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

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

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

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

                m_hstmt = m_hstmtPayment;

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

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

```
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.d_street_2,      sizeof(m_txn.Payment.d_street_2), NULL) !=
SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.d_city,          sizeof(m_txn.Payment.d_city),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.d_state,         sizeof(m_txn.Payment.d_state),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.d_zip,           sizeof(m_txn.Payment.d_zip),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_first,         sizeof(m_txn.Payment.c_first),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_middle,        sizeof(m_txn.Payment.c_middle), NULL) !=
SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_street_1,      sizeof(m_txn.Payment.c_street_1), NULL) !=
SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_street_2,      sizeof(m_txn.Payment.c_street_2), NULL) !=
SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_city,          sizeof(m_txn.Payment.c_city),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_state,         sizeof(m_txn.Payment.c_state),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_zip,           sizeof(m_txn.Payment.c_zip),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_phone,         sizeof(m_txn.Payment.c_phone),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i,
SQL_C_TYPE_TIMESTAMP, &m_txn.Payment.c_since,
0, NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_credit,        sizeof(m_txn.Payment.c_credit), NULL) !=
SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_DOUBLE,
&m_txn.Payment.c_credit_lim,0, NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_DOUBLE,
&m_txn.Payment.c_discount,      0, NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_DOUBLE,
&m_txn.Payment.c_balance,       0, NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_data,          sizeof(m_txn.Payment.c_data),
NULL) != SQL_SUCCESS
                        )
                        ThrowError(CODBCERR::eBindCol);
}

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

        m_hstmt = m_hstmtPayment;

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

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

ThrowError(CODBCERR::eExecDirect);

                        if ( SQLFetch(m_hstmt) == SQL_ERROR)

ThrowError(CODBCERR::eFetch);

                        SQLFreeStmt(m_hstmt, SQL_CLOSE);

                        if (m_txn.Payment.c_id == 0)
                                throw new CTPCC_ODBC_ERR(
CTPCC_ODBC_ERR::ERR_INVALID_CUST );
                        else
                                m_txn.Payment.exec_status_code
= eOK;

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

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

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

void CTPCC_ODBC::InitOrderStatusParams()
{
        if (   SQLAllocHandle(SQL_HANDLE_STMT, m_hdbc,
&m_hstmtOrderStatus) != SQL_SUCCESS
                || SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc,
&m_descOrderStatusCols1) != SQL_SUCCESS
                || SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc,
&m_descOrderStatusCols2) != SQL_SUCCESS
                )
                ThrowError(CODBCERR::eAllocHandle);

        m_hstmt = m_hstmtOrderStatus;

        if (   SQLSetStmtAttrW( m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descOrderStatusCols1, SQL_IS_POINTER ) != SQL_SUCCESS )
                ThrowError(CODBCERR::eSetStmtAttr);

        int i = 0;
        if (   SQLBindParameter(m_hstmt, ++i, SQL_PARAM_INPUT,
SQL_C_SSHORT, SQL_SMALLINT, 0, 0, &m_txn.OrderStatus.w_id, 0,
NULL) != SQL_SUCCESS
                || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.OrderStatus.d_id, 0, NULL) != SQL_SUCCESS
```

```
                        || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.OrderStatus.c_id, 0, NULL) != SQL_SUCCESS
                        || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_CHAR, SQL_CHAR,
sizeof(m_txn.OrderStatus.c_last), 0, &m_txn.OrderStatus.c_last,
sizeof(m_txn.OrderStatus.c_last), NULL) != SQL_SUCCESS
                        )
                        ThrowError(CODBCERR::eBindParam);

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

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


        if ( SQLSetStmtAttrW( m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descOrderStatusCols2, SQL_IS_POINTER ) != SQL_SUCCESS )
                        ThrowError(CODBCERR::eSetStmtAttr);

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

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

        m_hstmt = m_hstmtOrderStatus;

        if ( SQLSetStmtAttrW( m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descOrderStatusCols1, SQL_IS_POINTER ) != SQL_SUCCESS )
                        ThrowError(CODBCERR::eSetStmtAttr);

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

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

ThrowError(CODBCERR::eSetStmtAttr);

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

ThrowError(CODBCERR::eExecDirect);

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

ThrowError(CODBCERR::eSetStmtAttr);

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

ThrowError(CODBCERR::eFetchScroll);

                                        m_txn.OrderStatus.o_ol_cnt =
(short)m_RowsFetched;

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

ThrowError(CODBCERR::eSetStmtAttr);

                                                        if ( SQLMoreResults(m_hstmt) ==
SQL_ERROR )

ThrowError(CODBCERR::eMoreResults);

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

ThrowError(CODBCERR::eFetch);
                                        }
```

```
                                        SQLFreeStmt(m_hstmt, SQL_CLOSE);

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

m_txn.OrderStatus.exec_status_code = eOK;

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

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

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

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

                        m_hstmt = m_hstmtDelivery;

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

                        for (i=0;i<10;i++)
                        {
                                if ( SQLBindCol(m_hstmt, (UWORD)(i+1),
SQL_C_SLONG, &m_txn.Delivery.o_id[i], 0, NULL) != SQL_SUCCESS )
                                        ThrowError(CODBCERR::eBindCol);
                        }
}

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

                        m_hstmt = m_hstmtDelivery;

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

ThrowError(CODBCERR::eExecDirect);

                                        if ( SQLFetch(m_hstmt) == SQL_ERROR )

ThrowError(CODBCERR::eFetch);

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

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

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

tpcc_odbc.h

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

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

class CODBCERR : public CBaseErr
{
        public:
                enum ACTION
                {
```

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

                CODBCERR(void)
                {
                        m_eAction = eNone;
                        m_NativeError = 0;
                        m_bDeadLock = FALSE;
                        m_odbcerrstr = NULL;
                };

                ~CODBCERR()
                {
                        if (m_odbcerrstr != NULL)
                                delete [] m_odbcerrstr;
                };

                ACTION  m_eAction;
                int             m_NativeError;
                BOOL    m_bDeadLock;
                char   *m_odbcerrstr;

                int ErrorType() {return ERR_TYPE_ODBC;};
                int ErrorNum() {return m_NativeError;};
                char *ErrorText() {return m_odbcerrstr;};

};

class CTPCC_ODBC_ERR : public CBaseErr
{
        public:
                enum TPCC_ODBC_ERRS
                {
                        ERR_WRONG_SP_VERSION = 1,       // "Wrong version of stored procs on database server"
                        ERR_INVALID_CUST,
// "Invalid Customer id,name."
                        ERR_NO_SUCH_ORDER,
// "No orders found for customer."
                        ERR_RETRIED_TRANS,
// "Retries before transaction succeeded."
                };

                CTPCC_ODBC_ERR( int iErr ) { m_errno = iErr; m_iTryCount = 0; };

                CTPCC_ODBC_ERR( int iErr, int iTryCount ) { m_errno = iErr; m_iTryCount = iTryCount; };

                int             m_errno;
                int             m_iTryCount;

                int ErrorType() {return ERR_TYPE_TPCC_ODBC;};
                int ErrorNum() {return m_errno;};

                char *ErrorText();
};

class DllDecl CTPCC_ODBC : public CTPCC_BASE
{
        private:
                // declare variables and private functions here...
                BOOL            m_bDeadlock;            // transaction was selected as deadlock victim
                int                     m_MaxRetries;
// retry count on deadlock

                SQLHENV                 m_henv;
        // ODBC environment handle
                SQLHDBC                 m_hdbc;
                SQLHSTMT        m_hstmt;                // the current hstmt

                SQLHSTMT        m_hstmtNewOrder;
                SQLHSTMT        m_hstmtPayment;
                SQLHSTMT        m_hstmtDelivery;
                SQLHSTMT        m_hstmtOrderStatus;
                SQLHSTMT        m_hstmtStockLevel;

                SQLHDESC        m_descNewOrderCols1;
                SQLHDESC        m_descNewOrderCols2;
                SQLHDESC        m_descOrderStatusCols1;
                SQLHDESC        m_descOrderStatusCols2;

                // new-order specific fields
                SQLUINTEGER     m_BindOffset;
                SQLUINTEGER     m_RowsFetched;
                int                     m_no_commit_flag;

                void ThrowError( CODBCERR::ACTION eAction );

                void InitNewOrderParams();
                void InitPaymentParams();
                void InitDeliveryParams();
                void InitStockLevelParams();
                void InitOrderStatusParams();

                union
                {
                        NEW_ORDER_DATA          NewOrder;
                        PAYMENT_DATA            Payment;
                        DELIVERY_DATA           Delivery;
                        STOCK_LEVEL_DATA        StockLevel;
                        ORDER_STATUS_DATA       OrderStatus;
```

```
                }                                       m_txn;

        public:
                CTPCC_ODBC(LPCSTR szServer, LPCSTR szUser,
LPCSTR szPassword, LPCSTR szHost, LPCSTR szDatabase);
                ~CTPCC_ODBC(void);

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

                void NewOrder                   ();
                void Payment                    ();
                void Delivery                   ();
                void StockLevel                 ();
                void OrderStatus        ();

};


// wrapper routine for class constructor
extern "C" DllDecl CTPCC_ODBC* CTPCC_ODBC_new
        ( LPCSTR szServer, LPCSTR szUser, LPCSTR szPassword,
LPCSTR szHost, LPCSTR szDatabase );

typedef CTPCC_ODBC* (TYPE_CTPCC_ODBC)(LPCSTR, LPCSTR,
LPCSTR, LPCSTR, LPCSTR);
```

tpcc_tux.cpp

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

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

#include <tmenv.h>
#include <xa.h>
#include <atmi.h>

#ifdef ICECAP
// for IceCAP profiling
#include <icapexp.h>
#endif

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

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

static TPINIT                                   *tpinf;
static DWORD                                    TLSIsTpInitedKey;
static CRITICAL_SECTION                 TpCriticalSection;


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

                        // create thread local storage to determine
Tuxedo initialization per thread.
                        // it really should be possible to do this in the
DLL_THREAD_ATTACH call, but
                        // Ed says he could not get it to work.
                        // assumption:value init'd to 0
                        TLSIsTpInitedKey = TlsAlloc();

                        if ((tpinf = (TPINIT *)tpalloc("TPINIT",
NULL, sizeof(TPINIT))) == NULL)
                        {
                                // int TpRc = tperrno;
                                return FALSE;
                        }
                        tpinf->flags |= TPMULTICONTEXTS;

                        InitializeCriticalSection(&TpCriticalSection);
                        break;

                case DLL_PROCESS_DETACH:
                        TlsFree(TLSIsTpInitedKey);
                        DeleteCriticalSection(&TpCriticalSection);
                        break;

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

static void ThrTpInit()
{
        static int num_tpinits=0;
        int iRc, TpRc;

        // has this thread been initialized?  check thread local storage
        if(!TlsGetValue(TLSIsTpInitedKey))
        {
```

```
                        EnterCriticalSection(&TpCriticalSection);
                        itoa(++num_tpinits, tpinf->cltname, 10);

                        iRc = tpinit(tpinf);
                        TpRc = tperrno;
                        LeaveCriticalSection(&TpCriticalSection);

                        if (iRc < 0)
                                throw new CTUXERR( tperrno );

                        int value = 1;
                        TlsSetValue(TLSIsTpInitedKey,&value);
                }
}

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_TUXEDO* CTPCC_TUXEDO_new()
{
        return new CTPCC_TUXEDO();
}

CTPCC_TUXEDO::CTPCC_TUXEDO()
{
        //      Add initialization of Tuxedo Structures
        m_txn = (TUX_DATA *)tpalloc("CARRAY", NULL,
sizeof(TUX_DATA));
        if (m_txn == NULL)
                throw new CTUXERR( tperrno );
}

CTPCC_TUXEDO::~CTPCC_TUXEDO()
{
        // free the data structure allocated with tpalloc
        tpfree((char *)m_txn);
}

void CTPCC_TUXEDO::NewOrder()
{
        long    ilen, *olen;

        ThrTpInit();

        ilen = sizeof(TUX_DATA);
        olen = &ilen;

        if (tpcall("NEWORDER", (char *)m_txn, ilen, (char **)&m_txn,
(long *)olen, TPSIGRSTRT) == -1)
                throw new CTUXERR( tperrno );

        if ( m_txn->ErrorType != ERR_SUCCESS )
                throw new CTUXERR( m_txn->ErrorType, m_txn->error
);
}

void CTPCC_TUXEDO::Payment()
{
        long    ilen, *olen;

        ThrTpInit();

        ilen = sizeof(TUX_DATA);
        olen = &ilen;

        if (tpcall("PAYMENT", (char *)m_txn, ilen, (char **)&m_txn, (long
*)olen, TPSIGRSTRT) == -1)
                throw new CTUXERR( tperrno );

        if ( m_txn->ErrorType != ERR_SUCCESS )
                throw new CTUXERR( m_txn->ErrorType, m_txn->error
);
}

void CTPCC_TUXEDO::Delivery()
{
        int             iRc;
        long    ilen, *olen;

        // Note: Delivery txn code in the tuxedo server does not implement
logging of the delivery
        //      txn results, so cannot be used as is to run an auditable TPC-C
result.  For that
        //      reason, delivery txns should not be done via tuxedo.
        //      The code is included for completeness.
        m_txn->u.Delivery.exec_status_code = eDeliveryFailed;
        return;

        //  normal path...

        ThrTpInit();

        GetLocalTime(&m_txn->u.Delivery.queue_time);

        ilen = sizeof(TUX_DATA);
        olen = &ilen;

        if ((iRc = tpacall("DELIVERY", (char *)m_txn, ilen,
TPNOREPLY)) == -1)
        {
                int TpRc = tperrno;
                m_txn->u.Delivery.exec_status_code = eDeliveryFailed;
        }
        else
                m_txn->u.Delivery.exec_status_code = eOK;

}

void CTPCC_TUXEDO::StockLevel()
{
        long    ilen, *olen;

        ThrTpInit();

        ilen = sizeof(TUX_DATA);
        olen = &ilen;

        if (tpcall("STOCKLEVEL", (char *)m_txn, ilen, (char **)&m_txn,
(long *)olen, TPSIGRSTRT) == -1)
                throw new CTUXERR( tperrno );

        if ( m_txn->ErrorType != ERR_SUCCESS )
                throw new CTUXERR( m_txn->ErrorType, m_txn->error
);
}

void CTPCC_TUXEDO::OrderStatus()
{
        long    ilen, *olen;

        ThrTpInit();

        ilen = sizeof(TUX_DATA);
        olen = &ilen;

        if (tpcall("ORDERSTATUS", (char *)m_txn, ilen, (char **)&m_txn,
(long *)olen, TPSIGRSTRT) == -1)
                throw new CTUXERR( tperrno );
```

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

char *CTUXERR::ErrorText()
{
	if (m_iErrorType == 0)
	{
		if (m_errno == TPEOS)
			sprintf( m_szErrorText, "Error: TUXEDO
error # %d, OS error # %d", m_errno, m_iError );
		else
			sprintf( m_szErrorText, "Error: TUXEDO
error # %d", m_errno );
	}
	else
		sprintf( m_szErrorText, "Error: Class %d, error # %d",
m_iErrorType, m_iError );
	return m_szErrorText;
};
```

tpcc_tux.h

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

#pragma once

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

class DllDecl CTPCC_TUXEDO : public CTPCC_BASE
{
	private:
		struct TUX_DATA
		{
			int
ErrorType;
			int
error;

			union
			{
				NEW_ORDER_DATA
NewOrder;
				PAYMENT_DATA
Payment;
				DELIVERY_DATA
Delivery;
				STOCK_LEVEL_DATA
StockLevel;
				ORDER_STATUS_DATA
OrderStatus;
			} u;
		} *m_txn;

	public:
		CTPCC_TUXEDO();
		~CTPCC_TUXEDO(void);

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

		void NewOrder		();
		void Payment		();
		void Delivery		();
		void StockLevel		();
		void OrderStatus	();

};

class CTUXERR : public CBaseErr
{
	private:

		// TODO: should use the sz_Msg field of the base class
instead
		char m_szErrorText[64];

	public:
		// use this interface for genuine Tuxedo errors
		CTUXERR( int iErr )
		{
			m_errno = iErr;
			m_iErrorType = 0;
			m_iError = GetLastError();	// only
meaningful if m_errno == TPEOS
		};

		// use this interface to impersonate a non-Tuxedo error
type
		CTUXERR( int iErrorType, int iError )
		{
			m_iErrorType = iErrorType;
			m_iError = iError;
			m_errno = 0;
		}

		int		m_errno;
		int		m_iErrorType;
		int		m_iError;

		// A CTUXERR class can impersonate another class,
which happens if the error
		// was not actually a Tuxedo error, but was simply
transmitted back via Tuxedo.
		int ErrorType()
		{
```

```
                        if (m_iErrorType == 0)
                                return ERR_TYPE_TUXEDO;
                        else
                                return m_iErrorType;
                }

                int ErrorNum() {return m_errno;};
                char *ErrorText();
};

// wrapper routine for class constructor
extern "C" __declspec(dllexport) CTPCC_TUXEDO*
CTPCC_TUXEDO_new();

typedef CTPCC_TUXEDO* (TYPE_CTPCC_TUXEDO)();
```

trans.h

```
/*          FILE:               TRANS.H
 *                              Microsoft TPC-C Kit Ver.
4.20.000
 *                              Copyright Microsoft, 1999
 *          All Rights Reserved
 *
 *                              Version 4.10.000 audited by
Richard Gimarc, Performance Metrics, 3/17/99
 *
 *          PURPOSE:            Header file for TPC-C structure templates.
 *
 *  Change history:
 *                      4.20.000 - updated rev number to match kit
 */
#pragma once

// String length constants
#define SERVER_NAME_LEN         20
#define DATABASE_NAME_LEN       20
#define USER_NAME_LEN           20
#define PASSWORD_LEN            20
#define TABLE_NAME_LEN          20
#define I_DATA_LEN              50
#define I_NAME_LEN              24
#define BRAND_LEN               1
#define LAST_NAME_LEN           16
#define W_NAME_LEN              10
#define ADDRESS_LEN             20
#define STATE_LEN               2
#define ZIP_LEN                 9
#define S_DIST_LEN              24
#define S_DATA_LEN              50
#define D_NAME_LEN              10
#define FIRST_NAME_LEN          16
#define MIDDLE_NAME_LEN         2
#define PHONE_LEN               16
#define DATETIME_LEN            30
#define CREDIT_LEN              2
#define C_DATA_LEN              250
#define H_DATA_LEN              24
#define DIST_INFO_LEN           24
#define MAX_OL_NEW_ORDER_ITEMS  15
#define MAX_OL_ORDER_STATUS_ITEMS 15
#define STATUS_LEN              25
#define OL_DIST_INFO_LEN        24

// TIMESTAMP_STRUCT is provided by the ODBC header file sqltypes.h, but
is not available
// when compiling with dblib, so redefined here.  Note: we are using the symbol
"__SQLTYPES"
// (declared in sqltypes.h) as a way to determine if TIMESTAMP_STRUCT has
been declared.
#ifndef __SQLTYPES
        typedef struct
        {
                short           /*
SQLSMALLINT */    year;
                unsigned short  /* SQLUSMALLINT
*/          month;
                unsigned short  /* SQLUSMALLINT
*/          day;
                unsigned short  /* SQLUSMALLINT
*/          hour;
                unsigned short  /* SQLUSMALLINT
*/          minute;
                unsigned short  /* SQLUSMALLINT
*/          second;
                unsigned long   /* SQLUINTEGER */
fraction;
        } TIMESTAMP_STRUCT;
#endif

// possible values for exec_status_code after transaction completes
enum EXEC_STATUS
{
        eOK,                    // 0        "Transaction
commited."
        eInvalidItem,   // 1        "Item number is not valid."
        eDeliveryFailed // 2        "Delivery Post Failed."
};

// transaction structures
typedef struct
{
        // input params
        short                           ol_supply_w_id;
        long                            ol_i_id;
        short                           ol_quantity;

        // output params
        char
ol_i_name[I_NAME_LEN+1];
        char
ol_brand_generic[BRAND_LEN+1];
        double                          ol_i_price;
        double                          ol_amount;
        short                           ol_stock;
} OL_NEW_ORDER_DATA;

typedef struct
{
        // input params
        short           w_id;
        short           d_id;
        long            c_id;
        short           o_ol_cnt;

        // output params
        EXEC_STATUS                     exec_status_code;
        char            c_last[LAST_NAME_LEN+1];
        char            c_credit[CREDIT_LEN+1];
        double          c_discount;
        double          w_tax;
        double          d_tax;
        long                    o_id;
        short                           o_commit_flag;
```

```
        TIMESTAMP_STRUCT        o_entry_d;
        short                   o_all_local;
        double                  total_amount;
        OL_NEW_ORDER_DATA
OL[MAX_OL_NEW_ORDER_ITEMS];
} NEW_ORDER_DATA, *PNEW_ORDER_DATA;

typedef struct
{       // input params
        short                           w_id;
        short                           d_id;
        long                            c_id;
        short                           c_d_id;
        short                           c_w_id;
        double                          h_amount;
        char                    c_last[LAST_NAME_LEN+1];

        // output params
        EXEC_STATUS                             exec_status_code;
        TIMESTAMP_STRUCT        h_date;
        char                            w_street_1[ADDRESS_LEN+1];
        char                            w_street_2[ADDRESS_LEN+1];
        char                            w_city[ADDRESS_LEN+1];
        char                            w_state[STATE_LEN+1];
        char                            w_zip[ZIP_LEN+1];
        char                            d_street_1[ADDRESS_LEN+1];
        char                            d_street_2[ADDRESS_LEN+1];
        char                            d_city[ADDRESS_LEN+1];
        char                            d_state[STATE_LEN+1];
        char                    d_zip[ZIP_LEN+1];
        char                            c_first[FIRST_NAME_LEN+1];
        char                            c_middle[MIDDLE_NAME_LEN
+ 1];
        char                            c_street_1[ADDRESS_LEN+1];
        char                            c_street_2[ADDRESS_LEN+1];
        char                            c_city[ADDRESS_LEN+1];
        char                            c_state[STATE_LEN+1];
        char                            c_zip[ZIP_LEN+1];
        char                            c_phone[PHONE_LEN+1];
        TIMESTAMP_STRUCT        c_since;
        char                            c_credit[CREDIT_LEN+1];
        double                          c_credit_lim;
        double                          c_discount;
        double                          c_balance;
        char                            c_data[200+1];
} PAYMENT_DATA, *PPAYMENT_DATA;

typedef struct
{
        long                            ol_i_id;
        short                           ol_supply_w_id;
        short                           ol_quantity;
        double                          ol_amount;
        TIMESTAMP_STRUCT        ol_delivery_d;
} OL_ORDER_STATUS_DATA;

typedef struct
{       // input params
        short           w_id;
        short           d_id;
        long            c_id;
        char            c_last[LAST_NAME_LEN+1];

        // output params
        EXEC_STATUS                             exec_status_code;
        char            c_first[FIRST_NAME_LEN+1];
        char            c_middle[MIDDLE_NAME_LEN+1];
        double           c_balance;
        long            o_id;
        TIMESTAMP_STRUCT        o_entry_d;
        short           o_carrier_id;
        OL_ORDER_STATUS_DATA
OL[MAX_OL_ORDER_STATUS_ITEMS];
        short           o_ol_cnt;
} ORDER_STATUS_DATA, *PORDER_STATUS_DATA;


typedef struct
{       // input params
        short                   w_id;
        short                   o_carrier_id;

        // output params
        EXEC_STATUS                             exec_status_code;
        SYSTEMTIME                      queue_time;
        long                                    o_id[10];               //
id's of delivered orders for districts 1 to 10
} DELIVERY_DATA, *PDELIVERY_DATA;

//This structure is used for posting delivery transactions and for writing them to
the delivery server.
typedef struct _DELIVERY_TRANSACTION
{
        SYSTEMTIME      queue;                          //time
delivery transaction queued
        short                   w_id;                           //delivery
warehouse
        short                   o_carrier_id;           //carrier id
} DELIVERY_TRANSACTION;

typedef struct
{       // input params
        short                                   w_id;
        short                                   d_id;
        short                                   threshold;

        // output params
        EXEC_STATUS                             exec_status_code;
        long                                    low_stock;
} STOCK_LEVEL_DATA, *PSTOCK_LEVEL_DATA;
```

tuxapp.cpp

```
/*      FILE:           TUXAPP.CPP
 *                              Microsoft TPC-C Kit Ver.
4.20.000
 *                              Copyright Microsoft, 1999
 *      All Rights Reserved
 *
 *                              Version 4.10.000 audited by
Richard Gimarc, Performance Metrics, 3/17/99
 *
 *      PURPOSE:        Implementation for TPC-C Tuxedo server.
 *      Contact:    Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *                  4.20.000 - updated rev number to match kit
 */

#include <windows.h>
#include <process.h>
#include <tchar.h>
#include <stdio.h>
#include <stdarg.h>
#include <iostream.h>
```

```
#include <malloc.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include <sys\timeb.h>
#include <io.h>
#include <assert.h>

#include <sqltypes.h>
#include <sql.h>
#include <sqlext.h>

#include <tmenv.h>
#include <xa.h>
#include <atmi.h>

#include "..\..\common\src\trans.h"                    //tpckit transaction
header contains definations of structures specific to TPC-C
#include "..\..\common\src\error.h"
#include "..\..\common\src\txn_base.h"
#include "..\..\common\src\ReadRegistry.h"
#include "..\..\db_dblib_dll\src\tpcc_dblib.h"         // DBLIB
implementation of TPC-C txns
#include "..\..\db_odbc_dll\src\tpcc_odbc.h"           // ODBC
implementation of TPC-C txns
#include "tuxapp.h"

char        szMyComputerName[MAX_COMPUTERNAME_LENGTH+1];

// configuration settings from registry
TPCCREGISTRYDATA                Reg;

CTPCC_BASE                      *pTxn = NULL;


#include "..\..\common\src\ReadRegistry.cpp"

/* FUNCTION: tpsvrinit ( int argc, char *argv[])
 *
 * PURPOSE:         Initialize the Server to Database connection.
 *
 * RETURNS:                     int         0           Success
 *                                                      -1          Failure
 */

int tpsvrinit ( int argc, char *argv[] )
{
        try
        {
                DWORD dwSize =
MAX_COMPUTERNAME_LENGTH+1;
                GetComputerName(szMyComputerName, &dwSize);
                szMyComputerName[dwSize] = 0;

                if ( ReadTPCCRegistrySettings( &Reg ) )
                        throw new CTUXAPP_ERR(
ERR_MISSING_REGISTRY_ENTRIES );

                GetParameters(argc, argv);

                switch (Reg.eDB_Protocol)
                {
                case ODBC:
                        pTxn = new CTPCC_ODBC(
Reg.szDbServer, Reg.szDbUser, Reg.szDbPassword, szMyComputerName,
Reg.szDbName );
                        break;
                case DBLIB:
                        pTxn = new CTPCC_DBLIB(
Reg.szDbServer, Reg.szDbUser, Reg.szDbPassword, szMyComputerName,
Reg.szDbName );
                        break;
                }
        }
        catch (CBaseErr *e)
        {
                WriteMessageToEventLog(e->ErrorText());
                delete e;
        }
        catch (...)
        {
                WriteMessageToEventLog(TEXT("Unhandled
exception."));
        }

        return 0;
}

/* FUNCTION: tpsvrdone ( void )
 *
 */

void tpsvrdone ( void )
{
        delete pTxn;
        pTxn = NULL;
}

/* FUNCTION: BOOL GetParameters(int argc, char *argv[])
 *
 * PURPOSE:         This function parses the command line passed in to the
delivery executable, initializing
 *                              and filling in global variable parameters.
 *
 * ARGUMENTS:   int                     argc        number of command
line arguments passed to delivery
 *                                      char        *argv[]     array of
command line argument pointers
 *
 */

static void GetParameters(int argc, char *argv[])
{
        // advance through args until "--" is found
        for(int j=0; j<argc; j++)
        {
                if (strcmp(argv[j],"--") == 0)
                        break;
        }

        for(int i=j+1; i<argc; i++)
        {
                if ( argv[i][0] == '-' || argv[i][0] == '/' )
                {
                        switch(argv[i][1])
                        {
                                case 'S':
                                        strcpy(Reg.szDbServer,
argv[i]+2);
                                        break;
                                case 'D':
                                        strcpy(Reg.szDbName,
argv[i]+2);
                                        break;
                                case 'P':
```

```
strcpy(Reg.szDbPassword, argv[i]+2);
                                                        break;
                                                case 'U':
                                                        strcpy(Reg.szDbUser,
argv[i]+2);
                                                        break;
                                                default:
                                                        cout << "Microsoft
TPC-C Kit" << endl;
                                                        cout << "Tuxedo
Server" << endl << endl;
                                                        cout << "Usage:" <<
endl;
                                                        cout << "    tuxapp
[<tuxedo-args>] -- -S<sql-server> [-D<database>] [-U<user>] [-P<password>]"
<< endl << endl;
                                                        cout << "All parameters
default to values in registry." << endl;
                                                        throw new
CTUXAPP_ERR( ERR_BAD_SYNTAX );
                                        }
                        }
                }
}

static void WriteMessageToEventLog(LPTSTR lpszMsg)
{
   TCHAR   szMsg[256];
   HANDLE  hEventSource;
   LPTSTR  lpszStrings[2];

   // Use event logging to log the error.
   //
   hEventSource = RegisterEventSource(NULL, TEXT("TUXAPP.EXE"));

   _stprintf(szMsg, TEXT("Error in TUXAPP.EXE: "));
   lpszStrings[0] = szMsg;
   lpszStrings[1] = lpszMsg;

   if (hEventSource != NULL)
           {
      ReportEvent(hEventSource, // handle of event source
         EVENTLOG_ERROR_TYPE,  // event type
         0,                    // event category
         0,                    // event ID
         NULL,                 // current user's SID
         2,                    // strings in lpszStrings
         0,                    // no bytes of raw data
         (LPCTSTR *)lpszStrings,    // array of error strings
         NULL);                // no raw data

      (VOID) DeregisterEventSource(hEventSource);
   }
}

void NEWORDER( TPSVCINFO *rqst )
{
        PNEW_ORDER_DATA         pNewOrder;
        TUX_DATA                *pData;
        const int               iSize = sizeof(pData->u.NewOrder);

        try
        {
                pData = (TUX_DATA*)rqst->data;
                pData->retval = ERR_SUCCESS;
                pData->error = 0;
                pNewOrder = pTxn->BuffAddr_NewOrder();
                assert( rqst->len == sizeof(TUX_DATA) );
                memcpy(pNewOrder, &pData->u.NewOrder, iSize );

                pTxn->NewOrder();
                memcpy( &pData->u.NewOrder, pNewOrder, iSize );
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
        }
        catch (CBaseErr *e)
        {
                pData->retval = e->ErrorType();
                pData->error = e->ErrorNum();
                memcpy( &pData->u.NewOrder, pNewOrder, iSize );
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
                delete e;
        }
        catch (...)
        {
                WriteMessageToEventLog(TEXT("Unhandled
exception."));
                pData->retval = ERR_TYPE_LOGIC;
                pData->error = 0;
                memcpy( &pData->u.NewOrder, pNewOrder, iSize );
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
        }
}

void PAYMENT( TPSVCINFO *rqst )
{
        PPAYMENT_DATA  pPayment;
        TUX_DATA                *pData;
        const int               iSize = sizeof(pData->u.Payment);

        try
        {
                pData = (TUX_DATA*)rqst->data;
                pData->retval = ERR_SUCCESS;
                pData->error = 0;

                pPayment = pTxn->BuffAddr_Payment();
                assert( rqst->len == sizeof(TUX_DATA) );
                memcpy(pPayment, &pData->u.Payment, iSize );

                pTxn->Payment();
                memcpy( &pData->u.Payment, pPayment, iSize );
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
        }
        catch (CBaseErr *e)
        {
                pData->retval = e->ErrorType();
                pData->error = e->ErrorNum();
                memcpy( &pData->u.Payment, pPayment, iSize );
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
                delete e;
        }
        catch (...)
        {
                WriteMessageToEventLog(TEXT("Unhandled
exception."));
                pData->retval = ERR_TYPE_LOGIC;
                pData->error = 0;
                memcpy( &pData->u.Payment, pPayment, iSize );
```

```
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
        }
}

// Note: Delivery txn code below does not implement logging of the delivery
//       txn results, so cannot be used as is to run an auditable TPC-C result.
//       The code is included for completeness.
void DELIVERY( TPSVCINFO *rqst )
{
        PDELIVERY_DATA pDelivery;
        TUX_DATA                *pData;
        const int               iSize = sizeof(pData->u.Delivery);

        try
        {
                pData = (TUX_DATA*)rqst->data;
                pData->retval = ERR_SUCCESS;
                pData->error = 0;

                pDelivery = pTxn->BuffAddr_Delivery();
                assert( rqst->len == sizeof(TUX_DATA) );
                memcpy(pDelivery, &pData->u.Delivery, iSize );

                pTxn->Delivery();

                memcpy( &pData->u.Delivery, pDelivery, iSize );
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
        }
        catch (CBaseErr *e)
        {
                pData->retval = e->ErrorType();
                pData->error = e->ErrorNum();
                memcpy( &pData->u.Delivery, pDelivery, iSize );
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
                delete e;
        }
        catch (...)
        {
                WriteMessageToEventLog(TEXT("Unhandled
exception."));
                pData->retval = ERR_TYPE_LOGIC;
                pData->error = 0;
                memcpy( &pData->u.Delivery, pDelivery, iSize );
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
        }
}

void STOCKLEVEL( TPSVCINFO *rqst )
{
        PSTOCK_LEVEL_DATA       pStockLevel;
        TUX_DATA                        *pData;
        const int                       iSize =
sizeof(pData->u.StockLevel);

        try
        {
                pData = (TUX_DATA*)rqst->data;
                pData->retval = ERR_SUCCESS;
                pData->error = 0;

                pStockLevel = pTxn->BuffAddr_StockLevel();
                assert( rqst->len == sizeof(TUX_DATA) );
                memcpy(pStockLevel, &pData->u.StockLevel, iSize );
                pTxn->StockLevel();
                memcpy( &pData->u.StockLevel, pStockLevel, iSize );
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
        }
        catch (CBaseErr *e)
        {
                pData->retval = e->ErrorType();
                pData->error = e->ErrorNum();
                memcpy( &pData->u.StockLevel, pStockLevel, iSize );
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
                delete e;
        }
        catch (...)
        {
                WriteMessageToEventLog(TEXT("Unhandled
exception."));
                pData->retval = ERR_TYPE_LOGIC;
                pData->error = 0;
                memcpy( &pData->u.StockLevel, pStockLevel, iSize );
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
        }
}

void ORDERSTATUS( TPSVCINFO *rqst )
{
        PORDER_STATUS_DATA      pOrderStatus;
        TUX_DATA                        *pData;
        const int iSize = sizeof(pData->u.OrderStatus);

        try
        {
                pData = (TUX_DATA*)rqst->data;
                pData->retval = ERR_SUCCESS;
                pData->error = 0;

                pOrderStatus = pTxn->BuffAddr_OrderStatus();
                assert( rqst->len == sizeof(TUX_DATA) );
                memcpy(pOrderStatus, &pData->u.OrderStatus, iSize );

                pTxn->OrderStatus();
                memcpy( &pData->u.OrderStatus, pOrderStatus, iSize );
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
        }
        catch (CBaseErr *e)
        {
                pData->retval = e->ErrorType();
                pData->error = e->ErrorNum();
                memcpy( &pData->u.OrderStatus, pOrderStatus, iSize );
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
                delete e;
        }
        catch (...)
        {
                WriteMessageToEventLog(TEXT("Unhandled
exception."));
                pData->retval = ERR_TYPE_LOGIC;
                pData->error = 0;
                memcpy( &pData->u.OrderStatus, pOrderStatus, iSize );
                tpreturn( TPSUCCESS, 0, rqst->data,
sizeof(TUX_DATA), 0);
        }
}
```

```
/* FUNCTION: CTUXAPP_ERR::ErrorText
 *
 */

char* CTUXAPP_ERR::ErrorText(void)
{
        int i;

        static SERRORMSG errorMsgs[] =
        {
                { ERR_MISSING_REGISTRY_ENTRIES,  "Required
entries missing from registry."                 },
                { ERR_BAD_SYNTAX,
"Syntax error in input parameters."
},
                { ERR_UNKNOWN_DB_PROTOCOL,
"Unknown database protocol specified in registry."      },
                { 0,
        ""
                                                                }
        };

        static char szNotFound[] = "Unknown error number.";

        for(i=0; errorMsgs[i].szMsg[0]; i++)
        {
                if ( m_Error == errorMsgs[i].iError )
                        break;
        }
        if ( !errorMsgs[i].szMsg[0] )
                return szNotFound;
        else
                return errorMsgs[i].szMsg;
}
```

tuxapp.h

```
/*      FILE:           TUXAPP.H
 *                              Microsoft TPC-C Kit Ver.
4.20.000
 *                              Copyright Microsoft, 1999
 *      All Rights Reserved
 *
 *                              Version 4.10.000 audited by
Richard Gimarc, Performance Metrics, 3/17/99
 *
 *      PURPOSE:        Header file for TPC-C Tuxedo server.
 *
 *  Change history:
 *              4.20.000 - updated rev number to match kit
 */

enum TUXERROR
{
        ERR_MISSING_REGISTRY_ENTRIES = 1,
        ERR_BAD_SYNTAX,
        ERR_UNKNOWN_DB_PROTOCOL
};

class CTUXAPP_ERR : public CBaseErr
{
        public:
                TUXERROR m_Error;

                CTUXAPP_ERR(TUXERROR Err) {     m_Error =
Err; };
                ~CTUXAPP_ERR() {};
                int ErrorType() {return ERR_TYPE_TUXEDO;};
                int ErrorNum() {return m_Error;};
                char *ErrorText();
};

struct TUX_DATA
{
        int                                             retval;
        int                                             error;

        union
        {
                NEW_ORDER_DATA                  NewOrder;
                PAYMENT_DATA            Payment;
                DELIVERY_DATA           Delivery;
                STOCK_LEVEL_DATA        StockLevel;
                ORDER_STATUS_DATA       OrderStatus;
        } u;
};

static void GetParameters(int argc, char *argv[]);
static void WriteMessageToEventLog(LPTSTR lpszMsg);

#if defined(__cplusplus)
extern "C" {
#endif

void NEWORDER( TPSVCINFO *rqst );
void PAYMENT( TPSVCINFO *rqst );
void DELIVERY( TPSVCINFO *rqst );
void STOCKLEVEL( TPSVCINFO *rqst );
void ORDERSTATUS( TPSVCINFO *rqst );

#if defined(__cplusplus)
}
#endif
```

tuxmain.c

```
/*      FILE:           TUXMAIN.C
 *                              Microsoft TPC-C Kit Ver.
4.20.000
 *                              Copyright Microsoft, 1999
 *      All Rights Reserved
 *
 *                              Version 4.10.000 audited by
Richard Gimarc, Performance Metrics, 3/17/99
 *
 *      PURPOSE:        Implementation for TPC-C Tuxedo server.
 *      Contact:    Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *              4.20.000 - updated rev number to match kit
 */

#include <stdio.h>
#include <xa.h>
#include <atmi.h>

#if defined(__cplusplus)
extern "C" {
#endif
extern int _tmrunserver _((int));
extern void DELIVERY _((TPSVCINFO *));
extern void NEWORDER _((TPSVCINFO *));
extern void ORDERSTATUS _((TPSVCINFO *));
```

```
extern void PAYMENT _((TPSVCINFO *));
extern void STOCKLEVEL _((TPSVCINFO *));
#if defined(__cplusplus)
}
#endif

static struct tmdsptchtbl_t _tmdsptchtbl[] = {
        { "DELIVERY", "DELIVERY", (void (*) _((TPSVCINFO *)))
DELIVERY, 0, 0 },
        { "NEWORDER", "NEWORDER", (void (*) _((TPSVCINFO *)))
NEWORDER, 1, 0 },
        { "ORDERSTATUS", "ORDERSTATUS", (void (*)
_((TPSVCINFO *))) ORDERSTATUS, 2, 0 },
        { "PAYMENT", "PAYMENT", (void (*) _((TPSVCINFO *)))
PAYMENT, 3, 0 },
        { "STOCKLEVEL", "STOCKLEVEL", (void (*) _((TPSVCINFO
*))) STOCKLEVEL, 4, 0 },
        { NULL, NULL, NULL, 0, 0 }
};

#ifndef _TMDLLIMPORT
#define _TMDLLIMPORT
#endif

_TMDLLIMPORT extern struct xa_switch_t tmnull_switch;

struct tmsvrargs_t tmsvrargs = {
        NULL,
        &_tmdsptchtbl[0],
        0,
        tpsvrinit,
        tpsvrdone,
        _tmrunserver,           /* PRIVATE  */
        NULL,                           /* RESERVED */
        NULL,                           /* RESERVED */
        NULL,                           /* RESERVED */
        NULL                            /* RESERVED */
};

struct tmsvrargs_t *
#ifdef _TMPROTOTYPES
_tmgetsvrargs(void)
#else
_tmgetsvrargs()
#endif
{
        tmsvrargs.xa_switch = &tmnull_switch;
        return(&tmsvrargs);
}

int
#ifdef _TMPROTOTYPES
main(int argc, char **argv)
#else
main(argc,argv)
int argc;
char **argv;
#endif
{
#ifdef TMMAINEXIT
#include "mainexit.h"
#endif

        return( _tmstartserver( argc, argv, _tmgetsvrargs()));
}
```

txn_base.h

```
/*      FILE:           TXN_BASE.H
 *                              Microsoft TPC-C Kit Ver.
4.20.000
 *                              Copyright Microsoft, 1999
 *      All Rights Reserved
 *
 *                              Version 4.10.000 audited by
Richard Gimarc, Performance Metrics, 3/17/99
 *
 *      PURPOSE:        Header file for TPC-C txn class
implementation.
 *
 *  Change history:
 *              4.20.000 - updated rev number to match kit
 */

#pragma once

// need to declare functions for import, unless define has already been created
// by the DLL's .cpp module for export.
#ifndef DllDecl
#define DllDecl  __declspec( dllimport )
#endif

class DllDecl CTPCC_BASE
{
        public:
                CTPCC_BASE(void) {};
                virtual ~CTPCC_BASE(void) {};

                virtual PNEW_ORDER_DATA
BuffAddr_NewOrder()             = 0;
                virtual PPAYMENT_DATA
BuffAddr_Payment()      = 0;
                virtual PDELIVERY_DATA
BuffAddr_Delivery()     = 0;
                virtual PSTOCK_LEVEL_DATA
BuffAddr_StockLevel()   = 0;
                virtual PORDER_STATUS_DATA
BuffAddr_OrderStatus()  = 0;

                virtual void NewOrder                   () = 0;
                virtual void Payment            () = 0;
                virtual void Delivery           () = 0;
                virtual void StockLevel                 () = 0;
                virtual void OrderStatus        () = 0;
};
```

txnlog.h

```
/*      FILE:           TXNLOG.H
 *                              Microsoft TPC-C Kit Ver.
4.10.000
 *
 *                              NOTE: this file is RTE specific
and should not be included
 *                              in Full Disclosure Reports.
 *
 *                              Copyright Microsoft, 1999
 *
 *      PURPOSE:        Structure definitions for logging delivery txn
completion stats.
 *      Contact:    Charles Levine (clevine@microsoft.com)
 */


  typedef struct _TXN_NEWORDER
```

```
        {
    BYTE        OL_Count;       //range 0 to 31
    BYTE        OL_Remote_Count;    //range 0 to 31
    WORD        c_id;
    int         o_id;
        } TXN_NEWORDER;

typedef struct _TXN_PAYMENT
        {
    BYTE        CustByName;
    BYTE        IsRemote;
        } TXN_PAYMENT;

typedef struct _TXN_ORDERSTATUS
        {
            BYTE    CustByName;
        } TXN_ORDERSTATUS;

        typedef union _TXN_DETAILS
        {
            TXN_NEWORDER   NewOrder;
            TXN_PAYMENT    Payment;
            TXN_ORDERSTATUS    OrderStatus;
        } TXN_DETAILS;


        // Common header for all records in txn log.  The TxnType field is
        // a switch which identifies the particular variant.
        #define TXN_REC_TYPE_CONTROL        1       //

        #define TXN_REC_TYPE_TPCC           2
// replaces TRANSACTION_TYPE_TPCC
        #define TXN_REC_TYPE_TPCC_DELIV_DEF     3

        typedef struct _TXN_RECORD_HEADER
        {
            JULIAN_TIME     TxnStartT0;         //
start of txn
            BYTE    TxnType;            // one of
TXN_REC_TYPE_*
            BYTE    TxnSubType;         //
depends on TxnType
        } TXN_RECORD_HEADER, *PTXN_RECORD_HEADER;


        typedef struct _TXN_RECORD_CONTROL
        {
            // common header; must exactly match
TXN_RECORD_HEADER
            JULIAN_TIME     TxnStartT0;         //
start of txn
            BYTE    TxnType;            // =
TXN_REC_TYPE_CONTROL
            BYTE    TxnSubType;         //
depends on TxnType
            // end of common header

            DWORD   Len;                //
number of bytes after this field
        } TXN_RECORD_CONTROL, *PTXN_RECORD_CONTROL;


        // TPC-C Txn Record Layout:
        //
  //'TxnStartT0' is a Julian timestamp corresponding to the moment the
  //txn is sent to the SUT, i.e., beginning of response time.  Deltas
  //are in milliseconds.  Note that if RTDelay > 0, then the txn was
  //delayed by this amount.  The delay occurs at the beginning of the
  //response time.  So if RTDelay > 0, then the txn was actually sent
  //at TxnStartT0 + RTDelay.
  //
  //Graphically:
  //
  //  time -->
  //
  //   |--- Menu  ---|-- Keying  --|-- Response --|--- Think  --|
  //    <- DeltaT1 -> <- DeltaT2 -> <- DeltaT4  -> <- DeltaT3 ->
  //                      ^
  //                      ^ TxnStartT0
  //
  //RTDelay is the amount of response time delay included in DeltaT4.
  //RTDelay is recorded per txn because this value can be changed on
  //the fly, and so may vary from txn to txn.
  //
  //TxnStatus is the txn completion code.  It is used to indicate errors.
  //For example, in the New Order txn, 1% of txns abort.  TxnStatus will
  //reflect this.

        typedef struct _TXN_RECORD_TPCC
        {
            // common header; must exactly match
TXN_RECORD_HEADER
            JULIAN_TIME     TxnStartT0;         //
start of txn
            BYTE    TxnType;            // =
TXN_REC_TYPE_TPCC
            BYTE    TxnSubType;         //
depends on TxnType
            // end of common header

            int     DeltaT1;            // menu time (ms)
            int     DeltaT2;            // keying time (ms)
            int     DeltaT3;            // think time (ms)
            int     DeltaT4;            // response time (ms)
            int     RTDelay;            // response time delay
(ms)
            int             TxnError;       // error code
providing more detail for TxnStatus
            WORD    w_id;               // warehouse
ID
            BYTE    d_id;               // assigned
district ID for this thread
            BYTE    d_id_ThisTxn;       // district ID chosen for
this particular
            BYTE    TxnStatus;          // completion status for
txn to indicate errors
            BYTE    reserved;           // for word alignment
            TXN_DETAILS     TxnDetails;     //
        } TXN_RECORD_TPCC, *PTXN_RECORD_TPCC;

        // TPC-C Deferred Delivery Txn Record Layout:
        //
  //Incorporating delivery transaction information into the above
        //structure would increase the size of TXN_DETAILS from 8 to 42
bytes.
  //Hence, we store delivery transaction details in a separate structure.
  //
        typedef struct _TXN_RECORD_TPCC_DELIV_DEF
        {
            // common header; must exactly match
TXN_RECORD_HEADER
            JULIAN_TIME     TxnStartT0;         //
start of txn
            BYTE    TxnType;            // =
TXN_REC_TYPE_TPCC_DELIV_DEF
```

```
                BYTE    TxnSubType;                     // = 0
                // end of common header

                int     DeltaT4;                // response time (ms)
                int             DeltaTxnExec;   // execution time (ms)
                WORD    w_id;                   // warehouse ID
                BYTE    TxnStatus;              // completion status for txn to indicate errors
                BYTE    reserved;               // for word alignment
                short   o_carrier_id;   // carrier id
                long    o_id[10];               // returned delivery transaction ids
        } TXN_RECORD_TPCC_DELIV_DEF, *PTXN_RECORD_TPCC_DELIV_DEF;



#define         TXN_LOG_VERSION                 1
#define         TXN_DATA_START          4096    // offset in log file where log records start
#define         TXN_LOG_EYE_CATCHER     "BC"    // signature bytes at the start of log file


        ////////////////////////////////////////////////////////////////////////
        // The transaction log has a header as the first 4K block.
        //
        typedef struct _TXN_LOG_HEADER
        {
                char                    EyeCatcher[2];  // signature bytes; should always be "BC"
                int                             LogVersion;
        // set to TXN_LOG_VERSION
                JULIAN_TIME             BeginTxnTS;
// timestamp of first (lowest) txn start
                JULIAN_TIME             EndTxnTS;
// timestamp of last (highest) txn completion time
                int                             iRecCount;
        // number of records in log file
                BOOL                    bLogSorted;
                int                             iFileSize;
// file size in bytes

                // the record map provides a fast way to get close to a particular timestamp in a sorted log file.
//              struct
//              {
//                      JULIAN_TIME             TS;
        // timestamp of record
//                      int
iPos;           // byte position in file
//              }
RecMap[RecMapSize];
//#define         RecMapSize                      200

        } TXN_LOG_HEADER, *PTXN_LOG_HEADER;



#define READ_BUFFER_SIZE                64*1024
#define WRITE_BUFFER_SIZE                8*1024

#define NUM_READ_BUFFERS                1
#define NUM_WRITE_BUFFERS               2
#define MAX_NUM_BUFFERS                 2

// flags passed in to the constructor
#define TXN_LOG_WRITE           0x01
#define TXN_LOG_READ            0x02
#define TXN_LOG_SORTED          0x04

#define TXN_LOG_OS_ERROR        1
#define TXN_LOG_NOT_SORTED      2

#define SKIP_CTRL_RECS          1

class CTxnLog
{
        private:
                DWORD           iBufferSize;
//buffer allocated size
                DWORD           iBytesFreeInBuffer;
//total bytes available for use in buffer
                int                             iNumBuffers;
        //buffers in use
                int                             iActiveBuffer;
        //indicates which buffer is active: 0 or 1
                int                             iIoBuffer;
        //buffer for any pending IO operation
                int                             iFilePointer;
        //position in file.
                int                             iNextRec;
        //when reading, ordinal value of next record

                // A "save point" is remembered each time GetNextRecord is called with a start time specified.
                // The next time it is called, if start time is after the save point, we start scanning from the
                // save point.  This is particularly useful in FindBestInterval, where the log is scanned repeatedly.
                JULIAN_TIME             SavePtTime;
                int
iSavePtFilePointer;
                int
iSavePtNextRec;

                JULIAN_TIME     lastTS;
        //when writing sorted output, used to verify records are sorted
                BOOL            bWrite;
        //writing log file

                BOOL                    bLogSorted;
        // is log file sorted?  applies to both input and output
                JULIAN_TIME             BeginTxnTS;
        // timestamp of first (lowest) txn start
                JULIAN_TIME             EndTxnTS;
        // timestamp of last (highest) txn completion time
                int                             iRecCount;
                // number of records in log file

                BYTE            *pCurrent;
//ptr to current buffer
                BYTE
*pBuffer[MAX_NUM_BUFFERS];

                PTXN_RECORD_HEADER      *TxnArray;
//transaction record pointer array for sort

                DWORD           dwError;
                HANDLE          hTxnFile;
//handle to log file
```

```
                        HANDLE          hMapFile;
//map file used when sorting the log
                        HANDLE          hIoComplete;
//event to signify that there are no pending IOs
                        HANDLE          hLogFileIo;
                //event to signal the IO thread to write the inactive buffer

                        Spinlock    Spin;
//spin lock to protect the txn log file buffers

                        int Write(BYTE *ptr, DWORD Size);
                        static void LogFileIO(CTxnLog *);

                public:
                        CTxnLog::CTxnLog(LPCTSTR szFileName, DWORD
dwOpts);
                        ~CTxnLog(void);

                        int WriteToLog(PTXN_RECORD_TPCC pTxnRcrd);
                        int WriteToLog(PTXN_RECORD_TPCC_DELIV_DEF
pTxnRcrd);
                        int WriteToLog(PTXN_RECORD_CONTROL
pCtrlRec);
                        int WriteToLog(PTXN_RECORD_HEADER pCtrlRec);

                        int WriteCtrlRecToLog(BYTE SubType, LPTSTR lpStr,
DWORD dwLen);

                        void CloseTransactionLogFile(void);

                        PTXN_RECORD_HEADER GetNextRecord(BOOL
bSkipCtrlRecs = FALSE);
                        PTXN_RECORD_HEADER
GetNextRecord(JULIAN_TIME SeekTimeT0, BOOL bSkipCtrlRecs =
FALSE);

                        int Sort(void);
                        PTXN_RECORD_HEADER GetSortedRecord(int
index);

                        inline BOOL IsSorted(void) { return bLogSorted; };
                        inline JULIAN_TIME BeginTS(void) { return
BeginTxnTS; };
                        inline JULIAN_TIME EndTS(void) { return EndTxnTS;
};
                        inline int RecordCount(void) { return iRecCount; };
};

class CTXNLOG_ERR : public CBaseErr
{
                public:
                        enum CTPCC_DBLIB_ERRS
                        {
                                ERR_BAD_FILE_FORMAT = 1,                //
"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 ) { m_errno = iErr; };

                        int                     m_errno;

                        int ErrorType() {return ERR_TYPE_TXNLOG;};
                        int ErrorNum() {return m_errno;};

                        // TODO: need to complete...
                        char *ErrorText() {return "";};
};
```

webclnt.dsp

```
# Microsoft Developer Studio Project File - Name="webclnt" - Package
Owner=<4>
# Microsoft Developer Studio Generated Build File, Format Version 5.00
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Application" 0x0101

CFG=webclnt - Win32 Release
!MESSAGE This is not a valid makefile. To build this project using NMAKE,
!MESSAGE use the Export Makefile command and run
!MESSAGE
!MESSAGE NMAKE /f "Webclnt.mak".
!MESSAGE
!MESSAGE You can specify a configuration when running NMAKE
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "Webclnt.mak" CFG="webclnt - Win32 Release"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "webclnt - Win32 Release" (based on "Win32 (x86) Application")
!MESSAGE "webclnt - Win32 Debug" (based on "Win32 (x86) Application")
!MESSAGE

# Begin Project
# PROP Scc_ProjName ""
# PROP Scc_LocalPath ""
CPP=cl.exe
MTL=midl.exe
RSC=rc.exe

!IF  "$(CFG)" == "webclnt - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir ".\Release"
# PROP BASE Intermediate_Dir ".\Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir ".\Release"
# PROP Intermediate_Dir ".\Release"
# PROP Target_Dir ""
# ADD BASE CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
"_WINDOWS" /YX /c
# ADD CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "NDEBUG" /win32
# ADD MTL /nologo /D "NDEBUG" /mktyplib203 /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
```

```
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib
odbccp32.lib /nologo /subsystem:windows /machine:I386
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /machine:I386

!ELSEIF  "$(CFG)" == "webclnt - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir ".\Debug"
# PROP BASE Intermediate_Dir ".\Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir ".\Debug"
# PROP Intermediate_Dir ".\Debug"
# PROP Target_Dir ""
# ADD BASE CPP /nologo /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG"
/D "_WINDOWS" /YX /c
# ADD CPP /nologo /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D
"_WINDOWS" /YX /FD /c
# ADD BASE MTL /nologo /D "_DEBUG" /win32
# ADD MTL /nologo /D "_DEBUG" /mktyplib203 /win32
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib
odbccp32.lib /nologo /subsystem:windows /debug /machine:I386
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib odbccp32.lib
/nologo /subsystem:windows /debug /machine:I386

!ENDIF

# Begin Target

# Name "webclnt - Win32 Release"
# Name "webclnt - Win32 Debug"
# End Target
# End Project
```

webclnt.dsw

```
Microsoft Developer Studio Workspace File, Format Version 6.00
# WARNING: DO NOT EDIT OR DELETE THIS WORKSPACE FILE!

###############################################################################

Project: "db_dblib_dll"=.\db_dblib_dll\db_dblib_dll.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "db_odbc_dll"=.\db_odbc_dll\db_odbc_dll.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "install"=.\install\install.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
    Begin Project Dependency
    Project_Dep_Name isapi_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tuxapp
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name db_dblib_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name db_odbc_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tm_com_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tm_tuxedo_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tpcc_com_all
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tpcc_com_ps
    End Project Dependency
}}}

###############################################################################

Project: "isapi_dll"=.\isapi_dll\isapi_dll.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
    Begin Project Dependency
    Project_Dep_Name db_dblib_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name db_odbc_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tm_tuxedo_dll
    End Project Dependency
```

```
    Begin Project Dependency
    Project_Dep_Name tm_com_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tm_encina_dll
    End Project Dependency
}}}

###############################################################################

Project: "tm_com_dll"=.\tm_com_dll\tm_com_dll.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
    Begin Project Dependency
    Project_Dep_Name tpcc_com_ps
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name tpcc_com_all
    End Project Dependency
}}}

###############################################################################

Project: "tm_encina_dll"=.\tm_encina_dll\tm_encina_dll.dsp - Package
Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "tm_tuxedo_dll"=.\tm_tuxedo_dll\tm_tuxedo_dll.dsp - Package
Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "tpcc_com_all"=.\tpcc_com_all\tpcc_com_all.dsp - Package
Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
    Begin Project Dependency
    Project_Dep_Name tpcc_com_ps
    End Project Dependency
}}}

###############################################################################

Project: "tpcc_com_ps"=.\tpcc_com_ps\tpcc_com_ps.dsp - Package
Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
}}}

###############################################################################

Project: "tuxapp"=.\tuxapp\tuxapp.dsp - Package Owner=<4>

Package=<5>
{{{
}}}

Package=<4>
{{{
    Begin Project Dependency
    Project_Dep_Name db_dblib_dll
    End Project Dependency
    Begin Project Dependency
    Project_Dep_Name db_odbc_dll
    End Project Dependency
}}}

###############################################################################

Global:

Package=<5>
{{{
}}}

Package=<3>
{{{
}}}

###############################################################################
```

Stored Procedures

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,
                                                @i_id11 int = 0,
@s_w_id11 smallint = 0, @ol_qty11 smallint = 0,
                                                @i_id12 int = 0,
@s_w_id12 smallint = 0, @ol_qty12 smallint = 0,
                                                @i_id13 int = 0,
@s_w_id13 smallint = 0, @ol_qty13 smallint = 0,
                                                @i_id14 int = 0,
@s_w_id14 smallint = 0, @ol_qty14 smallint = 0,
                                                @i_id15 int = 0,
@s_w_id15 smallint = 0, @ol_qty15 smallint = 0


as
declare     @w_tax          numeric(4,4),
        @d_tax          numeric(4,4),
        @c_last         char(16),
        @c_credit       char(2),
        @c_discount     numeric(4,4),
        @i_price        numeric(5,2),
        @i_name         char(24),
        @i_data         char(50),
        @o_entry_d      datetime,
        @remote_flag    int,
        @s_quantity     smallint,
        @s_data         char(50),
        @s_dist         char(24),
                @li_no          int,
                @o_id                   int,
                @commit_flag    tinyint,
        @li_id          int,
        @li_s_w_id      smallint,
        @li_qty         smallint,
                @ol_number              int,
                @c_id_local             int

begin
```

```
begin transaction n

--  get district tax and next availible order id and update
--  plus initialize local variables

                update      district
                set         @d_tax       = d_tax,
                            @o_id        = d_next_o_id,
                            d_next_o_id  = d_next_o_id + 1,
                            @o_entry_d   = getdate(),
                            @li_no       = 0,
                            @commit_flag = 1
                where       d_w_id       = @w_id and
                            d_id         = @d_id

--  process orderlines

                while (@li_no < @o_ol_cnt)
                begin

                        select @li_no = @li_no + 1

--  set i_id, s_w_id, and qty for this lineitem

                        select      @li_id = case @li_no
                                        when 1 then @i_id1
                                        when 2 then @i_id2
                                        when 3 then @i_id3
                                        when 4 then @i_id4
                                        when 5 then @i_id5
                                        when 6 then @i_id6
                                        when 7 then @i_id7
                                        when 8 then @i_id8
                                        when 9 then @i_id9
                                        when 10 then @i_id10
                                        when 11 then @i_id11
                                        when 12 then @i_id12
                                        when 13 then @i_id13
                                        when 14 then @i_id14
                                        when 15 then @i_id15
                                        end,

                                @li_s_w_id = case @li_no
                                        when 1 then @s_w_id1
                                        when 2 then @s_w_id2
                                        when 3 then @s_w_id3
                                        when 4 then @s_w_id4
                                        when 5 then @s_w_id5
                                        when 6 then @s_w_id6
                                        when 7 then @s_w_id7
                                        when 8 then @s_w_id8
                                        when 9 then @s_w_id9
                                        when 10 then @s_w_id10
                                        when 11 then @s_w_id11
                                        when 12 then @s_w_id12
                                        when 13 then @s_w_id13
                                        when 14 then @s_w_id14
                                        when 15 then @s_w_id15
                                        end,

                                @li_qty = case  @li_no
                                        when 1 then @ol_qty1
                                        when 2 then @ol_qty2
                                        when 3 then @ol_qty3
                                        when 4 then @ol_qty4
                                        when 5 then @ol_qty5
                                        when 6 then @ol_qty6
                                        when 7 then @ol_qty7
```

```
                                        when 8 then @ol_qty8
                                        when 9 then @ol_qty9
                                        when 10 then @ol_qty10
                                        when 11 then @ol_qty11
                                        when 12 then @ol_qty12
                                        when 13 then @ol_qty13
                                        when 14 then @ol_qty14
                                        when 15 then @ol_qty15
                                        end

-- get item data (no one updates item)

                select  @i_price = i_price,
                        @i_name  = i_name,
                        @i_data  = i_data
                from    item (tablock repeatableread)
                where   i_id = @li_id

-- update stock values

                update  stock
                set     s_ytd           = s_ytd + @li_qty,
                        @s_quantity     = s_quantity   =
s_quantity - @li_qty +
                                                        case
when (s_quantity - @li_qty < 10) then 91 else 0 end,
                        s_order_cnt     = s_order_cnt + 1,
                        s_remote_cnt    = s_remote_cnt + case
when (@li_s_w_id = @w_id) then 0 else 1 end,
                        @s_data         = s_data,
                        @s_dist         = case @d_id
                                          when 1  then
s_dist_01
                                          when 2  then
s_dist_02
                                          when 3  then
s_dist_03
                                          when 4  then
s_dist_04
                                          when 5  then
s_dist_05
                                          when 6  then
s_dist_06
                                          when 7  then
s_dist_07
                                          when 8  then
s_dist_08
                                          when 9  then
s_dist_09
                                          when 10 then
s_dist_10
                                          end
                where   s_i_id          = @li_id and
                        s_w_id          = @li_s_w_id

-- if there actually is a stock (and item) with these ids, go to work

                if (@@rowcount > 0)
                begin

-- insert order_line data (using data from item and stock)

                        insert into order_line values(@o_id,
                                                        @d_id,

                                                        @w_id,
                                                        @li_no,

                                                        @li_id,


@li_s_w_id,
                                                        "dec 31,
1899",
                                                        @li_qty,

                                                        @i_price
* @li_qty,
                                                        @s_dist)


-- send line-item data to client

                                select  @i_name,
                                        @s_quantity,
                                        b_g = case when (
(patindex("%ORIGINAL%",@i_data) > 0) and

(patindex("%ORIGINAL%",@s_data) > 0) )
                                                then "B" else "G" end,
                                        @i_price,
                                        @i_price * @li_qty

                        end
                        else
                        begin

-- no item (or stock) found - triggers rollback condition

                                select "",0,"",0,0
                                select @commit_flag = 0

                        end
                end

-- get customer last name, discount, and credit rating

                select  @c_last     = c_last,
                        @c_discount = c_discount,
                        @c_credit   = c_credit,
                        @c_id_local = c_id
                from    customer (repeatableread)
                where   c_id                = @c_id and
                        c_w_id              = @w_id and
                        c_d_id              = @d_id

-- insert fresh row into orders table

                insert into orders values (     @o_id,
                                                        @d_id,
                                                        @w_id,
                                                        @c_id_local,
                                                        @o_entry_d,
                                                        0,
                                                        @o_ol_cnt,
                                                        @o_all_local)

-- insert corresponding row into new-order table

                insert into new_order values (  @o_id,
                                                        @d_id,
                                                        @w_id)

-- select warehouse tax
```

```
        select      @w_tax    = w_tax
        from        warehouse (repeatableread)
        where       w_id      = @w_id

        if (@commit_flag = 1)

                    commit transaction n
        else

-- all that work for nuthin!!!

                    rollback transaction n

-- return order data to client

        select      @w_tax,
                    @d_tax,
                    @o_id,
                    @c_last,
                    @c_discount,
                    @c_credit,
                    @o_entry_d,
                    @commit_flag

end

go
```

payment.sql

```
-- File:    PAYMENT.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose: Creates payment transaction stored procedure
--
--          Interface Level: 4.10.000

use tpcc
go

if exists (select name from sysobjects where name = "tpcc_payment" )
        drop procedure tpcc_payment
go

create proc tpcc_payment        @w_id       smallint,
                                @c_w_id     smallint,
                                @h_amount   numeric(6,2),
                                @d_id       tinyint,
                                @c_d_id     tinyint,
                                @c_id       int,
                                @c_last     char(16) = ""


as
declare @w_street_1   char(20),
        @w_street_2   char(20),
        @w_city       char(20),
        @w_state      char(2),
        @w_zip        char(9),
        @w_name       char(10),
        @d_street_1   char(20),
        @d_street_2   char(20),
        @d_city       char(20),
        @d_state      char(2),
        @d_zip        char(9),
        @d_name       char(10),
        @c_first      char(16),
        @c_middle     char(2),
        @c_street_1   char(20),
        @c_street_2   char(20),
        @c_city       char(20),
        @c_state      char(2),
        @c_zip        char(9),
        @c_phone      char(16),
        @c_since      datetime,
        @c_credit     char(2),
        @c_credit_lim numeric(12,2),
        @c_balance    numeric(12,2),
        @c_discount   numeric(4,4),
        @data         char(500),
        @c_data       char(500),
        @datetime     datetime,
        @w_ytd        numeric(12,2),
        @d_ytd        numeric(12,2),
        @cnt          smallint,
        @val          smallint,
        @screen_data  char(200),
            @d_id_local     tinyint,
            @w_id_local     smallint,
            @c_id_local     int

select @screen_data = ""

begin tran p

-- get payment date

        select      @datetime = getdate()

        if (@c_id = 0)
        begin

-- get customer id and info using last name

                select      @cnt      = count(*)
                from        customer (repeatableread)
                where       c_last    = @c_last and
                            c_w_id    = @c_w_id and
                            c_d_id    = @c_d_id


                select      @val = (@cnt + 1) / 2
                set         rowcount @val

                select      @c_id     = c_id
                from        customer (repeatableread)
                where       c_last    = @c_last and
                            c_w_id    = @c_w_id and
                            c_d_id    = @c_d_id
                order       by c_last, c_first

                set         rowcount 0
        end

-- get customer info and update balances

        update      customer
        set         @c_balance          = c_balance          = c_balance
- @h_amount,
                    c_payment_cnt       = c_payment_cnt + 1,
                    c_ytd_payment       = c_ytd_payment + @h_amount,
                    @c_first    = c_first,
                    @c_middle           = c_middle,
                    @c_last             = c_last,
```

```
                @c_street_1             = c_street_1,
                @c_street_2             = c_street_2,
                @c_city                 = c_city,
                @c_state   = c_state,
                @c_zip                  = c_zip,
                @c_phone = c_phone,
                @c_credit  = c_credit,
                @c_credit_lim           = c_credit_lim,
                @c_discount             = c_discount,
                @c_since   = c_since,
                @data                   = c_data,
                @c_id_local             = c_id
        where   c_id                    = @c_id and
                c_w_id                  = @c_w_id and
                c_d_id                  = @c_d_id

-- if customer has bad credit get some more info

        if (@c_credit = "BC")
        begin

--      compute new info

                select @c_data          = convert(char(5),@c_id) +
                                          convert(char(4),@c_d_id) +
                                          convert(char(5),@c_w_id) +
                                          convert(char(4),@d_id) +
                                          convert(char(5),@w_id) +
                                          convert(char(19),@h_amount) +
                                          substring(@data, 1, 458)


-- update customer info

                update  customer
                set     c_data  = @c_data

                where   c_id    = @c_id and
                        c_w_id  = @c_w_id and
                        c_d_id  = @c_d_id

                select  @screen_data = substring (@c_data,1,200)

        end

-- get district data and update year-to-date

        update  district
        set     d_ytd                   = d_ytd + @h_amount,
                @d_street_1             = d_street_1,
                @d_street_2             = d_street_2,
                @d_city                 = d_city,
                @d_state   = d_state,
                @d_zip                  = d_zip,
                @d_name                 = d_name,
                @d_id_local             = d_id
        where   d_w_id                  = @w_id and
                d_id                    = @d_id

-- get warehouse data and update year-to-date

        update  warehouse
        set     w_ytd                   = w_ytd + @h_amount,
                @w_street_1             = w_street_1,
                @w_street_2             = w_street_2,
                @w_city                 = w_city,
                @w_state  = w_state,
                @w_zip                  = w_zip,
                @w_name                 = w_name,
                @w_id_local             = w_id
        where   w_id                    = @w_id

-- create history record

        insert into history values (    @c_id_local,
                                        @c_d_id,
                                        @c_w_id,

                                        @d_id_local,
                                        @w_id_local,
                                        @datetime,
                                        @h_amount,
                                        @w_name + "    " +
@d_name)
commit tran p

-- return data to client

select  @c_id,
        @c_last,
        @datetime,
        @w_street_1,
        @w_street_2,
        @w_city,
        @w_state,
        @w_zip,
        @d_street_1,
        @d_street_2,
        @d_city,
        @d_state,
        @d_zip,
        @c_first,
        @c_middle,
        @c_street_1,
        @c_street_2,
        @c_city,
        @c_state,
        @c_zip,
        @c_phone,
        @c_since,
        @c_credit,
        @c_credit_lim,
        @c_discount,
        @c_balance,
        @screen_data

go
```

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
```

delivery.sql

```
-- File:    DELIVERY.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates delivery transaction stored procedure
--
--          Interface Level: 4.10.000

use tpcc
go

if exists (select name from sysobjects where name = "tpcc_delivery" )
        drop procedure tpcc_delivery
go

create proc tpcc_delivery       @w_id       smallint,

                                            @o_carrier_id   smallint
as

declare @d_id       tinyint,
      @o_id         int,
      @c_id         int,
```

```
        @total          numeric(12,2),
        @oid1           int,
        @oid2           int,
        @oid3           int,
        @oid4           int,
        @oid5           int,
        @oid6           int,
        @oid7           int,
        @oid8           int,
        @oid9           int,
        @oid10          int

select @d_id = 0

begin tran d

                while (@d_id < 10)
                begin

                        select @d_id  = @d_id + 1,
                                        @total = 0,
                                        @o_id  = 0

                                select  top 1
                                        @o_id       = no_o_id
                                from    new_order (serializable updlock)
                                where   no_w_id   = @w_id and
                                        no_d_id   = @d_id
                                order   by no_o_id asc

                                if (@@rowcount <> 0)
                                        begin

--  claim the order for this district

                                                delete  new_order
                                                where   no_w_id   = @w_id and
                                                        no_d_id   = @d_id and
                                                        no_o_id   = @o_id

--  set carrier_id on this order (and get customer id)

                                                update  orders
                                                set     o_carrier_id        =
@o_carrier_id,
                                                        @c_id               = o_c_id
                                                where   o_w_id              = @w_id
and
                                                        o_d_id              = @d_id
and
                                                        o_id                = @o_id

--  set date in all lineitems for this order (and sum amounts)

                                                update  order_line
                                                set     ol_delivery_d       = getdate(),
                                                        @total              = @total +
ol_amount
                                                where   ol_w_id             = @w_id
and
                                                        ol_d_id             = @d_id
and
                                                        ol_o_id             = @o_id

--  accummulate lineitem amounts for this order into customer

                                                update  customer
                                                set     c_balance  = c_balance + @total,
                                                        c_delivery_cnt      =
c_delivery_cnt + 1
                                                where   c_w_id              = @w_id
and
                                                        c_d_id              = @d_id
and
                                                        c_id                = @c_id

                                        end

                                  select @oid1 = case @d_id when  1  then @o_id else @oid1 end,
                                        @oid2 = case @d_id when  2  then @o_id else @oid2 end,
                                        @oid3 = case @d_id when  3  then @o_id else @oid3 end,
                                        @oid4 = case @d_id when  4  then @o_id else @oid4 end,
                                        @oid5 = case @d_id when  5  then @o_id else @oid5 end,
                                        @oid6 = case @d_id when  6  then @o_id else @oid6 end,
                                        @oid7 = case @d_id when  7  then @o_id else @oid7 end,
                                        @oid8 = case @d_id when  8  then @o_id else @oid8 end,
                                        @oid9 = case @d_id when  9  then @o_id else @oid9 end,
                                        @oid10 = case @d_id when 10 then @o_id else @oid10 end

                   end

commit tran d

-- return delivery data to client

select @oid1,
       @oid2,
       @oid3,
       @oid4,
       @oid5,
       @oid6,
       @oid7,
       @oid8,
       @oid9,
       @oid10

go
```

stocklev.sql

```
-- File:    STOCKLEV.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates stock level transaction stored procedure
--
--           Interface Level: 4.10.000

use tpcc
go

if exists (select name from sysobjects where name = "tpcc_stocklevel" )
            drop procedure tpcc_stocklevel
go

create proc tpcc_stocklevel     @w_id               smallint,
                                @d_id               tinyint,
                                @threshhold         smallint
as

declare     @o_id_low int,
            @o_id_high int

select      @o_id_low           = (d_next_o_id - 20),
            @o_id_high          = (d_next_o_id - 1)
from        district
```

```
where   d_w_id              = @w_id and
        d_id                = @d_id

select  count(distinct(s_i_id))
from    stock, order_line
where   ol_w_id             = @w_id and
        ol_d_id             = @d_id and
        ol_o_id               between @o_id_low and
                              @o_id_high and
        s_w_id              = ol_w_id and
        s_i_id              = ol_i_id and
        s_quantity < @threshhold

go
```

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 advan-
tage is that these
-- stored procs place almost no load on SQL Server and do not require a
database.
--
-- The purpose of these stored procs is to size and test the web client without the
need of a fully
-- scaled database.
--

drop proc tpcc_delivery
drop proc tpcc_neworder
drop proc tpcc_orderstatus
drop proc tpcc_payment
drop proc tpcc_stocklevel
drop proc tpcc_version
drop table order_line_null
go

create proc tpcc_delivery           @w_id          smallint,


@o_carrier_id   smallint
as

declare @d_id tinyint,
        @o_id int,
        @c_id int,
        @total numeric(12,2),
        @oid1 int,
        @oid2 int,
        @oid3 int,
        @oid4 int,
        @oid5 int,
        @oid6 int,
        @oid7 int,
        @oid8 int,
        @oid9 int,
        @oid10 int

declare @delaytime varchar(30)

-- uniform random delay of 0 - 1 second; avg = 0.50
select @delaytime = '00:00:0' + cast(cast((rand()*1.00) as decimal(4,3)) as
char(5))
waitfor delay @delaytime

select 3001, 3001, 3001, 3001, 3001, 3001, 3001, 3001, 3001, 3001


GO

create proc tpcc_neworder
                                                    @w_id          smallint,
                                                    @d_id          tinyint,
                                                    @c_id          int,
                                                    @o_ol_cnt      tinyint,
                                                    @o_all_local   tinyint,
                                                    @i_id1  int = 0,
@s_w_id1 smallint = 0, @ol_qty1 smallint = 0,
                                                    @i_id2  int = 0,
@s_w_id2 smallint = 0, @ol_qty2 smallint = 0,
                                                    @i_id3  int = 0,
@s_w_id3 smallint = 0, @ol_qty3 smallint = 0,
                                                    @i_id4  int = 0,
@s_w_id4 smallint = 0, @ol_qty4 smallint = 0,
                                                    @i_id5  int = 0,
@s_w_id5 smallint = 0, @ol_qty5 smallint = 0,
                                                    @i_id6  int = 0,
@s_w_id6 smallint = 0, @ol_qty6 smallint = 0,
                                                    @i_id7  int = 0,
@s_w_id7 smallint = 0, @ol_qty7 smallint = 0,
                                                    @i_id8  int = 0,
@s_w_id8 smallint = 0, @ol_qty8 smallint = 0,
                                                    @i_id9  int = 0,
@s_w_id9 smallint = 0, @ol_qty9 smallint = 0,
                                                    @i_id10 int = 0,
@s_w_id10 smallint = 0, @ol_qty10 smallint = 0,
```

```
                                                @i_id11 int = 0,
@s_w_id11 smallint = 0, @ol_qty11 smallint = 0,
                                                @i_id12 int = 0,
@s_w_id12 smallint = 0, @ol_qty12 smallint = 0,
                                                @i_id13 int = 0,
@s_w_id13 smallint = 0, @ol_qty13 smallint = 0,
                                                @i_id14 int = 0,
@s_w_id14 smallint = 0, @ol_qty14 smallint = 0,
                                                @i_id15 int = 0,
@s_w_id15 smallint = 0, @ol_qty15 smallint = 0


as
declare     @w_tax          numeric(4,4),
        @d_tax          numeric(4,4),
        @c_last         char(16),
        @c_credit       char(2),
        @c_discount     numeric(4,4),
        @i_price        numeric(5,2),
        @i_name         char(24),
        @o_entry_d      datetime,
                @li_no          int,
                @o_id                   int,
                @commit_flag    tinyint,
        @li_id          int,
        @li_qty         smallint

declare @delaytime varchar(30)

begin
   -- uniform random delay of 0 - 0.6 second; avg = 0.3
   select @delaytime = '00:00:0' + cast(cast((rand()*0.60) as decimal(4,3)) as
char(5))
   waitfor delay @delaytime

   --  process orderlines

                select @commit_flag = 1, @li_no = 0

   while (@li_no < @o_ol_cnt)
                begin

                select @li_id = case @li_no
                                        when 1 then @i_id1
                                           when 2 then @i_id2
                                           when 3 then @i_id3
                                           when 4 then @i_id4
                                           when 5 then @i_id5
                                           when 6 then @i_id6
                                           when 7 then @i_id7
                                           when 8 then @i_id8
                                           when 9 then @i_id9
                                           when 10 then @i_id10
                                           when 11 then @i_id11
                                           when 12 then @i_id12
                                           when 13 then @i_id13
                                           when 14 then @i_id14
                                           when 15 then @i_id15
                                           end


        select @li_no = @li_no + 1
                select @i_price = 23.45, @li_qty = @li_no

                if (@li_id = 999999)
                                begin
                                select ",0,",0,0
                                select @commit_flag = 0
                                end
                else
                                begin
                                select 'Item Name blah',17,'G', @i_price, @i_price *
@li_qty
                                end

                end

--  return order data to client

                select      @w_tax = 0.1234,
                                @d_tax = 0.0987,
                                @o_id = 3001,
                                @c_last = 'BAROUGHTABLE',
                                @c_discount = 0.2198,
                                @c_credit = 'GC',
                                @o_entry_d = getdate()

                select      @w_tax,
                                @d_tax,
                                @o_id,
                                @c_last,
                                @c_discount,
                                @c_credit,
                                @o_entry_d,
                                @commit_flag

end

GO

create proc tpcc_orderstatus @w_id                      smallint,

@d_id                   tinyint,


@c_id                   int,

@c_last     char(16) = ''

as

declare @c_balance              numeric(12,2),
        @c_first                char(16),
        @c_middle               char(2),
        @o_id                                   int,
        @o_entry_d              datetime,
        @o_carrier_id           smallint,
                @ol_cnt                         smallint

declare @delaytime varchar(30)


   -- uniform random delay of 0 - 0.2 second; avg = 0.1
   select @delaytime = '00:00:0' + cast(cast((rand()*0.20) as decimal(4,3)) as
char(5))
   waitfor delay @delaytime

                select
                    @c_id      = 113,
                    @c_balance = -10.00,
                    @c_first   = '8YCodgytqCj8',
                    @c_middle  = 'OE',
                    @c_last    = 'OUGHTOUGHTABLE',
                    @o_id  = 3456,
                    @o_entry_d = getdate(),
                    @o_carrier_id = 1
```

```
        select @ol_cnt = (rand() * 11) + 5
        SET ROWCOUNT @ol_cnt

        select
                ol_supply_w_id,
                ol_i_id,
            ol_quantity,
            ol_amount,
            ol_delivery_d
        from order_line_null

        select @c_id,
          @c_last,
          @c_first,
          @c_middle,
          @o_entry_d,
          @o_carrier_id,
          @c_balance,
          @o_id


GO

create proc tpcc_payment @w_id          smallint,
                                                        @c_w_id
   smallint,
                                                        @h_amount
    numeric(6,2),
                                                        @d_id
 tinyint,
                                                        @c_d_id
  tinyint,
                                                        @c_id
 int,
                                                        @c_last
  char(16) = ''

as
declare  @w_street_1     char(20),
       @w_street_2     char(20),
       @w_city         char(20),
       @w_state        char(2),
       @w_zip          char(9),
       @w_name         char(10),
       @d_street_1     char(20),
       @d_street_2     char(20),
       @d_city         char(20),
       @d_state        char(2),
       @d_zip          char(9),
       @d_name         char(10),
       @c_first        char(16),
       @c_middle       char(2),
       @c_street_1     char(20),
       @c_street_2     char(20),
       @c_city         char(20),
       @c_state        char(2),
       @c_zip          char(9),
       @c_phone        char(16),
       @c_since        datetime,
       @c_credit       char(2),
       @c_credit_lim   numeric(12,2),
       @c_balance      numeric(12,2),
       @c_discount     numeric(4,4),
       @data           char(500),
       @c_data         char(500),
       @datetime       datetime,
       @w_ytd          numeric(12,2),
       @d_ytd          numeric(12,2),
       @cnt            smallint,
       @val            smallint,
       @screen_data      char(200),
                         @d_id_local             tinyint,
                         @w_id_local             smallint,
                         @c_id_local             int

declare @delaytime varchar(30)

   -- uniform random delay of 0 - 0.3 second; avg = 0.15
   select @delaytime = '00:00:0' + cast(cast((rand()*0.30) as decimal(4,3)) as
char(5))
   waitfor delay @delaytime

   select @screen_data = ''


--  get customer info and update balances

              select
                        @d_street_1 = 'rqSHHakqyV',
                        @d_street_2 = 'zZ98nW3BR2s',
                        @d_city     = 'ArNr4GNFV9',
                        @d_state    = 'aV',
                        @d_zip      = '453511111'

--  get warehouse data and update year-to-date

              select
                        @w_street_1 = 'rqSHHakqyV',
                        @w_street_2 = 'zZ98nW3BR2s',
                        @w_city     = 'ArNr4GNFV9',
                        @w_state    = 'aV',
                        @w_zip      = '453511111'

              select
                        @c_id             = 123,
                        @c_balance     = -10000.00,
                        @c_first       = 'KmR03Xureb',
                        @c_middle      = 'OE',
                        @c_last        = 'BAROUGHTBAR',
                        @c_street_1    = 'QpGdOHjv8mR9vNI8V',
                        @c_street_2    = 'dzKoCObBqbC3yu',
                        @c_city        = 'zAKZXdC037FQxq',
                        @c_state       = 'QA',
                        @c_zip         = '700311111',
                        @c_phone       = '2967264064528555',
                        @c_credit      = 'GC',
                        @c_credit_lim  = 50000.00,
                        @c_discount    = 0.3069,
                        @c_since       = getdate(),
                        @datetime      = getdate()



--  return data to client

select  @c_id,
                        @c_last,
                        @datetime,
                        @w_street_1,
                        @w_street_2,
                        @w_city,
                        @w_state,
                        @w_zip,
                        @d_street_1,
                        @d_street_2,
```

```
                        @d_city,
                        @d_state,
                        @d_zip,
                        @c_first,
                        @c_middle,
                        @c_street_1,
                        @c_street_2,
                        @c_city,
                        @c_state,
                        @c_zip,
                        @c_phone,
                        @c_since,
                        @c_credit,
                        @c_credit_lim,
                        @c_discount,
                        @c_balance,
                        @screen_data


GO

create proc tpcc_stocklevel     @w_id           smallint,
                                                @d_id
tinyint,
                                                @threshhold
        smallint
as

declare @delaytime varchar(30)

   -- uniform random delay of 0 - 3.6 second; avg = 1.8
   select @delaytime = '00:00:0' + cast(cast((rand()*3.60) as decimal(4,3)) as
char(5))
   waitfor delay @delaytime

   select 49

GO

create proc tpcc_version
as
declare @version        char(8)

begin
        select @version = '4.10.000'
        select @version as 'Version'
end

GO

CREATE TABLE order_line_null (
        [ol_i_id] [int] NOT NULL ,
        [ol_supply_w_id] [smallint] NOT NULL ,
        [ol_delivery_d] [datetime] NOT NULL ,
        [ol_quantity] [smallint] NOT NULL ,
        [ol_amount] [numeric](6, 2) NOT NULL
) ON [PRIMARY]
GO

insert into order_line_null values ( 101, 1, getdate(), 1, 123.45 )
insert into order_line_null values ( 102, 1, getdate(), 2, 123.45 )
insert into order_line_null values ( 103, 1, getdate(), 3, 123.45 )
insert into order_line_null values ( 104, 1, getdate(), 4, 123.45 )
insert into order_line_null values ( 105, 1, getdate(), 5, 123.45 )
insert into order_line_null values ( 106, 1, getdate(), 1, 123.45 )
insert into order_line_null values ( 107, 1, getdate(), 2, 123.45 )
insert into order_line_null values ( 108, 1, getdate(), 3, 123.45 )
insert into order_line_null values ( 109, 1, getdate(), 4, 123.45 )
insert into order_line_null values ( 110, 1, getdate(), 5, 123.45 )
insert into order_line_null values ( 111, 1, getdate(), 1, 123.45 )
insert into order_line_null values ( 112, 1, getdate(), 2, 123.45 )
insert into order_line_null values ( 113, 1, getdate(), 3, 123.45 )
insert into order_line_null values ( 114, 1, getdate(), 4, 123.45 )
insert into order_line_null values ( 115, 1, getdate(), 5, 123.45 )

GO
```

Appendix B: Database Design

Database Build

backup.sql

```
-- File:    BACKUP.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates backup of tpcc database


declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

dump database tpcc to tpccback1, tpccback2, tpccback3, tpccback4 with init,
stats = 1

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

backupdev.sql

```
-- File:    BACKUPDEVB.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates tpcc database Backup Devices


use master
go

-- create backup devices

exec sp_addumpdevice 'disk','tpccback1','Y:\tpccback1.dmp'
go
exec sp_addumpdevice 'disk','tpccback2','Y:\tpccback2.dmp'
go
exec sp_addumpdevice 'disk','tpccback3','Z:\tpccback3.dmp'
go
exec sp_addumpdevice 'disk','tpccback4','Z:\tpccback4.dmp'
go
```

createdb.sql

```
-- File:    CREATEDB.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates tpcc database and backup files


use master
go

--          Create temporary table for timing

if exists ( select name from sysobjects where name = 'tpcc_timer' )
        drop table tpcc_timer
go

create table tpcc_timer
(
        start_date                              char(30),
        end_date                                char(30)
)

insert  into tpcc_timer values (0,0)
go

--          Store starting time

update  tpcc_timer
set     start_date  = (select convert(char(30), getdate(),9))
go

--  create main database files

CREATE DATABASE tpcc
ON PRIMARY
(       NAME            = MSSQL_tpcc_root,
        FILENAME        = "C:\MSSQL_tpcc_root.mdf",
        SIZE            = 8MB,
        FILEGROWTH      =0),
FILEGROUP       MSSQL_misc_fg
(       NAME            = MSSQL_misc1,
        FILENAME        = "H:",
        SIZE            = 60000MB,
        FILEGROWTH      = 0),
FILEGROUP       MSSQL_cs_fg
(       NAME            = MSSQL_cs1,
        FILENAME        = "F:",
        SIZE            = 60000MB,
        FILEGROWTH      = 0),
(       NAME            = MSSQL_cs2,
        FILENAME        = "G:",
        SIZE            = 60000MB,
        FILEGROWTH      = 0)
LOG ON
(       NAME            =MSSQL_tpcc_log,
        FILENAME        ="I:",
        SIZE            = 50000MB,
        FILEGROWTH      =0)
COLLATE Latin1_General_BIN
go

-- Store ending time
update  tpcc_timer
set     end_date    = (select convert(char(30), getdate(),9))
go

select "Elapsed time (in seconds): ", datediff(second,(select start_date from
tpcc_timer),(select end_date from tpcc_timer))

--          remove temporary table

if exists ( select name from sysobjects where name = 'tpcc_timer' )
        drop table tpcc_timer
go
```

dbopt1.sql

```
-- File:    DBOPT1.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          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
exec sp_dboption tpcc,'torn page detection',false
go

use tpcc
go

checkpoint
go
```

dbopt2.sql

```
-- File:    DBOPT2.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          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
```

idxcuscl.sql

```
-- File:    IDXCUSCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates clustered index on customer table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'customer_c1' )
            drop index customer.customer_c1

create unique clustered index customer_c1 on customer(c_w_id, c_d_id, c_id)
```

```
            on MSSQL_cs_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxcusnc.sql

```
-- File:    IDXCUSNC.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates non-clustered index on customer table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'customer_nc1' )
            drop index customer.customer_nc1

create unique nonclustered index customer_nc1 on customer(c_w_id, c_d_id,
c_last, c_first, c_id)
            on MSSQL_cs_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxdiscl.sql

```
-- File:    IDXDISCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates clustered index on district table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'district_c1' )
            drop index district.district_c1

create unique clustered index  district_c1 on district(d_w_id, d_id)
            with fillfactor=100 on MSSQL_misc_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxitmcl.sql

```
-- File:    IDXITMCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates clustered index on item table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'item_c1' )
            drop index item.item_c1

create unique clustered index item_c1 on item(i_id)
            on MSSQL_misc_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxnodcl.sql

```
-- File:    IDXNODCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates clustered index on new_order table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'new_order_c1' )
            drop index new_order.new_order_c1

create unique clustered index new_order_c1 on new_order(no_w_id, no_d_id,
no_o_id)
            on MSSQL_misc_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxodlcl.sql

```
-- File:    IDXODLCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates clustered index on order_line table
```

```
use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'order_line_c1' )
        drop index order_line.order_line_c1

create unique clustered index order_line_c1 on order_line(ol_w_id, ol_d_id,
ol_o_id, ol_number)
        on MSSQL_misc_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxordcl.sql

```
-- File:    IDXORDCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates clustered index on orders table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'orders_c1' )
        drop index orders.orders_c1

create unique clustered index orders_c1 on orders(o_w_id, o_d_id, o_id)
        on MSSQL_misc_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxordnc.sql

```
-- File:    IDXORDNC.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates non-clustered index on orders table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'orders_nc1' )
        drop index orders.orders_nc1

create index orders_nc1 on orders(o_w_id, o_d_id, o_c_id, o_id)
        on MSSQL_misc_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxstkcl.sql

```
-- File:    IDXSTKCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates clustered index on stock table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where  name = 'stock_c1' )
        drop index stock.stock_c1

create unique clustered index stock_c1 on stock(s_i_id, s_w_id)
        on MSSQL_cs_fg

select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

idxwarcl.sql

```
-- File:    IDXWARCL.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates clustered index on warehouse table


use tpcc
go

declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
select "Start date:", convert(varchar(30),@startdate,9)

if exists ( select name from sysindexes where name = 'warehouse_c1' )
        drop index warehouse.warehouse_c1

create unique clustered index warehouse_c1 on warehouse(w_id)
        with fillfactor=100 on MSSQL_misc_fg

select @enddate = getdate()
```

```
select "End date: ", convert(varchar(30),@enddate,9)
select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

removedb.sql

```
-- File:    REMOVEDB.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Removes tpcc database and backup files


use master
go

-- remove any existing database and backup files

exec sp_dbremove tpcc, dropdev
go

exec sp_dropdevice 'tpccback1'
exec sp_dropdevice 'tpccback2'
exec sp_dropdevice 'tpccback3'
exec sp_dropdevice 'tpccback4'
go
```

restore.sql

```
-- File:    RESTORE.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Loads database backup from backup files


declare @startdate datetime
declare @enddate datetime
select @startdate = getdate()
--select "Start date:", convert(varchar(30),@startdate,9)

load database tpcc from tpccback1, tpccback2, tpccback3, tpccback4 with stats
= 1

select @enddate = getdate()
--select "End date: ", convert(varchar(30),@enddate,9)
--select "Elapsed time (in seconds): ", datediff(second, @startdate, @enddate)

go
```

RunSQLCfg.sql

```
/*  TPC-C Benchmark Kit                                          */
/*                                                  */
/*  RUNSQLCFG.SQL                                          */
/*                                                  */
/*  This script file is used to set runtime server configuration parameters   */
/*                                                  */


exec sp_configure "show advanced option", 1
go

reconfigure with override
go

/* change this value to approximately the number of connected users */
exec sp_configure "max worker threads",240

/* increase priority of user threads */
exec sp_configure "priority boost",1

/* disable automatic checkpointing */
exec sp_configure "recovery interval",56

/* change to a mask appropriate for the number of processors on the server */
exec sp_configure "affinity mask",0x7

/* enable fibers */
exec sp_configure "lightweight pooling",1

/* enable update */
exec sp_configure "allow updates",1

/* set max degree of parallelism */
exec sp_configure "max degree of parallelism",1

go

reconfigure with override
go
```

sqlshutdown.sql

```
use tpcc
go
checkpoint
go
shutdown
go
```

tables.sql

```
-- File:    TABLES.SQL
--          Microsoft TPC-C Benchmark Kit Ver. 4.22
--          Copyright Microsoft, 2001
-- Purpose:  Creates TPC-C tables


use tpcc
go

--
--  Remove all existing TPC-C tables
--

if exists ( select name from sysobjects where name = 'warehouse' )
              drop table warehouse
go
if exists ( select name from sysobjects where name = 'district' )
              drop table district
go
if exists ( select name from sysobjects where name = 'customer' )
              drop table customer
go
if exists ( select name from sysobjects where name = 'history' )
              drop table history
go
if exists ( select name from sysobjects where name = 'new_order' )
```

```
        drop table new_order
go
if exists ( select name from sysobjects where name = 'orders' )
        drop table orders
go
if exists ( select name from sysobjects where name = 'order_line' )
        drop table order_line
go
if exists ( select name from sysobjects where name = 'item' )
        drop table item
go
if exists ( select name from sysobjects where name = 'stock' )
        drop table stock
go

--
--  Create new tables
--

create table warehouse
(
        w_id                    smallint,
        w_name                  char(10),
        w_street_1              char(20),
        w_street_2              char(20),
        w_city                  char(20),
        w_state                 char(2),
        w_zip                   char(9),
        w_tax                   numeric(4,4),
        w_ytd                   numeric(12,2)
) on MSSQL_misc_fg
go

create table district
(
        d_id                    tinyint,
        d_w_id                  smallint,
        d_name                  char(10),
        d_street_1              char(20),
        d_street_2              char(20),
        d_city                  char(20),
        d_state                 char(2),
        d_zip                   char(9),
        d_tax                   numeric(4,4),
        d_ytd                   numeric(12,2),
        d_next_o_id             int
) on MSSQL_misc_fg
go

create table customer
(
        c_id                    int,
        c_d_id                  tinyint,
        c_w_id                  smallint,
        c_first                 char(16),
        c_middle                char(2),
        c_last                  char(16),
        c_street_1              char(20),
        c_street_2              char(20),
        c_city                  char(20),
        c_state                 char(2),
        c_zip                   char(9),
        c_phone                 char(16),
        c_since                 datetime,
        c_credit                char(2),
        c_credit_lim            numeric(12,2),
        c_discount              numeric(4,4),
        c_balance               numeric(12,2),
        c_ytd_payment           numeric(12,2),
        c_payment_cnt           smallint,
        c_delivery_cnt          smallint,
        c_data                  char(500)
) on MSSQL_cs_fg
go

create table history
(
        h_c_id                  int,
        h_c_d_id                tinyint,
        h_c_w_id                smallint,
        h_d_id                  tinyint,
        h_w_id                  smallint,
        h_date                  datetime,
        h_amount                numeric(6,2),
        h_data                  char(24)
) on MSSQL_misc_fg
go

create table new_order
(
        no_o_id                 int,
        no_d_id                 tinyint,
        no_w_id                 smallint
) on MSSQL_misc_fg
go

create table orders
(
        o_id                    int,
        o_d_id                  tinyint,
        o_w_id                  smallint,
        o_c_id                  int,
        o_entry_d               datetime,
        o_carrier_id            tinyint,
        o_ol_cnt                tinyint,
        o_all_local             tinyint
) on MSSQL_misc_fg
go

create table order_line
(
        ol_o_id                 int,
        ol_d_id                 tinyint,
        ol_w_id                 smallint,
        ol_number               tinyint,
        ol_i_id                 int,
        ol_supply_w_id          smallint,
        ol_delivery_d           datetime,
        ol_quantity             smallint,
        ol_amount               numeric(6,2),
        ol_dist_info            char(24)
) on MSSQL_misc_fg
go

create table item
(
        i_id                    int,
        i_im_id                 int,
        i_name                  char(24),
        i_price                 numeric(5,2),
        i_data                  char(50)
) on MSSQL_misc_fg
go

create table stock
(
```

```
        s_i_id                          int,
        s_w_id                          smallint,
        s_quantity              smallint,
        s_dist_01               char(24),
        s_dist_02               char(24),
        s_dist_03               char(24),
        s_dist_04               char(24),
        s_dist_05               char(24),
        s_dist_06               char(24),
        s_dist_07               char(24),
        s_dist_08               char(24),
        s_dist_09               char(24),
        s_dist_10               char(24),
        s_ytd                           int,
        s_order_cnt                     smallint,
        s_remote_cnt            smallint,
        s_data                          char(50)
) on MSSQL_cs_fg
go
```

Verify_TpccLoad.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
```

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
```

Load Source Code

getargs.c

```
//          File:                   GETARGS.C
//                                      Microsoft TPC-C Kit Ver. 4.22
//                                      Copyright Microsoft, 1996, 1997,
1998, 1999, 2000, 2001
//          Purpose:    Source file for command line processing


// Includes
#include "tpcc.h"

//=============================================================
==============
//
// Function name: GetArgsLoader
//
//=============================================================
==============

void GetArgsLoader(int argc, char **argv, TPCCLDR_ARGS *pargs)
{
   int              i;
   char     *ptr;

#ifdef DEBUG
   printf("[%ld]DBG: Entering GetArgsLoader()\n", (int)
GetCurrentThreadId());
#endif

   /* init args struct with some useful values */
   pargs->server            = SERVER;
   pargs->user              = USER;
   pargs->password                  = PASSWORD;
   pargs->database                  = DATABASE;
   pargs->batch             = BATCH;
   pargs->num_warehouses            = UNDEF;
        pargs->tables_all                   = TRUE;
        pargs->table_item                   = FALSE;
        pargs->table_warehouse              = FALSE;
        pargs->table_customer               = FALSE;
        pargs->table_orders                 = FALSE;
        pargs->loader_res_file              =
LOADER_RES_FILE;
        pargs->pack_size            = DEFLDPACKSIZE;
        pargs->starting_warehouse   =
DEF_STARTING_WAREHOUSE;
        pargs->build_index                  = BUILD_INDEX;
        pargs->index_order                  = INDEX_ORDER;
        pargs->index_script_path    = INDEX_SCRIPT_PATH;
        pargs->scale_down                   = SCALE_DOWN;

   /* check for zero command line args */
   if ( argc == 1 )
                GetArgsLoaderUsage();

   for (i = 1; i < argc; ++i)
   {
                if (argv[i][0] != '-' && argv[i][0] != '/')
                {
                printf("\nUnrecognized command");
                GetArgsLoaderUsage();
                exit(1);
                }

                ptr = argv[i];

                switch (ptr[1])
                {
                case 'h':    /* Fall throught */
                case 'H':
                                GetArgsLoaderUsage();
                                break;

                case 'D':
                                pargs->database = ptr+2;
                                break;

                case 'P':
                                pargs->password = ptr+2;
                                break;

                case 'S':
                                pargs->server = ptr+2;
                                break;

                case 'U':
                                pargs->user = ptr+2;
                                break;

                case 'b':
                                pargs->batch = atol(ptr+2);
                                break;
```

```
                case 'W':
                                pargs->num_warehouses =
atol(ptr+2);
                                break;

                case 's':
                                pargs->starting_warehouse =
atol(ptr+2);
                                break;

                case 't':
                                {
                                        pargs->tables_all =
FALSE;
                                        if (strcmp(ptr+2,"item")
== 0)
pargs->table_item = TRUE;
                                        else if
(strcmp(ptr+2,"warehouse") == 0)
pargs->table_warehouse = TRUE;
                                        else if
(strcmp(ptr+2,"customer") == 0)
pargs->table_customer = TRUE;
                                        else if
(strcmp(ptr+2,"orders") == 0)
pargs->table_orders = TRUE;
                                        else
                                        {
                                        printf("\nUnrecognized
command");
                                        GetArgsLoaderUsage();
                                        exit(1);
                                        }

                                        break;
                                }
                        case 'f':
                                pargs->loader_res_file = ptr+2;
                                break;

                        case 'p':
                                pargs->pack_size = atol(ptr+2);
                                break;

                        case 'i':
                                pargs->build_index = atol(ptr+2);
                                break;

                        case 'o':
                                pargs->index_order = atol(ptr+2);
                                break;

                        case 'c':
                                pargs->scale_down = atol(ptr+2);
                                break;

                case 'd':
                                pargs->index_script_path = ptr+2;
                                break;

                default:
                        GetArgsLoaderUsage();
                                exit(-1);
                                break;
                        }
        }

        /* check for required args */
        if (pargs->num_warehouses == UNDEF )
        {
                        printf("Number of Warehouses is required\n");
                        exit(-2);
        }

        return;
}


//=========================================================
==============
//
// Function name: GetArgsLoaderUsage
//
//=========================================================
==============

void GetArgsLoaderUsage()
{

#ifdef DEBUG
    printf("[%ld]DBG: Entering GetArgsLoaderUsage()\n", (int)
GetCurrentThreadId());
#endif


    printf("TPCCLDR:\n\n");
                printf("Parameter                                       Default\n");
                printf("-------------------------------------------------------------\n");
    printf("-W Number of Warehouses to Load                     Required \n");
    printf("-S Server                                       %s\n", SERVER);
    printf("-U Username                                     %s\n", USER);
    printf("-P Password                                     %s\n", PASSWORD);
    printf("-D Database                                     %s\n", DATABASE);
                printf("-b Batch Size                                   %ld\n", (long)
BATCH);
                printf("-p TDS packet size                              %ld\n", (long)
DEFLDPACKSIZE);
                printf("-f Loader Results Output Filename               %s\n",
LOADER_RES_FILE);
                printf("-s Starting Warehouse                           %ld\n", (long)
DEF_STARTING_WAREHOUSE);
                printf("-i Build Option (data = 0, data and index = 1)      %ld\n",
(long) BUILD_INDEX);
                printf("-o Cluster Index Build Order (before = 1, after = 0)  %ld\n",
(long) INDEX_ORDER);
                printf("-c Build Scaled Database (normal = 0, tiny = 1)     %ld\n",
(long) SCALE_DOWN);
                printf("-d Index Script Path                            %s\n",
INDEX_SCRIPT_PATH);
                printf("-t Table to Load                                all tables \n");
    printf("   [item|warehouse|customer|orders]\n");
    printf("   Notes: \n");
    printf("     - the '-t' parameter may be included multiple times to \n");
    printf("       specify multiple tables to be loaded \n");
    printf("     - 'item' loads ITEM table \n");
    printf("     - 'warehouse' loads WAREHOUSE, DISTRICT, and STOCK
tables \n");
    printf("     - 'customer' loads CUSTOMER and HISTORY tables \n");
    printf("     - 'orders' load NEW-ORDER, ORDERS, ORDER-LINE tables
\n");
```

```
            printf("\nNote:  Command line switches are case sensitive.\n");

   exit(0);
}
```

random.c

```
//              File:                   RANDOM.C
//                                              Microsoft TPC-C Kit Ver. 4.22
//                                              Copyright Microsoft, 1996, 1997,
1998, 1999, 2000, 2001
//              Purpose:    Random number generation routines for database loader


// Includes
#include "tpcc.h"
#include "math.h"

// Defines
#define A           16807
#define M       2147483647
#define Q           127773      /* M div A */
#define R            2836      /* M mod A */
#define Thread          __declspec(thread)

// Globals
long            Thread Seed = 0;        /* thread local seed */

/*************************************************************
***************
*                                                   *
* random -                                                  *
*       Implements a GOOD pseudo random number generator.  This generator
*
*       will/should? run the complete period before repeating.          *
*                                                   *
* Copied from:                                              *
*       Random Numbers Generators: Good Ones Are Hard to Find.          *
*       Communications of the ACM - October 1988 Volume 31 Number 10
*
*                                                   *
* Machine Dependencies:                                     *
*       long must be 2 ^ 31 - 1 or greater.                 *
*                                                   *
*************************************************************
**************/

/*************************************************************
***************
* seed - load the Seed value used in irand and drand.  Should be used before  *
*       first call to irand or drand.                       *
*************************************************************
**************/

void seed(long val)
{

#ifdef DEBUG
   printf("[%ld]DBG: Entering seed()...\n", (int) GetCurrentThreadId());
            printf("Old Seed %ld New Seed %ld\n",Seed, val);
#endif

   if ( val < 0 )
               val = abs(val);

   Seed = val;
}


/*************************************************************
***************
*                                                   *
* irand - returns a 32 bit integer pseudo random number with a period of    *
*       1 to 2 ^ 32 - 1.                                    *
*                                                   *
* parameters:                                               *
*       none.                                               *
*                                                   *
* returns:                                                  *
*       32 bit integer - defined as long ( see above ).             *
*                                                   *
* side effects:                                             *
*       seed get recomputed.                                *
*************************************************************
**************/

long irand()
{
   register long    s;      /* copy of seed */
   register long    test;   /* test flag */
   register long    hi;     /* tmp value for speed */
   register long    lo;     /* tmp value for speed */

#ifdef DEBUG
   printf("[%ld]DBG: Entering irand()...\n", (int) GetCurrentThreadId());
#endif

   s = Seed;
   hi = s / Q;
   lo = s % Q;

   test = A * lo - R * hi;
   if ( test > 0 )
                        Seed = test;
   else
                        Seed = test + M;

   return( Seed );
}


/*************************************************************
***************
*                                                   *
* drand - returns a double pseudo random number between 0.0 and 1.0.        *
*       See irand.                                          *
*************************************************************
**************/
double drand()
{

#ifdef DEBUG
   printf("[%ld]DBG: Entering drand()...\n", (int) GetCurrentThreadId());
#endif

   return( (double)irand() / 2147483647.0);
}


//=============================================================
===============
// Function   : RandomNumber
//
```

```
// Description:
//============================================================
================
long RandomNumber(long lower, long upper)
{
   long rand_num;

#ifdef DEBUG
   printf("[%ld]DBG: Entering RandomNumber()...\n", (int)
GetCurrentThreadId());
#endif

            if ( upper == lower )   /* pgd 08-13-96 perf enhancement */
                        return lower;

            upper++;

   if ( upper <= lower )
                        rand_num = upper;
   else
                        rand_num = lower + irand() % (upper - lower); /* pgd
08-13-96 perf enhancement */


#ifdef DEBUG
   printf("[%ld]DBG: RandomNumber between %ld & %ld ==> %ld\n",
                                                (int) GetCurrentThreadId(), lower,
upper, rand_num);
#endif


   return rand_num;
}


#if 0

//Orginal code pgd 08/13/96

long RandomNumber(long lower,
                                                      long upper)
{
   long rand_num;

#ifdef DEBUG
   printf("[%ld]DBG: Entering RandomNumber()...\n", (int)
GetCurrentThreadId());
#endif

            upper++;

   if ((upper <= lower))
                        rand_num = upper;
   else
                        rand_num = lower + irand() % ((upper > lower) ? upper -
lower : upper);


#ifdef DEBUG
   printf("[%ld]DBG: RandomNumber between %ld & %ld ==> %ld\n",
                                                (int) GetCurrentThreadId(), lower,
upper, rand_num);
#endif


   return rand_num;
}
#endif
```

```
//============================================================
================
// Function   : NURand
//
// Description:
//============================================================
================
long NURand(int iConst,
                  long x,
                  long y,
                  long C)
{
   long rand_num;

#ifdef DEBUG
   printf("[%ld]DBG: Entering NURand()...\n", (int) GetCurrentThreadId());
#endif

   rand_num = (((RandomNumber(0,iConst) | RandomNumber(x,y)) + C) %
(y-x+1))+x;

#ifdef DEBUG
   printf("[%ld]DBG: NURand: num = %d\n", (int) GetCurrentThreadId(),
rand_num);
#endif

   return rand_num;
}
```

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[] =
"0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu
vwxyz";
            static       int          chArrayMax = 61;

#ifdef DEBUG
   printf("[%ld]DBG: Entering MakeAlphaString()\n", (int)
GetCurrentThreadId());
#endif

            len= RandomNumber(x, y);

            for (i=0; i<len; i++)
            {
                        cc = chArray[RandomNumber(0, chArrayMax)];
      str[i] = cc;
   }
            if ( len < z )
                        memset(str+len, ' ', z - len);
            str[len] = 0;

   return len;
}


//=============================================================
==============
//
// Function name: MakeOriginalAlphaString
//
//=============================================================
==============

int MakeOriginalAlphaString(int  x,
                                                                  int  y,

int  z,
                                                                     char *str,
                                                                  int  percent)
{
   int                  len;
```

```
    int                 val;
    int                 start;

#ifdef DEBUG
    printf("[%ld]DBG: Entering MakeOriginalAlphaString()\n", (int)
GetCurrentThreadId());
#endif

    // verify prercentage is valid
    if ((percent < 0) || (percent > 100))
    {
                        printf("MakeOrigianlAlphaString: Invalid percentage:
%d\n", percent);
                        exit(-1);
    }

    // verify string is at least 8 chars in length
    if ((x + y) <= 8)
    {
                        printf("MakeOriginalAlphaString: string length must be
>= 8\n");
                        exit(-1);
    }

    // Make Alpha String
    len = MakeAlphaString(x,y, z, str);

    val = RandomNumber(1,100);
    if (val <= percent)
    {
                        start = RandomNumber(0, len - 8);
                        strncpy(str + start, "ORIGINAL", 8);
    }


#ifdef DEBUG
    printf("[%ld]DBG: MakeOriginalAlphaString: : %s\n",
                                    (int) GetCurrentThreadId(), str);
#endif

    return strlen(str);
}


//=============================================================
==============
//
// Function name: MakeNumberString
//
//=============================================================
==============
int MakeNumberString(int  x, int  y, int  z, char *str)
{
            char tmp[16];

            //MakeNumberString is always called MakeZipNumberString(16,
16, 16, string)

            memset(str, '0', 16);
            itoa(RandomNumber(0, 99999999), tmp, 10);
            memcpy(str, tmp, strlen(tmp));

            itoa(RandomNumber(0, 99999999), tmp, 10);
            memcpy(str+8, tmp, strlen(tmp));

            str[16] = 0;

    return 16;
}


//=============================================================
==============
//
// Function name: MakeZipNumberString
//
//=============================================================
==============
int MakeZipNumberString(int  x, int  y, int  z, char *str)
{
            char tmp[16];

            //MakeZipNumberString is always called MakeZipNumberString(9,
9, 9, string)

            strcpy(str, "000011111");

            itoa(RandomNumber(0, 9999), tmp, 10);
            memcpy(str, tmp, strlen(tmp));

    return 9;
}


//=============================================================
==============
//
// Function name: InitString
//
//=============================================================
==============
void InitString(char *str, int len)
{
#ifdef DEBUG
    printf("[%ld]DBG: Entering InitString()\n", (int) GetCurrentThreadId());
#endif

            memset(str, ' ', len);
    str[len] = 0;
}


//=============================================================
==============
// Function name: InitAddress
//
// Description:
//
//=============================================================
==============

void InitAddress(char *street_1, char *street_2, char *city, char *state, char
*zip)
{
            memset(street_1, ' ', ADDRESS_LEN+1);
            memset(street_2, ' ', ADDRESS_LEN+1);
            memset(city, ' ', ADDRESS_LEN+1);

    street_1[ADDRESS_LEN+1] = 0;
    street_2[ADDRESS_LEN+1] = 0;
    city[ADDRESS_LEN+1]     = 0;

            memset(state, ' ', STATE_LEN+1);
    state[STATE_LEN+1] = 0;

            memset(zip, ' ', ZIP_LEN+1);
```

```
   zip[ZIP_LEN+1] = 0;
}


//==============================================================
==============
//
// Function name: PaddString
//
//==============================================================
==============

void PaddString(int max, char *name)
{
        int                     len;

        len = strlen(name);
        if ( len < max )
                memset(name+len, ' ', max - len);
        name[max] = 0;

        return;
}
```

time.c

```
//      File:           TIME.C
//                                      Microsoft TPC-C Kit Ver. 4.22
//                                      Copyright Microsoft, 1996, 1997,
1998, 1999, 2000, 2001
//      Purpose:    Source file for time functions


// Includes
#include "tpcc.h"

// Globals
static long start_sec;


//==============================================================
==============
//
// Function name: TimeNow
//
//==============================================================
==============

long TimeNow()
{
  long          time_now;
  struct    _timeb el_time;

#ifdef DEBUG
   printf("[%ld]DBG: Entering TimeNow()\n", (int) GetCurrentThreadId());
#endif

  _ftime(&el_time);

  time_now = ((el_time.time - start_sec) * 1000) + el_time.millitm;

  return time_now;
}
```

tpcc.h

```
//      File:           TPCC.H
//                                      Microsoft TPC-C Kit Ver. 4.22
//                                      Copyright Microsoft, 1996, 1997,
1998, 1999, 2000, 2001
//      Purpose:    Header file for TPC-C database loader


// Build number of TPC Benchmark Kit
#define TPCKIT_VER          "4.22"

// General headers
#include <windows.h>
#include <winbase.h>
#include <stdlib.h>
#include <stdio.h>
#include <process.h>
#include <stddef.h>
#include <stdarg.h>
#include <string.h>
#include <time.h>
#include <sys\timeb.h>
#include <sys\types.h>

// ODBC headers
#include <sql.h>
#include <sqlext.h>
#include <odbcss.h>

// General constants
#define MILLI               1000
#define FALSE                           0
#define TRUE                    1
#define UNDEF                                           -1
#define MINPRINTASCII                    32
#define MAXPRINTASCII                   126

// Default environment constants
#define SERVER                          ""
#define DATABASE                        "tpcc"
#define USER                    "sa"
#define PASSWORD                  ""

// Default loader arguments
#define BATCH                   10000
#define DEFLDPACKSIZE                   32768
#define LOADER_RES_FILE          "logs\\load.out"
#define LOADER_NURAND_C                 123
#define DEF_STARTING_WAREHOUSE          1
#define BUILD_INDEX                                             1
// build both data and indexes
#define INDEX_ORDER                                             1
// build indexes before load
#define SCALE_DOWN                                              0
  // build a normal scale database
#define INDEX_SCRIPT_PATH "scripts"

typedef struct
{
   char                         *server;
   char                         *database;
   char                         *user;
   char                         *password;
        BOOL                            tables_all;
// set if loading all tables
        BOOL                            table_item;
// set if loading ITEM table specifically
        BOOL                            table_warehouse;        //
set if loading WAREHOUSE, DISTRICT, and STOCK
```

```
        BOOL                                    table_customer;
// set if loading CUSTOMER and HISTORY
        BOOL                                    table_orders;
// set if loading NEW-ORDER, ORDERS, ORDER-LINE
   long                                 num_warehouses;
   long                                 batch;
   long                                 verbose;
        long                                    pack_size;
        char                                    *loader_res_file;
        char                                    *synch_servername;
        long                                    case_sensitivity;
        long                                    starting_warehouse;
        long                                    build_index;
        long                                    index_order;
        long                                    scale_down;
        char                                    *index_script_path;
} TPCCLDR_ARGS;

// String length constants
        #define SERVER_NAME_LEN         20
        #define DATABASE_NAME_LEN       20
        #define USER_NAME_LEN           20
        #define PASSWORD_LEN            20
        #define TABLE_NAME_LEN          20
        #define I_DATA_LEN              50
        #define I_NAME_LEN              24
        #define BRAND_LEN               1
        #define LAST_NAME_LEN           16
        #define W_NAME_LEN              10
        #define ADDRESS_LEN             20
        #define STATE_LEN               2
        #define ZIP_LEN                 9
        #define S_DIST_LEN              24
        #define S_DATA_LEN              50
        #define D_NAME_LEN              10
        #define FIRST_NAME_LEN          16
        #define MIDDLE_NAME_LEN         2
        #define PHONE_LEN               16
        #define CREDIT_LEN              2
        #define C_DATA_LEN              500
        #define H_DATA_LEN              24
        #define DIST_INFO_LEN           24
        #define MAX_OL_NEW_ORDER_ITEMS  15
        #define MAX_OL_ORDER_STATUS_ITEMS 15
        #define STATUS_LEN              25
        #define OL_DIST_INFO_LEN        24
        #define C_SINCE_LEN
23
        #define H_DATE_LEN
23
        #define OL_DELIVERY_D_LEN               23
        #define O_ENTRY_D_LEN           23


// Functions in random.c
void    seed();
long    irand();
double  drand();
void    WUCreate();
short   WURand();
long    RandomNumber(long lower, long upper);

// Functions in getargs.c;
void    GetArgsLoader();
void    GetArgsLoaderUsage();

// Functions in time.c
long    TimeNow();

// Functions in strings.c
void    MakeAddress();
void    LastName();
int     MakeAlphaString();
int     MakeOriginalAlphaString();
int     MakeNumberString();
int     MakeZipNumberString();
void    InitString();
void    InitAddress();
void    PaddString();
```

tpccldr.c

```
//      File:           TPCCLDR.C
//                              Microsoft TPC-C Kit Ver. 4.22
//                              Copyright Microsoft, 2000, 2001
//      Purpose:  Source file for TPC-C database loader


// Includes
#include "tpcc.h"
#include "search.h"

// Defines
#define MAXITEMS            100000
#define MAXITEMS_SCALE_DOWN                 100
#define CUSTOMERS_PER_DISTRICT  3000
#define CUSTOMERS_SCALE_DOWN    30
#define DISTRICT_PER_WAREHOUSE  10
#define ORDERS_PER_DISTRICT     3000
#define ORDERS_SCALE_DOWN       30
#define MAX_CUSTOMER_THREADS    2
#define MAX_ORDER_THREADS       3
#define MAX_MAIN_THREADS        4

// Functions declarations

void HandleErrorDBC (SQLHDBC  hdbc1);

void CheckSQL();
void CheckDataBase();

long NURand();
void LoadItem();
void LoadWarehouse();

void Stock();
void District();

void LoadCustomer();
void CustomerBufInit();
void CustomerBufLoad();
void LoadCustomerTable();
void LoadHistoryTable();

void LoadOrders();
void OrdersBufInit();
void OrdersBufLoad();
void LoadOrdersTable();
void LoadNewOrderTable();
void LoadOrderLineTable();
void GetPermutation();
void CheckForCommit();
void OpenConnections();
void BuildIndex();
void FormatDate ();
```

```
// Shared memory structures

typedef struct
{
   long            ol;
   long            ol_i_id;
   short           ol_supply_w_id;
   short           ol_quantity;
   double           ol_amount;
   char            ol_dist_info[DIST_INFO_LEN+1];
            char
ol_delivery_d[OL_DELIVERY_D_LEN+1];
} ORDER_LINE_STRUCT;

typedef struct
{
   long            o_id;
   short           o_d_id;
   short           o_w_id;
   long            o_c_id;
   short           o_carrier_id;
   short           o_ol_cnt;
   short           o_all_local;
            ORDER_LINE_STRUCT   o_ol[15];
} ORDERS_STRUCT;

typedef struct
{
   long                                    c_id;
   short                                   c_d_id;
   short                                   c_w_id;
            char
c_first[FIRST_NAME_LEN+1];
   char
c_middle[MIDDLE_NAME_LEN+1];
   char                                    c_last[LAST_NAME_LEN+1];
   char                                    c_street_1[ADDRESS_LEN+1];
   char                                    c_street_2[ADDRESS_LEN+1];
   char                                    c_city[ADDRESS_LEN+1];
   char                                    c_state[STATE_LEN+1];
   char                                    c_zip[ZIP_LEN+1];
   char                                    c_phone[PHONE_LEN+1];
   char                                    c_credit[CREDIT_LEN+1];
   double                                  c_credit_lim;
   double                                  c_discount;
//  fix to avoid ODBC float to numeric conversion problem.
//  double                                  c_balance;
            char                                    c_balance[6];

   double                                  c_ytd_payment;
            short                                   c_payment_cnt;
            short                                   c_delivery_cnt;
            char
c_data[C_DATA_LEN+1];
            double                                  h_amount;
   char                                    h_data[H_DATA_LEN+1];
} CUSTOMER_STRUCT;

typedef struct
{
            char
c_last[LAST_NAME_LEN+1];
            char
c_first[FIRST_NAME_LEN+1];
   long                                    c_id;
} CUSTOMER_SORT_STRUCT;

typedef struct
{
   long              time_start;
} LOADER_TIME_STRUCT;


// Global variables

char         szLastError[300];

HENV      henv;

HDBC      v_hdbc;                                                    //
for SQL Server version verification
HDBC      i_hdbc1;                                                   // for ITEM
table
HDBC      w_hdbc1;                                                   // for
WAREHOUSE, DISTRICT, STOCK
HDBC      c_hdbc1;                                                   // for
CUSTOMER
HDBC      c_hdbc2;                                                   // for
HISTORY
HDBC      o_hdbc1;                                                   // for
ORDERS
HDBC      o_hdbc2;                                                   // for
NEW-ORDER
HDBC      o_hdbc3;                                                   // for
ORDER-LINE

HSTMT     v_hstmt;                                                   // for SQL
Server version verification
HSTMT     i_hstmt1;
HSTMT     w_hstmt1;
HSTMT     c_hstmt1, c_hstmt2;
HSTMT     o_hstmt1, o_hstmt2, o_hstmt3;

ORDERS_STRUCT   orders_buf[ORDERS_PER_DISTRICT];
CUSTOMER_STRUCT customer_buf[CUSTOMERS_PER_DISTRICT];
long          orders_rows_loaded;
long          new_order_rows_loaded;
long          order_line_rows_loaded;
long          history_rows_loaded;
long          customer_rows_loaded;
long          stock_rows_loaded;
long          district_rows_loaded;
long          item_rows_loaded;
long          warehouse_rows_loaded;
long          main_time_start;
long          main_time_end;
long                                    max_items;
long                                    customers_per_district;
long                                    orders_per_district;
long                                    first_new_order;
long                                    last_new_order;


TPCCLDR_ARGS    *aptr, args;


//=============================================================
==============
//
// Function name: main
//
//=============================================================
==============

int main(int  argc, char **argv)
```

```
{
        DWORD         dwThreadID[MAX_MAIN_THREADS];
        HANDLE        hThread[MAX_MAIN_THREADS];
        FILE          *fLoader;
        char          buffer[255];
        int                                     i;

        for (i=0; i<MAX_MAIN_THREADS; i++)
                hThread[i] = NULL;

  printf("\n*************************************************");
        printf("\n*                                       *");
        printf("\n*  Microsoft SQL Server                 *");
        printf("\n*                                       *");
        printf("\n*  TPC-C BENCHMARK KIT:  Database loader *");
        printf("\n*  Version %s                        *", TPCKIT_VER);
        printf("\n*                                       *");

printf("\n*************************************************\n\n");

  // process command line arguments

  aptr = &args;
  GetArgsLoader(argc, argv, aptr);

        // verify database and tables exist before attempting to load

        CheckSQL();
        CheckDataBase();

        printf("Build interface is ODBC.\n");

        if (aptr->build_index == 0)
                printf("Data load only - no index creation.\n");
        else
                printf("Data load and index creation.\n");

        if (aptr->index_order == 0)
                printf("Clustered indexes will be created after bulk
load.\n");
        else
                printf("Clustered indexes will be created before bulk
load.\n");

        // set database scale values
        if (aptr->scale_down == 1)
        {
                printf("*** Scaled Down Database ***\n");
                max_items = MAXITEMS_SCALE_DOWN;
                customers_per_district =
CUSTOMERS_SCALE_DOWN;
                orders_per_district = ORDERS_SCALE_DOWN;
                first_new_order = 0;
                last_new_order  = 30;
        }
        else
        {
                max_items = MAXITEMS;
                customers_per_district =
CUSTOMERS_PER_DISTRICT;
                orders_per_district = ORDERS_PER_DISTRICT;
                first_new_order = 2100;
                last_new_order  = 3000;
        }


        // open connections to SQL Server
        OpenConnections();

        // open file for loader results
  fLoader = fopen(aptr->loader_res_file, "w");

  if (fLoader == NULL)
        {
                printf("Error, loader result file open failed.");
                exit(-1);
        }

  // start loading data

  sprintf(buffer,"TPC-C load started for %ld
warehouses.\n",aptr->num_warehouses);

        printf("%s",buffer);
        fprintf(fLoader,"%s",buffer);

        main_time_start = (TimeNow() / MILLI);

        // start parallel load threads


        if (aptr->tables_all || aptr->table_item)
        {
                fprintf(fLoader, "\nStarting loader threads for: item\n");

                hThread[0] = CreateThread(NULL,

 0,

 (LPTHREAD_START_ROUTINE) LoadItem,

 NULL,

 0,

 &dwThreadID[0]);

                if (hThread[0] == NULL)
                {
                        printf("Error, failed in creating creating thread
= 0.\n");
                        exit(-1);
                }
        }

        if (aptr->tables_all || aptr->table_warehouse)
        {
                fprintf(fLoader, "Starting loader threads for:
warehouse\n");

                hThread[1] = CreateThread(NULL,

 0,

 (LPTHREAD_START_ROUTINE) LoadWarehouse,

 NULL,

 0,

 &dwThreadID[1]);

                if (hThread[1] == NULL)
                {
```

```
                                printf("Error, failed in creating creating thread
= 1.\n");
                                exit(-1);
                        }
                }

                if (aptr->tables_all || aptr->table_customer)
                {
                        fprintf(fLoader, "Starting loader threads for:
customer\n");

                        hThread[2] = CreateThread(NULL,

 0,

 (LPTHREAD_START_ROUTINE) LoadCustomer,

 NULL,

 0,

 &dwThreadID[2]);

                        if (hThread[2] == NULL)
                        {
                                printf("Error, failed in creating creating main
thread = 2.\n");
                                exit(-1);
                        }
                }

                if (aptr->tables_all || aptr->table_orders)
                {
                        fprintf(fLoader, "Starting loader threads for: orders\n");

                        hThread[3] = CreateThread(NULL,

 0,

 (LPTHREAD_START_ROUTINE) LoadOrders,

 NULL,

 0,

 &dwThreadID[3]);

                        if (hThread[3] == NULL)
                        {
                                printf("Error, failed in creating creating main
thread = 3.\n");
                                exit(-1);
                        }
                }

                // Wait for threads to finish...
                for (i=0; i<MAX_MAIN_THREADS; i++)
                {
                        if (hThread[i] != NULL)
                        {
                                WaitForSingleObject( hThread[i], INFINITE
);
                                CloseHandle(hThread[i]);
                                hThread[i] = NULL;
                        }
                }

                main_time_end = (TimeNow() / MILLI);

   sprintf(buffer,"\nTPC-C load completed successfully in %ld minutes.\n",
                                (main_time_end - main_time_start)/60);

                printf("%s",buffer);
                fprintf(fLoader, "%s", buffer);

                fclose(fLoader);

                SQLFreeEnv(henv);

   exit(0);

                return 0;
}


//=================================================
==============
//
// Function name: LoadItem
//
//=================================================
==============

void LoadItem()
{
   long                 i_id;
                long                    i_im_id;
   char                 i_name[I_NAME_LEN+1];
   double               i_price;
   char                 i_data[I_DATA_LEN+1];
                char                    name[20];
                long                    time_start;
                RETCODE                         rc;
                DBINT                   rcint;
                char                    bcphint[128];

                // Seed with unique number
                seed(1);

                printf("Loading item table...\n");

                // if build index before load
                if ((aptr->build_index == 1) && (aptr->index_order == 1))
                        BuildIndex("idxitmcl");

                InitString(i_name, I_NAME_LEN+1);
                InitString(i_data, I_DATA_LEN+1);

                sprintf(name, "%s..%s", aptr->database, "item");

                rc = bcp_init(i_hdbc1, name, NULL, "logs\\item.err", DB_IN);
                if (rc != SUCCEED)
                        HandleErrorDBC(i_hdbc1);

                if ((aptr->build_index == 1) && (aptr->index_order == 1))
                {
                        sprintf(bcphint, "tablock, order (i_id),
ROWS_PER_BATCH = 100000");
                        rc = bcp_control(i_hdbc1, BCPHINTS, (void*) bcphint);
                        if (rc != SUCCEED)
                                HandleErrorDBC(i_hdbc1);
                }

                rc = bcp_bind(i_hdbc1, (BYTE *) &i_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT4, 1);
                if (rc != SUCCEED)
```

```
                HandleErrorDBC(i_hdbc1);

        rc = bcp_bind(i_hdbc1, (BYTE *) &i_im_id, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT4, 2);
        if (rc != SUCCEED)
                HandleErrorDBC(i_hdbc1);

        rc = bcp_bind(i_hdbc1, (BYTE *) i_name, 0, I_NAME_LEN,
NULL, 0, 0, 3);
        if (rc != SUCCEED)
                HandleErrorDBC(i_hdbc1);

        rc = bcp_bind(i_hdbc1, (BYTE *) &i_price, 0,
SQL_VARLEN_DATA, NULL, 0, SQLFLT8, 4);
        if (rc != SUCCEED)
                HandleErrorDBC(i_hdbc1);

        rc = bcp_bind(i_hdbc1, (BYTE *) i_data, 0, I_DATA_LEN, NULL,
0, 0, 5);
        if (rc != SUCCEED)
                HandleErrorDBC(i_hdbc1);

        time_start = (TimeNow() / MILLI);

        item_rows_loaded = 0;

        for (i_id = 1; i_id <= max_items; i_id++)
        {
                i_im_id = RandomNumber(1L, 10000L);

                MakeAlphaString(14, 24, I_NAME_LEN, i_name);

                i_price = ((float) RandomNumber(100L, 10000L))/100.0;

                MakeOriginalAlphaString(26, 50, I_DATA_LEN, i_data,
10);

                rc = bcp_sendrow(i_hdbc1);
                if (rc != SUCCEED)
                        HandleErrorDBC(i_hdbc1);

                item_rows_loaded++;
                CheckForCommit(i_hdbc1, i_hstmt1, item_rows_loaded,
"item", &time_start);
        }

        rcint = bcp_done(i_hdbc1);
        if (rcint < 0)
                HandleErrorDBC(i_hdbc1);

        printf("Finished loading item table.\n");

        SQLFreeStmt(i_hstmt1, SQL_DROP);
        SQLDisconnect(i_hdbc1);
        SQLFreeConnect(i_hdbc1);

        // if build index after load
        if ((aptr->build_index == 1) && (aptr->index_order == 0))
                BuildIndex("idxitmcl");

}


//==============================================================
====================
//
// Function   : LoadWarehouse
//
// Loads WAREHOUSE table and loads Stock and District as Warehouses are
created
//
//==============================================================
====================

void LoadWarehouse()
{
   short    w_id;
   char     w_name[W_NAME_LEN+1];
   char     w_street_1[ADDRESS_LEN+1];
   char     w_street_2[ADDRESS_LEN+1];
   char     w_city[ADDRESS_LEN+1];
   char     w_state[STATE_LEN+1];
   char     w_zip[ZIP_LEN+1];
   double   w_tax;
   double   w_ytd;
        char        name[20];
        long        time_start;
        RETCODE             rc;
        DBINT       rcint;
        char        bcphint[128];


        // Seed with unique number
        seed(2);

        printf("Loading warehouse table...\n");

        // if build index before load...
        if ((aptr->build_index == 1) && (aptr->index_order == 1))
                BuildIndex("idxwarcl");

        InitString(w_name, W_NAME_LEN+1);
        InitAddress(w_street_1, w_street_2, w_city, w_state, w_zip);

        sprintf(name, "%s..%s", aptr->database, "warehouse");

        rc = bcp_init(w_hdbc1, name, NULL, "logs\\whouse.err", DB_IN);

        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        if ((aptr->build_index == 1) && (aptr->index_order == 1))
        {
                sprintf(bcphint, "tablock, order (w_id),
ROWS_PER_BATCH = %d", aptr->num_warehouses);
                rc = bcp_control(w_hdbc1, BCPHINTS, (void*)
bcphint);
                if (rc != SUCCEED)
                        HandleErrorDBC(w_hdbc1);
        }

        rc = bcp_bind(w_hdbc1, (BYTE *) &w_id, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 1);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) w_name, 0, W_NAME_LEN,
NULL, 0, 0, 2);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) w_street_1, 0, ADDRESS_LEN,
NULL, 0, 0, 3);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);
```

```
		rc = bcp_bind(w_hdbc1, (BYTE *) w_street_2, 0, ADDRESS_LEN,
NULL, 0, 0, 4);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) w_city, 0, ADDRESS_LEN,
NULL, 0, 0, 5);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) w_state, 0, STATE_LEN,
NULL, 0, 0, 6);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) w_zip, 0, ZIP_LEN, NULL, 0, 0,
7);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) &w_tax, 0,
SQL_VARLEN_DATA, NULL, 0, SQLFLT8, 8);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		rc = bcp_bind(w_hdbc1, (BYTE *) &w_ytd, 0,
SQL_VARLEN_DATA, NULL, 0, SQLFLT8, 9);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		time_start = (TimeNow() / MILLI);

		warehouse_rows_loaded = 0;

		for (w_id = (short)aptr->starting_warehouse; w_id <=
aptr->num_warehouses; w_id++)
		{
			MakeAlphaString(6,10, W_NAME_LEN, w_name);

			MakeAddress(w_street_1, w_street_2, w_city, w_state,
w_zip);

			w_tax = ((float) RandomNumber(0L,2000L))/10000.00;

			w_ytd = 300000.00;

			rc = bcp_sendrow(w_hdbc1);
			if (rc != SUCCEED)
				HandleErrorDBC(w_hdbc1);

			warehouse_rows_loaded++;
			CheckForCommit(w_hdbc1, i_hstmt1,
warehouse_rows_loaded, "warehouse", &time_start);
		}

		rcint = bcp_done(w_hdbc1);
		if (rcint < 0)
			HandleErrorDBC(w_hdbc1);

		printf("Finished loading warehouse table.\n");

		// if build index after load...
		if ((aptr->build_index == 1) && (aptr->index_order == 0))
			BuildIndex("idxwarcl");

		stock_rows_loaded = 0;
		district_rows_loaded = 0;

		District();
		Stock();

}


//==============================================================
==============
//
// Function   : District
//
//==============================================================
==============

void District()
{
  short    d_id;
  short    d_w_id;
  char     d_name[D_NAME_LEN+1];
  char     d_street_1[ADDRESS_LEN+1];
  char     d_street_2[ADDRESS_LEN+1];
  char     d_city[ADDRESS_LEN+1];
  char     d_state[STATE_LEN+1];
  char     d_zip[ZIP_LEN+1];
  double   d_tax;
  double   d_ytd;
		char	name[20];
  long     d_next_o_id;
		long	time_start;
		int			w_id;
		RETCODE		rc;
		DBINT	rcint;
		char	bcphint[128];

		// Seed with unique number
		seed(4);

		printf("Loading district table...\n");

		// build index before load
		if ((aptr->build_index == 1) && (aptr->index_order == 1))
			BuildIndex("idxdiscl");

		InitString(d_name, D_NAME_LEN+1);
		InitAddress(d_street_1, d_street_2, d_city, d_state, d_zip);
		sprintf(name, "%s..%s", aptr->database, "district");

		rc = bcp_init(w_hdbc1, name, NULL, "logs\\district.err", DB_IN);

		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);

		if ((aptr->build_index == 1) && (aptr->index_order == 1))
		{
			sprintf(bcphint, "tablock, order (d_w_id, d_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 10));
			rc = bcp_control(w_hdbc1, BCPHINTS, (void*)
bcphint);
			if (rc != SUCCEED)
				HandleErrorDBC(w_hdbc1);
		}

		rc = bcp_bind(w_hdbc1, (BYTE *) &d_id, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 1);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);
```

```
        rc = bcp_bind(w_hdbc1, (BYTE *) &d_w_id, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 2);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) d_name, 0, D_NAME_LEN,
NULL, 0, 0, 3);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) d_street_1, 0, ADDRESS_LEN,
NULL, 0, 0, 4);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) d_street_2, 0, ADDRESS_LEN,
NULL, 0, 0, 5);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) d_city, 0, ADDRESS_LEN,
NULL, 0, 0, 6);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) d_state, 0, STATE_LEN, NULL,
0, 0, 7);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) d_zip, 0, ZIP_LEN, NULL, 0, 0,
8);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) &d_tax, 0,
SQL_VARLEN_DATA, NULL, 0, SQLFLT8, 9);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) &d_ytd, 0,
SQL_VARLEN_DATA, NULL, 0, SQLFLT8, 10);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = bcp_bind(w_hdbc1, (BYTE *) &d_next_o_id, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT4, 11);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        d_ytd  = 30000.0;

        d_next_o_id = orders_per_district+1;

        time_start = (TimeNow() / MILLI);

        for (w_id = aptr->starting_warehouse; w_id <=
aptr->num_warehouses; w_id++)
        {
                d_w_id = w_id;

                for (d_id = 1; d_id <= DISTRICT_PER_WAREHOUSE;
d_id++)
                {
                        MakeAlphaString(6,10,D_NAME_LEN,
d_name);

                        MakeAddress(d_street_1, d_street_2, d_city,
d_state, d_zip);

                        d_tax = ((float)
RandomNumber(0L,2000L))/10000.00;

                        rc = bcp_sendrow(w_hdbc1);
                        if (rc != SUCCEED)
                                HandleErrorDBC(w_hdbc1);

                        district_rows_loaded++;
                        CheckForCommit(w_hdbc1, w_hstmt1,
district_rows_loaded, "district", &time_start);
                }
   }

        rcint = bcp_done(w_hdbc1);
        if (rcint < 0)
                HandleErrorDBC(w_hdbc1);

        printf("Finished loading district table.\n");

        // if build index after load...
        if ((aptr->build_index == 1) && (aptr->index_order == 0))
                BuildIndex("idxdiscl");

   return;
}


//=============================================================
==============
//
// Function   : Stock
//
//=============================================================
==============

void Stock()
{
   long     s_i_id;
   short    s_w_id;
   short    s_quantity;
   char     s_dist_01[S_DIST_LEN+1];
   char     s_dist_02[S_DIST_LEN+1];
   char     s_dist_03[S_DIST_LEN+1];
   char     s_dist_04[S_DIST_LEN+1];
   char     s_dist_05[S_DIST_LEN+1];
   char     s_dist_06[S_DIST_LEN+1];
   char     s_dist_07[S_DIST_LEN+1];
   char     s_dist_08[S_DIST_LEN+1];
   char     s_dist_09[S_DIST_LEN+1];
   char     s_dist_10[S_DIST_LEN+1];
   long     s_ytd;
   short    s_order_cnt;
   short    s_remote_cnt;
   char     s_data[S_DATA_LEN+1];
   short    len;
        char        name[20];
        long        time_start;
        RETCODE             rc;
        DBINT    rcint;
        char        bcphint[128];

        // Seed with unique number
        seed(3);

        // if build index before load...
```

```
	if ((aptr->build_index == 1) && (aptr->index_order == 1))
		BuildIndex("idxstkcl");

	sprintf(name, "%s..%s", aptr->database, "stock");

	rc = bcp_init(w_hdbc1, name, NULL, "logs\\stock.err", DB_IN);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	if ((aptr->build_index == 1) && (aptr->index_order == 1))
	{
		sprintf(bcphint, "tablock, order (s_i_id, s_w_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 100000));
		rc = bcp_control(w_hdbc1, BCPHINTS, (void*)
bcphint);
		if (rc != SUCCEED)
			HandleErrorDBC(w_hdbc1);
	}

	rc = bcp_bind(w_hdbc1, (BYTE *) &s_i_id, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT4, 1);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	bcp_bind(w_hdbc1, (BYTE *) &s_w_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 2);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) &s_quantity, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 3);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_01, 0, S_DIST_LEN,
NULL, 0, 0, 4);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_02, 0, S_DIST_LEN,
NULL, 0, 0, 5);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_03, 0, S_DIST_LEN,
NULL, 0, 0, 6);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_04, 0, S_DIST_LEN,
NULL, 0, 0, 7);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_05, 0, S_DIST_LEN,
NULL, 0, 0, 8);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_06, 0, S_DIST_LEN,
NULL, 0, 0, 9);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_07, 0, S_DIST_LEN,
NULL, 0, 0, 10);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_08, 0, S_DIST_LEN,
NULL, 0, 0, 11);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_09, 0, S_DIST_LEN,
NULL, 0, 0, 12);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_10, 0, S_DIST_LEN,
NULL, 0, 0, 13);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) &s_ytd, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT4, 14);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) &s_order_cnt, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 15);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) &s_remote_cnt, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 16);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	rc = bcp_bind(w_hdbc1, (BYTE *) s_data, 0, S_DATA_LEN,
NULL, 0, 0, 17);
	if (rc != SUCCEED)
		HandleErrorDBC(w_hdbc1);

	s_ytd = s_order_cnt = s_remote_cnt = 0;

	time_start = (TimeNow() / MILLI);

	printf("...Loading stock table\n");

	for (s_i_id=1; s_i_id <= max_items; s_i_id++)
	{

		for (s_w_id = (short)aptr->starting_warehouse; s_w_id
<= aptr->num_warehouses; s_w_id++)
		{

			s_quantity =
(short)RandomNumber(10L,100L);
			len = MakeAlphaString(24,24,S_DIST_LEN,
s_dist_01);
			len = MakeAlphaString(24,24,S_DIST_LEN,
s_dist_02);
			len = MakeAlphaString(24,24,S_DIST_LEN,
s_dist_03);
			len = MakeAlphaString(24,24,S_DIST_LEN,
s_dist_04);
			len = MakeAlphaString(24,24,S_DIST_LEN,
s_dist_05);
			len = MakeAlphaString(24,24,S_DIST_LEN,
s_dist_06);
			len = MakeAlphaString(24,24,S_DIST_LEN,
s_dist_07);
			len = MakeAlphaString(24,24,S_DIST_LEN,
s_dist_08);
```

```
                                len = MakeAlphaString(24,24,S_DIST_LEN,
s_dist_09);
                                len = MakeAlphaString(24,24,S_DIST_LEN,
s_dist_10);

                                len = MakeOriginalAlphaString(26,50,
S_DATA_LEN, s_data,10);

                                rc = bcp_sendrow(w_hdbc1);
                                if (rc != SUCCEED)
                                        HandleErrorDBC(w_hdbc1);

                                stock_rows_loaded++;
                                CheckForCommit(w_hdbc1, w_hstmt1,
stock_rows_loaded, "stock", &time_start);

                        }
                }

                rcint = bcp_done(w_hdbc1);
                if (rcint < 0)
                        HandleErrorDBC(w_hdbc1);

                printf("Finished loading stock table.\n");

                SQLFreeStmt(w_hstmt1, SQL_DROP);
                SQLDisconnect(w_hdbc1);
                SQLFreeConnect(w_hdbc1);

                // if build index after load...
                if ((aptr->build_index == 1) && (aptr->index_order == 0))
                        BuildIndex("idxstkcl");

                return;
}


//=================================================================
//
// Function   : LoadCustomer
//
//=================================================================

void LoadCustomer()
{
                LOADER_TIME_STRUCT      customer_time_start;
                LOADER_TIME_STRUCT      history_time_start;
                short                   w_id;
   short                d_id;
                DWORD
dwThreadID[MAX_CUSTOMER_THREADS];
                HANDLE
hThread[MAX_CUSTOMER_THREADS];
                char                    name[20];
                RETCODE
rc;
                DBINT                                           rcint;
                char
bcphint[128];
                char                                            cmd[256];
                // SQLRETURN                                    rc_1;
                // SQLSMALLINT                                  recnum,
MsgLen;
                // SQLCHAR
SqlState[6], Msg[SQL_MAX_MESSAGE_LENGTH];
                // SQLINTEGER                                   NativeError;

                // Seed with unique number
                seed(5);

                printf("Loading customer and history tables...\n");

                // if build index before load...
                if ((aptr->build_index == 1) && (aptr->index_order == 1))
                        BuildIndex("idxcuscl");

                // Initialize bulk copy
                sprintf(name, "%s..%s", aptr->database, "customer");

                rc = bcp_init(c_hdbc1, name, NULL, "logs\\customer.err", DB_IN);

                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

                if ((aptr->build_index == 1) && (aptr->index_order == 1))
                {
                        sprintf(bcphint, "tablock, order (c_w_id, c_d_id, c_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 30000));
                        rc = bcp_control(c_hdbc1, BCPHINTS, (void*) bcphint);

                        if (rc != SUCCEED)
                                HandleErrorDBC(c_hdbc1);
                }

                sprintf(name, "%s..%s", aptr->database, "history");

                rc = bcp_init(c_hdbc2, name, NULL, "logs\\history.err", DB_IN);

                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc2);

                sprintf(bcphint, "tablock");
                rc = bcp_control(c_hdbc2, BCPHINTS, (void*) bcphint);
                if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc2);

                customer_rows_loaded    = 0;
                history_rows_loaded     = 0;

                CustomerBufInit();

                customer_time_start.time_start = (TimeNow() / MILLI);
                history_time_start.time_start = (TimeNow() / MILLI);

                for (w_id = (short)aptr->starting_warehouse; w_id <=
aptr->num_warehouses; w_id++)
                {
                        for (d_id = 1; d_id <= DISTRICT_PER_WAREHOUSE;
d_id++)
                        {

                                CustomerBufLoad(d_id, w_id);

                                // Start parallel loading threads here...

                                // Start customer table thread

                                printf("...Loading customer table for: d_id =
%d, w_id = %d\n", d_id, w_id);

                                hThread[0] = CreateThread(NULL,

                  0,
```

```
		(LPTHREAD_START_ROUTINE) LoadCustomerTable,

		&customer_time_start,

		0,

		&dwThreadID[0]);

				if (hThread[0] == NULL)
				{
					printf("Error, failed in creating
creating thread = 0.\n");
					exit(-1);
				}

				// Start History table thread

				printf("...Loading history table for: d_id = %d,
w_id = %d\n", d_id, w_id);

				hThread[1] = CreateThread(NULL,

		0,

		(LPTHREAD_START_ROUTINE) LoadHistoryTable,

		&history_time_start,

		0,

		&dwThreadID[1]);

				if (hThread[1] == NULL)
				{
					printf("Error, failed in creating
creating thread = 1.\n");
					exit(-1);
				}

				WaitForSingleObject( hThread[0], INFINITE
);
				WaitForSingleObject( hThread[1], INFINITE
);

				if (CloseHandle(hThread[0]) == FALSE)
				{
					printf("Error, failed in closing
customer thread handle with errno: %d\n", GetLastError());
				}

				if (CloseHandle(hThread[1]) == FALSE)
				{
					printf("Error, failed in closing
history thread handle with errno: %d\n", GetLastError());
				}


			}

		}

		// flush the bulk connection
		rcint = bcp_done(c_hdbc1);
		if (rcint < 0)
			HandleErrorDBC(c_hdbc1);

		rcint = bcp_done(c_hdbc2);
		if (rcint < 0)
			HandleErrorDBC(c_hdbc2);

		printf("Finished loading customer table.\n");

		// if build index after load...
		if ((aptr->build_index == 1) && (aptr->index_order == 0))
			BuildIndex("idxcuscl");

		// build non-clustered index
		if (aptr->build_index == 1)
			BuildIndex("idxcusnc");

		// Output the NURAND used for the loader into C_FIRST for C_ID
= 1,
		// C_W_ID = 1, and C_D_ID = 1
		sprintf(cmd, "isql -S%s -U%s -P%s -d%s -e -Q\"update customer set
c_first = 'C_LOAD = %d' where c_id = 1 and c_w_id = 1 and c_d_id = 1\" >
logs\\nurand_load.log",
					aptr->server,
					aptr->user,
					aptr->password,
					aptr->database,
					LOADER_NURAND_C);

		system(cmd);

		SQLFreeStmt(c_hstmt1, SQL_DROP);
		SQLDisconnect(c_hdbc1);
		SQLFreeConnect(c_hdbc1);

		SQLFreeStmt(c_hstmt2, SQL_DROP);
		SQLDisconnect(c_hdbc2);
		SQLFreeConnect(c_hdbc2);


   return;

}


//=================================================
==============
//
// Function   : CustomerBufInit
//
//=================================================
==============

void CustomerBufInit()
{
		int	i;

		for (i=0;i<customers_per_district;i++)
		{
			customer_buf[i].c_id = 0;
			customer_buf[i].c_d_id = 0;
			customer_buf[i].c_w_id = 0;

			strcpy(customer_buf[i].c_first,"");
			strcpy(customer_buf[i].c_middle,"");
			strcpy(customer_buf[i].c_last,"");
			strcpy(customer_buf[i].c_street_1,"");
			strcpy(customer_buf[i].c_street_2,"");
			strcpy(customer_buf[i].c_city,"");
			strcpy(customer_buf[i].c_state,"");
			strcpy(customer_buf[i].c_zip,"");
			strcpy(customer_buf[i].c_phone,"");
```

```
                        strcpy(customer_buf[i].c_credit,"");

                        customer_buf[i].c_credit_lim = 0;
                        customer_buf[i].c_discount = (float) 0;

                        //  fix to avoid ODBC float to numeric conversion
problem.
                        //              customer_buf[i].c_balance = 0;
                        strcpy(customer_buf[i].c_balance,"");

                        customer_buf[i].c_ytd_payment = 0;
                        customer_buf[i].c_payment_cnt = 0;
                        customer_buf[i].c_delivery_cnt = 0;

                        strcpy(customer_buf[i].c_data,"");

                        customer_buf[i].h_amount = 0;

                        strcpy(customer_buf[i].h_data,"");

                }


}


//=============================================================
==============
//
// Function   : CustomerBufLoad
//
// Fills shared buffer for HISTORY and CUSTOMER
//=============================================================
==============

void CustomerBufLoad(int d_id, int w_id)
{
                long                                            i;
   CUSTOMER_SORT_STRUCT    c[CUSTOMERS_PER_DISTRICT];


                for (i=0;i<customers_per_district;i++)
                {
                        if (i < 1000)
                                LastName(i, c[i].c_last);
                        else

LastName(NURand(255,0,999,LOADER_NURAND_C), c[i].c_last);

                        MakeAlphaString(8,16,FIRST_NAME_LEN,
c[i].c_first);

                        c[i].c_id = i+1;

                }

                printf("...Loading customer buffer for: d_id = %d, w_id = %d\n",
                                d_id, w_id);

                for (i=0;i<customers_per_district;i++)
                {

                        customer_buf[i].c_d_id = d_id;
                        customer_buf[i].c_w_id = w_id;
                        customer_buf[i].h_amount = 10.0;

                        customer_buf[i].c_ytd_payment  = 10.0;
                        customer_buf[i].c_payment_cnt  = 1;
                        customer_buf[i].c_delivery_cnt = 0;

                        // Generate CUSTOMER and HISTORY data

                        customer_buf[i].c_id = c[i].c_id;

                        strcpy(customer_buf[i].c_first, c[i].c_first);
                        strcpy(customer_buf[i].c_last, c[i].c_last);

                        customer_buf[i].c_middle[0] = 'O';
                        customer_buf[i].c_middle[1] = 'E';

                        MakeAddress(customer_buf[i].c_street_1,
                                        customer_buf[i].c_street_2,
                                        customer_buf[i].c_city,
                                        customer_buf[i].c_state,
                                        customer_buf[i].c_zip);

                        MakeNumberString(16, 16, PHONE_LEN,
customer_buf[i].c_phone);

                        if (RandomNumber(1L, 100L) > 10)
                                customer_buf[i].c_credit[0] = 'G';
                        else
                                customer_buf[i].c_credit[0] = 'B';
                        customer_buf[i].c_credit[1] = 'C';

                        customer_buf[i].c_credit_lim = 50000.0;
                        customer_buf[i].c_discount = ((float)
RandomNumber(0L, 5000L)) / 10000.0;

                        //  fix to avoid ODBC float to numeric conversion
problem.
                        //  customer_buf[i].c_balance = -10.0;
                        strcpy(customer_buf[i].c_balance,"-10.0");

                        MakeAlphaString(300, 500, C_DATA_LEN,
customer_buf[i].c_data);

                        // Generate HISTORY data
                        MakeAlphaString(12, 24, H_DATA_LEN,
customer_buf[i].h_data);

                }
}

//=============================================================
==============
//
// Function   : LoadCustomerTable
//
//=============================================================
==============

void LoadCustomerTable(LOADER_TIME_STRUCT *customer_time_start)
{
                int        i;
   long       c_id;
   short      c_d_id;
   short      c_w_id;
   char       c_first[FIRST_NAME_LEN+1];
   char       c_middle[MIDDLE_NAME_LEN+1];
   char       c_last[LAST_NAME_LEN+1];
   char       c_street_1[ADDRESS_LEN+1];
   char       c_street_2[ADDRESS_LEN+1];
   char       c_city[ADDRESS_LEN+1];
   char       c_state[STATE_LEN+1];
```

```
   char       c_zip[ZIP_LEN+1];
   char       c_phone[PHONE_LEN+1];
   char       c_credit[CREDIT_LEN+1];
   double     c_credit_lim;
   double     c_discount;

              //  fix to avoid ODBC float to numeric conversion problem.
              //  double              c_balance;
              char                    c_balance[6];

   double     c_ytd_payment;
   short      c_payment_cnt;
   short      c_delivery_cnt;
   char       c_data[C_DATA_LEN+1];
              char                    c_since[C_SINCE_LEN+1];
              RETCODE                 rc;

   rc = bcp_bind(c_hdbc1, (BYTE *) &c_id, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT4, 1);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 2);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

              rc = bcp_bind(c_hdbc1, (BYTE *) &c_w_id, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 3);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_first, 0, FIRST_NAME_LEN, NULL, 0,
0, 4);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_middle, 0,
MIDDLE_NAME_LEN,NULL, 0, 0, 5);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_last, 0, LAST_NAME_LEN, NULL, 0,
0, 6);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_street_1, 0, ADDRESS_LEN, NULL, 0,
0, 7);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_street_2, 0, ADDRESS_LEN,
NULL,0,0, 8);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_city, 0, ADDRESS_LEN, NULL, 0, 0,
9);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_state, 0, STATE_LEN, NULL, 0, 0, 10);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_zip, 0, ZIP_LEN, NULL, 0, 0, 11);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_phone, 0, PHONE_LEN, NULL, 0, 0,
12);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

              rc = bcp_bind(c_hdbc1, (BYTE *) &c_since, 0, C_SINCE_LEN,
NULL, 0, SQLCHARACTER, 13);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_credit, 0, CREDIT_LEN, NULL, 0, 0,
14);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) &c_credit_lim, 0,
SQL_VARLEN_DATA, NULL, 0, SQLFLT8, 15);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) &c_discount, 0, SQL_VARLEN_DATA,
NULL, 0, SQLFLT8, 16);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);



              //  fix to avoid ODBC float to numeric conversion problem.

   //  rc = bcp_bind(c_hdbc1, (BYTE *) &c_balance, 0,
SQL_VARLEN_DATA, NULL, 0, SQLFLT8, 17);
              //  if (rc != SUCCEED)
              //            HandleErrorDBC(c_hdbc1);
   rc = bcp_bind(c_hdbc1, (BYTE *) c_balance, 0, 5, NULL, 0,
SQLCHARACTER, 17);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);



   rc = bcp_bind(c_hdbc1, (BYTE *) &c_ytd_payment, 0,
SQL_VARLEN_DATA, NULL, 0, SQLFLT8, 18);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) &c_payment_cnt, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 19);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) &c_delivery_cnt,0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 20);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   rc = bcp_bind(c_hdbc1, (BYTE *) c_data, 0, 500, NULL, 0, 0, 21);
              if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc1);

   for (i = 0; i < customers_per_district; i++)
   {
                        c_id = customer_buf[i].c_id;
                        c_d_id = customer_buf[i].c_d_id;
                        c_w_id = customer_buf[i].c_w_id;

                        strcpy(c_first, customer_buf[i].c_first);
                        strcpy(c_middle, customer_buf[i].c_middle);
                        strcpy(c_last, customer_buf[i].c_last);
```

```
                        strcpy(c_street_1, customer_buf[i].c_street_1);
                        strcpy(c_street_2, customer_buf[i].c_street_2);
                        strcpy(c_city, customer_buf[i].c_city);
                        strcpy(c_state, customer_buf[i].c_state);
                        strcpy(c_zip, customer_buf[i].c_zip);
                        strcpy(c_phone, customer_buf[i].c_phone);
                        strcpy(c_credit, customer_buf[i].c_credit);

                        FormatDate(&c_since);


                        c_credit_lim = customer_buf[i].c_credit_lim;
                        c_discount = customer_buf[i].c_discount;

                        //  fix to avoid ODBC float to numeric conversion
problem.
                        //  c_balance = customer_buf[i].c_balance;
                        strcpy(c_balance, customer_buf[i].c_balance);

                        c_ytd_payment = customer_buf[i].c_ytd_payment;
                        c_payment_cnt = customer_buf[i].c_payment_cnt;
                        c_delivery_cnt = customer_buf[i].c_delivery_cnt;

                        strcpy(c_data, customer_buf[i].c_data);

                        // Send data to server
                        rc = bcp_sendrow(c_hdbc1);
                        if (rc != SUCCEED)
                                HandleErrorDBC(c_hdbc1);

                        customer_rows_loaded++;
                        CheckForCommit(c_hdbc1, c_hstmt1,
customer_rows_loaded, "customer", &customer_time_start->time_start);
   }

}


//============================================================
==============
//
// Function   : LoadHistoryTable
//
//============================================================
==============

void LoadHistoryTable(LOADER_TIME_STRUCT *history_time_start)
{
            int         i;
   long      c_id;
   short     c_d_id;
   short     c_w_id;
            double      h_amount;
   char      h_data[H_DATA_LEN+1];
            char                h_date[H_DATE_LEN+1];
            RETCODE                     rc;

   rc = bcp_bind(c_hdbc2, (BYTE *) &c_id, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT4, 1);
            if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc2);

   rc = bcp_bind(c_hdbc2, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 2);
            if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc2);

   rc = bcp_bind(c_hdbc2, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 3);
            if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc2);

   rc = bcp_bind(c_hdbc2, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 4);
            if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc2);

   rc = bcp_bind(c_hdbc2, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 5);
            if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc2);

            rc = bcp_bind(c_hdbc2, (BYTE *) &h_date, 0, H_DATE_LEN,
NULL, 0, SQLCHARACTER, 6);
            if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc2);

   rc = bcp_bind(c_hdbc2, (BYTE *) &h_amount, 0, SQL_VARLEN_DATA,
NULL, 0, SQLFLT8, 7);
            if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc2);

   rc = bcp_bind(c_hdbc2, (BYTE *) h_data, 0, H_DATA_LEN, NULL, 0, 0,
8);
            if (rc != SUCCEED)
                        HandleErrorDBC(c_hdbc2);

   for (i = 0; i < customers_per_district; i++)
   {
                        c_id = customer_buf[i].c_id;
                        c_d_id = customer_buf[i].c_d_id;
                        c_w_id = customer_buf[i].c_w_id;
                        h_amount = customer_buf[i].h_amount;
                        strcpy(h_data, customer_buf[i].h_data);

                        FormatDate(&h_date);

                        // send to server
                        rc = bcp_sendrow(c_hdbc2);
                        if (rc != SUCCEED)
                                HandleErrorDBC(c_hdbc2);

                        history_rows_loaded++;
                        CheckForCommit(c_hdbc2, c_hstmt2,
history_rows_loaded, "history", &history_time_start->time_start);
   }

}


//============================================================
=====-==============
//
// Function   : LoadOrders
//
//============================================================
====================

void LoadOrders()
{
            LOADER_TIME_STRUCT    orders_time_start;
            LOADER_TIME_STRUCT    new_order_time_start;
            LOADER_TIME_STRUCT    order_line_time_start;
            short                   w_id;
   short              d_id;
```

```
	DWORD
dwThreadID[MAX_ORDER_THREADS];
	HANDLE
hThread[MAX_ORDER_THREADS];
	char				name[20];
	RETCODE
rc;
	char
bcphint[128];

	// seed with unique number
	seed(6);

	printf("Loading orders...\n");

	// if build index before load...
	if ((aptr->build_index == 1) && (aptr->index_order == 1))
	{
			BuildIndex("idxordcl");
			BuildIndex("idxnodcl");
			BuildIndex("idxodlcl");
	}

	// initialize bulk copy
	sprintf(name, "%s..%s", aptr->database, "orders");

	rc = bcp_init(o_hdbc1, name, NULL, "logs\\orders.err", DB_IN);
	if (rc != SUCCEED)
		HandleErrorDBC(o_hdbc1);

	if ((aptr->build_index == 1) && (aptr->index_order == 1))
	{
		sprintf(bcphint, "tablock, order (o_w_id, o_d_id, o_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 30000));
		rc = bcp_control(o_hdbc1, BCPHINTS, (void*) bcphint);

		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc1);
	}

	sprintf(name, "%s..%s", aptr->database, "new_order");

	rc = bcp_init(o_hdbc2, name, NULL, "logs\\neword.err", DB_IN);

	if (rc != SUCCEED)
		HandleErrorDBC(o_hdbc2);

	if ((aptr->build_index == 1) && (aptr->index_order == 1))
	{
		sprintf(bcphint, "tablock, order (no_w_id, no_d_id,
no_o_id), ROWS_PER_BATCH = %u", (aptr->num_warehouses * 9000));
		rc = bcp_control(o_hdbc2, BCPHINTS, (void*) bcphint);

		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc2);
	}

	sprintf(name, "%s..%s", aptr->database, "order_line");

	rc = bcp_init(o_hdbc3, name, NULL, "logs\\ordline.err", DB_IN);

	if (rc != SUCCEED)
		HandleErrorDBC(o_hdbc3);

  if ((aptr->build_index == 1) && (aptr->index_order == 1))
	{
		sprintf(bcphint, "tablock, order (ol_w_id, ol_d_id,
ol_o_id, ol_number), ROWS_PER_BATCH = %u", (aptr->num_warehouses *
300000));
		rc = bcp_control(o_hdbc3, BCPHINTS, (void*) bcphint);

		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc3);
	}

	orders_rows_loaded      = 0;
	new_order_rows_loaded   = 0;
	order_line_rows_loaded  = 0;

	OrdersBufInit();

	orders_time_start.time_start = (TimeNow() / MILLI);
	new_order_time_start.time_start = (TimeNow() / MILLI);
	order_line_time_start.time_start = (TimeNow() / MILLI);

	for (w_id = (short)aptr->starting_warehouse; w_id <=
aptr->num_warehouses; w_id++)
	{
		for (d_id = 1; d_id <= DISTRICT_PER_WAREHOUSE;
d_id++)
		{

			OrdersBufLoad(d_id, w_id);

			// start parallel loading threads here...

			// start Orders table thread

			printf("...Loading Order Table for: d_id = %d,
w_id = %d\n", d_id, w_id);

			hThread[0] = CreateThread(NULL,

		0,

		(LPTHREAD_START_ROUTINE) LoadOrdersTable,

		&orders_time_start,

		0,

		&dwThreadID[0]);

			if (hThread[0] == NULL)
			{
				printf("Error, failed in creating
creating thread = 0.\n");
				exit(-1);
			}

			// start NewOrder table thread

			printf("...Loading New-Order Table for: d_id
= %d, w_id = %d\n", d_id, w_id);

			hThread[1] = CreateThread(NULL,

		0,

		(LPTHREAD_START_ROUTINE) LoadNewOrderTable,

		&new_order_time_start,

		0,
```

```
		&dwThreadID[1]);

                                if (hThread[1] == NULL)
                                {
                                        printf("Error, failed in creating
creating thread = 1.\n");
                                        exit(-1);
                                }

                                // start Order-Line table thread

                                printf("...Loading Order-Line Table for: d_id
= %d, w_id = %d\n", d_id, w_id);

                                hThread[2] = CreateThread(NULL,

		0,

		(LPTHREAD_START_ROUTINE) LoadOrderLineTable,

		&order_line_time_start,

		0,

		&dwThreadID[2]);

                                if (hThread[2] == NULL)
                                {
                                        printf("Error, failed in creating
creating thread = 2.\n");
                                        exit(-1);
                                }

                                WaitForSingleObject( hThread[0], INFINITE
);
                                WaitForSingleObject( hThread[1], INFINITE
);
                                WaitForSingleObject( hThread[2], INFINITE
);

                                if (CloseHandle(hThread[0]) == FALSE)
                                {
                                        printf("Error, failed in closing
Orders thread handle with errno: %d\n", GetLastError());
                                }

                                if (CloseHandle(hThread[1]) == FALSE)
                                {
                                        printf("Error, failed in closing
NewOrder thread handle with errno: %d\n", GetLastError());
                                }

                                if (CloseHandle(hThread[2]) == FALSE)
                                {
                                        printf("Error, failed in closing
OrderLine thread handle with errno: %d\n", GetLastError());
                                }

                        }
                }

		printf("Finished loading orders.\n");


   return;
}

//==============================================================
//
// Function   : OrdersBufInit
//
// Clears shared buffer for ORDERS, NEWORDER, and ORDERLINE
//
//==============================================================

void OrdersBufInit()
{
		int     i;
		int                     j;

		for (i=0;i<orders_per_district;i++)
		{
                        orders_buf[i].o_id = 0;
                        orders_buf[i].o_d_id = 0;
                        orders_buf[i].o_w_id = 0;
                        orders_buf[i].o_c_id = 0;
                        orders_buf[i].o_carrier_id = 0;
                        orders_buf[i].o_ol_cnt = 0;
                        orders_buf[i].o_all_local = 0;

                        for (j=0;j<=14;j++)
                        {
                                orders_buf[i].o_ol[j].ol = 0;
                                orders_buf[i].o_ol[j].ol_i_id = 0;

                                orders_buf[i].o_ol[j].ol_supply_w_id = 0;
                                orders_buf[i].o_ol[j].ol_quantity = 0;
                                orders_buf[i].o_ol[j].ol_amount = 0;
                                strcpy(orders_buf[i].o_ol[j].ol_dist_info,"");
                        }
		}


}


//==============================================================
//
// Function   : OrdersBufLoad
//
// Fills shared buffer for ORDERS, NEWORDER, and ORDERLINE
//
//==============================================================

void OrdersBufLoad(int d_id, int w_id)
{

		int     cust[ORDERS_PER_DISTRICT+1];
		long    o_id;
		short   ol;

		printf("...Loading Order Buffer for: d_id = %d, w_id = %d\n",
                                d_id, w_id);

		GetPermutation(cust, orders_per_district);

		for (o_id=0;o_id<orders_per_district;o_id++)
		{

                        // Generate ORDER and NEW-ORDER data
```

```
                        orders_buf[o_id].o_d_id = d_id;
                        orders_buf[o_id].o_w_id = w_id;
                        orders_buf[o_id].o_id = o_id+1;
                        orders_buf[o_id].o_c_id = cust[o_id+1];
                        orders_buf[o_id].o_ol_cnt = (short)RandomNumber(5L,
15L);

                        if (o_id < first_new_order)
                        {
                                orders_buf[o_id].o_carrier_id =
(short)RandomNumber(1L, 10L);
                                orders_buf[o_id].o_all_local  = 1;
                        }
                        else
                        {
                                orders_buf[o_id].o_carrier_id = 0;
                                orders_buf[o_id].o_all_local  = 1;
                        }

                        for (ol=0; ol<orders_buf[o_id].o_ol_cnt; ol++)
                        {

                                orders_buf[o_id].o_ol[ol].ol = ol+1;
                                orders_buf[o_id].o_ol[ol].ol_i_id =
RandomNumber(1L, max_items);
                                orders_buf[o_id].o_ol[ol].ol_supply_w_id =
w_id;
                                orders_buf[o_id].o_ol[ol].ol_quantity = 5;
                                MakeAlphaString(24, 24,
OL_DIST_INFO_LEN, &orders_buf[o_id].o_ol[ol].ol_dist_info);

                                // Generate ORDER-LINE data
                                if (o_id < first_new_order)
                                {


orders_buf[o_id].o_ol[ol].ol_amount = 0;
                                        // Added to insure ol_delivery_d
set properly during load


FormatDate(&orders_buf[o_id].o_ol[ol].ol_delivery_d);

                                }
                                else
                                {

orders_buf[o_id].o_ol[ol].ol_amount = RandomNumber(1,999999)/100.0;

                                        // Added to insure ol_delivery_d
set properly during load

                                        // odbc datetime format

strcpy(orders_buf[o_id].o_ol[ol].ol_delivery_d,"1899-12-31 00:00:00.000");

                                }
                        }
                }
}


//=============================================================
==============
//
// Function   : LoadOrdersTable
//
//=============================================================
==============

void LoadOrdersTable(LOADER_TIME_STRUCT *orders_time_start)
{
                int     i;
   long         o_id;
                short   o_d_id;
                short   o_w_id;
   long         o_c_id;
   short        o_carrier_id;
   short        o_ol_cnt;
   short        o_all_local;
                char            o_entry_d[O_ENTRY_D_LEN+1];
                RETCODE                 rc;
                DBINT           rcint;

                // bind ORDER data
   rc = bcp_bind(o_hdbc1, (BYTE *) &o_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT4, 1);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc1);

   rc = bcp_bind(o_hdbc1, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 2);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc1);

   rc = bcp_bind(o_hdbc1, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 3);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc1);

   rc = bcp_bind(o_hdbc1, (BYTE *) &o_c_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT4, 4);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc1);

                rc = bcp_bind(o_hdbc1, (BYTE *) &o_entry_d, 0,
O_ENTRY_D_LEN, NULL, 0, SQLCHARACTER, 5);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc1);

   rc = bcp_bind(o_hdbc1, (BYTE *) &o_carrier_id, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 6);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc1);

   rc = bcp_bind(o_hdbc1, (BYTE *) &o_ol_cnt, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 7);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc1);

   rc = bcp_bind(o_hdbc1, (BYTE *) &o_all_local, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 8);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc1);

   for (i = 0; i < orders_per_district; i++)
   {
                        o_id        = orders_buf[i].o_id;
                        o_d_id      = orders_buf[i].o_d_id;
                        o_w_id      = orders_buf[i].o_w_id;
                        o_c_id      = orders_buf[i].o_c_id;
                        o_carrier_id = orders_buf[i].o_carrier_id;
                        o_ol_cnt    = orders_buf[i].o_ol_cnt;
                        o_all_local  = orders_buf[i].o_all_local;
```

```
                        FormatDate(&o_entry_d);

                        // send data to server
                        rc = bcp_sendrow(o_hdbc1);
                        if (rc != SUCCEED)
                                HandleErrorDBC(o_hdbc1);

                        orders_rows_loaded++;
                        CheckForCommit(o_hdbc1, o_hstmt1,
orders_rows_loaded, "orders", &orders_time_start->time_start);
   }

        // rcint = bcp_batch(o_hdbc1);
        // if (rcint < 0)
        //      HandleErrorDBC(o_hdbc1);

        if ((o_w_id == aptr->num_warehouses) && (o_d_id == 10))
        {
                rcint = bcp_done(o_hdbc1);
                if (rcint < 0)
                        HandleErrorDBC(o_hdbc1);

                SQLFreeStmt(o_hstmt1, SQL_DROP);
                SQLDisconnect(o_hdbc1);
                SQLFreeConnect(o_hdbc1);

                // if build index after load...
                if ((aptr->build_index == 1) && (aptr->index_order ==
0))
                        BuildIndex("idxordcl");

                // build non-clustered index
                if (aptr->build_index == 1)
                        BuildIndex("idxordnc");
        }

}


//=============================================================
==============
//
// Function   : LoadNewOrderTable
//
//=============================================================
==============

void LoadNewOrderTable(LOADER_TIME_STRUCT *new_order_time_start)
{
   int      i;
   long     o_id;
   short    o_d_id;
   short    o_w_id;
        RETCODE                 rc;
        DBINT           rcint;

        // Bind NEW-ORDER data

   rc = bcp_bind(o_hdbc2, (BYTE *) &o_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT4, 1);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc2);

   rc = bcp_bind(o_hdbc2, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 2);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc2);

   rc = bcp_bind(o_hdbc2, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 3);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc2);

        for (i = first_new_order; i < last_new_order; i++)
        {
                o_id    = orders_buf[i].o_id;
                o_d_id  = orders_buf[i].o_d_id;
                o_w_id  = orders_buf[i].o_w_id;

                rc = bcp_sendrow(o_hdbc2);
                if (rc != SUCCEED)
                        HandleErrorDBC(o_hdbc2);

                new_order_rows_loaded++;
                CheckForCommit(o_hdbc2, o_hstmt2,
new_order_rows_loaded, "new_order", &new_order_time_start->time_start);
        }

        // rcint = bcp_batch(o_hdbc2);
        // if (rcint < 0)
        //      HandleErrorDBC(o_hdbc2);

        if ((o_w_id == aptr->num_warehouses) && (o_d_id == 10))
        {
                rcint = bcp_done(o_hdbc2);
                if (rcint < 0)
                        HandleErrorDBC(o_hdbc2);

                SQLFreeStmt(o_hstmt2, SQL_DROP);
                SQLDisconnect(o_hdbc2);
                SQLFreeConnect(o_hdbc2);

                // if build index after load...
                if ((aptr->build_index == 1) && (aptr->index_order ==
0))
                        BuildIndex("idxnodcl");

        }

}


//=============================================================
==============
//
// Function   : LoadOrderLineTable
//
//=============================================================
==============

void LoadOrderLineTable(LOADER_TIME_STRUCT *order_line_time_start)
{
        int     i,j;
   long     o_id;
        short   o_d_id;
        short   o_w_id;
   long     ol;
        long    ol_i_id;
   short    ol_supply_w_id;
   short    ol_quantity;
   double   ol_amount;
   char     ol_dist_info[DIST_INFO_LEN+1];
        char            ol_delivery_d[OL_DELIVERY_D_LEN+1];
        RETCODE                 rc;
        DBINT           rcint;
```

```
		// bind ORDER-LINE data
   rc = bcp_bind(o_hdbc3, (BYTE *) &o_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT4, 1);
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc3);

   rc = bcp_bind(o_hdbc3, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 2);
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc3);

   rc = bcp_bind(o_hdbc3, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 3);
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc3);

   rc = bcp_bind(o_hdbc3, (BYTE *) &ol, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT4, 4);
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc3);

   rc = bcp_bind(o_hdbc3, (BYTE *) &ol_i_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT4, 5);
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc3);

   rc = bcp_bind(o_hdbc3, (BYTE *) &ol_supply_w_id, 0,
SQL_VARLEN_DATA, NULL, 0, SQLINT2, 6);
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc3);

		rc = bcp_bind(o_hdbc3, (BYTE *) &ol_delivery_d, 0,
OL_DELIVERY_D_LEN, NULL, 0, SQLCHARACTER, 7);
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc3);

   rc = bcp_bind(o_hdbc3, (BYTE *) &ol_quantity, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 8);
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc3);

   rc = bcp_bind(o_hdbc3, (BYTE *) &ol_amount, 0, SQL_VARLEN_DATA,
NULL, 0, SQLFLT8, 9);
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc3);

   rc = bcp_bind(o_hdbc3, (BYTE *) ol_dist_info, 0, DIST_INFO_LEN,
NULL, 0, 0, 10);
		if (rc != SUCCEED)
			HandleErrorDBC(o_hdbc3);

		for (i = 0; i < orders_per_district; i++)
   {
			o_id    = orders_buf[i].o_id;
			o_d_id  = orders_buf[i].o_d_id;
			o_w_id  = orders_buf[i].o_w_id;

			for (j=0; j < orders_buf[i].o_ol_cnt; j++)
			{
				ol          = orders_buf[i].o_ol[j].ol;
				ol_i_id     = orders_buf[i].o_ol[j].ol_i_id;
				ol_supply_w_id =
orders_buf[i].o_ol[j].ol_supply_w_id;
				ol_quantity    =
orders_buf[i].o_ol[j].ol_quantity;
				ol_amount      =
orders_buf[i].o_ol[j].ol_amount;

strcpy(ol_delivery_d,orders_buf[i].o_ol[j].ol_delivery_d);


strcpy(ol_dist_info,orders_buf[i].o_ol[j].ol_dist_info);

				rc = bcp_sendrow(o_hdbc3);
				if (rc != SUCCEED)
					HandleErrorDBC(o_hdbc3);

				order_line_rows_loaded++;
				CheckForCommit(o_hdbc3, o_hstmt3,
order_line_rows_loaded, "order_line", &order_line_time_start->time_start);
			}

		}

		// rcint = bcp_batch(o_hdbc3);
		// if (rcint < 0)
		//		HandleErrorDBC(o_hdbc3);

		if ((o_w_id == aptr->num_warehouses) && (o_d_id == 10))
		{
			rcint = bcp_done(o_hdbc3);
			if (rcint < 0)
				HandleErrorDBC(o_hdbc3);

			SQLFreeStmt(o_hstmt3, SQL_DROP);
			SQLDisconnect(o_hdbc3);
			SQLFreeConnect(o_hdbc3);

			// if build index after load...
			if ((aptr->build_index == 1) && (aptr->index_order ==
0))
				BuildIndex("idxodlcl");

		}

}


//=============================================================
==============
//
// Function   : GetPermutation
//
//=============================================================
==============

void GetPermutation(int perm[], int n)
{
		int i, r, t;

		for (i=1;i<=n;i++)
			perm[i] = i;

		for (i=1;i<=n;i++)
		{
			r = RandomNumber(i,n);
			t = perm[i];
			perm[i] = perm[r];
			perm[r] = t;
		}

}
```

```
//==========================================================
==============
//
// Function   : CheckForCommit
//
//==========================================================
==============

void CheckForCommit(HDBC hdbc,
                                                HSTMT hstmt,
                                        int rows_loaded,
                                                char *table_name,
                                        long *time_start)
{

   long      time_end, time_diff;
             // DBINT  rcint;

   if ( !(rows_loaded % aptr->batch) )
   {

                        // rcint = bcp_batch(hdbc);
                        // if (rcint < 0)
                        //              HandleErrorDBC(hdbc);

                        time_end = (TimeNow() / MILLI);
                        time_diff = time_end - *time_start;

                        printf("-> Loaded %ld rows into %s in %ld sec - Total =
%d (%.2f rps)\n",
                                aptr->batch,
                                table_name,
                                        time_diff,
                                rows_loaded,
                                        (float) aptr->batch / (time_diff ?
time_diff : 1L));

                        *time_start = time_end;
   }

   return;
}


//==========================================================
==============
//
// Function   : OpenConnections
//
//==========================================================
==============

void OpenConnections()
{

             RETCODE        rc;

             char                               szDriverString[300];
             char                               szDriverStringOut[1024];
             SQLSMALLINT                        cbDriverStringOut;


             SQLAllocHandle(SQL_HANDLE_ENV, SQL_NULL_HANDLE,
&henv );

             SQLSetEnvAttr(henv, SQL_ATTR_ODBC_VERSION,
(void*)SQL_OV_ODBC3, 0 );

             SQLAllocHandle(SQL_HANDLE_DBC, henv , &i_hdbc1);
             SQLAllocHandle(SQL_HANDLE_DBC, henv , &w_hdbc1);
             SQLAllocHandle(SQL_HANDLE_DBC, henv , &c_hdbc1);
             SQLAllocHandle(SQL_HANDLE_DBC, henv , &c_hdbc2);
             SQLAllocHandle(SQL_HANDLE_DBC, henv , &o_hdbc1);
             SQLAllocHandle(SQL_HANDLE_DBC, henv , &o_hdbc2);
             SQLAllocHandle(SQL_HANDLE_DBC, henv , &o_hdbc3);

             SQLSetConnectAttr(i_hdbc1, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );
             SQLSetConnectAttr(w_hdbc1, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );
             SQLSetConnectAttr(c_hdbc1, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );
             SQLSetConnectAttr(c_hdbc2, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );
             SQLSetConnectAttr(o_hdbc1, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );
             SQLSetConnectAttr(o_hdbc2, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );
             SQLSetConnectAttr(o_hdbc3, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );

             // Open connections to SQL Server

             // Connection 1

             sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,

aptr->server,
                                                                aptr->user,

aptr->password,

aptr->database );

             rc = SQLSetConnectOption (i_hdbc1, SQL_PACKET_SIZE,
aptr->pack_size);
             if (rc != SUCCEED)
                          HandleErrorDBC(i_hdbc1);

             rc = SQLDriverConnect ( i_hdbc1,
                                                          NULL,

(SQLCHAR*)&szDriverString[0] ,
                                                                SQL_NTS,

(SQLCHAR*)&szDriverStringOut[0],

sizeof(szDriverStringOut),

&cbDriverStringOut,

SQL_DRIVER_NOPROMPT );
             if (rc != SUCCEED)
                          HandleErrorDBC(i_hdbc1);

             // Connection 2

             sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,

aptr->server,
                                                                aptr->user,

aptr->password,
```

```
aptr->database );

        rc = SQLSetConnectOption (w_hdbc1, SQL_PACKET_SIZE,
aptr->pack_size);
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        rc = SQLDriverConnect ( w_hdbc1,

NULL,

(SQLCHAR*)&szDriverString[0] ,

SQL_NTS,

(SQLCHAR*)&szDriverStringOut[0],

sizeof(szDriverStringOut),

&cbDriverStringOut,

SQL_DRIVER_NOPROMPT );
        if (rc != SUCCEED)
                HandleErrorDBC(w_hdbc1);

        // Connection 3

        sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,

aptr->server,
                                                        aptr->user,

aptr->password,

aptr->database );

        rc = SQLSetConnectOption (c_hdbc1, SQL_PACKET_SIZE,
aptr->pack_size);
        if (rc != SUCCEED)
                HandleErrorDBC(c_hdbc1);

        rc = SQLDriverConnect ( c_hdbc1,

NULL,

(SQLCHAR*)&szDriverString[0] ,

SQL_NTS,

(SQLCHAR*)&szDriverStringOut[0],

sizeof(szDriverStringOut),

&cbDriverStringOut,

SQL_DRIVER_NOPROMPT );
        if (rc != SUCCEED)
                HandleErrorDBC(c_hdbc1);

        // Connection 4

        sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,

aptr->server,
                                                        aptr->user,
aptr->password,

aptr->database );

        rc = SQLSetConnectOption (c_hdbc2, SQL_PACKET_SIZE,
aptr->pack_size);
        if (rc != SUCCEED)
                HandleErrorDBC(c_hdbc2);

        rc = SQLDriverConnect ( c_hdbc2,

NULL,

(SQLCHAR*)&szDriverString[0] ,

SQL_NTS,

(SQLCHAR*)&szDriverStringOut[0],

sizeof(szDriverStringOut),

&cbDriverStringOut,

SQL_DRIVER_NOPROMPT );
        if (rc != SUCCEED)
                HandleErrorDBC(c_hdbc2);

        // Connection 5

        sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,

aptr->server,
                                                        aptr->user,

aptr->password,

aptr->database );

        rc = SQLSetConnectOption (o_hdbc1, SQL_PACKET_SIZE,
aptr->pack_size);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);

        rc = SQLDriverConnect ( o_hdbc1,

NULL,

(SQLCHAR*)&szDriverString[0] ,

SQL_NTS,

(SQLCHAR*)&szDriverStringOut[0],

sizeof(szDriverStringOut),

&cbDriverStringOut,

SQL_DRIVER_NOPROMPT );
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc1);

        // Connection 6

        sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
```

```
aptr->server,
                                                        aptr->user,
aptr->password,
aptr->database );

        rc = SQLSetConnectOption (o_hdbc2, SQL_PACKET_SIZE,
aptr->pack_size);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc2);

        rc = SQLDriverConnect ( o_hdbc2,
NULL,
(SQLCHAR*)&szDriverString[0] ,
SQL_NTS,
(SQLCHAR*)&szDriverStringOut[0],
sizeof(szDriverStringOut),
&cbDriverStringOut,
SQL_DRIVER_NOPROMPT );
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc2);

        // Connection 7

        sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
aptr->server,
                                                        aptr->user,
aptr->password,
aptr->database );

        rc = SQLSetConnectOption (o_hdbc3, SQL_PACKET_SIZE,
aptr->pack_size);
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc3);

        rc = SQLDriverConnect ( o_hdbc3,
NULL,
(SQLCHAR*)&szDriverString[0] ,
SQL_NTS,
(SQLCHAR*)&szDriverStringOut[0],
sizeof(szDriverStringOut),
&cbDriverStringOut,
SQL_DRIVER_NOPROMPT );
        if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc3);

}
```

```
//=============================================================
==============
//
// Function name: BuildIndex
//
//=============================================================
==============

void BuildIndex(char  *index_script)
{
        char        cmd[256];

        printf("Starting index creation:  %s\n",index_script);

        sprintf(cmd, "isql -S%s -U%s -P%s -e -i%s\\%s.sql > logs\\%s.log",
                                        aptr->server,
                                        aptr->user,
                                        aptr->password,
                                        aptr->index_script_path,
                                        index_script,
                                        index_script);

        system(cmd);

        printf("Finished index creation:  %s\n",index_script);
}


void HandleErrorDBC (SQLHDBC  hdbc1)
{

        SQLCHAR                 SqlState[6],
Msg[SQL_MAX_MESSAGE_LENGTH];
        SQLINTEGER  NativeError;
        SQLSMALLINT i, MsgLen;
        SQLRETURN   rc2;
        char                timebuf[128];
        char                datebuf[128];
        FILE                *fp1;

        i = 1;
        while (( rc2 = SQLGetDiagRec(SQL_HANDLE_DBC , hdbc1, i,
SqlState , &NativeError,
                                        Msg, sizeof(Msg) , &MsgLen ))
!= SQL_NO_DATA )
        {

                sprintf( szLastError , "%s" ,  Msg );

                _strtime(timebuf);
                _strdate(datebuf);

                printf( "[%s : %s] %s\n" , datebuf, timebuf, szLastError);

                fp1 = fopen("logs\\tpccldr.err","w");
                if (fp1 == NULL)
                        printf("ERROR:  Unable to open errorlog
file.\n");
                else
                {
                        fprintf(fp1, "[%s : %s] %s\n" , datebuf,
timebuf, szLastError);
                        fclose(fp1);
                }

                i++;

        }
```

```
}

void HandleErrorSTMT (HSTMT  hstmt1)
{

        SQLCHAR                 SqlState[6],
Msg[SQL_MAX_MESSAGE_LENGTH];
        SQLINTEGER  NativeError;
        SQLSMALLINT i, MsgLen;
        SQLRETURN   rc2;
        char            timebuf[128];
        char            datebuf[128];
        FILE            *fp1;

        i = 1;
        while (( rc2 = SQLGetDiagRec(SQL_HANDLE_STMT , hstmt1, i,
SqlState , &NativeError,
                                        Msg, sizeof(Msg) , &MsgLen ))
!= SQL_NO_DATA )
        {

                sprintf( szLastError , "%s" ,  Msg );

                _strtime(timebuf);
                _strdate(datebuf);

                printf( "[%s : %s] %s\n" , datebuf, timebuf, szLastError);

                fp1 = fopen("logs\\tpccldr.err","w");
                if (fp1 == NULL)
                        printf("ERROR:  Unable to open errorlog
file.\n");
                else
                {
                        fprintf(fp1, "[%s : %s] %s\n" , datebuf,
timebuf, szLastError);
                        fclose(fp1);
                }

                i++;

        }
}


void FormatDate ( char* szTimeCOutput )
{

        struct tm when;
        time_t now;

        time( &now );
        when  = *localtime( &now );

        mktime( &when );

        // odbc datetime format
        strftime( szTimeCOutput , 30 , "%Y-%m-%d %H:%M:%S.000",
&when );

        return;

}

//==========================================================
==============
//
// Function   : CheckSQL
//
//==========================================================
==============

void CheckSQL()
{

        RETCODE         rc;

        char                    szDriverString[300];
        char                    szDriverStringOut[1024];
        int                             SQLBuildFlag;
        char                    resp;

        SQLSMALLINT             cbDriverStringOut;
        SQLCHAR                 SQLVersion[19];
        SQLINTEGER              SQLVersionInd;



        SQLAllocHandle(SQL_HANDLE_ENV, SQL_NULL_HANDLE,
&henv );

        SQLSetEnvAttr(henv, SQL_ATTR_ODBC_VERSION,
(void*)SQL_OV_ODBC3, 0 );

        SQLAllocHandle(SQL_HANDLE_DBC, henv , &v_hdbc);

        SQLSetConnectAttr(v_hdbc, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );

        // Open connection to SQL Server

        sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s" ,

aptr->server,
                                                        aptr->user,

aptr->password );

        if ( SQLSetConnectAttr( v_hdbc, SQL_ATTR_PACKET_SIZE,
(SQLPOINTER)aptr->pack_size, SQL_IS_UINTEGER ) != SQL_SUCCESS )
                HandleErrorDBC(v_hdbc);

        rc = SQLDriverConnect ( v_hdbc,
                                                NULL,

(SQLCHAR*)&szDriverString[0] ,
                                                SQL_NTS,

(SQLCHAR*)&szDriverStringOut[0],

sizeof(szDriverStringOut),

&cbDriverStringOut,

SQL_DRIVER_NOPROMPT );

        if ((rc != SQL_SUCCESS) && (rc !=
SQL_SUCCESS_WITH_INFO))
                HandleErrorDBC(v_hdbc);

        if ( SQLAllocHandle(SQL_HANDLE_STMT, v_hdbc , &v_hstmt)
!= SQL_SUCCESS )
                HandleErrorSTMT(v_hstmt);
```

```
	rc = SQLBindCol(v_hstmt, 4, SQL_C_CHAR, &SQLVersion,
sizeof(SQLVersion), &SQLVersionInd);

	// issue SQL Server extended stored procedure (xp_msver) to
determine installed version
	rc = SQLExecDirect(v_hstmt, "EXECUTE xp_msver
ProductVersion", SQL_NTS);

	if ((rc != SQL_SUCCESS) && (rc !=
SQL_SUCCESS_WITH_INFO))
		HandleErrorSTMT(v_hstmt);

	rc = SQLFetch(v_hstmt);

	if (rc != SQL_SUCCESS)
		HandleErrorDBC(v_hdbc);

	// Check build number to ensure 8.00.194 or higher

	SQLBuildFlag = 1;

	// first check the Major version

	if ( SQLVersion[0] == '8' )
	{
		if (( SQLVersion[2] == '0') & ( SQLVersion[3] == '0' )  )
		{
			if ( SQLVersion[5] == '1' )
			{
				if ( (SQLVersion[6] == '9') &
(SQLVersion[7] == '4') )
				{
					SQLBuildFlag = 0;
					printf("You are using
SQL Server version = %9s\n\n", SQLVersion);
				}
				else
				{
					SQLBuildFlag = 1;
				}
			}
			else
			{
				if ( SQLVersion[5] == '3' )
				{
					if ( (SQLVersion[6] >=
53) & (SQLVersion[7] >= 48) )
					{

SQLBuildFlag = 0;
							printf("You
are using SQL Server version = %9s\n\n", SQLVersion);
					}
					else
					{

SQLBuildFlag = 1;
					}
				}
			}
		}
	}
	else
	{
		SQLBuildFlag = 1;
	}

	if ( SQLBuildFlag == 1 )
	{
		printf("NOTE:  The SQL Server version you are using is
not supported\n");
		printf("for TPC-C benchmarking.  You currently have
SQL Server version %9s\n",SQLVersion);
		printf("installed.  Please upgrade to Microsoft SQL
Server 2000 (8.00.0194) or better.\n");
		printf("and re-run the SETUP program.\n\n");
		printf("Do you wish to continue with setup? (Y/N): ");
		resp = getchar();
		if ( ( resp == 'N' ) || (resp == 'n') )
		{
			printf("\nSetup Aborted!\n");
			exit(1);
		}
	}

	SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
	SQLDisconnect(v_hdbc);
	SQLFreeHandle(SQL_HANDLE_DBC, v_hdbc);

	return;

}


//=================================================
==============
//
// Function   : CheckDataBase
//
//=================================================
==============

void CheckDataBase()
{

	RETCODE	rc;

	char			szDriverString[300];
	char			szDriverStringOut[1024];
	char			TablesBitMap[9] =
{"000000000"};
	int				i, ExitFlag;

	SQLSMALLINT		cbDriverStringOut;
	SQLCHAR			TabName[10];
	SQLINTEGER		TabNameInd, TabCount,
TabCountInd;


	ExitFlag = 0;

	SQLAllocHandle(SQL_HANDLE_ENV, SQL_NULL_HANDLE,
&henv );

	SQLSetEnvAttr(henv, SQL_ATTR_ODBC_VERSION,
(void*)SQL_OV_ODBC3, 0 );

	SQLAllocHandle(SQL_HANDLE_DBC, henv , &v_hdbc);

	SQLSetConnectAttr(v_hdbc, SQL_COPT_SS_BCP, (void
*)SQL_BCP_ON, SQL_IS_INTEGER );

	// Open connection to SQL Server

	sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
```

```
aptr->server,
                                                                aptr->user,
aptr->password,
aptr->database );

        rc = SQLSetConnectAttr( v_hdbc, SQL_ATTR_PACKET_SIZE,
(SQLPOINTER)aptr->pack_size, SQL_IS_UINTEGER );
        if (rc != SQL_SUCCESS)
                HandleErrorDBC(v_hdbc);

        rc = SQLDriverConnect ( v_hdbc,
                                                        NULL,
(SQLCHAR*)&szDriverString[0] ,
                                                                SQL_NTS,
(SQLCHAR*)&szDriverStringOut[0],
sizeof(szDriverStringOut),
&cbDriverStringOut,
SQL_DRIVER_NOPROMPT );

        // if the rc is SQL_ERROR, the the TPCC database probably does
not exist
        if (rc == SQL_ERROR)
        {
                printf("The database TPCC does not appear to exist!\n");
                printf("\nCheck LOGS\\ directory for database creation
errors.\n");

                // cleanup database connections and handles
                SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
                SQLDisconnect(v_hdbc);
                SQLFreeHandle(SQL_HANDLE_DBC, v_hdbc);

                // since there is not a database, exit back to SETUP.CMD
                exit(1);
        }

        if ( SQLAllocHandle(SQL_HANDLE_STMT, v_hdbc , &v_hstmt)
!= SQL_SUCCESS )
                HandleErrorDBC(v_hdbc);

        if ( SQLBindCol(v_hstmt, 1, SQL_C_ULONG, &TabCount, 0,
&TabCountInd) != SQL_SUCCESS )
                HandleErrorSTMT(v_hstmt);

        // count the number of user tables from sysobjects
        rc = SQLExecDirect(v_hstmt, "select count(*) from sysobjects
where xtype = \'U\'", SQL_NTS);
        if ((rc != SQL_SUCCESS) && (rc !=
SQL_SUCCESS_WITH_INFO))
                HandleErrorSTMT(v_hstmt);

        if ( SQLFetch(v_hstmt) != SQL_SUCCESS )
                HandleErrorSTMT(v_hstmt);

        // if the number of tables is less than 9, select all the user tables in
TPCC
        if (TabCount != 9)
        {
                SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
                SQLAllocHandle(SQL_HANDLE_STMT, v_hdbc ,
&v_hstmt);

                if ( SQLBindCol(v_hstmt, 1, SQL_C_CHAR,
&TabName, sizeof(TabName), &TabNameInd) != SQL_SUCCESS )
                        HandleErrorSTMT(v_hstmt);

                // select the list of user tables into a result set
                rc = SQLExecDirect(v_hstmt, "select * from sysobjects
where xtype = \'U\'", SQL_NTS);
                if ((rc != SQL_SUCCESS) && (rc !=
SQL_SUCCESS_WITH_INFO))
                        HandleErrorSTMT(v_hstmt);

                // go through the result set and set the bitmap for each
found table
                // set the bitmap to '1' if the table name is found

                while ((rc = SQLFetch(v_hstmt)) != SQL_NO_DATA)
                {
                        switch( TabName[0] )
                        {
                        case 'w':
                                TablesBitMap[0] = '1';
                                break;
                        case 'd':
                                TablesBitMap[1] = '1';
                                break;
                        case 'c':
                                TablesBitMap[2] = '1';
                                break;
                        case 'h':
                                TablesBitMap[3] = '1';
                                break;
                        case 'n':
                                TablesBitMap[4] = '1';
                                break;
                        case 'o':
                                if (TabName[5] = 's')
                                        TablesBitMap[5] = '1';
                                if (TabName[5] = '_')
                                        TablesBitMap[6] = '1';
                                break;
                        case 'i':
                                TablesBitMap[7] = '1';
                                break;
                        case 's':
                                TablesBitMap[8] = '1';
                                break;
                        }
                }

                // a '0' ExitFlag means do NOT exit the loader early, a '1'
means exit the loader early
                ExitFlag = 0;

                // interate through the bitmap to display which table(s) is
actually missing
                for (i = 0; i <= 8; i++)
                {
                        switch(i)
                        {
                        case 0:
                                if (TablesBitMap[i] == '0')
                                {
                                        printf("The Warehouse
table is missing or damaged.\n");
                                        ExitFlag = 1;
```

```
                }
                break;
        case 1:
                if (TablesBitMap[i] == '0')
                {
                        printf("The District
table is missing or damaged.\n");
                        ExitFlag = 1;
                }
                break;
        case 2:
                if (TablesBitMap[i] == '0')
                {
                        printf("The Customer
table is missing or damaged.\n");
                        ExitFlag = 1;
                }
                break;
        case 3:
                if (TablesBitMap[i] == '0')
                {
                        printf("The History
table is missing or damaged.\n");
                        ExitFlag = 1;
                }
                break;
        case 4:
                if (TablesBitMap[i] == '0')
                {
                        printf("The New_Order
table is missing or damaged.\n");
                        ExitFlag = 1;
                }
                break;
        case 5:
                if (TablesBitMap[i] == '0')
                {
                        printf("The Orders table
is missing or damaged.\n");
                        ExitFlag = 1;
                }
                break;
        case 6:
                if (TablesBitMap[i] == '0')
                {
                        printf("The Order_Line
table is missing or damaged.\n");
                        ExitFlag = 1;
                }
                break;
        case 7:
                if (TablesBitMap[i] == '0')
                {
                        printf("The Item table is
missing or damaged.\n");
                        ExitFlag = 1;
                }
                break;
        case 8:
                if (TablesBitMap[i] == '0')
                {
                        printf("The Stock table
is missing or damaged.\n");
                        ExitFlag = 1;
                }
                break;
        }
    }

        // if one or more tables are missing, display message and
exit the loader
        if (ExitFlag = 1)
        {
                printf("\nExiting TPC-C Loader!\n");
                printf("\nCheck LOGS\\ directory for
database\n");
                printf("or table creation errors.\n");

                // cleanup database connections and handles
                SQLFreeHandle(SQL_HANDLE_STMT,
v_hstmt);
                SQLDisconnect(v_hdbc);
                SQLFreeHandle(SQL_HANDLE_DBC,
v_hdbc);

                exit(1);
        }
    }

    // cleanup database connections and handles
    SQLFreeHandle(SQL_HANDLE_STMT, v_hstmt);
    SQLDisconnect(v_hdbc);
    SQLFreeHandle(SQL_HANDLE_DBC, v_hdbc);

    return;
}
```

tpccldr.mak

```
# Microsoft Developer Studio Generated NMAKE File, Format Version 4.10
# ** DO NOT EDIT **

# TARGTYPE "Win32 (x86) Console Application" 0x0103

!IF "$(CFG)" == ""
CFG=tpccldr - Win32 Debug
!MESSAGE No configuration specified.  Defaulting to tpccldr - Win32 Debug.
!ENDIF

!IF "$(CFG)" != "tpccldr - Win32 Release" && "$(CFG)" !=\
 "tpccldr - Win32 Debug"
!MESSAGE Invalid configuration "$(CFG)" specified.
!MESSAGE You can specify a configuration when running NMAKE on this
makefile
!MESSAGE by defining the macro CFG on the command line.  For example:
!MESSAGE
!MESSAGE NMAKE /f "tpccldr.mak" CFG="tpccldr - Win32 Debug"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "tpccldr - Win32 Release" (based on "Win32 (x86) Console
Application")
!MESSAGE "tpccldr - Win32 Debug" (based on "Win32 (x86) Console
Application")
!MESSAGE
!ERROR An invalid configuration is specified.
!ENDIF

!IF "$(OS)" == "Windows_NT"
NULL=
!ELSE
NULL=nul
!ENDIF
################################################################
###############
```

```
# Begin Project
# PROP Target_Last_Scanned "tpccldr - Win32 Debug"
RSC=rc.exe
CPP=cl.exe

!IF  "$(CFG)" == "tpccldr - 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 "objects"
# PROP Target_Dir ""
OUTDIR=.\bin
INTDIR=.\objects

ALL : "$(OUTDIR)\tpccldr.exe"

CLEAN :
	-@erase "$(INTDIR)\getargs.obj"
	-@erase "$(INTDIR)\random.obj"
	-@erase "$(INTDIR)\strings.obj"
	-@erase "$(INTDIR)\time.obj"
	-@erase "$(INTDIR)\tpccldr.obj"
	-@erase "$(OUTDIR)\tpccldr.exe"

"$(OUTDIR)" :
    if not exist "$(OUTDIR)/$(NULL)" mkdir "$(OUTDIR)"

"$(INTDIR)" :
    if not exist "$(INTDIR)/$(NULL)" mkdir "$(INTDIR)"

# ADD BASE CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
"_CONSOLE" /YX /c
# ADD CPP /nologo /MT /W3 /GX /O2 /I "c:\mssql\dblib\include" /D
"NDEBUG" /D "WIN32" /D "_CONSOLE" /D "DBNTWIN32" /c
# SUBTRACT CPP /YX
CPP_PROJ=/nologo /MT /W3 /GX /O2 /I "c:\mssql\dblib\include" /D
"NDEBUG" /D\
 "WIN32" /D "_CONSOLE" /D "DBNTWIN32" /Fo"$(INTDIR)/" /c
CPP_OBJS=.\objects/
CPP_SBRS=.\.
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
BSC32_FLAGS=/nologo /o"$(OUTDIR)/tpccldr.bsc"
BSC32_SBRS= \

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:console /machine:I386
# ADD LINK32 c:\mssql\dblib\lib\ntwdblib.lib kernel32.lib user32.lib gdi32.lib
winspool.lib comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib
uuid.lib odbc32.lib odbccp32.lib /nologo /subsystem:console /pdb:none
/machine:I386
LINK32_FLAGS=c:\mssql\dblib\lib\ntwdblib.lib kernel32.lib user32.lib
gdi32.lib\
 winspool.lib comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib\
 uuid.lib odbc32.lib odbccp32.lib /nologo /subsystem:console /pdb:none\
 /machine:I386 /out:"$(OUTDIR)/tpccldr.exe"
LINK32_OBJS= \
	"$(INTDIR)\getargs.obj" \
	"$(INTDIR)\random.obj" \
	"$(INTDIR)\strings.obj" \
	"$(INTDIR)\time.obj" \
	"$(INTDIR)\tpccldr.obj"

"$(OUTDIR)\tpccldr.exe" : "$(OUTDIR)" $(DEF_FILE) $(LINK32_OBJS)
    $(LINK32) @<<
  $(LINK32_FLAGS) $(LINK32_OBJS)
<<

!ELSEIF  "$(CFG)" == "tpccldr - 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 "objects"
# PROP Target_Dir ""
OUTDIR=.\bin
INTDIR=.\objects

ALL : "$(OUTDIR)\tpccldr.exe"

CLEAN :
	-@erase "$(INTDIR)\getargs.obj"
	-@erase "$(INTDIR)\random.obj"
	-@erase "$(INTDIR)\strings.obj"
	-@erase "$(INTDIR)\time.obj"
	-@erase "$(INTDIR)\tpccldr.obj"
	-@erase "$(INTDIR)\vc40.idb"
	-@erase "$(INTDIR)\vc40.pdb"
	-@erase "$(OUTDIR)\tpccldr.exe"

"$(OUTDIR)" :
    if not exist "$(OUTDIR)/$(NULL)" mkdir "$(OUTDIR)"

"$(INTDIR)" :
    if not exist "$(INTDIR)/$(NULL)" mkdir "$(INTDIR)"

# ADD BASE CPP /nologo /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG"
/D "_CONSOLE" /YX /c
# ADD CPP /nologo /MTd /W3 /Gm /GX /Zi /Od /I "c:\mssql\dblib\include" /D
"_DEBUG" /D "WIN32" /D "_CONSOLE" /D "DBNTWIN32" /c
# SUBTRACT CPP /YX
CPP_PROJ=/nologo /MTd /W3 /Gm /GX /Zi /Od /I "c:\mssql\dblib\include" /D\
 "_DEBUG" /D "WIN32" /D "_CONSOLE" /D "DBNTWIN32"
/Fo"$(INTDIR)/"\
 /Fd"$(INTDIR)/" /c
CPP_OBJS=.\objects/
CPP_SBRS=.\.
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
BSC32_FLAGS=/nologo /o"$(OUTDIR)/tpccldr.bsc"
BSC32_SBRS= \

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:console /debug /machine:I386
```

```
# ADD LINK32 c:\mssql\dblib\lib\ntwdblib.lib kernel32.lib user32.lib gdi32.lib
winspool.lib comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib
uuid.lib odbc32.lib odbccp32.lib /nologo /subsystem:console /pdb:none /debug
/machine:I386
LINK32_FLAGS=c:\mssql\dblib\lib\ntwdblib.lib kernel32.lib user32.lib
gdi32.lib\
 winspool.lib comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib\
 uuid.lib odbc32.lib odbccp32.lib /nologo /subsystem:console /pdb:none /debug\
 /machine:I386 /out:"$(OUTDIR)/tpccldr.exe"
LINK32_OBJS= \
                "$(INTDIR)\getargs.obj" \
                "$(INTDIR)\random.obj" \
                "$(INTDIR)\strings.obj" \
                "$(INTDIR)\time.obj" \
                "$(INTDIR)\tpccldr.obj"

"$(OUTDIR)\tpccldr.exe" : "$(OUTDIR)" $(DEF_FILE) $(LINK32_OBJS)
    $(LINK32) @<<
  $(LINK32_FLAGS) $(LINK32_OBJS)
<<

!ENDIF

.c{$(CPP_OBJS)}.obj:
   $(CPP) $(CPP_PROJ) $<

.cpp{$(CPP_OBJS)}.obj:
   $(CPP) $(CPP_PROJ) $<

.cxx{$(CPP_OBJS)}.obj:
   $(CPP) $(CPP_PROJ) $<

.c{$(CPP_SBRS)}.sbr:
   $(CPP) $(CPP_PROJ) $<

.cpp{$(CPP_SBRS)}.sbr:
   $(CPP) $(CPP_PROJ) $<

.cxx{$(CPP_SBRS)}.sbr:
   $(CPP) $(CPP_PROJ) $<

################################################################
###############
# Begin Target

# Name "tpccldr - Win32 Release"
# Name "tpccldr - Win32 Debug"

!IF  "$(CFG)" == "tpccldr - Win32 Release"

!ELSEIF  "$(CFG)" == "tpccldr - Win32 Debug"

!ENDIF

################################################################
###############
# Begin Source File

SOURCE=.\src\random.c
DEP_CPP_RANDO=\
                ".\src\tpcc.h"\
                "\mssql\dblib\include\sqldb.h"\
                "\mssql\dblib\include\sqlfront.h"\


"$(INTDIR)\random.obj" : $(SOURCE) $(DEP_CPP_RANDO) "$(INTDIR)"
   $(CPP) $(CPP_PROJ) $(SOURCE)


# End Source File
################################################################
###############
# Begin Source File

SOURCE=.\src\strings.c
DEP_CPP_STRIN=\
                ".\src\tpcc.h"\
                "\mssql\dblib\include\sqldb.h"\
                "\mssql\dblib\include\sqlfront.h"\


"$(INTDIR)\strings.obj" : $(SOURCE) $(DEP_CPP_STRIN) "$(INTDIR)"
   $(CPP) $(CPP_PROJ) $(SOURCE)


# End Source File
################################################################
###############
# Begin Source File

SOURCE=.\src\time.c
DEP_CPP_TIME_=\
                ".\src\tpcc.h"\
                "\mssql\dblib\include\sqldb.h"\
                "\mssql\dblib\include\sqlfront.h"\


"$(INTDIR)\time.obj" : $(SOURCE) $(DEP_CPP_TIME_) "$(INTDIR)"
   $(CPP) $(CPP_PROJ) $(SOURCE)


# End Source File
################################################################
###############
# Begin Source File

SOURCE=.\src\tpccldr.c
DEP_CPP_TPCCL=\
                ".\src\tpcc.h"\
                "\mssql\dblib\include\sqldb.h"\
                "\mssql\dblib\include\sqlfront.h"\


"$(INTDIR)\tpccldr.obj" : $(SOURCE) $(DEP_CPP_TPCCL) "$(INTDIR)"
   $(CPP) $(CPP_PROJ) $(SOURCE)


# End Source File
################################################################
###############
# Begin Source File

SOURCE=.\src\getargs.c
DEP_CPP_GETAR=\
                ".\src\tpcc.h"\
                "\mssql\dblib\include\sqldb.h"\
                "\mssql\dblib\include\sqlfront.h"\


"$(INTDIR)\getargs.obj" : $(SOURCE) $(DEP_CPP_GETAR) "$(INTDIR)"
   $(CPP) $(CPP_PROJ) $(SOURCE)


# End Source File
# End Target
# End Project
```

##
###############

Appendix C: Tunable Parameters

Microsoft Windows 2000 Server Configuration Parameters

Microsoft Windows 2000 Server Services

Server Configuration Parameters

Microsoft Windows 2000 Server Configuration
The following services were set as manual on the server:
  Alerter
  Computer Browser
  DHCP Client
  Distributed File System
  Distributed Link Tracking Client
  DNS Client
  IPSEC Policy Agent
  License Logging Service
  Messager
  Print Spooler
  Remote Registry Service
  Removable Storage
  RUN as Service
  System Event Notification
  Task Scheduler

Microsoft SQL Server 2000 Startup Parameters

Microsoft SQL Server 2000 Startup Parameters

c:\Program Files\Microsoft SQL Server\MSSQL\Binn\sqlservr.exe -c -x -t3502 -g88

Where:

-c Start SQL Server independent of the Service Control Manager
-x Disable the keeping of CPU time and cache hit ratio statistics
-t3502 Writes a message to the SQL Server Errorlog showing the beginning and ending time of each checkpoint
-g88 Specifies the amount of memory that is set aside for allocations not from the buffer pool

Microsoft SQL Server 2000 Configuration Parameters

```
1> 2> 3> 4> 5> 6> 7> 8> 9> 10> 11>
--  File:     VERSION.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.22
--            Copyright Microsoft, 2001
--  Purpose:  Returns SQL Server version string



print " "
select convert(char(30), getdate(),9)
print " "

 ------------------------------
 Feb 25 2002  7:57:29:687AM

(1 row affected)

1> 2> 3>
select @@version




 ---------------------------------------------------------------------------
              ---------------------------------------------------------------
              ---------------------------------------------------------------
              -----------------------------------
 Microsoft SQL Server  2000 - 8.00.534 (Intel X86)
              Nov 19 2001 13:23:50
              Cop
              yright (c) 1988-2000 Microsoft Corporation
              Standard Edition on Windows
               NT 5.0 (Build 2195: Service Pack 2)



(1 row affected)
1> 2>
1> 2> 3> 4> 5> 6> 7> 8> 9> 10>
--  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 " "

 ------------------------------
 Feb 25 2002  7:57:30:513AM

(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
          15          15
 allow updates                                0           1
           0
 awe enabled                                  0           1
           0
 c2 audit mode                                0           1
           0
 cost threshold for parallelism               0       32767
           5           5
 cursor threshold                            -1  2147483647
          -1          -1
 default full-text language                   0  2147483647
        1033        1033
 default language                             0        9999
           0
```

```
 fill factor (%)                          0       100          0
0
 index create memory (KB)                       704  2147483647
       0         0
 lightweight pooling                      0         1          1
   1
 locks                                 5000  2147483647          0
      0
 max degree of parallelism                0        32          1
       1
 max server memory (MB)                         4  2147483647
2147483647  2147483647
 max text repl size (B)                   0  2147483647
65536       65536
 max worker threads                      32       32767
225         225
 media retention                          0       365          0
   0
 min memory per query (KB)                      512  2147483647
       1024        1024
 min server memory (MB)                         0  2147483647
      0          0
 nested triggers                          0         1          1
1
 network packet size (B)                  512       65536
4096        4096
 open objects                             0  2147483647          0
       0
 priority boost                           0         1          1
1
 query governor cost limit                      0  2147483647
   0         0
 query wait (s)                          -1  2147483647         -1
       -1
 recovery interval (min)                  0       32767
56          56
 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>
```

Microsoft Windows 2000 Server System Information Report

System Information report written at: 02/26/2002 05:32:52 PM
[System Information]

[Following are sub-categories of this main category]

[System Summary]

Item	Value
OS Name	Microsoft Windows 2000 Server
Version	5.0.2195 Service Pack 2 Build 2195
OS Manufacturer	Microsoft Corporation
System Name	TPCC-2WAY
System Manufacturer	IBM
System Model	eServer xSeries 360 -[86861RX]-
System Type	X86-based PC
Processor	x86 Family 15 Model 1 Stepping 1 GenuineIntel ~1600 Mhz
Processor	x86 Family 15 Model 1 Stepping 1 GenuineIntel ~1600 Mhz
Processor	x86 Family 15 Model 1 Stepping 1 GenuineIntel ~1600 Mhz
Processor	x86 Family 15 Model 1 Stepping 1 GenuineIntel ~1600 Mhz
BIOS Version	IBM BIOS Ver 1.02
Windows Directory	C:\WINNT
System Directory	C:\WINNT\System32
Boot Device	\Device\Harddisk0\Partition1
Locale	United States
User Name	TPCC-2WAY\Administrator
Time Zone	Eastern Standard Time
Total Physical Memory	2,605,504 KB
Available Physical Memory	664,488 KB
Total Virtual Memory	7,147,576 KB
Available Virtual Memory	3,417,880 KB
Page File Space	4,542,072 KB
Page File	C:\pagefile.sys

[Hardware Resources]

[Following are sub-categories of this main category]

[Conflicts/Sharing]

Resource	Device
IRQ 17	IBM (Version 4.94) Remote Supervisor+Serial Port+Mouse/Keyboard
IRQ 17	IBM (Version 4.94) Remote Supervisor + Mouse/Keyboard
IRQ 17	IBM (Version 4.94) Remote Supervisor Serial Port (COM3)

[DMA]

Channel	Device	Status
2	Standard floppy disk controller	OK
4	Direct memory access controller	OK

[Forced Hardware]

Device	PNP Device ID
No Forced Hardware	

[I/O]

Address Range	Device	Status
0x0000-0x1FFF	PCI bus	OK
0x0000-0x1FFF	Direct memory access controller	OK
0x03B0-0x03BB	S3 Graphics Inc. Savage4	OK
0x03C0-0x03DF	S3 Graphics Inc. Savage4	OK
0x1800-0x187F	IBM (Version 4.94) Remote Supervisor+Serial Port+Mouse/Keyboard	OK
0x1880-0x18BF	Intel(R) 82559 Fast Ethernet LAN on Motherboard	OK
0x1900-0x19FF	Adaptec AIC-7892 Ultra160/m PCI SCSI Card	OK
0x0A79-0x0A79	ISAPNP Read Data Port	OK
0x0279-0x0279	ISAPNP Read Data Port	OK
0x02F4-0x02F7	ISAPNP Read Data Port	OK
0x002E-0x002F	Motherboard resources	OK

0x0438-0x0439 Motherboard resources OK
0x0430-0x0437 Motherboard resources OK
0x0060-0x0060 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard OK
0x0064-0x0064 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard OK
0x03F0-0x03F5 Standard floppy disk controller OK
0x03F7-0x03F7 Standard floppy disk controller OK
0x03F8-0x03FF Motherboard resources OK
0x0020-0x0021 Advanced programmable interrupt controller OK
0x00A0-0x00A1 Advanced programmable interrupt controller OK
0x0080-0x008F Direct memory access controller OK
0x00C0-0x00DF Direct memory access controller OK
0x0040-0x0043 System timer OK
0x0070-0x0073 System CMOS/real time clock OK
0x0061-0x0061 System speaker OK
0x0374-0x0375 Motherboard resources OK
0x0377-0x0377 Motherboard resources OK
0x0490-0x04AF Motherboard resources OK
0x040B-0x040B Motherboard resources OK
0x04D0-0x04D1 Motherboard resources OK
0x04D6-0x04D6 Motherboard resources OK
0x0600-0x0600 Motherboard resources OK
0x0C00-0x0C01 Motherboard resources OK
0x0C14-0x0C14 Motherboard resources OK
0x0C49-0x0C49 Motherboard resources OK
0x0C4A-0x0C4A Motherboard resources OK
0x0C52-0x0C52 Motherboard resources OK
0x0CD6-0x0CD7 Motherboard resources OK
0x0F50-0x0F58 Motherboard resources OK
0x0700-0x070F Standard Dual Channel PCI IDE Controller OK
0x01F0-0x01F7 Primary IDE Channel OK
0x03F6-0x03F6 Primary IDE Channel OK
0x0170-0x0177 Secondary IDE Channel OK
0x0376-0x0376 Secondary IDE Channel OK
0x4000-0x7FFF PCI bus OK
0x4000-0x7FFF DEC 21154 PCI to PCI bridge OK
0x4000-0x7FFF Mylex eXtremeRAID 2000 Disk Array Controller OK
0x5000-0x5FFF DEC 21154 PCI to PCI bridge OK
0x5000-0x5FFF Mylex eXtremeRAID 2000 Disk Array Controller OK
0x2000-0x3FFF PCI bus OK
0x2000-0x3FFF DEC 21154 PCI to PCI bridge OK
0x2000-0x3FFF Mylex eXtremeRAID 2000 Disk Array Controller OK

[IRQs]

IRQ Number Device
36 Microsoft ACPI-Compliant System
39 S3 Graphics Inc. Savage4
17 IBM (Version 4.94) Remote Supervisor+Serial Port+Mouse/Keyboard
17 IBM (Version 4.94) Remote Supervisor + Mouse/Keyboard
17 IBM (Version 4.94) Remote Supervisor Serial Port (COM3)
42 Intel(R) 82559 Fast Ethernet LAN on Motherboard
41 Adaptec AIC-7892 Ultra160/m PCI SCSI Card
1 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
12 PS/2 Compatible Mouse
6 Standard floppy disk controller
8 System CMOS/real time clock
14 Primary IDE Channel
16 Standard OpenHCD USB Host Controller
43 Mylex eXtremeRAID 2000 Disk Array Controller
19 Mylex eXtremeRAID 2000 Disk Array Controller
29 Mylex eXtremeRAID 2000 Disk Array Controller

[Memory]

Range Device Status
0xF0000000-0xF7FFFFFF PCI bus OK
0xF0000000-0xF7FFFFFF S3 Graphics Inc. Savage4 OK
0xF8000000-0xFBFFFFFF PCI bus OK
0xFBF80000-0xFBFFFFFF S3 Graphics Inc. Savage4 OK
0xA0000-0xBFFFF S3 Graphics Inc. Savage4 OK
0xFBC00000-0xFBDFFFFF IBM (Version 4.94) Remote Supervisor+Serial Port+Mouse/Keyboard OK
0xFBC00000-0xFBDFFFFF IBM (Version 4.94) Remote Supervisor + Mouse/Keyboard OK
0xFBF7F000-0xFBF7FFFF Intel(R) 82559 Fast Ethernet LAN on Motherboard OK
0xFBE00000-0xFBEFFFFF Intel(R) 82559 Fast Ethernet LAN on Motherboard OK
0xFBF7E000-0xFBF7EFFF Adaptec AIC-7892 Ultra160/m PCI SCSI Card OK
0xFBF7D000-0xFBF7DFFF Standard OpenHCD USB Host Controller OK
0xE4000000-0xE7FFFFFF PCI bus OK
0xE4000000-0xE7FFFFFF DEC 21154 PCI to PCI bridge OK
0xE4000000-0xE7FFFFFF Mylex eXtremeRAID 2000 Disk Array Controller OK
0xE8000000-0xEFFFFFFF PCI bus OK
0xE8000000-0xEFFFFFFF DEC 21154 PCI to PCI bridge OK
0xE8000000-0xEFFFFFFF Mylex eXtremeRAID 2000 Disk Array Controller OK
0xEC000000-0xEE3FFFFF DEC 21154 PCI to PCI bridge OK
0xEC000000-0xEE3FFFFF Mylex eXtremeRAID 2000 Disk Array Controller OK
0xE6000000-0xE7FFFFFF DEC 21154 PCI to PCI bridge OK
0xE6000000-0xE7FFFFFF Mylex eXtremeRAID 2000 Disk Array Controller OK
0xDE000000-0xDFFFFFFF PCI bus OK
0xDE000000-0xDFFFFFFF DEC 21154 PCI to PCI bridge OK
0xDE000000-0xDFFFFFFF Mylex eXtremeRAID 2000 Disk Array Controller OK
0xE0000000-0xE3FFFFFF PCI bus OK
0xE0000000-0xE3FFFFFF DEC 21154 PCI to PCI bridge OK
0xE0000000-0xE3FFFFFF Mylex eXtremeRAID 2000 Disk Array Controller OK

[Components]

[Following are sub-categories of this main category]

[Multimedia]

[Following are sub-categories of this main category]

[Audio Codecs]

Codec Manufacturer Description Status File Version Size Creation Date
c:\winnt\system32\lhacm.acm Microsoft Corporation
OK C:\WINNT\System32\LHACM.ACM 4.4.3385 33.27 KB (34,064 bytes) 2/12/2002 3:36:42 PM
c:\winnt\system32\tssoft32.acm DSP GROUP, INC. OK
C:\WINNT\System32\TSSOFT32.ACM 1.01 9.27 KB (9,488 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\iac25_32.ax Intel Corporation Indeo® audio software
OK C:\WINNT\System32\IAC25_32.AX 2.05.53 195.00 KB (199,680 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\msadp32.acm Microsoft Corporation
OK C:\WINNT\System32\MSADP32.ACM 5.00.2134.1 14.77 KB (15,120 bytes) 12/7/1999 7:00:00 AM

c:\winnt\system32\msg723.acm Microsoft Corporation
OK C:\WINNT\System32\MSG723.ACM 4.4.3385 106.77 KB (109,328 bytes) 2/12/2002 3:36:41 PM
c:\winnt\system32\msgsm32.acm Microsoft Corporation
OK C:\WINNT\System32\MSGSM32.ACM 5.00.2134.1 22.27 KB (22,800 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\imaadp32.acm Microsoft Corporation
OK C:\WINNT\System32\IMAADP32.ACM 5.00.2134.1 16.27 KB (16,656 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\msg711.acm Microsoft Corporation
OK C:\WINNT\System32\MSG711.ACM 5.00.2134.1 10.27 KB (10,512 bytes) 12/7/1999 7:00:00 AM

[Video Codecs]

Codec Manufacturer Description Status File Version Size Creation Date
c:\winnt\system32\ir50_32.dll Intel Corporation Indeo® video 5.10
OK C:\WINNT\System32\IR50_32.DLL R.5.10.15.2.55 737.50 KB (755,200 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\msh261.drv Microsoft Corporation
OK C:\WINNT\System32\MSH261.DRV 4.4.3385 163.77 KB (167,696 bytes) 2/12/2002 3:36:42 PM
c:\winnt\system32\msh263.drv Microsoft Corporation
OK C:\WINNT\System32\MSH263.DRV 4.4.3385 252.27 KB (258,320 bytes) 2/12/2002 3:36:08 PM
c:\winnt\system32\msrle32.dll Microsoft Corporation
OK C:\WINNT\System32\MSRLE32.DLL 5.00.2134.1 10.77 KB (11,024 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\msvidc32.dll Microsoft Corporation
OK C:\WINNT\System32\MSVIDC32.DLL 5.00.2134.1 27.27 KB (27,920 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\ir32_32.dll Intel(R) Corporation OK C:\WINNT\System32\IR32_32.DLL Not Available 194.50 KB (199,168 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\iccvid.dll Radius Inc. OK C:\WINNT\System32\ICCVID.DLL 1.10.0.6 108.00 KB (110,592 bytes) 12/7/1999 7:00:00 AM

[CD-ROM]

Item Value
Drive D:
Description CD-ROM Drive
Media Loaded False
Media Type CD-ROM
Name LG CD-ROM CRN-8245B
Manufacturer (Standard CD-ROM drives)
Status OK
Transfer Rate Not Available
SCSI Target ID 0
PNP Device ID IDE\CDROMLG_CD-ROM_CRN-8245B_____1.13____\5&326853DD&0&0.0.0

[Sound Device]

Item Value
No sound devices

[Display]

Item Value
Name S3 Graphics Inc. Savage4
PNP Device ID PCI\VEN_5333&DEV_8A22&SUBSYS_01C51014&REV_06\3&267A616A&0&08
Adapter Type S3 Savage4, S3 Graphics Incorporated compatible
Adapter Description S3 Graphics Inc. Savage4
Adapter RAM 8.00 MB (8,388,608 bytes)
Installed Drivers s3savg4.dll
Driver Version 5.12.01.8013-8.40.02a
INF File oem7.inf (S3SAVAGE4 section)
Color Planes 1
Color Table Entries 4294967296
Resolution 800 x 600 x 60 hertz
Bits/Pixel 32

[Infrared]

Item Value
No infrared devices

[Input]

[Following are sub-categories of this main category]

[Keyboard]

Item Value
Description Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
Name Enhanced (101- or 102-key)
Layout 00000409
PNP Device ID ACPI\PNP0303\4&23FD4C84&0
NumberOfFunctionKeys 12

[Pointing Device]

Item Value
Hardware Type PS/2 Compatible Mouse
Number of Buttons 3
Status OK
PNP Device ID ACPI\PNP0F13\4&23FD4C84&0
Power Management Supported False
Double Click Threshold 6
Handedness Right Handed Operation

[Modem]

Item Value
No modems

[Network]

[Following are sub-categories of this main category]

[Adapter]

Item Value
Name [00000000] Intel(R) 82559 Fast Ethernet LAN on Motherboard
Adapter Type Ethernet 802.3
Product Name Intel(R) 82559 Fast Ethernet LAN on Motherboard
Installed True
PNP Device ID PCI\VEN_8086&DEV_1229&SUBSYS_024D1014&REV_08\3&267A616A&0&18
Last Reset 2/26/2002 11:56:08 AM
Index 0
Service Name E100B
IP Address 192.168.132.252
IP Subnet 255.255.255.0

Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:02:55:AC:03:35
Service Name E100B
IRQ Number 42
I/O Port 0x1880-0x18BF
Driver c:\winnt\system32\drivers\e100bnt5.sys (119056, 5.40.11.0000)

Name [00000001] RAS Async Adapter
Adapter Type Not Available
Product Name RAS Async Adapter
Installed True
PNP Device ID Not Available
Last Reset 2/26/2002 11:56:08 AM
Index 1
Service Name AsyncMac
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Service Name Not Available

Name [00000002] WAN Miniport (L2TP)
Adapter Type Not Available
Product Name WAN Miniport (L2TP)
Installed True
PNP Device ID ROOT\MS_L2TPMINIPORT\0000
Last Reset 2/26/2002 11:56:08 AM
Index 2
Service Name Rasl2tp
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Service Name Rasl2tp
Driver c:\winnt\system32\drivers\rasl2tp.sys (50800, 5.00.2179.1)

Name [00000003] WAN Miniport (PPTP)
Adapter Type Wide Area Network (WAN)
Product Name WAN Miniport (PPTP)
Installed True
PNP Device ID ROOT\MS_PPTPMINIPORT\0000
Last Reset 2/26/2002 11:56:08 AM
Index 3
Service Name PptpMiniport
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 50:50:54:50:30:30
Service Name PptpMiniport
Driver c:\winnt\system32\drivers\raspptp.sys (47856, 5.00.2160.1)

Name [00000004] Direct Parallel
Adapter Type Not Available
Product Name Direct Parallel
Installed True
PNP Device ID ROOT\MS_PTIMINIPORT\0000
Last Reset 2/26/2002 11:56:08 AM
Index 4
Service Name Raspti
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Service Name Raspti
Driver c:\winnt\system32\drivers\raspti.sys (16880, 5.00.2146.1)

Name [00000005] WAN Miniport (IP)
Adapter Type Not Available
Product Name WAN Miniport (IP)
Installed True
PNP Device ID ROOT\MS_NDISWANIP\0000
Last Reset 2/26/2002 11:56:08 AM
Index 5
Service Name NdisWan
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Service Name NdisWan
Driver c:\winnt\system32\drivers\ndiswan.sys (90096, 5.00.2195.2779)

[Protocol]

Item Value
Name MSAFD Tcpip [TCP/IP]
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 16 bytes
MaximumMessageSize 0 bytes
MessageOriented False
MinimumAddressSize 16 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData True
SupportsGracefulClosing True
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD Tcpip [UDP/IP]
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 16 bytes
MaximumMessageSize 65467 bytes
MessageOriented True
MinimumAddressSize 16 bytes
PseudoStreamOriented False

SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting True

Name RSVP UDP Service Provider
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 16 bytes
MaximumMessageSize 65467 bytes
MessageOriented True
MinimumAddressSize16 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption True
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting True

Name RSVP TCP Service Provider
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 16 bytes
MaximumMessageSize 0 bytes
MessageOriented False
MinimumAddressSize16 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption True
SupportsExpeditedData True
SupportsGracefulClosing True
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{AC2230C8-BF13-444A-A222-74EC5BD01F30}] SEQPACKET 0
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{AC2230C8-BF13-444A-A222-74EC5BD01F30}] DATAGRAM 0
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{6BB65635-7BFD-442B-AFEE-C0F2A19FF003}] SEQPACKET 1
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{6BB65635-7BFD-442B-AFEE-C0F2A19FF003}] DATAGRAM 1
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{9226BDEF-9023-497E-A30D-BAC00032C798}] SEQPACKET 2
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize20 bytes
PseudoStreamOriented False

SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{9226BDEF-9023-497E-A30D-BAC00032C798}] DATAGRAM 2
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize 20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

[WinSock]

Item Value
File c:\winnt\system32\winsock.dll
Version 3.10
Size 2.80 KB (2,864 bytes)

File c:\winnt\system32\wsock32.dll
Version 5.00.2195.2871
Size 21.27 KB (21,776 bytes)

[Ports]

[Following are sub-categories of this main category]

[Serial]

Item Value
Name COM3
Status OK
PNP Device ID MF\PCI#VEN_1014&DEV_010F&SUBSYS_01131014&REV_00\4&1E58712&0&10#CHILD0001
Maximum Input Buffer Size Not Available
Maximum Output Buffer Size Not Available
Settable Baud Rate Not Available
Settable Data Bits Not Available
Settable Flow Control Not Available
Settable Parity Not Available
Settable Parity Check Not Available
Settable Stop Bits Not Available
Settable RLSD Not Available
Supports RLSD Not Available
Supports 16 Bit Mode Not Available
Supports Special Characters Not Available
IRQ Number 17
Driver c:\winnt\system32\drivers\ibmcomw.sys (54284, 4.94)

[Parallel]

Item Value
No parallel port information

[Storage]

[Following are sub-categories of this main category]

[Drives]

Item Value
Drive A:
Description 3 1/2 Inch Floppy Drive

Drive C:
Description Local Fixed Disk
Compressed False
File System NTFS
Size 16.94 GB (18,186,059,776 bytes)
Free Space 13.75 GB (14,764,904,448 bytes)
Volume Name
Volume Serial Number E0A9A541
Partition Disk #0, Partition #0
Partition Size 16.94 GB (18,186,061,824 bytes)
Starting Offset 32256 bytes
Drive Description Disk drive
Drive Manufacturer (Standard disk drives)
Drive Model IBM-PSG ST318404LC !# SCSI Disk Device
Drive BytesPerSector 512
Drive MediaLoaded True
Drive MediaType Fixed hard disk media
Drive Partitions 1
Drive SCSIBus 0
Drive SCSILogicalUnit 0
Drive SCSIPort 2
Drive SCSITargetId 12
Drive SectorsPerTrack 63
Drive Size 18194319360 bytes
Drive TotalCylinders 2212
Drive TotalSectors 35535780
Drive TotalTracks 564060
Drive TracksPerCylinder 255

Drive F:
Description Local Fixed Disk
Compressed Not Available
File System Not Available
Size Not Available
Free Space Not Available
Volume Name Not Available
Volume Serial Number Not Available

Drive G:
Description Local Fixed Disk
Compressed Not Available
File System Not Available
Size Not Available
Free Space Not Available
Volume Name Not Available
Volume Serial Number Not Available

Drive H:
Description Local Fixed Disk
Compressed Not Available
File System Not Available

Size Not Available
Free Space Not Available
Volume Name Not Available
Volume Serial Number Not Available

Drive I:
Description Local Fixed Disk
Compressed Not Available
File System Not Available
Size Not Available
Free Space Not Available
Volume Name Not Available
Volume Serial Number Not Available

Drive Y:
Description Local Fixed Disk
Compressed False
File System NTFS
Size 195.36 GB (209,769,279,488 bytes)
Free Space 56.76 GB (60,946,370,560 bytes)
Volume Name Backup_2
Volume Serial Number 501251B5
Partition Disk #2, Partition #0
Partition Size 711.04 GB (763,470,489,600 bytes)
Starting Offset 8225280 bytes
Drive Description \\.\PHYSICALDRIVE2
Drive Manufacturer Not Available
Drive Model Not Available
Drive BytesPerSector 512
Drive MediaLoaded True
Drive MediaType Fixed hard disk media
Drive Partitions 2
Drive SCSIBus 4
Drive SCSILogicalUnit 0
Drive SCSIPort 4
Drive SCSITargetId 0
Drive SectorsPerTrack 63
Drive Size 763478714880 bytes
Drive TotalCylinders 92821
Drive TotalSectors 1491169365
Drive TotalTracks 23669355
Drive TracksPerCylinder 255

Drive Z:
Description Local Fixed Disk
Compressed False
File System NTFS
Size 195.36 GB (209,769,279,488 bytes)
Free Space 56.75 GB (60,932,247,552 bytes)
Volume Name Backup_1
Volume Serial Number 58D1C4F1
Partition Disk #1, Partition #0
Partition Size 711.04 GB (763,470,489,600 bytes)
Starting Offset 8225280 bytes
Drive Description \\.\PHYSICALDRIVE1
Drive Manufacturer Not Available
Drive Model Not Available
Drive BytesPerSector 512
Drive MediaLoaded True
Drive MediaType Fixed hard disk media
Drive Partitions 2
Drive SCSIBus 4
Drive SCSILogicalUnit 0
Drive SCSIPort 3
Drive SCSITargetId 0
Drive SectorsPerTrack 63
Drive Size 763478714880 bytes
Drive TotalCylinders 92821
Drive TotalSectors 1491169365
Drive TotalTracks 23669355
Drive TracksPerCylinder 255

Drive E:
Description Network Connection
Provider Name \\192.168.132.253\e$

[SCSI]

Item Value
Name Adaptec AIC-7892 Ultra160/m PCI SCSI Card
Caption Adaptec AIC-7892 Ultra160/m PCI SCSI Card
Driver adpu160m
Status OK
PNP Device ID
PCI\VEN_9005&DEV_008F&SUBSYS_02011014&REV_02\3&267A616A&0&20
Device ID
PCI\VEN_9005&DEV_008F&SUBSYS_02011014&REV_02\3&267A616A&0&20
Device Map Not Available
Index Not Available
Max Number Controlled Not Available
IRQ Number 41
I/O Port 0x1900-0x19FF
Driver c:\winnt\system32\drivers\adpu160m.sys (64432, v3.10a)

Name Mylex eXtremeRAID 2000 Disk Array Controller
Caption Mylex eXtremeRAID 2000 Disk Array Controller
Driver dac2w2k
Status OK
PNP Device ID
PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&1138865F&0&4008
Device ID
PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&1138865F&0&4008
Device Map Not Available
Index Not Available
Max Number Controlled Not Available
IRQ Number 43
I/O Port 0x5000-0x5FFF
Driver c:\winnt\system32\drivers\dac2w2k.sys (174464, 80.00-01)

Name Mylex eXtremeRAID 2000 Disk Array Controller
Caption Mylex eXtremeRAID 2000 Disk Array Controller
Driver dac2w2k
Status OK
PNP Device ID
PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&1A9D83F&0&4018
Device ID
PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&1A9D83F&0&4018
Device Map Not Available
Index Not Available
Max Number Controlled Not Available
IRQ Number 19
I/O Port 0x4000-0x7FFF
Driver c:\winnt\system32\drivers\dac2w2k.sys (174464, 80.00-01)

Name Mylex eXtremeRAID 2000 Disk Array Controller
Caption Mylex eXtremeRAID 2000 Disk Array Controller
Driver dac2w2k
Status OK

PNP Device ID
PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&235BDD1F&0&4008
Device ID
PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&235BDD1F&0&4008
Device Map Not Available
Index Not Available
Max Number Controlled Not Available
IRQ Number 29
I/O Port 0x2000-0x3FFF
Driver c:\winnt\system32\drivers\dac2w2k.sys (174464, 80.00-01)

[Printing]

Name Port Name Server Name
No printing information

[Problem Devices]

Device PNP Device ID Error Code
No Problem Devices

[USB]

Device PNP Device ID
Standard OpenHCD USB Host Controller
PCI\VEN_1166&DEV_0220&SUBSYS_02201166&REV_04\3&267A616A&0&7A
USB Root Hub USB\ROOT_HUB\4&372644EA&0

[Software Environment]

[Following are sub-categories of this main category]

[Drivers]

Name Description File Type Started Start Mode State Status Error Control Accept Pause Accept Stop
abiosdsk Abiosdsk Not Available Kernel Driver False Disabled Stopped OK Ignore False False
abp480n5 abp480n5 Not Available Kernel Driver False Disabled Stopped OK Normal False False
acpi Microsoft ACPI Driver c:\winnt\system32\drivers\acpi.sys Kernel Driver True Boot Running OK Normal False True
acpiec ACPIEC c:\winnt\system32\drivers\acpiec.sys Kernel Driver False Disabled Stopped OK Normal False False
adpu160m adpu160m c:\winnt\system32\drivers\adpu160m.sys Kernel Driver True Boot Running OK Normal False True
afd AFD Networking Support Environment c:\winnt\system32\drivers\afd.sys Kernel Driver True Auto Running OK Normal False True
aha154x Aha154x Not Available Kernel Driver False Disabled Stopped OK Normal False False
aic116x aic116x Not Available Kernel Driver False Disabled Stopped OK Normal False False
aic78u2 aic78u2 Not Available Kernel Driver False Disabled Stopped OK Normal False False
aic78xx aic78xx Not Available Kernel Driver False Disabled Stopped OK Normal False False
ami0nt ami0nt Not Available Kernel Driver False Disabled Stopped OK Normal False False
amsint amsint Not Available Kernel Driver False Disabled Stopped OK Normal False False
asc asc Not Available Kernel Driver False Disabled Stopped OK Normal False False
asc3350p asc3350p Not Available Kernel Driver False Disabled Stopped OK Normal False False
asc3550 asc3550 Not Available Kernel Driver False Disabled Stopped OK Normal False False
asyncmac RAS Asynchronous Media Driver c:\winnt\system32\drivers\asyncmac.sys Kernel Driver False Manual Stopped OK Normal False False
atapi Standard IDE/ESDI Hard Disk Controller c:\winnt\system32\drivers\atapi.sys Kernel Driver True Boot Running OK Normal False True
atdisk Atdisk Not Available Kernel Driver False Disabled Stopped OK Ignore False False
atmarpc ATM ARP Client Protocol c:\winnt\system32\drivers\atmarpc.sys Kernel Driver False Manual Stopped OK Normal False False
audstub Audio Stub Driver c:\winnt\system32\drivers\audstub.sys Kernel Driver True Manual Running OK Normal False True
beep Beep c:\winnt\system32\drivers\beep.sys Kernel Driver True System Running OK Normal False True
buslogic BusLogic Not Available Kernel Driver False Disabled Stopped OK Normal False False
cd20xrnt cd20xrnt Not Available Kernel Driver False Disabled Stopped OK Normal False False
cdaudio Cdaudio c:\winnt\system32\drivers\cdaudio.sys Kernel Driver False System Stopped OK Ignore False False
cdfs Cdfs c:\winnt\system32\drivers\cdfs.sys File System Driver True Disabled Running OK Normal False True
cdrom CD-ROM Driver c:\winnt\system32\drivers\cdrom.sys Kernel Driver True System Running OK Normal False True
changer Changer Not Available Kernel Driver False System Stopped OK Ignore False False
cpqarray Cpqarray Not Available Kernel Driver False Disabled Stopped OK Normal False False
cpqarry2 cpqarry2 Not Available Kernel Driver False Disabled Stopped OK Normal False False
cpqfcalm cpqfcalm Not Available Kernel Driver False Disabled Stopped OK Normal False False
cpqfws2e cpqfws2e Not Available Kernel Driver False Disabled Stopped OK Normal False False
dac2w2k dac2w2k c:\winnt\system32\drivers\dac2w2k.sys Kernel Driver True Boot Running OK Normal False True
dac960nt dac960nt Not Available Kernel Driver False Disabled Stopped OK Normal False False
deckzpsx deckzpsx Not Available Kernel Driver False Disabled Stopped OK Normal False False
dfsdriver DfsDriver c:\winnt\system32\drivers\dfs.sys File System Driver True Boot Running OK Normal False True
disk Disk Driver c:\winnt\system32\drivers\disk.sys Kernel Driver True Boot Running OK Normal False True
diskperf Diskperf c:\winnt\system32\drivers\diskperf.sys Kernel Driver True Boot Running OK Normal False True
dmboot dmboot c:\winnt\system32\drivers\dmboot.sys Kernel Driver False Disabled Stopped OK Normal False False
dmio Logical Disk Manager Driver c:\winnt\system32\drivers\dmio.sys Kernel Driver True Boot Running OK Normal False True

dmload dmload c:\winnt\system32\drivers\dmload.sys Kernel Driver True Boot Running OK Normal False True
e100b Intel(R) PRO Adapter Driver c:\winnt\system32\drivers\e100bnt5.sys Kernel Driver True Manual Running OK Normal False True
efs EFS c:\winnt\system32\drivers\efs.sys File System Driver True Disabled Running OK Normal False True
fastfat Fastfat c:\winnt\system32\drivers\fastfat.sys File System Driver True Disabled Running OK Normal False True
fd16_700 Fd16_700 Not Available Kernel Driver False Disabled Stopped OK Normal False False
fdc Floppy Disk Controller Driver c:\winnt\system32\drivers\fdc.sys Kernel Driver True Manual Running OK Normal False True
fips Fips c:\winnt\system32\drivers\fips.sys Kernel Driver True Auto Running OK Normal False True
fireport fireport Not Available Kernel Driver False Disabled Stopped OK Normal False False
flashpnt flashpnt Not Available Kernel Driver False Disabled Stopped OK Normal False False
flpydisk Floppy Disk Driver c:\winnt\system32\drivers\flpydisk.sys Kernel Driver True Manual Running OK Normal False True
ftdisk Volume Manager Driver c:\winnt\system32\drivers\ftdisk.sys Kernel Driver True Boot Running OK Normal False True
gpc Generic Packet Classifier c:\winnt\system32\drivers\msgpc.sys Kernel Driver True Manual Running OK Normal False True
i8042prt i8042 Keyboard and PS/2 Mouse Port Driver c:\winnt\system32\drivers\i8042prt.sys Kernel Driver True System Running OK Normal False True
ibmcomw IBM (Version 4.94) Remote Supervisor Serial Port c:\winnt\system32\drivers\ibmcomw.sys Kernel Driver True Manual Running OK Normal False True
ibmhpa IBMHPA c:\winnt\system32\drivers\ibmhpa.sys Kernel Driver True Manual Running OK Normal False True
ibmhpf IBM Netfinity ActivePCI Filter Driver c:\winnt\system32\drivers\ibmhpf.sys Kernel Driver True Boot Running OK Normal False True
ibmspw IBM (Version 4.94) Remote Supervisor + Mouse/Keyboard c:\winnt\system32\drivers\ibmspw.sys Kernel Driver True Manual Running OK Normal False True
ini910u ini910u Not Available Kernel Driver False Disabled Stopped OK Normal False False
intelide IntelIde Not Available Kernel Driver False Disabled Stopped OK Normal False False
ipfilterdriver IP Traffic Filter Driver c:\winnt\system32\drivers\ipfltdrv.sys Kernel Driver False Manual Stopped OK Normal False False
ipinip IP in IP Tunnel Driver c:\winnt\system32\drivers\ipinip.sys Kernel Driver False Manual Stopped OK Normal False False
ipnat IP Network Address Translator c:\winnt\system32\drivers\ipnat.sys Kernel Driver False Manual Stopped OK Normal False False
ipsec IPSEC driver c:\winnt\system32\drivers\ipsec.sys Kernel Driver False Manual Stopped OK Normal False False
ipsraidn ipsraidn Not Available Kernel Driver False Disabled Stopped OK Normal False False
isapnp PnP ISA/EISA Bus Driver c:\winnt\system32\drivers\isapnp.sys Kernel Driver True Boot Running OK Critical False True
kbdclass Keyboard Class Driver c:\winnt\system32\drivers\kbdclass.sys Kernel Driver True System Running OK Normal False True
ksecdd KSecDD c:\winnt\system32\drivers\ksecdd.sys Kernel Driver True Boot Running OK Normal False True
lbrtfdc lbrtfdc Not Available Kernel Driver False System Stopped OK Ignore False False
lp6nds35 lp6nds35 Not Available Kernel Driver False Disabled Stopped OK Normal False False
macdisk macdisk c:\winnt\system32\drivers\mac2w2k.sys Kernel Driver True Boot Running OK Normal False True
mf mf c:\winnt\system32\drivers\mf.sys Kernel Driver True Manual Running OK Normal False True
mnmdd mnmdd c:\winnt\system32\drivers\mnmdd.sys Kernel Driver True System Running OK Ignore False True
modem Modem c:\winnt\system32\drivers\modem.sys Kernel Driver False Manual Stopped OK Ignore False False
mouclass Mouse Class Driver c:\winnt\system32\drivers\mouclass.sys Kernel Driver True System Running OK Normal False True
mountmgr MountMgr c:\winnt\system32\drivers\mountmgr.sys Kernel Driver True Boot Running OK Normal False True
mraid35x mraid35x Not Available Kernel Driver False Disabled Stopped OK Normal False False
mrxsmb MRXSMB c:\winnt\system32\drivers\mrxsmb.sys File System Driver True System Running OK Normal False True
msfs Msfs c:\winnt\system32\drivers\msfs.sys File System Driver True System Running OK Normal False True
mskssrv Microsoft Streaming Service Proxy c:\winnt\system32\drivers\mskssrv.sys Kernel Driver False Manual Stopped OK Normal False False
mspclock Microsoft Streaming Clock Proxy c:\winnt\system32\drivers\mspclock.sys Kernel Driver False Manual Stopped OK Normal False False
mspqm Microsoft Streaming Quality Manager Proxy c:\winnt\system32\drivers\mspqm.sys Kernel Driver False Manual Stopped OK Normal False False
mup Mup c:\winnt\system32\drivers\mup.sys File System Driver True Boot Running OK Normal False True
ncrc710 Ncrc710 Not Available Kernel Driver False Disabled Stopped OK Normal False False
ndis NDIS System Driver c:\winnt\system32\drivers\ndis.sys Kernel Driver True Boot Running OK Normal False True
ndistapi Remote Access NDIS TAPI Driver c:\winnt\system32\drivers\ndistapi.sys Kernel Driver True Manual Running OK Normal False True
ndiswan Remote Access NDIS WAN Driver c:\winnt\system32\drivers\ndiswan.sys Kernel Driver True Manual Running OK Normal False True
ndproxy NDIS Proxy c:\winnt\system32\drivers\ndproxy.sys Kernel Driver True Manual Running OK Normal False True
netbios NetBIOS Interface c:\winnt\system32\drivers\netbios.sys File System Driver True System Running OK Normal False True
netbt NetBios over Tcpip c:\winnt\system32\drivers\netbt.sys Kernel Driver True System Running OK Normal False True

```
netdetect NetDetect c:\winnt\system32\drivers\netdtect.sys Kernel
Driver False Manual Stopped OK Normal False
False
npfs Npfs c:\winnt\system32\drivers\npfs.sys File System
Driver True System Running OK Normal False
True
ntfs Ntfs c:\winnt\system32\drivers\ntfs.sys File System
Driver True Disabled Running OK Normal False
True
null Null c:\winnt\system32\drivers\null.sys Kernel
Driver True System Running OK Normal False
True
nwlnkflt IPX Traffic Filter Driver
c:\winnt\system32\drivers\nwlnkflt.sys Kernel Driver False
Manual Stopped OK Normal False False
nwlnkfwd IPX Traffic Forwarder Driver
c:\winnt\system32\drivers\nwlnkfwd.sys Kernel Driver False
Manual Stopped OK Normal False False
openhci Microsoft USB Open Host Controller Driver
c:\winnt\system32\drivers\openhci.sys Kernel Driver True
Manual Running OK Normal False True
parallel Parallel c:\winnt\system32\drivers\parallel.sys Kernel
Driver False Auto Stopped OK Ignore False
False
parport Parport c:\winnt\system32\drivers\parport.sys Kernel
Driver False Auto Stopped OK Ignore False
False
partmgr PartMgr c:\winnt\system32\drivers\partmgr.sys Kernel
Driver True Boot Running OK Normal False
True
parvdm ParVdm c:\winnt\system32\drivers\parvdm.sys Kernel
Driver False Auto Stopped OK Ignore False
False
pci PCI Bus Driver c:\winnt\system32\drivers\pci.sys Kernel
Driver True Boot Running OK Critical False
True
pcidump PCIDump Not Available Kernel Driver False
System Stopped OK Ignore False False
pciide PCIIde c:\winnt\system32\drivers\pciide.sys Kernel
Driver True Boot Running OK Normal False
True
pcmcia Pcmcia c:\winnt\system32\drivers\pcmcia.sys Kernel
Driver False Disabled Stopped OK Normal False
False
pdcomp PDCOMP Not Available Kernel Driver False
Manual Stopped OK Ignore False False
pdframe PDFRAME Not Available Kernel Driver
False Manual Stopped OK Ignore False False
pdreli PDRELI Not Available Kernel Driver False
Manual Stopped OK Ignore False False
pdrframe PDRFRAME Not Available Kernel Driver
False Manual Stopped OK Ignore False False
pptpminiport WAN Miniport (PPTP)
c:\winnt\system32\drivers\raspptp.sys Kernel Driver True
Manual Running OK Normal False True
ptilink Direct Parallel Link Driver
c:\winnt\system32\drivers\ptilink.sys Kernel Driver True
Manual Running OK Normal False True
ql1080 ql1080 Not Available Kernel Driver False
Disabled Stopped OK Normal False False
ql10wnt Ql10wnt Not Available Kernel Driver False
Disabled Stopped OK Normal False False
ql1240 ql1240 Not Available Kernel Driver False
Disabled Stopped OK Normal False False
ql2100 ql2100 Not Available Kernel Driver False
Disabled Stopped OK Normal False False
rasacd Remote Access Auto Connection Driver
c:\winnt\system32\drivers\rasacd.sys Kernel Driver True
System Running OK Normal False True
rasl2tp WAN Miniport (L2TP)
c:\winnt\system32\drivers\rasl2tp.sys Kernel Driver True
Manual Running OK Normal False True
raspti Direct Parallel c:\winnt\system32\drivers\raspti.sys
Kernel Driver True Manual Running OK Normal
False True
rca Microsoft Streaming Network Raw Channel Access
c:\winnt\system32\drivers\rca.sys Kernel Driver False Manual
Stopped OK Normal False False
rdbss Rdbss c:\winnt\system32\drivers\rdbss.sys File System
Driver True System Running OK Normal False
True
rdpwd RDPWD c:\winnt\system32\drivers\rdpwd.sys Kernel
Driver False Manual Stopped OK Ignore False
False
redbook Digital CD Audio Playback Filter Driver
c:\winnt\system32\drivers\redbook.sys Kernel Driver False
System Stopped OK Normal False False
s3inc S3Inc c:\winnt\system32\drivers\s3sav4m.sys Kernel
Driver False Manual Stopped OK Ignore False
False
s3savage4 S3SAVAGE4 c:\winnt\system32\drivers\s3savg4m.sys
Kernel Driver True Manual Running OK Ignore
False True
serial Serial c:\winnt\system32\drivers\serial.sys Kernel
Driver False Auto Stopped OK Ignore False
False
sfloppy Sfloppy c:\winnt\system32\drivers\sfloppy.sys Kernel
Driver False System Stopped OK Ignore False
False
sglfb sglfb Not Available Kernel Driver False
System Stopped OK Normal False False
simbad Simbad Not Available Kernel Driver False
Disabled Stopped OK Normal False False
sparrow Sparrow Not Available Kernel Driver False
Disabled Stopped OK Normal False False
spud Special Purpose Utility Driver c:\winnt\system32\drivers\spud.sys
Kernel Driver False Manual Stopped OK Normal
False False
srv Srv c:\winnt\system32\drivers\srv.sys File System Driver
True Manual Running OK Normal False True
swenum Software Bus Driver c:\winnt\system32\drivers\swenum.sys
Kernel Driver True Manual Running OK Normal
False True
symc810 symc810 Not Available Kernel Driver False
Disabled Stopped OK Normal False False
symc8xx symc8xx Not Available Kernel Driver False
Disabled Stopped OK Normal False False
sym_hi sym_hi Not Available Kernel Driver False
Disabled Stopped OK Normal False False
tcpip TCP/IP Protocol Driver c:\winnt\system32\drivers\tcpip.sys
Kernel Driver True System Running OK Normal
False True
tdasync TDASYNC c:\winnt\system32\drivers\tdasync.sys
Kernel Driver False Manual Stopped OK Ignore
False False
tdipx TDIPX c:\winnt\system32\drivers\tdipx.sys Kernel
Driver False Manual Stopped OK Ignore False
False
tdnetb TDNETB c:\winnt\system32\drivers\tdnetb.sys Kernel
Driver False Manual Stopped OK Ignore False
False
tdpipe TDPIPE c:\winnt\system32\drivers\tdpipe.sys Kernel
Driver False Manual Stopped OK Ignore False
False
```

tdspx TDSPX c:\winnt\system32\drivers\tdspx.sys Kernel
Driver False Manual Stopped OK Ignore False
False
tdtcp TDTCP c:\winnt\system32\drivers\tdtcp.sys Kernel
Driver False Manual Stopped OK Ignore False
False
termdd Terminal Device Driver
c:\winnt\system32\drivers\termdd.sys Kernel Driver False
Disabled Stopped OK Normal False False
tga tga Not Available Kernel Driver False
System Stopped OK Ignore False False
udfs Udfs c:\winnt\system32\drivers\udfs.sys File System
Driver False Disabled Stopped OK Normal False
False
ultra66 ultra66 Not Available Kernel Driver False
Disabled Stopped OK Normal False False
update Microcode Update Driver
c:\winnt\system32\drivers\update.sys Kernel Driver True
Manual Running OK Normal False True
usbhub Microsoft USB Standard Hub Driver
c:\winnt\system32\drivers\usbhub.sys Kernel Driver True
Manual Running OK Normal False True
vgasave VgaSave c:\winnt\system32\drivers\vga.sys Kernel
Driver True System Running OK Ignore False
True
wanarp Remote Access IP ARP Driver
c:\winnt\system32\drivers\wanarp.sys Kernel Driver True
Manual Running OK Normal False True
wdica WDICA Not Available Kernel Driver False
Manual Stopped OK Ignore False False

[Environment Variables]

Variable Value User Name
ComSpec %SystemRoot%\system32\cmd.exe <SYSTEM>
NUMBER_OF_PROCESSORS 4 <SYSTEM>
OS Windows_NT <SYSTEM>
Os2LibPath %SystemRoot%\system32\os2\dll; <SYSTEM>
Path
%SystemRoot%\system32;%SystemRoot%;%SystemRoot%\System32\Wbem;
C:\Program Files\Microsoft SQL Server\80\Tools\BINN;C:\Program
Files\Microsoft SQL Server\MSSQL\BINN <SYSTEM>
PATHEXT
.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH <SYSTEM>
PROCESSOR_ARCHITECTURE x86 <SYSTEM>
PROCESSOR_IDENTIFIER x86 Family 15 Model 1 Stepping 1,
GenuineIntel <SYSTEM>
PROCESSOR_LEVEL 15 <SYSTEM>
PROCESSOR_REVISION 0101 <SYSTEM>
TEMP %SystemRoot%\TEMP <SYSTEM>
TMP %SystemRoot%\TEMP <SYSTEM>
windir %SystemRoot% <SYSTEM>
TEMP %USERPROFILE%\Local Settings\Temp
TPCC-2WAY\Administrator
TMP %USERPROFILE%\Local Settings\Temp
TPCC-2WAY\Administrator

[Jobs]

[Following are sub-categories of this main category]

[Print]

Document Size Owner Notify Status Time Submitted
Start Time Until Time Elapsed Time Pages Printed Job ID
Priority Parameters Driver Name Print Processor Host Print
Queue Data Type Name

Unknown Unknown Unknown Unknown Unknown Unknown Unknown
Unknown Unknown Unknown Unknown Unknown Unknown Unknown
Unknown Unknown Unknown Unknown

[Network Connections]

Local Name Remote Name Type Status User Name
E: \\192.168.132.253\e$ Disk OK
TPCC-2WAY\Administrator

[Running Tasks]

Name Path Process ID Priority Min Working Set Max
Working Set Start Time Version Size File Date
system idle process Not Available 0 0 Not
Available Not Available Not Available Unknown Unknown
Unknown
system Not Available 8 8 0 1413120
Not Available Unknown Unknown Unknown
smss.exe c:\winnt\system32\smss.exe 172 11 204800
1413120 2/26/2002 4:56:23 PM 5.00.2195.2901 44.27 KB
(45,328 bytes) 12/7/1999 7:00:00 AM
csrss.exe Not Available 200 13 Not Available
Not Available 2/26/2002 4:56:28 PM Unknown Unknown
Unknown
winlogon.exe c:\winnt\system32\winlogon.exe 220 13
204800 1413120 2/26/2002 4:56:30 PM 5.00.2195.2953
173.77 KB (177,936 bytes) 12/7/1999 7:00:00 AM
services.exe c:\winnt\system32\services.exe 248 9
204800 1413120 2/26/2002 4:56:31 PM 5.00.2195.2780
86.77 KB (88,848 bytes) 12/7/1999 7:00:00 AM
lsass.exe c:\winnt\system32\lsass.exe 260 9 204800
1413120 2/26/2002 4:56:31 PM 5.00.2195.2964 32.77 KB
(33,552 bytes) 12/7/1999 7:00:00 AM
svchost.exe c:\winnt\system32\svchost.exe 432 8
204800 1413120 2/26/2002 4:56:34 PM 5.00.2134.1
7.77 KB (7,952 bytes) 12/7/1999 7:00:00 AM
msdtc.exe c:\winnt\system32\msdtc.exe 460 8 204800
1413120 2/26/2002 4:56:35 PM 1999.9.3421.3 6.77 KB
(6,928 bytes) 2/12/2002 10:31:38 AM
ibmhpasv.exe c:\winnt\system32\ibmhpasv.exe 632 8
204800 1413120 2/26/2002 4:56:38 PM 5. 0. 0. 0 28.62 KB
(29,305 bytes) 9/12/2001 10:26:38 PM
ibmspsvc.exe c:\winnt\system32\ibmspsvc.exe 648 8
204800 1413120 2/26/2002 4:56:38 PM Not Available
29.50 KB (30,208 bytes) 1/1/1980
ibmsprem.exe c:\winnt\system32\ibmsprem.exe 672 8
204800 1413120 2/26/2002 4:56:38 PM Not Available
35.00 KB (35,840 bytes) 1/1/1980
ibmsprem.exe c:\winnt\system32\ibmsprem.exe 680 8
204800 1413120 2/26/2002 4:56:38 PM Not Available
35.00 KB (35,840 bytes) 1/1/1980
tcpsvcs.exe c:\winnt\system32\tcpsvcs.exe 716 8
204800 1413120 2/26/2002 4:56:38 PM 5.00.2134.1
24.77 KB (25,360 bytes) 12/7/1999 7:00:00 AM
winmgmt.exe c:\winnt\system32\wbem\winmgmt.exe 744 8
204800 1413120 2/26/2002 4:56:39 PM 1.50.1085.0029
192.08 KB (196,685 bytes) 2/13/2002 7:46:37 AM
svchost.exe c:\winnt\system32\svchost.exe 664 8
204800 1413120 2/26/2002 4:56:48 PM 5.00.2134.1
7.77 KB (7,952 bytes) 12/7/1999 7:00:00 AM
explorer.exe c:\winnt\explorer.exe 848 8 204800
1413120 2/26/2002 4:56:48 PM 5.00.3315.2846 237.27 KB
(242,960 bytes) 2/13/2002 7:46:32 AM
svchost.exe c:\winnt\system32\svchost.exe 1048 8
204800 1413120 2/26/2002 4:56:56 PM 5.00.2134.1
7.77 KB (7,952 bytes) 12/7/1999 7:00:00 AM

cmd.exe c:\winnt\system32\cmd.exe 892 8 204800 1413120 2/26/2002 4:57:17 PM 5.00.2195.2104 230.77 KB (236,304 bytes) 12/7/1999 7:00:00 AM
sqlservr.exe c:\program files\microsoft sql server\mssql\binn\sqlservr.exe 940 13 204800 1413120 2/26/2002 4:57:27 PM 2000.080.0534.00 7.10 MB (7,442,513 bytes) 2/12/2002 3:57:15 PM
cmd.exe c:\winnt\system32\cmd.exe 864 8 204800 1413120 2/26/2002 5:09:46 PM 5.00.2195.2104 230.77 KB (236,304 bytes) 12/7/1999 7:00:00 AM
isqlw.exe c:\program files\microsoft sql server\80\tools\binn\isqlw.exe 776 8 204800 1413120 2/26/2002 5:28:14 PM 2000.080.0382.00 344.56 KB (352,828 bytes) 2/12/2002 3:57:37 PM
mmc.exe c:\winnt\system32\mmc.exe 708 8 204800 1413120 2/26/2002 5:30:56 PM 5.00.2195.2301 589.27 KB (603,408 bytes) 2/13/2002 7:46:10 AM
rsvp.exe c:\winnt\system32\rsvp.exe 1260 8 204800 1413120 2/26/2002 5:32:27 PM 5.00.2167.1 172.77 KB (176,912 bytes) 12/7/1999 7:00:00 AM

[Loaded Modules]

Name Version Size File Date Manufacturer Path
traffic.dll 5.00.2139.1 30.77 KB (31,504 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\traffic.dll
rsvp.exe 5.00.2167.1 172.77 KB (176,912 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\rsvp.exe
wbemprox.dll 1.50.1085.0045 40.08 KB (41,040 bytes) 2/13/2002 7:46:37 AM Microsoft Corporation c:\winnt\system32\wbem\wbemprox.dll
rassapi.dll 5.00.2188.1 14.27 KB (14,608 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\rassapi.dll
adsnt.dll 5.00.2195.2778 195.27 KB (199,952 bytes) 2/13/2002 7:45:56 AM Microsoft Corporation c:\winnt\system32\adsnt.dll
dbghelp.dll 5.00.2195.2104 159.27 KB (163,088 bytes) 5/4/2001 1:05:02 PM Microsoft Corporation c:\winnt\system32\dbghelp.dll
localsec.dll 5.00.2195.2130 230.27 KB (235,792 bytes) 2/13/2002 7:46:09 AM Microsoft Corporation c:\winnt\system32\localsec.dll
devmgr.dll 5.00.2166.1 215.77 KB (220,944 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\devmgr.dll
filemgmt.dll 5.00.2195.2165 287.27 KB (294,160 bytes) 2/13/2002 7:46:04 AM Microsoft Corporation c:\winnt\system32\filemgmt.dll
pdh.dll 5.00.2195.2739 147.77 KB (151,312 bytes) 2/13/2002 7:46:23 AM Microsoft Corporation c:\winnt\system32\pdh.dll
smlogcfg.dll 5.00.2195.2485 273.27 KB (279,824 bytes) 2/13/2002 7:46:27 AM Microsoft Corporation c:\winnt\system32\smlogcfg.dll
cabinet.dll 5.00.2147.1 54.77 KB (56,080 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\cabinet.dll
msinfo32.dll 5.00.2177.1 312.27 KB (319,760 bytes) 2/12/2002 3:36:37 PM Microsoft Corporation c:\program files\common files\microsoft shared\msinfo\msinfo32.dll
riched20.dll 5.30.23.1205 421.27 KB (431,376 bytes) 2/13/2002 7:46:24 AM Microsoft Corporation c:\winnt\system32\riched20.dll
riched32.dll 5.00.2134.1 3.77 KB (3,856 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\riched32.dll
els.dll 5.00.2175.1 151.27 KB (154,896 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\els.dll
ntmsmgr.dll 1,0,0,1 427.77 KB (438,032 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation and HighGround Systems, Inc. c:\winnt\system32\ntmsmgr.dll
mmfutil.dll 1.50.1085.0000 32.06 KB (32,829 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\mmfutil.dll
logdrive.dll 1.50.1085.0000 200.06 KB (204,863 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\logdrive.dll
dfrgres.dll 5.00.2150.1 27.50 KB (28,160 bytes) 12/7/1999 7:00:00 AM Executive Software International, Inc. c:\winnt\system32\dfrgres.dll
dfrgsnap.dll 5.00.2195.2104 41.77 KB (42,768 bytes) 2/13/2002 7:46:01 AM Executive Software International, Inc. c:\winnt\system32\dfrgsnap.dll
dmdskres.dll 2195.2104.297.3 119.50 KB (122,368 bytes) 2/13/2002 7:46:02 AM Microsoft Corp., VERITAS Software c:\winnt\system32\dmdskres.dll
dmutil.dll 2195.2104.297.3 42.27 KB (43,280 bytes) 2/13/2002 7:46:02 AM VERITAS Software Corp. c:\winnt\system32\dmutil.dll
ntmsapi.dll 5.00.1948.1 51.77 KB (53,008 bytes) 2/13/2002 7:46:20 AM Microsoft Corporation c:\winnt\system32\ntmsapi.dll
dmdskmgr.dll 2215.2215.297.3 160.27 KB (164,112 bytes) 2/13/2002 7:46:02 AM Microsoft Corp., VERITAS Software c:\winnt\system32\dmdskmgr.dll
mycomput.dll 5.00.2134.1 107.77 KB (110,352 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\mycomput.dll
mmcndmgr.dll 5.00.2178.1 815.27 KB (834,832 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\mmcndmgr.dll
mfc42u.dll 6.00.8665.0 972.05 KB (995,384 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\mfc42u.dll
mmc.exe 5.00.2195.2301 589.27 KB (603,408 bytes) 2/13/2002 7:46:10 AM Microsoft Corporation c:\winnt\system32\mmc.exe
dbmslpcn.dll 2000.080.0534.00 28.56 KB (29,244 bytes) 2/12/2002 3:57:18 PM Microsoft Corporation c:\winnt\system32\dbmslpcn.dll
dbnetlib.dll 2000.080.0528.00 84.08 KB (86,097 bytes) 2/12/2002 5:33:09 PM Microsoft Corporation c:\winnt\system32\dbnetlib.dll
sqlsrv32.rll 2000.080.0528.00 88.00 KB (90,112 bytes) 2/12/2002 5:33:10 PM Microsoft Corporation c:\winnt\system32\sqlsrv32.rll
sqlsrv32.dll 2000.080.0528.00 460.08 KB (471,121 bytes) 2/12/2002 5:33:10 PM Microsoft Corporation c:\winnt\system32\sqlsrv32.dll
sqllex.dll 2000.080.0194.00 148.06 KB (151,616 bytes) 2/12/2002 3:57:44 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\sqllex.dll
objmgr.rll 2000.080.0194.00 56.00 KB (57,344 bytes) 2/12/2002 3:57:37 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\resources\1033\objmgr.rll
objmgr.dll 2000.080.0382.00 304.56 KB (311,872 bytes) 2/12/2002 3:57:37 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\objmgr.dll
odbccp32.dll 3.520.6019.0 100.27 KB (102,672 bytes) 2/13/2002 7:46:21 AM Microsoft Corporation c:\winnt\system32\odbccp32.dll

isqlw.rll 2000.080.0382.00 240.00 KB (245,760 bytes) 2/12/2002 3:57:37 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\resources\1033\isqlw.rll
sqlqry.rll 2000.080.0194.00 180.00 KB (184,320 bytes) 2/12/2002 3:57:37 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\resources\1033\sqlqry.rll
pfutil80.rll 2000.080.0382.00 144.00 KB (147,456 bytes) 2/12/2002 3:57:45 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\resources\1033\pfutil80.rll
pfclnt80.rll 2000.080.0194.00 28.00 KB (28,672 bytes) 2/12/2002 3:57:43 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\resources\1033\pfclnt80.rll
semsfc.rll 2000.080.0194.00 24.00 KB (24,576 bytes) 2/12/2002 3:57:45 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\resources\1033\semsfc.rll
sqlgui.rll 2000.080.0194.00 56.00 KB (57,344 bytes) 2/12/2002 3:57:45 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\resources\1033\sqlgui.rll
sqlsvc.rll 2000.080.0194.00 24.00 KB (24,576 bytes) 2/12/2002 3:57:43 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\resources\1033\sqlsvc.rll
odbcint.dll 3.520.6019.0 88.00 KB (90,112 bytes) 2/13/2002 7:46:21 AM Microsoft Corporation c:\winnt\system32\odbcint.dll
pfclnt80.dll 2000.080.0534.00 404.56 KB (414,272 bytes) 2/12/2002 3:57:43 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\pfclnt80.dll
semsfc.dll 2000.080.0534.00 224.56 KB (229,952 bytes) 2/12/2002 3:57:44 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\semsfc.dll
pfutil80.dll 2000.080.0534.00 272.56 KB (279,104 bytes) 2/12/2002 3:57:45 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\pfutil80.dll
sqlqry.dll 2000.080.0382.00 392.56 KB (401,984 bytes) 2/12/2002 3:57:37 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\sqlqry.dll
odbcbcp.dll 2000.080.0528.00 28.57 KB (29,252 bytes) 2/12/2002 5:33:10 PM Microsoft Corporation c:\winnt\system32\odbcbcp.dll
sqlsvc.dll 2000.080.0382.00 92.56 KB (94,784 bytes) 2/12/2002 3:57:43 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\sqlsvc.dll
odbc32.dll 3.520.6019.0 212.27 KB (217,360 bytes) 2/13/2002 7:46:21 AM Microsoft Corporation c:\winnt\system32\odbc32.dll
w95scm.dll 2000.080.0194.00 48.56 KB (49,728 bytes) 2/12/2002 3:57:43 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\w95scm.dll
sqlgui.dll 2000.080.0534.00 444.56 KB (455,232 bytes) 2/12/2002 3:57:43 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\sqlgui.dll
sqlresld.dll 2000.080.0382.00 28.56 KB (29,248 bytes) 2/12/2002 3:57:43 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\sqlresld.dll
sqlunirl.dll 2000.080.0380.00 176.56 KB (180,800 bytes) 4/9/2001 10:46:18 AM Microsoft Corporation c:\winnt\system32\sqlunirl.dll
isqlw.exe 2000.080.0382.00 344.56 KB (352,828 bytes) 2/12/2002 3:57:37 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\isqlw.exe
ssmslpcn.dll 2000.080.0534.00 28.56 KB (29,244 bytes) 2/12/2002 3:57:18 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\ssmslpcn.dll
security.dll 5.00.2154.1 5.77 KB (5,904 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\security.dll
ssnmpn70.dll 2000.080.0534.00 24.56 KB (25,148 bytes) 2/12/2002 3:57:18 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\ssnmpn70.dll
ssnetlib.dll 2000.080.0534.00 84.56 KB (86,588 bytes) 2/12/2002 3:57:17 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\ssnetlib.dll
sqlevn70.rll 2000.080.0534.00 28.00 KB (28,672 bytes) 2/12/2002 3:57:18 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\resources\1033\sqlevn70.rll
msvcirt.dll 6.10.8637.0 76.05 KB (77,878 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msvcirt.dll
sqlsort.dll 2000.080.0534.00 576.56 KB (590,396 bytes) 2/12/2002 3:57:17 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\sqlsort.dll
ums.dll 2000.080.0382.00 48.07 KB (49,228 bytes) 2/12/2002 3:57:17 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\ums.dll
opends60.dll 2000.080.0194.00 24.06 KB (24,639 bytes) 2/12/2002 3:57:17 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\opends60.dll
sqlservr.exe 2000.080.0534.00 7.10 MB (7,442,513 bytes) 2/12/2002 3:57:15 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\sqlservr.exe
cmd.exe 5.00.2195.2104 230.77 KB (236,304 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\cmd.exe
tapisrv.dll 5.00.2195.2955 169.27 KB (173,328 bytes) 2/13/2002 7:46:28 AM Microsoft Corporation c:\winnt\system32\tapisrv.dll
thumbvw.dll 5.00.2920.0000 183.27 KB (187,664 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\thumbvw.dll
jscript.dll 5.1.0.5907 476.06 KB (487,481 bytes) 2/13/2002 7:46:08 AM Microsoft Corporation c:\winnt\system32\jscript.dll
imm32.dll 5.00.2195.2821 94.27 KB (96,528 bytes) 2/13/2002 7:46:06 AM Microsoft Corporation c:\winnt\system32\imm32.dll
netplwiz.dll 5.00.2195.2370 169.77 KB (173,840 bytes) 2/13/2002 7:46:18 AM Microsoft Corporation c:\winnt\system32\netplwiz.dll
netmsg.dll 5.00.2137.1 152.50 KB (156,160 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\netmsg.dll
comdlg32.dll 5.00.3103.1000 236.77 KB (242,448 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\comdlg32.dll
netui2.dll 5.00.2134.1 280.27 KB (286,992 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\netui2.dll
mprui.dll 5.00.2195.2104 54.77 KB (56,080 bytes) 2/13/2002 7:46:10 AM Microsoft Corporation c:\winnt\system32\mprui.dll
wininet.dll 5.00.3315.1000 456.77 KB (467,728 bytes) 2/13/2002 7:46:31 AM Microsoft Corporation c:\winnt\system32\wininet.dll
msdbg.dll 6.00.8424 67.50 KB (69,120 bytes) 2/12/2002 10:34:12 AM Microsoft Corporation c:\winnt\system32\msdbg.dll
pdm.dll 6.00.8424 179.27 KB (183,574 bytes) 2/12/2002 10:34:12 AM Microsoft Corporation c:\winnt\system32\pdm.dll
mlang.dll 5.00.3103.1000 510.77 KB (523,024 bytes) 2/13/2002 7:46:09 AM Microsoft Corporation c:\winnt\system32\mlang.dll
urlmon.dll 5.00.3315.1000 441.27 KB (451,856 bytes) 2/13/2002 7:46:29 AM Microsoft Corporation c:\winnt\system32\urlmon.dll
browselc.dll 5.00.3315.2846 34.50 KB (35,328 bytes) 2/13/2002 7:45:57 AM Microsoft Corporation c:\winnt\system32\browselc.dll
faxshell.dll 5.00.2134.1 8.27 KB (8,464 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\faxshell.dll

msacm32.dll 5.00.2134.1 65.27 KB (66,832 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msacm32.dll
avifil32.dll 5.00.2134.1 76.27 KB (78,096 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\avifil32.dll
msvfw32.dll 5.00.2134.1 113.77 KB (116,496 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msvfw32.dll
docprop2.dll 5.00.2178.1 297.77 KB (304,912 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\docprop2.dll
linkinfo.dll 5.00.2134.1 15.77 KB (16,144 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\linkinfo.dll
powrprof.dll 5.00.3103.1000 13.27 KB (13,584 bytes) 2/13/2002 7:46:23 AM Microsoft Corporation c:\winnt\system32\powrprof.dll
batmeter.dll 5.00.3103.1000 20.27 KB (20,752 bytes) 2/13/2002 7:45:57 AM Microsoft Corporation c:\winnt\system32\batmeter.dll
stobject.dll 5.00.2195.2780 79.27 KB (81,168 bytes) 2/13/2002 7:46:28 AM Microsoft Corporation c:\winnt\system32\stobject.dll
msi.dll 1.11.2405.0 1.69 MB (1,767,184 bytes) 2/13/2002 7:46:13 AM Microsoft Corporation c:\winnt\system32\msi.dll
webcheck.dll 5.00.3315.1000 251.77 KB (257,808 bytes) 2/13/2002 7:46:30 AM Microsoft Corporation c:\winnt\system32\webcheck.dll
ntshrui.dll 5.00.2134.1 46.77 KB (47,888 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\ntshrui.dll
mydocs.dll 5.00.2920.0000 55.77 KB (57,104 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\mydocs.dll
browseui.dll 5.00.3315.2846 788.77 KB (807,696 bytes) 2/13/2002 7:45:58 AM Microsoft Corporation c:\winnt\system32\browseui.dll
shdocvw.dll 5.00.3315.2879 1.05 MB (1,104,144 bytes) 2/13/2002 7:46:26 AM Microsoft Corporation c:\winnt\system32\shdocvw.dll
explorer.exe 5.00.3315.2846 237.27 KB (242,960 bytes) 2/13/2002 7:46:32 AM Microsoft Corporation c:\winnt\explorer.exe
rasdlg.dll 5.00.2195.2671 514.27 KB (526,608 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\rasdlg.dll
netcfgx.dll 5.00.2195.2228 534.77 KB (547,600 bytes) 2/13/2002 7:46:18 AM Microsoft Corporation c:\winnt\system32\netcfgx.dll
sens.dll 5.00.2163.1 36.77 KB (37,648 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\sens.dll
rasmans.dll 5.00.2195.2728 147.27 KB (150,800 bytes) 2/13/2002 7:46:24 AM Microsoft Corporation c:\winnt\system32\rasmans.dll
netshell.dll 5.00.2195.2779 457.27 KB (468,240 bytes) 2/13/2002 7:46:18 AM Microsoft Corporation c:\winnt\system32\netshell.dll
netman.dll 5.00.2195.2779 89.27 KB (91,408 bytes) 2/13/2002 7:46:18 AM Microsoft Corporation c:\winnt\system32\netman.dll
es.dll 2000.2.3471.1 222.27 KB (227,600 bytes) 2/13/2002 7:46:04 AM Microsoft Corporation c:\winnt\system32\es.dll
netui1.dll 5.00.2134.1 210.27 KB (215,312 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\netui1.dll
netui0.dll 5.00.2134.1 70.27 KB (71,952 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\netui0.dll
ntlanman.dll 5.00.2157.1 35.27 KB (36,112 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\ntlanman.dll
wshnetbs.dll 5.00.2134.1 7.77 KB (7,952 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\wshnetbs.dll
ntmarta.dll 5.00.2195.2862 98.77 KB (101,136 bytes) 2/13/2002 7:46:20 AM Microsoft Corporation c:\winnt\system32\ntmarta.dll
provthrd.dll 1.50.1085.0000 68.07 KB (69,708 bytes) 2/12/2002 3:36:27 PM Microsoft Corporation c:\winnt\system32\wbem\provthrd.dll
ntevt.dll 1.50.1085.0000 192.06 KB (196,669 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\wbem\ntevt.dll
perfos.dll 5.00.2155.1 21.27 KB (21,776 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\perfos.dll
wmi.dll 5.00.2191.1 6.27 KB (6,416 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\wmi.dll
psapi.dll 5.00.2134.1 28.27 KB (28,944 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\psapi.dll
framedyn.dll 1.50.1085.0000 164.05 KB (167,992 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\wbem\framedyn.dll
cimwin32.dll 1.50.1085.0038 1.02 MB (1,073,232 bytes) 2/13/2002 7:46:35 AM Microsoft Corporation c:\winnt\system32\wbem\cimwin32.dll
wbemsvc.dll 1.50.1085.0007 40.07 KB (41,036 bytes) 2/13/2002 7:46:37 AM Microsoft Corporation c:\winnt\system32\wbem\wbemsvc.dll
wbemess.dll 1.50.1085.0039 364.07 KB (372,804 bytes) 2/13/2002 7:46:37 AM Microsoft Corporation c:\winnt\system32\wbem\wbemess.dll
fastprox.dll 1.50.1085.0037 144.08 KB (147,536 bytes) 2/13/2002 7:46:36 AM Microsoft Corporation c:\winnt\system32\wbem\fastprox.dll
wbemcore.dll 1.50.1085.0036 628.07 KB (643,140 bytes) 2/13/2002 7:46:37 AM Microsoft Corporation c:\winnt\system32\wbem\wbemcore.dll
wbemcomn.dll 1.50.1085.0021 692.07 KB (708,675 bytes) 2/13/2002 7:46:36 AM Microsoft Corporation c:\winnt\system32\wbem\wbemcomn.dll
winmgmt.exe 1.50.1085.0029 192.08 KB (196,685 bytes) 2/13/2002 7:46:37 AM Microsoft Corporation c:\winnt\system32\wbem\winmgmt.exe
simptcp.dll 5.00.2134.1 19.27 KB (19,728 bytes) 2/12/2002 10:31:31 AM Microsoft Corporation c:\winnt\system32\simptcp.dll
tcpsvcs.exe 5.00.2134.1 24.77 KB (25,360 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\tcpsvcs.exe
ibmspw.dll 4.94 64.00 KB (65,536 bytes) 1/1/1980 IBM Corporation c:\winnt\system32\ibmspw.dll
ibmsprem.exe Not Available 35.00 KB (35,840 bytes) 1/1/1980 Not Available c:\winnt\system32\ibmsprem.exe
ibmspsvc.exe Not Available 29.50 KB (30,208 bytes) 1/1/1980 Not Available c:\winnt\system32\ibmspsvc.exe
ibmhpasv.exe 5. 0. 0. 0 28.62 KB (29,305 bytes) 9/12/2001 10:26:38 PM IBM Corporation c:\winnt\system32\ibmhpasv.exe

mtxoci.dll 2000.2.3471.1 101.77 KB (104,208 bytes) 2/13/2002 7:46:18 AM Microsoft Corporation c:\winnt\system32\mtxoci.dll
resutils.dll 5.00.2195.2787 39.77 KB (40,720 bytes) 2/13/2002 7:46:24 AM Microsoft Corporation c:\winnt\system32\resutils.dll
clusapi.dll 5.00.2195.2104 54.27 KB (55,568 bytes) 2/13/2002 7:45:59 AM Microsoft Corporation c:\winnt\system32\clusapi.dll
msvcp50.dll 5.00.7051 552.50 KB (565,760 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msvcp50.dll
xolehlp.dll 1999.9.3421.3 17.27 KB (17,680 bytes) 2/12/2002 10:31:39 AM Microsoft Corporation c:\winnt\system32\xolehlp.dll
msdtclog.dll 1999.9.3421.3 89.77 KB (91,920 bytes) 2/12/2002 10:31:38 AM Microsoft Corporation c:\winnt\system32\msdtclog.dll
mtxclu.dll 2000.2.3471.1 51.27 KB (52,496 bytes) 2/13/2002 7:46:17 AM Microsoft Corporation c:\winnt\system32\mtxclu.dll
msdtcprx.dll 2000.2.3471.1 665.77 KB (681,744 bytes) 2/13/2002 7:46:11 AM Microsoft Corporation c:\winnt\system32\msdtcprx.dll
txfaux.dll 2000.2.3471.1 374.27 KB (383,248 bytes) 2/13/2002 7:46:29 AM Microsoft Corporation c:\winnt\system32\txfaux.dll
msdtctm.dll 2000.2.3471.1 1.07 MB (1,120,528 bytes) 2/13/2002 7:46:11 AM Microsoft Corporation c:\winnt\system32\msdtctm.dll
msdtc.exe 1999.9.3421.3 6.77 KB (6,928 bytes) 2/12/2002 10:31:38 AM Microsoft Corporation c:\winnt\system32\msdtc.exe
rasadhlp.dll 5.00.2168.1 7.27 KB (7,440 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\rasadhlp.dll
winrnr.dll 5.00.2160.1 18.77 KB (19,216 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\winrnr.dll
dhcpcsvc.dll 5.00.2195.2778 88.77 KB (90,896 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\dhcpcsvc.dll
tapi32.dll 5.00.2182.1 123.27 KB (126,224 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\tapi32.dll
rasman.dll 5.00.2195.2780 54.77 KB (56,080 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\rasman.dll
rasapi32.dll 5.00.2195.2671 189.77 KB (194,320 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\rasapi32.dll
iphlpapi.dll 5.00.2173.2 67.77 KB (69,392 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\iphlpapi.dll
rnr20.dll 5.00.2195.2871 35.77 KB (36,624 bytes) 2/13/2002 7:46:25 AM Microsoft Corporation c:\winnt\system32\rnr20.dll
wshtcpip.dll 5.00.2195.2104 17.27 KB (17,680 bytes) 2/13/2002 7:46:31 AM Microsoft Corporation c:\winnt\system32\wshtcpip.dll
msafd.dll 5.00.2195.2779 106.77 KB (109,328 bytes) 2/13/2002 7:46:11 AM Microsoft Corporation c:\winnt\system32\msafd.dll
rpcss.dll 5.00.2195.2815 231.27 KB (236,816 bytes) 2/13/2002 7:46:25 AM Microsoft Corporation c:\winnt\system32\rpcss.dll
svchost.exe 5.00.2134.1 7.77 KB (7,952 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\svchost.exe
scecli.dll 5.00.2195.2780 105.27 KB (107,792 bytes) 2/13/2002 7:46:25 AM Microsoft Corporation c:\winnt\system32\scecli.dll
atl.dll 3.00.8449 57.56 KB (58,938 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\atl.dll
certcli.dll 5.00.2195.2778 130.77 KB (133,904 bytes) 2/13/2002 7:45:59 AM Microsoft Corporation c:\winnt\system32\certcli.dll
esent.dll 6.0.3940.13 1.08 MB (1,135,376 bytes) 2/13/2002 7:46:04 AM Microsoft Corporation c:\winnt\system32\esent.dll
mswsock.dll 5.00.2195.2871 62.77 KB (64,272 bytes) 2/13/2002 7:46:17 AM Microsoft Corporation c:\winnt\system32\mswsock.dll
ntdsatq.dll 5.00.2195.2878 31.27 KB (32,016 bytes) 2/13/2002 7:46:19 AM Microsoft Corporation c:\winnt\system32\ntdsatq.dll
ntdsa.dll 5.00.2195.2899 990.77 KB (1,014,544 bytes) 2/13/2002 7:46:19 AM Microsoft Corporation c:\winnt\system32\ntdsa.dll
kdcsvc.dll 5.00.2195.2878 137.77 KB (141,072 bytes) 2/13/2002 7:46:09 AM Microsoft Corporation c:\winnt\system32\kdcsvc.dll
sfmapi.dll 5.00.2134.1 38.77 KB (39,696 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\sfmapi.dll
rtutils.dll 5.00.2168.1 43.77 KB (44,816 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\rtutils.dll
adsldpc.dll 5.00.2195.2842 127.27 KB (130,320 bytes) 2/13/2002 7:45:56 AM Microsoft Corporation c:\winnt\system32\adsldpc.dll
activeds.dll 5.00.2195.2778 174.77 KB (178,960 bytes) 2/13/2002 7:45:51 AM Microsoft Corporation c:\winnt\system32\activeds.dll
mprapi.dll 5.00.2181.1 79.27 KB (81,168 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\mprapi.dll
rassfm.dll 5.00.2195.2671 21.27 KB (21,776 bytes) 2/13/2002 7:46:24 AM Microsoft Corporation c:\winnt\system32\rassfm.dll
mpr.dll 5.00.2195.2779 53.27 KB (54,544 bytes) 2/13/2002 7:46:10 AM Microsoft Corporation c:\winnt\system32\mpr.dll
rsabase.dll 5.00.2195.2228 128.27 KB (131,344 bytes) 5/4/2001 1:05:02 PM Microsoft Corporation c:\winnt\system32\rsabase.dll
schannel.dll 5.00.2195.2922 138.27 KB (141,584 bytes) 5/4/2001 1:05:02 PM Microsoft Corporation c:\winnt\system32\schannel.dll
netlogon.dll 5.00.2195.2865 357.77 KB (366,352 bytes) 2/13/2002 7:46:18 AM Microsoft Corporation c:\winnt\system32\netlogon.dll
kerberos.dll 5.00.2195.2913 198.77 KB (203,536 bytes) 2/13/2002 7:46:09 AM Microsoft Corporation c:\winnt\system32\kerberos.dll
msprivs.dll5.00.2154.1 41.50 KB (42,496 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msprivs.dll
samsrv.dll 5.00.2195.2918 369.77 KB (378,640 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\samsrv.dll
lsasrv.dll 5.00.2195.2964 492.77 KB (504,592 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\lsasrv.dll
lsass.exe 5.00.2195.2964 32.77 KB (33,552 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\lsass.exe

wmicore.dll 5.00.2195.2842 72.27 KB (74,000 bytes) 2/13/2002 7:46:31 AM Microsoft Corporation c:\winnt\system32\wmicore.dll
psbase.dll 5.00.2195.2779 111.77 KB (114,448 bytes) 2/13/2002 7:46:23 AM Microsoft Corporation c:\winnt\system32\psbase.dll
cryptsvc.dll 5.00.2181.1 61.77 KB (63,248 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\cryptsvc.dll
cryptdll.dll 5.00.2135.1 41.27 KB (42,256 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\cryptdll.dll
wkssvc.dll 5.00.2195.2780 95.27 KB (97,552 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\wkssvc.dll
srvsvc.dll 5.00.2195.2904 79.27 KB (81,168 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\srvsvc.dll
cfgmgr32.dll 5.00.2134.1 16.77 KB (17,168 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\cfgmgr32.dll
dmserver.dll 2195.2778.297.3 11.77 KB (12,048 bytes) 2/13/2002 7:46:02 AM VERITAS Software Corp. c:\winnt\system32\dmserver.dll
winsta.dll 5.00.2195.2386 36.77 KB (37,648 bytes) 2/13/2002 7:46:31 AM Microsoft Corporation c:\winnt\system32\winsta.dll
icmp.dll 5.00.2134.1 7.27 KB (7,440 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\icmp.dll
lmhsvc.dll 5.00.2195.2778 9.77 KB (10,000 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\lmhsvc.dll
eventlog.dll 5.00.2178.1 43.77 KB (44,816 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\eventlog.dll
ntdsapi.dll 5.00.2195.2661 55.77 KB (57,104 bytes) 2/13/2002 7:46:19 AM Microsoft Corporation c:\winnt\system32\ntdsapi.dll
scesrv.dll 5.00.2195.2780 226.27 KB (231,696 bytes) 2/13/2002 7:46:25 AM Microsoft Corporation c:\winnt\system32\scesrv.dll
umpnpmgr.dll 5.00.2182.1 86.27 KB (88,336 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\umpnpmgr.dll
services.exe 5.00.2195.2780 86.77 KB (88,848 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\services.exe
msv1_0.dll 5.00.2195.2900 111.77 KB (114,448 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msv1_0.dll
clbcatq.dll 2000.2.3471.1 496.77 KB (508,688 bytes) 2/13/2002 7:45:59 AM Microsoft Corporation c:\winnt\system32\clbcatq.dll
oleaut32.dll 2.40.4517 612.27 KB (626,960 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\oleaut32.dll
cscui.dll 5.00.2195.2959 228.27 KB (233,744 bytes) 2/13/2002 7:46:00 AM Microsoft Corporation c:\winnt\system32\cscui.dll
winspool.drv 5.00.2195.2780 109.77 KB (112,400 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\winspool.drv
winscard.dll 5.00.2134.1 77.27 KB (79,120 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\winscard.dll
wlnotify.dll 5.00.2195.2780 53.77 KB (55,056 bytes) 2/13/2002 7:46:31 AM Microsoft Corporation c:\winnt\system32\wlnotify.dll
cscdll.dll 5.00.2195.2401 98.27 KB (100,624 bytes) 2/13/2002 7:46:00 AM Microsoft Corporation c:\winnt\system32\cscdll.dll
lz32.dll 5.00.2134.1 9.77 KB (10,000 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\lz32.dll
version.dll 5.00.2134.1 15.77 KB (16,144 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\version.dll
rsaenh.dll 5.00.2195.2228 130.77 KB (133,904 bytes) 2/13/2002 7:47:25 AM Microsoft Corporation c:\winnt\system32\rsaenh.dll
mscat32.dll 5.131.2134.1 7.77 KB (7,952 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\mscat32.dll
ole32.dll 5.00.2195.2887 969.77 KB (993,040 bytes) 2/13/2002 7:46:22 AM Microsoft Corporation c:\winnt\system32\ole32.dll
imagehlp.dll 5.00.2195.2778 125.77 KB (128,784 bytes) 5/4/2001 1:05:02 PM Microsoft Corporation c:\winnt\system32\imagehlp.dll
msasn1.dll 5.00.2134.1 51.27 KB (52,496 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msasn1.dll
crypt32.dll 5.131.2195.2833 451.27 KB (462,096 bytes) 2/13/2002 7:46:00 AM Microsoft Corporation c:\winnt\system32\crypt32.dll
wintrust.dll 5.131.2195.2779 162.27 KB (166,160 bytes) 2/13/2002 7:46:31 AM Microsoft Corporation c:\winnt\system32\wintrust.dll
setupapi.dll 5.00.2195.2663 555.77 KB (569,104 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\setupapi.dll
winmm.dll 5.00.2161.1 184.77 KB (189,200 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\winmm.dll
comctl32.dll 5.81 537.77 KB (550,672 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\comctl32.dll
shlwapi.dll 5.00.3315.1000 282.77 KB (289,552 bytes) 2/13/2002 7:46:27 AM Microsoft Corporation c:\winnt\system32\shlwapi.dll
shell32.dll 5.00.3315.2902 2.25 MB (2,359,056 bytes) 2/13/2002 7:46:27 AM Microsoft Corporation c:\winnt\system32\shell32.dll
msgina.dll 5.00.2195.2779 324.27 KB (332,048 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msgina.dll
wsock32.dll 5.00.2195.2871 21.27 KB (21,776 bytes) 2/13/2002 7:46:32 AM Microsoft Corporation c:\winnt\system32\wsock32.dll
dnsapi.dll 5.00.2195.2785 130.77 KB (133,904 bytes) 2/13/2002 7:46:02 AM Microsoft Corporation c:\winnt\system32\dnsapi.dll
wldap32.dll 5.00.2195.2797 125.27 KB (128,272 bytes) 2/13/2002 7:46:31 AM Microsoft Corporation c:\winnt\system32\wldap32.dll
ws2help.dll 5.00.2134.1 17.77 KB (18,192 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\ws2help.dll
ws2_32.dll 5.00.2195.2780 67.77 KB (69,392 bytes) 2/13/2002 7:46:31 AM Microsoft Corporation c:\winnt\system32\ws2_32.dll
samlib.dll 5.00.2195.2780 49.77 KB (50,960 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\samlib.dll

netrap.dll 5.00.2134.1 11.27 KB (11,536 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\netrap.dll
netapi32.dll 5.00.2195.2808 303.77 KB (311,056 bytes) 2/13/2002 7:46:18 AM Microsoft Corporation c:\winnt\system32\netapi32.dll
profmap.dll 5.00.2181.1 29.27 KB (29,968 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\profmap.dll
secur32.dll 5.00.2195.2862 46.77 KB (47,888 bytes) 2/13/2002 7:46:26 AM Microsoft Corporation c:\winnt\system32\secur32.dll
sfc.dll 5.00.2195.2896 92.11 KB (94,320 bytes) 2/13/2002 7:46:26 AM Microsoft Corporation c:\winnt\system32\sfc.dll
nddeapi.dll 5.00.2137.1 15.27 KB (15,632 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\nddeapi.dll
userenv.dll 5.00.2195.2780 361.77 KB (370,448 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\userenv.dll
user32.dll 5.00.2195.2821 392.77 KB (402,192 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\user32.dll
gdi32.dll 5.00.2195.2778 228.77 KB (234,256 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\gdi32.dll
rpcrt4.dll 5.00.2195.2832 437.27 KB (447,760 bytes) 2/13/2002 7:46:25 AM Microsoft Corporation c:\winnt\system32\rpcrt4.dll
advapi32.dll 5.00.2195.2867 351.77 KB (360,208 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\advapi32.dll
kernel32.dll 5.00.2195.2778 714.77 KB (731,920 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\kernel32.dll
msvcrt.dll 6.10.8924.0 284.05 KB (290,869 bytes) 5/4/2001 1:05:02 PM Microsoft Corporation c:\winnt\system32\msvcrt.dll
winlogon.exe 5.00.2195.2953 173.77 KB (177,936 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\winlogon.exe
sfcfiles.dll 5.00.2195.2967 948.27 KB (971,024 bytes) 2/13/2002 7:46:26 AM Microsoft Corporation c:\winnt\system32\sfcfiles.dll
ntdll.dll 5.00.2195.2779 478.77 KB (490,256 bytes) 5/4/2001 1:05:02 PM Microsoft Corporation c:\winnt\system32\ntdll.dll
smss.exe 5.00.2195.2901 44.27 KB (45,328 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\smss.exe

[Services]

Display Name Name State Start Mode Service Type Path Error Control Start Name Tag ID
Alerter Alerter Stopped Manual Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
Application Management AppMgmt Stopped Manual Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
Computer Browser Browser Stopped Manual Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
Indexing Service cisvc Stopped Manual Share Process c:\winnt\system32\cisvc.exe Normal LocalSystem 0
ClipBook ClipSrv Stopped Manual Own Process c:\winnt\system32\clipsrv.exe Normal LocalSystem 0
Distributed File System Dfs Stopped Manual Own Process c:\winnt\system32\dfssvc.exe Normal LocalSystem 0
DHCP Client Dhcp Stopped Manual Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
Logical Disk Manager Administrative Service dmadmin Stopped Manual Share Process c:\winnt\system32\dmadmin.exe /com Normal LocalSystem 0
Logical Disk Manager dmserver Running Auto Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
DNS Client Dnscache Stopped Manual Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
Event Log Eventlog Running Auto Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
COM+ Event System EventSystem Running Manual Share Process c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Fax Service Fax Stopped Manual Own Process c:\winnt\system32\faxsvc.exe Normal LocalSystem 0
Mylex Global Array Manager Server gamscm Stopped Manual Own Process system32\gamserv\gamscm.exe Normal LocalSystem 0
Internet Authentication Service IAS Stopped Manual Share Process c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem 0
IBM eServer ActivePCI Alert Service IBMHPS Running Auto Own Process c:\winnt\system32\ibmhpasv.exe Normal LocalSystem 0
IBM Advanced System Management Remote Mouse ibmspsvc Running Auto Own Process c:\winnt\system32\ibmspsvc.exe Normal LocalSystem 0
IIS Admin Service IISADMIN Stopped Manual Share Process c:\winnt\system32\inetsrv\inetinfo.exe Normal LocalSystem 0
Intersite Messaging IsmServ Stopped Disabled Own Process c:\winnt\system32\ismserv.exe Normal LocalSystem 0
Kerberos Key Distribution Center kdc Stopped Disabled Share Process c:\winnt\system32\lsass.exe Normal LocalSystem 0
Server lanmanserver Running Auto Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
Workstation lanmanworkstation Running Auto Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
License Logging Service LicenseService Stopped Manual Own Process c:\winnt\system32\llssrv.exe Normal LocalSystem 0
TCP/IP NetBIOS Helper Service LmHosts Running Auto Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
Messenger Messenger Stopped Manual Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
NetMeeting Remote Desktop Sharing mnmsrvc Stopped Manual Own Process c:\winnt\system32\mnmsrvc.exe Normal LocalSystem 0
Distributed Transaction Coordinator MSDTC Running Auto Own Process c:\winnt\system32\msdtc.exe Normal LocalSystem 0
Windows Installer MSIServer Stopped Manual Share Process c:\winnt\system32\msiexec.exe /v Normal LocalSystem 0
MSSQLSERVER MSSQLSERVER Stopped Manual Own Process c:\progra~1\micros~3\mssql\binn\sqlservr.exe Normal LocalSystem 0
MSSQLServerADHelper MSSQLServerADHelper Stopped Manual Own Process c:\program files\microsoft sql server\80\tools\binn\sqladhlp.exe Normal LocalSystem 0
Network DDE NetDDE Stopped Manual Share Process c:\winnt\system32\netdde.exe Normal LocalSystem 0
Network DDE DSDM NetDDEdsdm Stopped Manual Share Process c:\winnt\system32\netdde.exe Normal LocalSystem 0
Net Logon Netlogon Stopped Manual Share Process c:\winnt\system32\lsass.exe Normal LocalSystem 0

Network Connections Netman Running Manual Share Process
c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem 0
File Replication NtFrs Stopped Manual Own Process
c:\winnt\system32\ntfrs.exe Ignore LocalSystem 0
NT LM Security Support Provider NtLmSsp Stopped Manual
Share Process c:\winnt\system32\lsass.exe Normal
LocalSystem 0
Removable Storage NtmsSvc Stopped Manual Share Process
c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Plug and Play PlugPlay Running Auto Share Process
c:\winnt\system32\services.exe Normal LocalSystem 0
IPSEC Policy Agent PolicyAgent Stopped Manual Share
Process c:\winnt\system32\lsass.exe Normal LocalSystem 0
Protected Storage ProtectedStorage Running Auto Share
Process c:\winnt\system32\services.exe Normal LocalSystem 0
Remote Access Auto Connection Manager RasAuto Stopped Manual
Share Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Remote Access Connection Manager RasMan Stopped Manual
Share Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Routing and Remote Access RemoteAccess Stopped Disabled
Share Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Remote Registry Service RemoteRegistry Stopped Manual
Own Process c:\winnt\system32\regsvc.exe Normal
LocalSystem 0
Remote Procedure Call (RPC) Locator RpcLocator Stopped
Manual Own Process c:\winnt\system32\locator.exe Normal
LocalSystem 0
Remote Procedure Call (RPC) RpcSs Running Auto Share
Process c:\winnt\system32\svchost -k rpcss Normal
LocalSystem 0
QoS Admission Control (RSVP) RSVP Running Auto Own
Process c:\winnt\system32\rsvp.exe -s Normal LocalSystem 0
Security Accounts Manager SamSs Running Auto Share
Process c:\winnt\system32\lsass.exe Normal LocalSystem 0
Smart Card Helper SCardDrv Stopped Manual Share Process
c:\winnt\system32\scardsvr.exe Ignore LocalSystem 0
Smart Card SCardSvr Stopped Manual Share Process
c:\winnt\system32\scardsvr.exe Ignore LocalSystem 0
Task Scheduler Schedule Stopped Manual Share Process
c:\winnt\system32\mstask.exe Normal LocalSystem 0
RunAs Service seclogon Stopped Manual Share Process
c:\winnt\system32\services.exe Ignore LocalSystem 0
System Event Notification SENS Stopped Manual Share
Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Internet Connection Sharing SharedAccess Stopped Manual
Share Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Simple TCP/IP Services SimpTcp Running Auto Share
Process c:\winnt\system32\tcpsvcs.exe Normal LocalSystem 0
Print Spooler Spooler Stopped Manual Own Process
c:\winnt\system32\spoolsv.exe Normal LocalSystem 0
SQLSERVERAGENT SQLSERVERAGENT Stopped
Manual Own Process c:\progra~1\micros~3\mssql\binn\sqlagent.exe
Normal LocalSystem 0
Performance Logs and Alerts SysmonLog Stopped Auto
Own Process c:\winnt\system32\smlogsvc.exe Normal
LocalSystem 0
Telephony TapiSrv Running Manual Share Process
c:\winnt\system32\svchost.exe -k tapisrv Normal LocalSystem 0
Terminal Services TermService Stopped Disabled Own
Process c:\winnt\system32\termsrv.exe Normal LocalSystem 0
Telnet TlntSvr Stopped Manual Own Process
c:\winnt\system32\tlntsvr.exe Normal LocalSystem 0
Distributed Link Tracking Server TrkSvr Stopped Manual Share
Process c:\winnt\system32\services.exe Normal LocalSystem 0
Distributed Link Tracking Client TrkWks Stopped Manual Share
Process c:\winnt\system32\services.exe Normal LocalSystem 0
Uninterruptible Power Supply UPS Stopped Manual Own
Process c:\winnt\system32\ups.exe Normal LocalSystem 0
Utility Manager UtilMan Stopped Manual Own Process
c:\winnt\system32\utilman.exe Normal LocalSystem 0
Windows Time W32Time Stopped Manual Share Process
c:\winnt\system32\services.exe Normal LocalSystem 0
World Wide Web Publishing Service W3SVC Stopped Manual
Share Process c:\winnt\system32\inetsrv\inetinfo.exe Normal
LocalSystem 0
Windows Management Instrumentation WinMgmt Running Auto
Own Process c:\winnt\system32\wbem\winmgmt.exe Ignore
LocalSystem 0
Windows Management Instrumentation Driver Extensions Wmi
Running Manual Share Process c:\winnt\system32\services.exe
Normal LocalSystem 0

[Program Groups]

Group Name Name User Name
Accessories Default User:Accessories Default User
Accessories\Accessibility Default User:Accessories\Accessibility
Default User
Accessories\Entertainment Default User:Accessories\Entertainment
Default User
Accessories\System Tools Default User:Accessories\System Tools
Default User
Startup Default User:Startup Default User
Accessories All Users:Accessories All Users
Accessories\Accessibility All Users:Accessories\Accessibility
All Users
Accessories\Communications All Users:Accessories\Communications
All Users
Accessories\Entertainment All Users:Accessories\Entertainment
All Users
Accessories\Games All Users:Accessories\Games All Users
Accessories\Microsoft Script Debugger All Users:Accessories\Microsoft
Script Debugger All Users
Accessories\System Tools All Users:Accessories\System Tools
All Users
Administrative Tools All Users:Administrative Tools All Users
Microsoft SQL Server All Users:Microsoft SQL Server All Users
Startup All Users:Startup All Users
Accessories TPCC-2WAY\Administrator:Accessories
TPCC-2WAY\Administrator
Accessories\Accessibility
TPCC-2WAY\Administrator:Accessories\Accessibility
TPCC-2WAY\Administrator
Accessories\Entertainment
TPCC-2WAY\Administrator:Accessories\Entertainment
TPCC-2WAY\Administrator
Accessories\System Tools
TPCC-2WAY\Administrator:Accessories\System Tools
TPCC-2WAY\Administrator
Administrative Tools TPCC-2WAY\Administrator:Administrative Tools
TPCC-2WAY\Administrator
Startup TPCC-2WAY\Administrator:Startup
TPCC-2WAY\Administrator

[Startup Programs]

Program Command User NameLocation
Service Manager c:\progra~1\micros~3\80\tools\binn\sqlmangr.exe /n
All Users Common Startup

[OLE Registration]

Object Local Server
Sound (OLE2) sndrec32.exe
Media Clip mplay32.exe
Video Clip mplay32.exe /avi
MIDI Sequence mplay32.exe /mid
Sound Not Available
Media Clip Not Available
Image Document "C:\Program Files\Windows NT\Accessories\ImageVue\KodakImg.exe"
WordPad Document "%ProgramFiles%\Windows NT\Accessories\WORDPAD.EXE"
Windows Media Services DRM Storage object Not Available
Bitmap Image mspaint.exe

[Internet Explorer 5]

[Following are sub-categories of this main category]

[Summary]

Item Value
Version 5.00.3315.1000
Build 53315.1000
Product ID 51876-270-5272642-05525
Application Path C:\Program Files\Internet Explorer
Language English (United States)
Active Printer Not Available

Cipher Strength 168-bit
Content Advisor Disabled
IEAK Install No

[File Versions]

File Version Size Date Path Company
advapi32.dll 5.0.2195.2867 352 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
advpack.dll 5.0.3103.1000 87 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
browselc.dll 5.0.3315.2846 35 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
browseui.dll 5.0.3315.2846 789 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
ckcnv.exe 5.0.2189.1 9 KB 12/7/1999 7:00:00 AM C:\WINNT\system32 Microsoft Corporation
comctl32.dll 5.81.3103.1000 538 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
crypt32.dll 5.131.2195.2833 451 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
enhsig.dll <File Missing> Not Available Not Available Not Available Not Available
iemigrat.dll <File Missing> Not Available Not Available Not Available Not Available
iesetup.dll 5.0.3103.1000 57 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
iexplore.exe 5.0.2920.0 59 KB 12/7/1999 7:00:00 AM C:\Program Files\Internet Explorer Microsoft Corporation
imagehlp.dll 5.0.2195.2778 126 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
imghelp.dll <File Missing> Not Available Not Available Not Available Not Available
inseng.dll 5.0.3103.1000 72 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
jobexec.dll 5.0.0.1 47 KB 12/7/1999 7:00:00 AM C:\WINNT\system32 Microsoft Corporation
jscript.dll 5.1.0.5907 476 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
jsproxy.dll 5.0.2920.0 13 KB 12/7/1999 7:00:00 AM C:\WINNT\system32 Microsoft Corporation
msaahtml.dll <File Missing> Not Available Not Available Not Available Not Available
mshtml.dll 5.0.3315.2870 2290 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
msjava.dll 5.0.3802.0 923 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
msoss.dll <File Missing> Not Available Not Available Not Available Not Available
msxml.dll 8.0.5718.1 493 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
occache.dll 5.0.3103.1000 86 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
ole32.dll 5.0.2195.2887 970 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
oleaut32.dll 2.40.4517.0 612 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
olepro32.dll 5.0.4517.0 160 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
rsabase.dll 5.0.2195.2228 128 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
rsaenh.dll 5.0.2195.2228 131 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
rsapi32.dll <File Missing> Not Available Not Available Not Available Not Available
rsasig.dll <File Missing> Not Available Not Available Not Available Not Available
schannel.dll 5.1.2195.0 138 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
shdoc401.dll <File Missing> Not Available Not Available Not Available Not Available
shdocvw.dll 5.0.3315.2879 1078 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
shell32.dll 5.0.3315.2902 2304 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
shlwapi.dll 5.0.3315.1000 283 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
url.dll 5.0.2920.0 82 KB 12/7/1999 7:00:00 AM C:\WINNT\system32 Microsoft Corporation
urlmon.dll 5.0.3315.1000 441 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
vbscript.dll 5.1.0.5907 428 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
webcheck.dll 5.0.3315.1000 252 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
win.com 5.0.2134.1 24 KB 12/7/1999 7:00:00 AM C:\WINNT\system32 Microsoft Corporation
wininet.dll 5.0.3315.1000 457 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
winsock.dll 3.10.0.103 3 KB 12/7/1999 7:00:00 AM C:\WINNT\system32 Microsoft Corporation
wintrust.dll 5.131.2195.2779 162 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
wsock.vxd <File Missing> Not Available Not Available Not Available Not Available
wsock32.dll 5.0.2195.2871 21 KB 5/4/2001 12:05:02 PM C:\WINNT\system32 Microsoft Corporation
wsock32n.dll <File Missing> Not Available Not Available Not Available Not Available

[Connectivity]

Item Value
Connection Preference Never dial
EnableHttp1.1 1

ProxyHttp1.1 0

LAN Settings

AutoConfigProxy wininet.dll
AutoProxyDetectMode Enabled
AutoConfigURL
Proxy Disabled
ProxyServer
ProxyOverride

[Cache]

[Following are sub-categories of this main category]

[Summary]

Item Value
Page Refresh Type Automatic
Temporary Internet Files Folder C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files
Total Disk Space 17343 MB
Available Disk Space 14080 MB
Maximum Cache Size 541 MB
Available Cache Size 542 MB

[List of Objects]

Program File Status CodeBase
No cached object information available

[Content]

[Following are sub-categories of this main category]

[Summary]

Item Value
Content Advisor Disabled

[Personal Certificates]

Issued To Issued By Validity Signature Algorithm
Administrator Administrator 2/12/2002 to 1/19/2102 sha1RSA

[Other People Certificates]

Issued To Issued By Validity Signature Algorithm
No other people certificate information available

[Publishers]

Name
No publisher information available

[Security]

Zone Security Level
Local intranet Medium-low
Trusted sites Low
Internet Medium
Restricted sites High

Disk Controller Configuration Parameters

Mylex eXtremeRAID 2000 Controller 1

GCFVERSION=2.00;

Begin

BeginGroup

PhysicalDevice0 = Channel=0, Target=0, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice1 = Channel=0, Target=1, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice2 = Channel=0, Target=2, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice3 = Channel=0, Target=3, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice4 = Channel=0, Target=4, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice5 = Channel=0, Target=5, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice6 = Channel=0, Target=6, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice7 = Channel=0, Target=8, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice8 = Channel=0, Target=9, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice9 = Channel=0, Target=10, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice10 = Channel=0, Target=11, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice11 = Channel=0, Target=12, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice12 = Channel=0, Target=13, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice13 = Channel=0, Target=14, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice14 = Channel=1, Target=0, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice15 = Channel=1, Target=1, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice16 = Channel=1, Target=2, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice17 = Channel=1, Target=3, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice18 = Channel=1, Target=4, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice19 = Channel=1, Target=5, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice20 = Channel=1, Target=6, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice21 = Channel=1, Target=8, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice22 = Channel=1, Target=9, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice23 = Channel=1, Target=10, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice24 = Channel=1, Target=11, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice25 = Channel=1, Target=12, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice26 = Channel=1, Target=13, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice27 = Channel=1, Target=14, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice28 = Channel=2, Target=0, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice29 = Channel=2, Target=1, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice30 = Channel=2, Target=2, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice31 = Channel=2, Target=3, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice32 = Channel=2, Target=4, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

PhysicalDevice33 = Channel=2, Target=5, Size=17336MB,
State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

PhysicalDevice34 = Channel=2, Target=6, Size=17336MB,
State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

PhysicalDevice35 = Channel=2, Target=8, Size=17336MB,
State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

PhysicalDevice36 = Channel=2, Target=9, Size=17336MB,
State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

PhysicalDevice37 = Channel=2, Target=10, Size=17336MB,
State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

PhysicalDevice38 = Channel=2, Target=11, Size=17336MB,
State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

PhysicalDevice39 = Channel=2, Target=12, Size=17336MB,
State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

PhysicalDevice40 = Channel=2, Target=13, Size=17336MB,
State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

PhysicalDevice41 = Channel=2, Target=14, Size=17336MB,
State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

IntermediateDevice0 = StripeSize=64KB, Raid=0, WriteThrough=1,
Size=242704MB,

(PhysicalDevice0, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice1, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice2, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice3, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice4, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice5, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice6, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice7, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice8, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice9, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice10, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice11, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice12, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice13, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks);

IntermediateDevice1 = StripeSize=64KB, Raid=0, WriteThrough=1,
Size=242704MB,

(PhysicalDevice14, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice15, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice16, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice17, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice18, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice19, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice20, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice21, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice22, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

(PhysicalDevice23, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

```
                (PhysicalDevice24, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice25, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice26, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice27, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks);

        IntermediateDevice2 = StripeSize=64KB, Raid=0, WriteThrough=1,
Size=242704MB,

                (PhysicalDevice28, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice29, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice30, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice31, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice32, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice33, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice34, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice35, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice36, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice37, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice38, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice39, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice40, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice41, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks);

        LogicalDevice0 = StripeSize=64KB, Raid=12, WriteThrough=1,
Size=728112MB, BIOSGeometry=8GB,

                (IntermediateDevice0, StartAddress=0MB,
Size=242704MB),

                (IntermediateDevice1, StartAddress=0MB,
Size=242704MB),

                (IntermediateDevice2, StartAddress=0MB,
Size=242704MB);

EndGroup

BeginControllerParameter

        ControllerName = eXtremeRAID 2000;

        ControllerType = 28;

        FirmwareVersion = 7.00;

        CacheLineSize = 8KB;

        AutomaticRebuildRate = 50;

        BackgroundInitializeRate = 50;

        ConsistencyCheckRate = 50;

        MORERate = 50;

        InitiatorID = 7;

        DevicesPerSpin = 2;

        SequentialDelay = 6S;

        EnableDriveSizing = 0;

        EnableClustering = 0;

        EnableBGInit = 1;

        EnableBiosLoadDelay = 0;

        EnableForcedUnitAccess = 0;

        DisableBios = 0;

        EnableCDROMBoot = 0;

        EnableStorageWorks = 0;

        EnableSAFTE = 0;

        EnableSES = 0;

        EnableARM = 1;

        EnableOFM = 1;

        OEMCode = 0;

        StartupOption = 0;

        EnableTempOffline = 0;

        EnablePatrolRead = 0;

        EnableSmartMode = 0;

        DlyBtwnIterations = 0;

        SmartScanInterval = 0;

EndControllerParameter

End
```

Mylex eXtremeRAID 2000 Controller 2

GCFVERSION=2.00;

Begin

BeginGroup

PhysicalDevice0 = Channel=0, Target=0, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice1 = Channel=0, Target=1, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice2 = Channel=0, Target=2, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice3 = Channel=0, Target=3, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice4 = Channel=0, Target=4, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice5 = Channel=0, Target=5, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice6 = Channel=0, Target=6, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice7 = Channel=0, Target=8, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice8 = Channel=0, Target=9, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice9 = Channel=0, Target=10, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice10 = Channel=0, Target=11, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice11 = Channel=0, Target=12, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice12 = Channel=0, Target=13, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice13 = Channel=0, Target=14, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice14 = Channel=1, Target=0, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice15 = Channel=1, Target=1, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice16 = Channel=1, Target=2, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice17 = Channel=1, Target=3, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice18 = Channel=1, Target=4, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice19 = Channel=1, Target=5, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice20 = Channel=1, Target=6, Size=17336MB, State=Online,
TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice21 = Channel=1, Target=8, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice22 = Channel=1, Target=9, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice23 = Channel=1, Target=10, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice24 = Channel=1, Target=11, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice25 = Channel=1, Target=12, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice26 = Channel=1, Target=13, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice27 = Channel=1, Target=14, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice28 = Channel=2, Target=0, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice29 = Channel=2, Target=1, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice30 = Channel=2, Target=2, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice31 = Channel=2, Target=3, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice32 = Channel=2, Target=4, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice33 = Channel=2, Target=5, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice34 = Channel=2, Target=6, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice35 = Channel=2, Target=8, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice36 = Channel=2, Target=9, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice37 = Channel=2, Target=10, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice38 = Channel=2, Target=11, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice39 = Channel=2, Target=12, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice40 = Channel=2, Target=13, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice41 = Channel=2, Target=14, Size=17336MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

IntermediateDevice0 = StripeSize=64KB, Raid=0, WriteThrough=1, Size=242704MB,

(PhysicalDevice0, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice1, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice2, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice3, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice4, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice5, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice6, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice7, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice8, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice9, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice10, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice11, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice12, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice13, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks);

IntermediateDevice1 = StripeSize=64KB, Raid=0, WriteThrough=1, Size=242704MB,

(PhysicalDevice14, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice15, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice16, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice17, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice18, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice19, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice20, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice21, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice22, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice23, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice24, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice25, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice26, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice27, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks);

IntermediateDevice2 = StripeSize=64KB, Raid=0, WriteThrough=1, Size=242704MB,

(PhysicalDevice28, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice29, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice30, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice31, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice32, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice33, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice34, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice35, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice36, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice37, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice38, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice39, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice40, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice41, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks);

LogicalDevice0 = StripeSize=64KB, Raid=12, WriteThrough=1, Size=728112MB, BIOSGeometry=8GB,

(IntermediateDevice0, StartAddress=0MB, Size=242704MB),

(IntermediateDevice1, StartAddress=0MB, Size=242704MB),

(IntermediateDevice2, StartAddress=0MB, Size=242704MB);

EndGroup

BeginControllerParameter

ControllerName = eXtremeRAID 2000;

ControllerType = 28;

FirmwareVersion = 7.00;

CacheLineSize = 8KB;

AutomaticRebuildRate = 50;

BackgroundInitializeRate = 50;

ConsistencyCheckRate = 50;

MORERate = 50;

InitiatorID = 7;

DevicesPerSpin = 2;

SequentialDelay = 6S;

EnableDriveSizing = 0;

EnableClustering = 0;

EnableBGInit = 1;

EnableBiosLoadDelay = 0;

EnableForcedUnitAccess = 0;

DisableBios = 0;

EnableCDROMBoot = 0;

EnableStorageWorks = 0;

EnableSAFTE = 0;

EnableSES = 0;

EnableARM = 1;

EnableOFM = 1;

OEMCode = 0;

StartupOption = 0;

EnableTempOffline = 0;

EnablePatrolRead = 0;

EnableSmartMode = 0;

DlyBtwnIterations = 0;

SmartScanInterval = 0;

EndControllerParameter

End

Mylex eXtremeRAID 2000 Controller 3

GCFVERSION=2.00;

Begin

BeginGroup

PhysicalDevice0 = Channel=0, Target=0, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice1 = Channel=0, Target=1, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice2 = Channel=0, Target=2, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice3 = Channel=0, Target=3, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice4 = Channel=0, Target=4, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice5 = Channel=0, Target=5, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice6 = Channel=1, Target=8, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice7 = Channel=1, Target=9, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice8 = Channel=1, Target=10, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice9 = Channel=1, Target=11, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice10 = Channel=1, Target=12, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice11 = Channel=2, Target=0, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice12 = Channel=2, Target=1, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice13 = Channel=2, Target=2, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice14 = Channel=2, Target=3, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice15 = Channel=2, Target=4, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice16 = Channel=2, Target=5, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice17 = Channel=3, Target=8, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice18 = Channel=3, Target=9, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice19 = Channel=3, Target=10, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice20 = Channel=3, Target=11, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

PhysicalDevice21 = Channel=3, Target=12, Size=17340MB, State=Online,

TransferSpeed=80MHz, TransferWidth=16Bit, MaxTag=16;

IntermediateDevice0 = StripeSize=64KB, Raid=0, WriteThrough=1, Size=190696MB,

(PhysicalDevice0, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice1, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice2, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice3, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice4, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice5, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice6, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice7, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice8, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice9, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice10, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks);

IntermediateDevice1 = StripeSize=64KB, Raid=0, WriteThrough=1, Size=190696MB,

(PhysicalDevice11, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice12, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice13, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice14, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice15, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

(PhysicalDevice16, StartAddress=0MB/0Blocks, Size=17336MB/35504128Blocks),

```
                (PhysicalDevice17, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice18, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice19, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice20, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice21, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks);

        LogicalDevice0 = StripeSize=64KB, Raid=12, WriteThrough=1,
Size=381392MB, BIOSGeometry=8GB,

                (IntermediateDevice0, StartAddress=0MB,
Size=190696MB),

                (IntermediateDevice1, StartAddress=0MB,
Size=190696MB);

        PhysicalDevice22 = Channel=0, Target=6, Size=34698MB,
State=Online,

                TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

        PhysicalDevice23 = Channel=2, Target=6, Size=34698MB,
State=Online,

                TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

        PhysicalDevice24 = Channel=1, Target=13, Size=17340MB,
State=Online,

                TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

        PhysicalDevice25 = Channel=3, Target=13, Size=17340MB,
State=Online,

                TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

        PhysicalDevice26 = Channel=1, Target=14, Size=17340MB,
State=Online,

                TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

        PhysicalDevice27 = Channel=3, Target=14, Size=17340MB,
State=Online,

                TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;

        IntermediateDevice2 = StripeSize=64KB, Raid=1, WriteThrough=1,
Size=34696MB,

                (PhysicalDevice22, StartAddress=0MB/0Blocks,
Size=34696MB/71057408Blocks),

                (PhysicalDevice23, StartAddress=0MB/0Blocks,
Size=34696MB/71057408Blocks);

        IntermediateDevice3 = StripeSize=64KB, Raid=1, WriteThrough=1,
Size=17336MB,

                (PhysicalDevice24, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice25, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks);

        IntermediateDevice4 = StripeSize=64KB, Raid=1, WriteThrough=1,
Size=17336MB,

                (PhysicalDevice26, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks),

                (PhysicalDevice27, StartAddress=0MB/0Blocks,
Size=17336MB/35504128Blocks);

        LogicalDevice1 = StripeSize=64KB, Raid=12, WriteThrough=1,
Size=69368MB, BIOSGeometry=8GB,

                (IntermediateDevice2, StartAddress=0MB,
Size=34696MB),

                (IntermediateDevice3, StartAddress=0MB,
Size=17336MB),

                (IntermediateDevice4, StartAddress=0MB,
Size=17336MB);

 EndGroup

 EndGroup

 BeginControllerParameter

        ControllerName = eXtremeRAID 2000;

        ControllerType = 28;

        FirmwareVersion = 7.00;

        CacheLineSize = 8KB;

        AutomaticRebuildRate = 50;

        BackgroundInitializeRate = 50;

        ConsistencyCheckRate = 50;

        MORERate = 50;

        InitiatorID = 7;

        DevicesPerSpin = 2;

        SequentialDelay = 6S;

        EnableDriveSizing = 0;

        EnableClustering = 0;

        EnableBGInit = 1;

        EnableBiosLoadDelay = 0;

        EnableForcedUnitAccess = 0;
```

```
        DisableBios = 0;

        EnableCDROMBoot = 0;

        EnableStorageWorks = 0;

        EnableSAFTE = 0;

        EnableSES = 0;

        EnableARM = 1;

        EnableOFM = 1;

        OEMCode = 0;

        StartupOption = 0;

        EnableTempOffline = 0;

        EnablePatrolRead = 0;

        EnableSmartMode = 0;

        DlyBtwnIterations = 0;

        SmartScanInterval = 0;

 EndControllerParameter

End
```

Client Configuration Parameters

Microsoft Windows 2000 Server System Information Report

System Information report written at: 02/26/2002 05:33:00 PM
[System Information]

[Following are sub-categories of this main category]

[System Summary]

Item	Value
OS Name	Microsoft Windows 2000 Server
Version	5.0.2195 Service Pack 2 Build 2195
OS Manufacturer	Microsoft Corporation
System Name	CLIENT10
System Manufacturer	IBM
System Model	IBM eserver xSeries 220 -[4444aaa]-
System Type	X86-based PC
Processor	x86 Family 6 Model 11 Stepping 1 GenuineIntel ~1128 Mhz
Processor	x86 Family 6 Model 11 Stepping 1 GenuineIntel ~1128 Mhz
BIOS Version	IBM BIOS Ver 1.0
Windows Directory	C:\WINNT
System Directory	C:\WINNT\System32
Boot Device	\Device\Harddisk0\Partition1
Locale	United States
User Name	CLIENT10\Administrator
Time Zone	Eastern Standard Time
Total Physical Memory	785,880 KB
Available Physical Memory	676,096 KB
Total Virtual Memory	3,100,632 KB
Available Virtual Memory	2,920,660 KB
Page File Space	2,314,752 KB
Page File	C:\pagefile.sys

[Hardware Resources]

[Following are sub-categories of this main category]

[Conflicts/Sharing]

Resource	Device
No conflicted/shared resources	

[DMA]

Channel	Device	Status
2	Standard floppy disk controller	OK
4	Direct memory access controller	OK

[Forced Hardware]

Device	PNP Device ID
No Forced Hardware	

[I/O]

Address Range	Device	Status
0x0000-0x303F	PCI bus	OK
0x0000-0x303F	Direct memory access controller	OK
0x03B0-0x03BB	S3 Graphics Inc. Savage4	OK
0x03C0-0x03DF	S3 Graphics Inc. Savage4	OK
0x3000-0x303F	IBM 10/100 Ethernet Server Adapter	OK
0x2000-0x2FFF	DEC 21152 PCI to PCI bridge	OK
0x2000-0x2FFF	Intel(R) PRO/100+ Dual Port Server Adapter	OK
0x2020-0x203F	Intel(R) PRO/100+ Dual Port Server Adapter #2	OK
0x0A79-0x0A79	ISAPNP Read Data Port	OK
0x0279-0x0279	ISAPNP Read Data Port	OK
0x02F4-0x02F7	ISAPNP Read Data Port	OK
0x002E-0x002F	Motherboard resources	OK
0x0438-0x0439	Motherboard resources	OK
0x0430-0x0437	Motherboard resources	OK
0x0430-0x0437	Not Available	OK
0x0060-0x0060	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard	OK
0x0064-0x0064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard	OK
0x03F0-0x03F5	Standard floppy disk controller	OK
0x03F7-0x03F7	Standard floppy disk controller	OK
0x0378-0x037F	Printer Port (LPT1)	OK
0x03F8-0x03FF	Communications Port (COM1)	OK
0x02F8-0x02FF	Communications Port (COM2)	OK
0x0020-0x0021	Advanced programmable interrupt controller	OK
0x00A0-0x00A1	Advanced programmable interrupt controller	OK
0x0080-0x008F	Direct memory access controller	OK
0x00C0-0x00DF	Direct memory access controller	OK
0x0040-0x0043	System timer	OK
0x0070-0x0073	System CMOS/real time clock	OK
0x0061-0x0061	System speaker	OK
0x00F0-0x00FF	Numeric data processor	OK
0x0600-0x0600	Motherboard resources	OK
0x0374-0x0375	Motherboard resources	OK
0x0377-0x0377	Motherboard resources	OK
0x0F50-0x0F58	Motherboard resources	OK
0x0700-0x070F	Standard Dual Channel PCI IDE Controller	OK
0x01F0-0x01F7	Primary IDE Channel	OK
0x03F6-0x03F6	Primary IDE Channel	OK
0x0170-0x0177	Secondary IDE Channel	OK

0x0376-0x0376 Secondary IDE Channel OK
0x3040-0xFFFF PCI bus OK
0x3100-0x31FF Adaptec AIC-7892 - Ultra160 SCSI OK
0x4000-0x4FFF DEC 21152 PCI to PCI bridge OK
0x4000-0x4FFF Intel(R) PRO/100+ Dual Port Server Adapter #3 OK
0x4020-0x403F Intel(R) PRO/100+ Dual Port Server Adapter #4 OK

[IRQs]

IRQ Number Device
30 Microsoft ACPI-Compliant System
31 S3 Graphics Inc. Savage4
27 IBM 10/100 Ethernet Server Adapter
16 Intel(R) PRO/100+ Dual Port Server Adapter
17 Intel(R) PRO/100+ Dual Port Server Adapter #2
1 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
12 PS/2 Compatible Mouse
6 Standard floppy disk controller
4 Communications Port (COM1)
3 Communications Port (COM2)
8 System CMOS/real time clock
13 Numeric data processor
14 Primary IDE Channel
10 Standard OpenHCD USB Host Controller
28 Adaptec AIC-7892 - Ultra160 SCSI
20 Intel(R) PRO/100+ Dual Port Server Adapter #3
21 Intel(R) PRO/100+ Dual Port Server Adapter #4

[Memory]

Range Device Status
0xA0000-0xBFFFF PCI bus OK
0xA0000-0xBFFFF S3 Graphics Inc. Savage4 OK
0xF0000000-0xFBFFFFFF PCI bus OK
0xF0000000-0xFBFFFFFF S3 Graphics Inc. Savage4 OK
0xFC000000-0xFFFFFFFF PCI bus OK
0xFEB80000-0xFEBFFFFF S3 Graphics Inc. Savage4 OK
0xFEB7F000-0xFEB7FFFF IBM 10/100 Ethernet Server Adapter OK
0xFEB40000-0xFEB5FFFF IBM 10/100 Ethernet Server Adapter OK
0xFD000000-0xFE1FFFFF DEC 21152 PCI to PCI bridge OK
0xFBF00000-0xFBFFFFFF DEC 21152 PCI to PCI bridge OK
0xFBF00000-0xFBFFFFFF Intel(R) PRO/100+ Dual Port Server Adapter OK
0xFE000000-0xFE0FFFFF Intel(R) PRO/100+ Dual Port Server Adapter OK
0xFBF01000-0xFBF01FFF Intel(R) PRO/100+ Dual Port Server Adapter #2 OK
0xFE100000-0xFE1FFFFF Intel(R) PRO/100+ Dual Port Server Adapter #2 OK
0xFEB7E000-0xFEB7EFFF Standard OpenHCD USB Host Controller OK
0x30000000-0xECFFFFFF PCI bus OK
0xED000000-0xEFFFFFFF PCI bus OK
0xEFFFF000-0xEFFFFFFF Adaptec AIC-7892 - Ultra160 SCSI OK
0xEE000000-0xEF1FFFFF DEC 21152 PCI to PCI bridge OK
0xECF00000-0xECFFFFFF DEC 21152 PCI to PCI bridge OK
0xECF00000-0xECFFFFFF Intel(R) PRO/100+ Dual Port Server Adapter #3 OK
0xEF000000-0xEF0FFFFF Intel(R) PRO/100+ Dual Port Server Adapter #3 OK
0xECF01000-0xECF01FFF Intel(R) PRO/100+ Dual Port Server Adapter #4 OK
0xEF100000-0xEF1FFFFF Intel(R) PRO/100+ Dual Port Server Adapter #4 OK

[Components]

[Following are sub-categories of this main category]

[Multimedia]

[Following are sub-categories of this main category]

[Audio Codecs]

Codec Manufacturer Description Status File Version Size Creation Date
c:\winnt\system32\imaadp32.acm Microsoft Corporation
OK C:\WINNT\System32\IMAADP32.ACM 5.00.2134.1
16.27 KB (16,656 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\iac25_32.ax Intel Corporation Indeo® audio software
OK C:\WINNT\System32\IAC25_32.AX 2.05.53 195.00 KB
(199,680 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\tssoft32.acm DSP GROUP, INC. OK
C:\WINNT\System32\TSSOFT32.ACM 1.01 9.27 KB (9,488 bytes)
12/7/1999 7:00:00 AM
c:\winnt\system32\msg723.acm Microsoft Corporation
OK C:\WINNT\System32\MSG723.ACM 4.4.3385 106.77 KB
(109,328 bytes) 9/17/2001 2:09:33 PM
c:\winnt\system32\lhacm.acm Microsoft Corporation
OK C:\WINNT\System32\LHACM.ACM 4.4.3385 33.27 KB
(34,064 bytes) 9/17/2001 2:09:34 PM
c:\winnt\system32\msadp32.acm Microsoft Corporation
OK C:\WINNT\System32\MSADP32.ACM 5.00.2134.1
14.77 KB (15,120 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\msg711.acm Microsoft Corporation
OK C:\WINNT\System32\MSG711.ACM 5.00.2134.1
10.27 KB (10,512 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\msgsm32.acm Microsoft Corporation
OK C:\WINNT\System32\MSGSM32.ACM 5.00.2134.1
22.27 KB (22,800 bytes) 12/7/1999 7:00:00 AM

[Video Codecs]

Codec Manufacturer Description Status File Version Size Creation Date
c:\winnt\system32\ir50_32.dll Intel Corporation Indeo® video 5.10
OK C:\WINNT\System32\IR50_32.DLL R.5.10.15.2.55
737.50 KB (755,200 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\msh261.drv Microsoft Corporation
OK C:\WINNT\System32\MSH261.DRV 4.4.3385 163.77 KB
(167,696 bytes) 9/17/2001 2:09:33 PM
c:\winnt\system32\ir32_32.dll Intel(R) Corporation OK
C:\WINNT\System32\IR32_32.DLL Not Available 194.50 KB
(199,168 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\msvidc32.dll Microsoft Corporation
OK C:\WINNT\System32\MSVIDC32.DLL 5.00.2134.1
27.27 KB (27,920 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\msh263.drv Microsoft Corporation
OK C:\WINNT\System32\MSH263.DRV 4.4.3385 252.27 KB
(258,320 bytes) 9/17/2001 2:09:09 PM
c:\winnt\system32\iccvid.dll Radius Inc. OK
C:\WINNT\System32\ICCVID.DLL 1.10.0.6 108.00 KB (110,592 bytes) 12/7/1999 7:00:00 AM
c:\winnt\system32\msrle32.dll Microsoft Corporation
OK C:\WINNT\System32\MSRLE32.DLL 5.00.2134.1
10.77 KB (11,024 bytes) 12/7/1999 7:00:00 AM

[CD-ROM]

Item Value
Drive D:
Description CD-ROM Drive
Media Loaded False
Media Type CD-ROM
Name LG CD-ROM CRD-8484B
Manufacturer (Standard CD-ROM drives)
Status OK
Transfer Rate Not Available
SCSI Target ID 0
PNP Device ID
IDE\CDROMLG_CD-ROM_CRD-8484B_____1.05____\5
&326853DD&0&0.0.0

[Sound Device]

Item Value
No sound devices

[Display]

Item Value
Name S3 Graphics Inc. Savage4
PNP Device ID
PCI\VEN_5333&DEV_8A22&SUBSYS_01C51014&REV_06\3&267A616A
&0&08
Adapter Type S3 Savage4, S3 Graphics Incorporated compatible
Adapter Description S3 Graphics Inc. Savage4
Adapter RAM 8.00 MB (8,388,608 bytes)
Installed Drivers s3savg4.dll
Driver Version 5.12.01.8013-8.40.02a
INF File oem4.inf (S3SAVAGE4 section)
Color Planes 1
Color Table Entries 4294967296
Resolution 800 x 600 x 60 hertz
Bits/Pixel 32

[Infrared]

Item Value
No infrared devices

[Input]

[Following are sub-categories of this main category]

[Keyboard]

Item Value
Description Standard 101/102-Key or Microsoft Natural PS/2
Keyboard
Name Enhanced (101- or 102-key)
Layout 00000409
PNP Device ID ACPI\PNP0303\4&389C1010&0
NumberOfFunctionKeys 12

[Pointing Device]

Item Value
Hardware Type PS/2 Compatible Mouse
Number of Buttons 3
Status OK
PNP Device ID ACPI\PNP0F13\4&389C1010&0
Power Management Supported False
Double Click Threshold 6
Handedness Right Handed Operation

[Modem]

Item Value
No modems

[Network]

[Following are sub-categories of this main category]

[Adapter]

Item Value
Name [00000000] Intel(R) PRO/100+ Dual Port Server Adapter
Adapter Type Ethernet 802.3
Product Name Intel(R) PRO/100+ Dual Port Server Adapter
Installed True
PNP Device ID
PCI\VEN_8086&DEV_1229&SUBSYS_10F08086&REV_05\4&273796BB&
0&2048
Last Reset 2/26/2002 11:56:43 AM
Index 0
Service Name E100B
IP Address 192.168.110.10
IP Subnet 255.255.255.0
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:03:47:22:5D:1E
Service Name E100B
IRQ Number 16
I/O Port 0x2000-0x2FFF
Driver c:\winnt\system32\drivers\e100bnt5.sys (119056, 5.40.11.0000)

Name [00000001] Intel(R) PRO/100+ Dual Port Server Adapter
Adapter Type Ethernet 802.3
Product Name Intel(R) PRO/100+ Dual Port Server Adapter
Installed True
PNP Device ID
PCI\VEN_8086&DEV_1229&SUBSYS_10F08086&REV_05\4&273796BB&
0&2848
Last Reset 2/26/2002 11:56:43 AM
Index 1
Service Name E100B
IP Address 192.168.120.10
IP Subnet 255.255.255.0
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:03:47:22:5D:1F
Service Name E100B
IRQ Number 17
I/O Port 0x2020-0x203F
Driver c:\winnt\system32\drivers\e100bnt5.sys (119056, 5.40.11.0000)

Name [00000002] RAS Async Adapter
Adapter Type Not Available
Product Name RAS Async Adapter
Installed True
PNP Device ID Not Available
Last Reset 2/26/2002 11:56:43 AM
Index 2

Service Name AsyncMac
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Service Name Not Available

Name [00000003] WAN Miniport (L2TP)
Adapter Type Not Available
Product Name WAN Miniport (L2TP)
Installed True
PNP Device ID ROOT\MS_L2TPMINIPORT\0000
Last Reset 2/26/2002 11:56:43 AM
Index 3
Service Name Rasl2tp
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Service Name Rasl2tp
Driver c:\winnt\system32\drivers\rasl2tp.sys (50800, 5.00.2179.1)

Name [00000004] WAN Miniport (PPTP)
Adapter Type Wide Area Network (WAN)
Product Name WAN Miniport (PPTP)
Installed True
PNP Device ID ROOT\MS_PPTPMINIPORT\0000
Last Reset 2/26/2002 11:56:43 AM
Index 4
Service Name PptpMiniport
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 50:50:54:50:30:30
Service Name PptpMiniport
Driver c:\winnt\system32\drivers\raspptp.sys (47856, 5.00.2160.1)

Name [00000005] Direct Parallel
Adapter Type Not Available
Product Name Direct Parallel
Installed True
PNP Device ID ROOT\MS_PTIMINIPORT\0000
Last Reset 2/26/2002 11:56:43 AM
Index 5
Service Name Raspti
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Service Name Raspti
Driver c:\winnt\system32\drivers\raspti.sys (16880, 5.00.2146.1)

Name [00000006] WAN Miniport (IP)
Adapter Type Not Available
Product Name WAN Miniport (IP)
Installed True
PNP Device ID ROOT\MS_NDISWANIP\0000
Last Reset 2/26/2002 11:56:43 AM
Index 6
Service Name NdisWan
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Service Name NdisWan
Driver c:\winnt\system32\drivers\ndiswan.sys (90096, 5.00.2195.2779)

Name [00000007] IBM 10/100 Ethernet Server Adapter
Adapter Type Ethernet 802.3
Product Name IBM 10/100 Ethernet Server Adapter
Installed True
PNP Device ID
PCI\VEN_8086&DEV_1229&SUBSYS_01F11014&REV_0C\3&267A616A&0&10
Last Reset 2/26/2002 11:56:43 AM
Index 7
Service Name E100B
IP Address 192.168.132.251
IP Subnet 255.255.255.0
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:02:55:AA:02:D7
Service Name E100B
IRQ Number 27
I/O Port 0x3000-0x303F
Driver c:\winnt\system32\drivers\e100bnt5.sys (119056, 5.40.11.0000)

Name [00000008] Intel(R) PRO/100+ Dual Port Server Adapter
Adapter Type Ethernet 802.3
Product Name Intel(R) PRO/100+ Dual Port Server Adapter
Installed True
PNP Device ID
PCI\VEN_8086&DEV_1229&SUBSYS_10F08086&REV_05\4&15F5026D&0&2028
Last Reset 2/26/2002 11:56:43 AM
Index 8
Service Name E100B
IP Address 192.168.210.10
IP Subnet 255.255.255.0
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:90:27:E8:71:60
Service Name E100B
IRQ Number 20
I/O Port 0x4000-0x4FFF
Driver c:\winnt\system32\drivers\e100bnt5.sys (119056, 5.40.11.0000)

Name [00000009] Intel(R) PRO/100+ Dual Port Server Adapter
Adapter Type Ethernet 802.3
Product Name Intel(R) PRO/100+ Dual Port Server Adapter

Installed True
PNP Device ID
PCI\VEN_8086&DEV_1229&SUBSYS_10F08086&REV_05\4&15F5026D&0&2828
Last Reset 2/26/2002 11:56:43 AM
Index 9
Service Name E100B
IP Address 192.168.220.10
IP Subnet 255.255.255.0
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:90:27:E8:71:61
Service Name E100B
IRQ Number 21
I/O Port 0x4020-0x403F
Driver c:\winnt\system32\drivers\e100bnt5.sys (119056, 5.40.11.0000)

[Protocol]

Item Value
Name MSAFD Tcpip [TCP/IP]
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 16 bytes
MaximumMessageSize 0 bytes
MessageOriented False
MinimumAddressSize 16 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData True
SupportsGracefulClosing True
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD Tcpip [UDP/IP]
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 16 bytes
MaximumMessageSize 65467 bytes
MessageOriented True
MinimumAddressSize 16 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting True

Name RSVP UDP Service Provider
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 16 bytes
MaximumMessageSize 65467 bytes
MessageOriented True
MinimumAddressSize 16 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting True

Name RSVP TCP Service Provider
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 16 bytes
MaximumMessageSize 0 bytes
MessageOriented False
MinimumAddressSize 16 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption True
SupportsExpeditedData True
SupportsGracefulClosing True
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{44CF5AB0-B478-4D98-AD86-5CD3B62648C2}] SEQPACKET 6
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize 20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{44CF5AB0-B478-4D98-AD86-5CD3B62648C2}] DATAGRAM 6
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize 20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{8380E329-FA5D-4971-8863-45389D633A46}] SEQPACKET 5
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{8380E329-FA5D-4971-8863-45389D633A46}] DATAGRAM 5
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{6FCF19B9-D1BC-4314-A154-2E811A2CC678}] SEQPACKET 4
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{6FCF19B9-D1BC-4314-A154-2E811A2CC678}] DATAGRAM 4
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{151BB450-3D28-4525-B2D4-2331C74DCD26}] SEQPACKET 0
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{151BB450-3D28-4525-B2D4-2331C74DCD26}] DATAGRAM 0
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{FA92D5FD-6E01-4F18-A447-837FEDE46296}] SEQPACKET 1
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False

SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{FA92D5FD-6E01-4F18-A447-837FEDE46296}] DATAGRAM 1
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize 20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{8F354C3B-893D-43F7-B7B0-3BF884D63BF1}] SEQPACKET 2
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize 20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{8F354C3B-893D-43F7-B7B0-3BF884D63BF1}] DATAGRAM 2
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize 20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{9788862E-F4FC-434F-AEBB-56AA0E507EF7}] SEQPACKET 3
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize 20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{9788862E-F4FC-434F-AEBB-56AA0E507EF7}] DATAGRAM 3
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize 20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

[WinSock]

Item Value
File c:\winnt\system32\winsock.dll
Version 3.10
Size 2.80 KB (2,864 bytes)

File c:\winnt\system32\wsock32.dll
Version 5.00.2195.2871
Size 21.27 KB (21,776 bytes)

[Ports]

[Following are sub-categories of this main category]

[Serial]

Item Value
Name COM1
Status OK
PNP Device ID ACPI\PNP0501\1
Maximum Input Buffer Size 0
Maximum Output Buffer Size False
Settable Baud Rate True
Settable Data Bits True
Settable Flow Control True
Settable Parity True
Settable Parity Check True
Settable Stop Bits True
Settable RLSD True

Supports RLSD True
Supports 16 Bit Mode False
Supports Special Characters False
Baud Rate 9600
Bits/Byte 8
Stop Bits 1
Parity None
Busy 0
Abort Read/Write on Error 0
Binary Mode Enabled -1
Continue XMit on XOff 0
CTS Outflow Control 0
Discard NULL Bytes 0
DSR Outflow Control 0
DSR Sensitivity 0
DTR Flow Control Type Enable
EOF Character 0
Error Replace Character 0
Error Replacement Enabled 0
Event Character 0
Parity Check Enabled 0
RTS Flow Control Type Enable
XOff Character 19
XOffXMit Threshold 512
XOn Character 17
XOnXMit Threshold 2048
XOnXOff InFlow Control 0
XOnXOff OutFlow Control 0
IRQ Number 4
I/O Port 0x03F8-0x03FF
Driver c:\winnt\system32\drivers\serial.sys (62416, 5.00.2195.2780)

Name COM2
Status OK
PNP Device ID ACPI\PNP0501\2
Maximum Input Buffer Size 0
Maximum Output Buffer Size False
Settable Baud Rate True
Settable Data Bits True
Settable Flow Control True
Settable Parity True
Settable Parity Check True
Settable Stop Bits True
Settable RLSD True
Supports RLSD True
Supports 16 Bit Mode False
Supports Special Characters False
Baud Rate 9600
Bits/Byte 8
Stop Bits 1
Parity None
Busy 0
Abort Read/Write on Error 0
Binary Mode Enabled -1
Continue XMit on XOff 0
CTS Outflow Control 0
Discard NULL Bytes 0
DSR Outflow Control 0
DSR Sensitivity 0
DTR Flow Control Type Enable
EOF Character 0
Error Replace Character 0
Error Replacement Enabled 0
Event Character 0
Parity Check Enabled 0
RTS Flow Control Type Enable
XOff Character 19
XOffXMit Threshold 512
XOn Character 17
XOnXMit Threshold 2048
XOnXOff InFlow Control 0
XOnXOff OutFlow Control 0
IRQ Number 3
I/O Port 0x02F8-0x02FF
Driver c:\winnt\system32\drivers\serial.sys (62416, 5.00.2195.2780)

[Parallel]

Item Value
Name LPT1
PNP Device ID ACPI\PNP0400\1

[Storage]

[Following are sub-categories of this main category]

[Drives]

Item Value
Drive A:
Description 3 1/2 Inch Floppy Drive

Drive C:
Description Local Fixed Disk
Compressed False
File System NTFS
Size 8.46 GB (9,088,901,120 bytes)
Free Space 5.83 GB (6,263,201,792 bytes)
Volume Name
Volume Serial Number 1C67EB25
Partition Disk #0, Partition #0
Partition Size 8.46 GB (9,088,902,144 bytes)
Starting Offset 32256 bytes
Drive Description Disk drive
Drive Manufacturer (Standard disk drives)
Drive Model IBM-PSG ST39204LC !# SCSI Disk Device
Drive BytesPerSector 512
Drive MediaLoaded True
Drive MediaType Fixed hard disk media
Drive Partitions 1
Drive SCSIBus 0
Drive SCSILogicalUnit 0
Drive SCSIPort 2
Drive SCSITargetId 0
Drive SectorsPerTrack 63
Drive Size 9097159680 bytes
Drive TotalCylinders 1106
Drive TotalSectors 17767890
Drive TotalTracks 282030
Drive TracksPerCylinder 255

Drive E:
Description Network Connection
Provider Name \\192.168.132.253\e$

[SCSI]

Item Value
Name Adaptec AIC-7892 - Ultra160 SCSI
Caption Adaptec AIC-7892 - Ultra160 SCSI
Driver adpu160m
Status OK

PNP Device ID
PCI\VEN_9005&DEV_008F&SUBSYS_008F1014&REV_02\3&13C0B0C5&0&18
Device ID
PCI\VEN_9005&DEV_008F&SUBSYS_008F1014&REV_02\3&13C0B0C5&0&18
Device Map Not Available
Index Not Available
Max Number Controlled Not Available
IRQ Number 28
I/O Port 0x3100-0x31FF
Driver c:\winnt\system32\drivers\adpu160m.sys (88000, d4.10 (4.10.4000))

[Printing]

Name Port Name Server Name
No printing information

[Problem Devices]

Device PNP Device ID Error Code
Not Available ACPI\IBM37D1\4&389C1010&0 28

[USB]

Device PNP Device ID
Standard OpenHCD USB Host Controller
PCI\VEN_1166&DEV_0220&SUBSYS_02201166&REV_04\3&267A616A&0&7A
USB Root Hub USB\ROOT_HUB\4&372644EA&0

[Software Environment]

[Following are sub-categories of this main category]

[Drivers]

Name Description File Type Started Start Mode
State Status Error Control Accept Pause Accept Stop
abiosdsk Abiosdsk Not Available Kernel Driver False
Disabled Stopped OK Ignore False False
abp480n5 abp480n5 Not Available Kernel Driver False
Disabled Stopped OK Normal False False
acpi Microsoft ACPI Driver c:\winnt\system32\drivers\acpi.sys
Kernel Driver True Boot Running OK Normal
False True
acpiec ACPIEC c:\winnt\system32\drivers\acpiec.sys Kernel
Driver False Disabled Stopped OK Normal False
False
adpu160m adpu160m c:\winnt\system32\drivers\adpu160m.sys Kernel
Driver True Boot Running OK Normal False
True
afd AFD Networking Support Environment
c:\winnt\system32\drivers\afd.sys Kernel Driver True Auto
Running OK Normal False True
aha154x Aha154x Not Available Kernel Driver False
Disabled Stopped OK Normal False False
aic116x aic116x Not Available Kernel Driver False
Disabled Stopped OK Normal False False
aic78u2 aic78u2 Not Available Kernel Driver False
Disabled Stopped OK Normal False False
aic78xx aic78xx Not Available Kernel Driver False
Disabled Stopped OK Normal False False
ami0nt ami0nt Not Available Kernel Driver False
Disabled Stopped OK Normal False False
amsint amsint Not Available Kernel Driver False
Disabled Stopped OK Normal False False
asc asc Not Available Kernel Driver False
Disabled Stopped OK Normal False False
asc3350p asc3350p Not Available Kernel Driver False
Disabled Stopped OK Normal False False
asc3550 asc3550 Not Available Kernel Driver False
Disabled Stopped OK Normal False False
asyncmac RAS Asynchronous Media Driver
c:\winnt\system32\drivers\asyncmac.sys Kernel Driver False
Manual Stopped OK Normal False False
atapi Standard IDE/ESDI Hard Disk Controller
c:\winnt\system32\drivers\atapi.sys Kernel Driver True
Boot Running OK Normal False True
atdisk Atdisk Not Available Kernel Driver False
Disabled Stopped OK Ignore False False
atmarpc ATM ARP Client Protocol
c:\winnt\system32\drivers\atmarpc.sys Kernel Driver False
Manual Stopped OK Normal False False
audstub Audio Stub Driver c:\winnt\system32\drivers\audstub.sys
Kernel Driver True Manual Running OK Normal
False True
beep Beep c:\winnt\system32\drivers\beep.sys Kernel
Driver True System Running OK Normal False
True
buslogic BusLogic Not Available Kernel Driver False
Disabled Stopped OK Normal False False
cd20xrnt cd20xrnt Not Available Kernel Driver False
Disabled Stopped OK Normal False False
cdaudio Cdaudio c:\winnt\system32\drivers\cdaudio.sys Kernel
Driver False System Stopped OK Ignore False
False
cdfs Cdfs c:\winnt\system32\drivers\cdfs.sys File System
Driver True Disabled Running OK Normal False
True
cdrom CD-ROM Driver c:\winnt\system32\drivers\cdrom.sys
Kernel Driver True System Running OK Normal
False True
changer Changer Not Available Kernel Driver False
System Stopped OK Ignore False False
cpqarray Cpqarray Not Available Kernel Driver False
Disabled Stopped OK Normal False False
cpqarry2 cpqarry2 Not Available Kernel Driver False
Disabled Stopped OK Normal False False
cpqfcalm cpqfcalm Not Available Kernel Driver False
Disabled Stopped OK Normal False False
cpqfws2e cpqfws2e Not Available Kernel Driver False
Disabled Stopped OK Normal False False
dac960nt dac960nt Not Available Kernel Driver False
Disabled Stopped OK Normal False False
deckzpsx deckzpsx Not Available Kernel Driver False
Disabled Stopped OK Normal False False
dfsdriver DfsDriver c:\winnt\system32\drivers\dfs.sys File System Driver
True Boot Running OK Normal False True
disk Disk Driver c:\winnt\system32\drivers\disk.sys
Kernel Driver True Boot Running OK Normal
False True
diskperf Diskperf c:\winnt\system32\drivers\diskperf.sys Kernel
Driver True Boot Running OK Normal False
True
dmboot dmboot c:\winnt\system32\drivers\dmboot.sys Kernel
Driver False Disabled Stopped OK Normal False
False
dmio Logical Disk Manager Driver
c:\winnt\system32\drivers\dmio.sys Kernel Driver True
Boot Running OK Normal False True
dmload dmload c:\winnt\system32\drivers\dmload.sys Kernel
Driver True Boot Running OK Normal False
True

```
e100b    Intel(R) PRO Adapter Driver
c:\winnt\system32\drivers\e100bnt5.sys    Kernel Driver    True
Manual    Running    OK    Normal    False    True
efs    EFS    c:\winnt\system32\drivers\efs.sys    File System Driver
True    Disabled    Running    OK    Normal    False    True
fastfat    Fastfat    c:\winnt\system32\drivers\fastfat.sys    File System
Driver    True    Disabled    Running    OK    Normal    False
True
fd16_700    Fd16_700    Not Available    Kernel Driver    False
Disabled    Stopped    OK    Normal    False    False
fdc    Floppy Disk Controller Driver    c:\winnt\system32\drivers\fdc.sys
Kernel Driver    True    Manual    Running    OK    Normal
False    True
fips    Fips    c:\winnt\system32\drivers\fips.sys    Kernel
Driver    True    Auto    Running    OK    Normal    False
True
fireport    fireport    Not Available    Kernel Driver    False
Disabled    Stopped    OK    Normal    False    False
flashpnt    flashpnt    Not Available    Kernel Driver    False
Disabled    Stopped    OK    Normal    False    False
flpydisk    Floppy Disk Driver    c:\winnt\system32\drivers\flpydisk.sys
Kernel Driver    True    Manual    Running    OK    Normal
False    True
ftdisk    Volume Manager Driver
c:\winnt\system32\drivers\ftdisk.sys    Kernel Driver    True
Boot    Running    OK    Normal    False    True
gpc    Generic Packet Classifier
c:\winnt\system32\drivers\msgpc.sys    Kernel Driver    True
Manual    Running    OK    Normal    False    True
i8042prt    i8042 Keyboard and PS/2 Mouse Port Driver
c:\winnt\system32\drivers\i8042prt.sys    Kernel Driver    True
System    Running    OK    Normal    False    True
ini910u    ini910u    Not Available    Kernel Driver    False
Disabled    Stopped    OK    Normal    False    False
intelide    IntelIde    Not Available    Kernel Driver    False
Disabled    Stopped    OK    Normal    False    False
ipfilterdriver    IP Traffic Filter Driver
c:\winnt\system32\drivers\ipfltdrv.sys    Kernel Driver    False
Manual    Stopped    OK    Normal    False    False
ipinip    IP in IP Tunnel Driver    c:\winnt\system32\drivers\ipinip.sys
Kernel Driver    False    Manual    Stopped    OK    Normal
False    False
ipnat    IP Network Address Translator    c:\winnt\system32\drivers\ipnat.sys
Kernel Driver    False    Manual    Stopped    OK    Normal
False    False
ipsec    IPSEC driver    c:\winnt\system32\drivers\ipsec.sys
Kernel Driver    True    Manual    Running    OK    Normal
False    True
ipsraidn    ipsraidn    Not Available    Kernel Driver    False
Disabled    Stopped    OK    Normal    False    False
isapnp    PnP ISA/EISA Bus Driver
c:\winnt\system32\drivers\isapnp.sys    Kernel Driver    True
Boot    Running    OK    Critical    False    True
kbdclass    Keyboard Class Driver
c:\winnt\system32\drivers\kbdclass.sys    Kernel Driver    True
System    Running    OK    Normal    False    True
ksecdd    KSecDD    c:\winnt\system32\drivers\ksecdd.sys    Kernel
Driver    True    Boot    Running    OK    Normal    False
True
lbrtfdc    lbrtfdc    Not Available    Kernel Driver    False
System    Stopped    OK    Ignore    False    False
lp6nds35    lp6nds35    Not Available    Kernel Driver    False
Disabled    Stopped    OK    Normal    False    False
mnmdd    mnmdd    c:\winnt\system32\drivers\mnmdd.sys    Kernel
Driver    True    System    Running    OK    Ignore    False
True
modem    Modem    c:\winnt\system32\drivers\modem.sys    Kernel
Driver    False    Manual    Stopped    OK    Ignore    False
False
mouclass    Mouse Class Driver    c:\winnt\system32\drivers\mouclass.sys
Kernel Driver    True    System    Running    OK    Normal
False    True
mountmgr    MountMgr    c:\winnt\system32\drivers\mountmgr.sys    Kernel
Driver    True    Boot    Running    OK    Normal    False
True
mraid35x    mraid35x    Not Available    Kernel Driver    False
Disabled    Stopped    OK    Normal    False    False
mrxsmb    MRXSMB    c:\winnt\system32\drivers\mrxsmb.sys    File System
Driver    True    System    Running    OK    Normal    False
True
msfs    Msfs    c:\winnt\system32\drivers\msfs.sys    File System
Driver    True    System    Running    OK    Normal    False
True
mskssrv    Microsoft Streaming Service Proxy
c:\winnt\system32\drivers\mskssrv.sys    Kernel Driver    False
Manual    Stopped    OK    Normal    False    False
mspclock    Microsoft Streaming Clock Proxy
c:\winnt\system32\drivers\mspclock.sys    Kernel Driver    False
Manual    Stopped    OK    Normal    False    False
mspqm    Microsoft Streaming Quality Manager Proxy
c:\winnt\system32\drivers\mspqm.sys    Kernel Driver    False
Manual    Stopped    OK    Normal    False    False
mup    Mup    c:\winnt\system32\drivers\mup.sys    File System
Driver    True    Boot    Running    OK    Normal    False
True
ncrc710    Ncrc710    Not Available    Kernel Driver    False
Disabled    Stopped    OK    Normal    False    False
ndis    NDIS System Driver    c:\winnt\system32\drivers\ndis.sys
Kernel Driver    True    Boot    Running    OK    Normal
False    True
ndistapi    Remote Access NDIS TAPI Driver
c:\winnt\system32\drivers\ndistapi.sys    Kernel Driver    True
Manual    Running    OK    Normal    False    True
ndiswan    Remote Access NDIS WAN Driver
c:\winnt\system32\drivers\ndiswan.sys    Kernel Driver    True
Manual    Running    OK    Normal    False    True
ndproxy    NDIS Proxy    c:\winnt\system32\drivers\ndproxy.sys
Kernel Driver    True    Manual    Running    OK    Normal
False    True
netbios    NetBIOS Interface    c:\winnt\system32\drivers\netbios.sys
File System Driver    True    System    Running    OK    Normal
False    True
netbt    NetBios over Tcpip    c:\winnt\system32\drivers\netbt.sys
Kernel Driver    True    System    Running    OK    Normal
False    True
netdetect    NetDetect    c:\winnt\system32\drivers\netdtect.sys    Kernel
Driver    False    Manual    Stopped    OK    Normal    False
False
npfs    Npfs    c:\winnt\system32\drivers\npfs.sys    File System
Driver    True    System    Running    OK    Normal    False
True
ntfs    Ntfs    c:\winnt\system32\drivers\ntfs.sys    File System
Driver    True    Disabled    Running    OK    Normal    False
True
null    Null    c:\winnt\system32\drivers\null.sys    Kernel
Driver    True    System    Running    OK    Normal    False
True
nwlnkflt    IPX Traffic Filter Driver
c:\winnt\system32\drivers\nwlnkflt.sys    Kernel Driver    False
Manual    Stopped    OK    Normal    False    False
nwlnkfwd    IPX Traffic Forwarder Driver
c:\winnt\system32\drivers\nwlnkfwd.sys    Kernel Driver    False
Manual    Stopped    OK    Normal    False    False
```

openhci Microsoft USB Open Host Controller Driver
c:\winnt\system32\drivers\openhci.sys Kernel Driver True
Manual Running OK Normal False True
parallel Parallel class driver c:\winnt\system32\drivers\parallel.sys
Kernel Driver True Manual Running OK Normal
False True
parport Parallel port driver c:\winnt\system32\drivers\parport.sys
Kernel Driver True System Running OK Ignore
False True
partmgr PartMgr c:\winnt\system32\drivers\partmgr.sys Kernel
Driver True Boot Running OK Normal False
True
parvdm ParVdm c:\winnt\system32\drivers\parvdm.sys Kernel
Driver True Auto Running OK Ignore False
True
pci PCI Bus Driver c:\winnt\system32\drivers\pci.sys Kernel
Driver True Boot Running OK Critical False
True
pcidump PCIDump Not Available Kernel Driver False
System Stopped OK Ignore False False
pciide PCIIde c:\winnt\system32\drivers\pciide.sys Kernel
Driver True Boot Running OK Normal False
True
pcmcia Pcmcia c:\winnt\system32\drivers\pcmcia.sys Kernel
Driver False Disabled Stopped OK Normal False
False
pdcomp PDCOMP Not Available Kernel Driver False
Manual Stopped OK Ignore False False
pdframe PDFRAME Not Available Kernel Driver
False Manual Stopped OK Ignore False False
pdreli PDRELI Not Available Kernel Driver False
Manual Stopped OK Ignore False False
pdrframe PDRFRAME Not Available Kernel Driver
False Manual Stopped OK Ignore False False
pptpminiport WAN Miniport (PPTP)
c:\winnt\system32\drivers\raspptp.sys Kernel Driver True
Manual Running OK Normal False True
ptilink Direct Parallel Link Driver
c:\winnt\system32\drivers\ptilink.sys Kernel Driver True
Manual Running OK Normal False True
ql1080 ql1080 Not Available Kernel Driver False
Disabled Stopped OK Normal False False
ql10wnt Ql10wnt Not Available Kernel Driver False
Disabled Stopped OK Normal False False
ql1240 ql1240 Not Available Kernel Driver False
Disabled Stopped OK Normal False False
ql2100 ql2100 Not Available Kernel Driver False
Disabled Stopped OK Normal False False
rasacd Remote Access Auto Connection Driver
c:\winnt\system32\drivers\rasacd.sys Kernel Driver True
System Running OK Normal False True
rasl2tp WAN Miniport (L2TP)
c:\winnt\system32\drivers\rasl2tp.sys Kernel Driver True
Manual Running OK Normal False True
raspti Direct Parallel c:\winnt\system32\drivers\raspti.sys
Kernel Driver True Manual Running OK Normal
False True
rca Microsoft Streaming Network Raw Channel Access
c:\winnt\system32\drivers\rca.sys Kernel Driver False Manual
Stopped OK Normal False False
rdbss Rdbss c:\winnt\system32\drivers\rdbss.sys File System
Driver True System Running OK Normal False
True
rdpwd RDPWD c:\winnt\system32\drivers\rdpwd.sys Kernel
Driver False Manual Stopped OK Ignore False
False
redbook Digital CD Audio Playback Filter Driver
c:\winnt\system32\drivers\redbook.sys Kernel Driver False
System Stopped OK Normal False False
s3inc S3Inc c:\winnt\system32\drivers\s3sav4m.sys Kernel
Driver False Manual Stopped OK Ignore False
False
s3savage4 S3SAVAGE4 c:\winnt\system32\drivers\s3savg4m.sys
Kernel Driver True Manual Running OK Ignore
False True
serenum Serenum Filter Driver c:\winnt\system32\drivers\serenum.sys
Kernel Driver True Manual Running OK Normal
False True
serial Serial port driver c:\winnt\system32\drivers\serial.sys
Kernel Driver True System Running OK Ignore
False True
sfloppy Sfloppy c:\winnt\system32\drivers\sfloppy.sys Kernel
Driver False System Stopped OK Ignore False
False
sglfb sglfb Not Available Kernel Driver False
System Stopped OK Normal False False
simbad Simbad Not Available Kernel Driver False
Disabled Stopped OK Normal False False
sparrow Sparrow Not Available Kernel Driver False
Disabled Stopped OK Normal False False
spud Special Purpose Utility Driver c:\winnt\system32\drivers\spud.sys
Kernel Driver True Manual Running OK Normal
False True
srv Srv c:\winnt\system32\drivers\srv.sys File System Driver
True Manual Running OK Normal False True
swenum Software Bus Driver c:\winnt\system32\drivers\swenum.sys
Kernel Driver True Manual Running OK Normal
False True
symc810 symc810 Not Available Kernel Driver False
Disabled Stopped OK Normal False False
symc8xx symc8xx Not Available Kernel Driver False
Disabled Stopped OK Normal False False
sym_hi sym_hi Not Available Kernel Driver False
Disabled Stopped OK Normal False False
tcpip TCP/IP Protocol Driver c:\winnt\system32\drivers\tcpip.sys
Kernel Driver True System Running OK Normal
False True
tdasync TDASYNC c:\winnt\system32\drivers\tdasync.sys
Kernel Driver False Manual Stopped OK Ignore
False False
tdipx TDIPX c:\winnt\system32\drivers\tdipx.sys Kernel
Driver False Manual Stopped OK Ignore False
False
tdnetb TDNETB c:\winnt\system32\drivers\tdnetb.sys Kernel
Driver False Manual Stopped OK Ignore False
False
tdpipe TDPIPE c:\winnt\system32\drivers\tdpipe.sys Kernel
Driver False Manual Stopped OK Ignore False
False
tdspx TDSPX c:\winnt\system32\drivers\tdspx.sys Kernel
Driver False Manual Stopped OK Ignore False
False
tdtcp TDTCP c:\winnt\system32\drivers\tdtcp.sys Kernel
Driver False Manual Stopped OK Ignore False
False
termdd Terminal Device Driver
c:\winnt\system32\drivers\termdd.sys Kernel Driver False
Disabled Stopped OK Normal False False
tga tga Not Available Kernel Driver False
System Stopped OK Ignore False False
udfs Udfs c:\winnt\system32\drivers\udfs.sys File System
Driver False Disabled Stopped OK Normal False
False

ultra66 ultra66 Not Available Kernel Driver False
Disabled Stopped OK Normal False False
update Microcode Update Driver
c:\winnt\system32\drivers\update.sys Kernel Driver True
Manual Running OK Normal False True
usbhub Microsoft USB Standard Hub Driver
c:\winnt\system32\drivers\usbhub.sys Kernel Driver True
Manual Running OK Normal False True
vgasave VgaSave c:\winnt\system32\drivers\vga.sys Kernel
Driver True System Running OK Ignore False
True
wanarp Remote Access IP ARP Driver
c:\winnt\system32\drivers\wanarp.sys Kernel Driver True
Manual Running OK Normal False True
wdica WDICA Not Available Kernel Driver False
Manual Stopped OK Ignore False False
nmscfg NIC Management Service Configuration Driver
\??\c:\winnt\system32\drivers\nmscfg.sys Kernel Driver True
Manual Running OK Normal False True

[Environment Variables]

Variable Value User Name
ComSpec %SystemRoot%\system32\cmd.exe <SYSTEM>
Os2LibPath %SystemRoot%\system32\os2\dll; <SYSTEM>
Path
%SystemRoot%\system32;%SystemRoot%;%SystemRoot%\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 6 <SYSTEM>
PROCESSOR_IDENTIFIER x86 Family 6 Model 11 Stepping 1,
GenuineIntel <SYSTEM>
PROCESSOR_REVISION 0b01 <SYSTEM>
NUMBER_OF_PROCESSORS 2 <SYSTEM>
PATHEXT
.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH <SYSTEM>
TEMP %SystemRoot%\TEMP <SYSTEM>
TMP %SystemRoot%\TEMP <SYSTEM>
TEMP %USERPROFILE%\Local Settings\Temp
CLIENT10\Administrator
TMP %USERPROFILE%\Local Settings\Temp
CLIENT10\Administrator

[Jobs]

[Following are sub-categories of this main category]

[Print]

Document Size Owner Notify Status Time Submitted
Start Time Until Time Elapsed Time Pages Printed Job ID
Priority Parameters Driver Name Print Processor Host Print
Queue Data Type Name
No print jobs

[Network Connections]

Local Name Remote Name Type Status User Name
E: \\192.168.132.253\e$ Disk OK
CLIENT10\Administrator

[Running Tasks]

Name Path Process ID Priority Min Working Set Max
Working Set Start Time Version Size File Date
system idle process Not Available 0 0 Not
Available Not Available Not Available Unknown Unknown
Unknown
system Not Available 8 8 0 1413120
Not Available Unknown Unknown Unknown
smss.exe c:\winnt\system32\smss.exe 164 11 204800
1413120 2/26/2002 4:56:58 PM 5.00.2195.2901 44.27 KB
(45,328 bytes) 12/7/1999 7:00:00 AM
csrss.exe Not Available 188 13 Not Available
Not Available 2/26/2002 4:57:02 PM Unknown Unknown
Unknown
winlogon.exe c:\winnt\system32\winlogon.exe 208 13
204800 1413120 2/26/2002 4:57:04 PM 5.00.2195.2953
173.77 KB (177,936 bytes) 12/7/1999 7:00:00 AM
services.exe c:\winnt\system32\services.exe 236 9
204800 1413120 2/26/2002 4:57:05 PM 5.00.2195.2780
86.77 KB (88,848 bytes) 12/7/1999 7:00:00 AM
lsass.exe c:\winnt\system32\lsass.exe 248 9 204800
1413120 2/26/2002 4:57:05 PM 5.00.2195.2964 32.77 KB
(33,552 bytes) 12/7/1999 7:00:00 AM
svchost.exe c:\winnt\system32\svchost.exe 420 8
204800 1413120 2/26/2002 4:57:08 PM 5.00.2134.1
7.77 KB (7,952 bytes) 12/7/1999 7:00:00 AM
spoolsv.exe c:\winnt\system32\spoolsv.exe 448 8
204800 1413120 2/26/2002 4:57:09 PM 5.00.2161.1
43.77 KB (44,816 bytes) 9/17/2001 9:39:14 AM
msdtc.exe c:\winnt\system32\msdtc.exe 476 8 204800
1413120 2/26/2002 4:57:09 PM 1999.9.3421.3 6.77 KB
(6,928 bytes) 9/17/2001 10:04:52 AM
svchost.exe c:\winnt\system32\svchost.exe 608 8
204800 1413120 2/26/2002 4:57:11 PM 5.00.2134.1
7.77 KB (7,952 bytes) 12/7/1999 7:00:00 AM
llssrv.exe c:\winnt\system32\llssrv.exe 632 9 204800
1413120 2/26/2002 4:57:11 PM 5.00.2195.2649 114.27 KB
(117,008 bytes) 5/4/2001 12:05:02 PM
nmssvc.exe c:\winnt\system32\nmssvc.exe 664 8
204800 1413120 2/26/2002 4:57:11 PM 1.64.0.0 1012.00 KB
(1,036,288 bytes) 10/8/2001 4:31:07 PM
regsvc.exe c:\winnt\system32\regsvc.exe 744 8 204800
1413120 2/26/2002 4:57:12 PM 5.00.2195.2104 65.27 KB
(66,832 bytes) 9/24/2001 10:26:33 AM
mstask.exe c:\winnt\system32\mstask.exe 780 8 204800
1413120 2/26/2002 4:57:13 PM 4.71.2195.1 115.27 KB
(118,032 bytes) 9/24/2001 10:26:26 AM
tcpsvcs.exe c:\winnt\system32\tcpsvcs.exe 924 8
204800 1413120 2/26/2002 4:57:28 PM 5.00.2134.1
24.77 KB (25,360 bytes) 12/7/1999 7:00:00 AM
winmgmt.exe c:\winnt\system32\wbem\winmgmt.exe 944 8
204800 1413120 2/26/2002 4:57:28 PM 1.50.1085.0029
192.08 KB (196,685 bytes) 9/24/2001 10:26:43 AM
inetinfo.exe c:\winnt\system32\inetsrv\inetinfo.exe 976 8
204800 1413120 2/26/2002 4:57:28 PM 5.00.0984 14.27 KB
(14,608 bytes) 9/24/2001 10:27:34 AM
dfssvc.exe c:\winnt\system32\dfssvc.exe 1012 8 204800
1413120 2/26/2002 4:57:29 PM 5.00.2195.2841 88.27 KB
(90,384 bytes) 9/24/2001 10:26:13 AM
explorer.exe c:\winnt\explorer.exe 1148 8 204800
1413120 2/26/2002 4:58:01 PM 5.00.3315.2846 237.27 KB
(242,960 bytes) 9/24/2001 10:26:39 AM
promon.exe c:\winnt\system32\promon.exe 1200 8
204800 1413120 2/26/2002 4:58:03 PM 4.08 30.50 KB
(31,232 bytes) 10/8/2001 4:31:08 PM
svchost.exe c:\winnt\system32\svchost.exe 1312 8
204800 1413120 2/26/2002 4:58:19 PM 5.00.2134.1
7.77 KB (7,952 bytes) 12/7/1999 7:00:00 AM

mmc.exe c:\winnt\system32\mmc.exe 848 8 204800 1413120 2/26/2002 5:28:51 PM 5.00.2195.2301 589.27 KB (603,408 bytes) 9/24/2001 10:26:20 AM
rsvp.exe c:\winnt\system32\rsvp.exe 1228 8 204800 1413120 2/26/2002 5:30:52 PM 5.00.2167.1 172.77 KB (176,912 bytes) 12/7/1999 7:00:00 AM

[Loaded Modules]

Name Version Size File Date Manufacturer Path
traffic.dll 5.00.2139.1 30.77 KB (31,504 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\traffic.dll
rsvp.exe 5.00.2167.1 172.77 KB (176,912 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\rsvp.exe
wbemprox.dll 1.50.1085.0045 40.08 KB (41,040 bytes) 9/24/2001 10:26:43 AM Microsoft Corporation c:\winnt\system32\wbem\wbemprox.dll
mlang.dll 5.00.3103.1000 510.77 KB (523,024 bytes) 9/24/2001 10:26:20 AM Microsoft Corporation c:\winnt\system32\mlang.dll
rassapi.dll 5.00.2188.1 14.27 KB (14,608 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\rassapi.dll
adsnt.dll 5.00.2195.2778 195.27 KB (199,952 bytes) 9/24/2001 10:26:09 AM Microsoft Corporation c:\winnt\system32\adsnt.dll
dbghelp.dll 5.00.2195.2104 159.27 KB (163,088 bytes) 5/4/2001 12:05:02 PM Microsoft Corporation c:\winnt\system32\dbghelp.dll
localsec.dll 5.00.2195.2130 230.27 KB (235,792 bytes) 9/24/2001 10:26:19 AM Microsoft Corporation c:\winnt\system32\localsec.dll
devmgr.dll 5.00.2166.1 215.77 KB (220,944 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\devmgr.dll
filemgmt.dll 5.00.2195.2165 287.27 KB (294,160 bytes) 9/24/2001 10:26:16 AM Microsoft Corporation c:\winnt\system32\filemgmt.dll
pdh.dll 5.00.2195.2739 147.77 KB (151,312 bytes) 9/24/2001 10:26:32 AM Microsoft Corporation c:\winnt\system32\pdh.dll
smlogcfg.dll 5.00.2195.2485 273.27 KB (279,824 bytes) 9/24/2001 10:26:35 AM Microsoft Corporation c:\winnt\system32\smlogcfg.dll
cabinet.dll 5.00.2147.1 54.77 KB (56,080 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\cabinet.dll
msinfo32.dll 5.00.2177.1 312.27 KB (319,760 bytes) 9/17/2001 2:09:30 PM Microsoft Corporation c:\program files\common files\microsoft shared\msinfo\msinfo32.dll
riched20.dll 5.30.23.1205 421.27 KB (431,376 bytes) 9/24/2001 10:26:33 AM Microsoft Corporation c:\winnt\system32\riched20.dll
riched32.dll 5.00.2134.1 3.77 KB (3,856 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\riched32.dll
els.dll 5.00.2175.1 151.27 KB (154,896 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\els.dll
ntmsmgr.dll 1,0,0,1 427.77 KB (438,032 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation and HighGround Systems, Inc. c:\winnt\system32\ntmsmgr.dll
mmfutil.dll 1.50.1085.0000 32.06 KB (32,829 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\mmfutil.dll
logdrive.dll 1.50.1085.0000 200.06 KB (204,863 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\logdrive.dll
dfrgres.dll 5.00.2150.1 27.50 KB (28,160 bytes) 12/7/1999 7:00:00 AM Executive Software International, Inc. c:\winnt\system32\dfrgres.dll
dfrgsnap.dll 5.00.2195.2104 41.77 KB (42,768 bytes) 9/24/2001 10:26:13 AM Executive Software International, Inc. c:\winnt\system32\dfrgsnap.dll
dmdskres.dll 2195.2104.297.3 119.50 KB (122,368 bytes) 9/24/2001 10:26:14 AM Microsoft Corp., VERITAS Software c:\winnt\system32\dmdskres.dll
dmutil.dll 2195.2104.297.3 42.27 KB (43,280 bytes) 9/24/2001 10:26:14 AM VERITAS Software Corp. c:\winnt\system32\dmutil.dll
ntmsapi.dll 5.00.1948.1 51.77 KB (53,008 bytes) 9/24/2001 10:26:29 AM Microsoft Corporation c:\winnt\system32\ntmsapi.dll
dmdskmgr.dll 2215.2215.297.3 160.27 KB (164,112 bytes) 9/24/2001 10:26:13 AM Microsoft Corp., VERITAS Software c:\winnt\system32\dmdskmgr.dll
mycomput.dll 5.00.2134.1 107.77 KB (110,352 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\mycomput.dll
mmcndmgr.dll 5.00.2178.1 815.27 KB (834,832 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\mmcndmgr.dll
mmc.exe 5.00.2195.2301 589.27 KB (603,408 bytes) 9/24/2001 10:26:20 AM Microsoft Corporation c:\winnt\system32\mmc.exe
tapisrv.dll 5.00.2195.2955 169.27 KB (173,328 bytes) 9/24/2001 10:26:36 AM Microsoft Corporation c:\winnt\system32\tapisrv.dll
promon.exe 4.08 30.50 KB (31,232 bytes) 10/8/2001 4:31:08 PM Intel Corporation c:\winnt\system32\promon.exe
wininet.dll 5.00.3315.1000 456.77 KB (467,728 bytes) 9/24/2001 10:26:38 AM Microsoft Corporation c:\winnt\system32\wininet.dll
netplwiz.dll 5.00.2195.2370 169.77 KB (173,840 bytes) 9/24/2001 10:26:28 AM Microsoft Corporation c:\winnt\system32\netplwiz.dll
netmsg.dll 5.00.2137.1 152.50 KB (156,160 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\netmsg.dll
netui2.dll 5.00.2134.1 280.27 KB (286,992 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\netui2.dll
mprui.dll 5.00.2195.2104 54.77 KB (56,080 bytes) 9/24/2001 10:26:21 AM Microsoft Corporation c:\winnt\system32\mprui.dll
urlmon.dll 5.00.3315.1000 441.27 KB (451,856 bytes) 9/24/2001 10:26:37 AM Microsoft Corporation c:\winnt\system32\urlmon.dll
browselc.dll 5.00.3315.2846 34.50 KB (35,328 bytes) 9/24/2001 10:26:10 AM Microsoft Corporation c:\winnt\system32\browselc.dll
faxshell.dll 5.00.2134.1 8.27 KB (8,464 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\faxshell.dll
msacm32.dll 5.00.2134.1 65.27 KB (66,832 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msacm32.dll
avifil32.dll 5.00.2134.1 76.27 KB (78,096 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\avifil32.dll
msvfw32.dll 5.00.2134.1 113.77 KB (116,496 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msvfw32.dll

docprop2.dll 5.00.2178.1 297.77 KB (304,912 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\docprop2.dll
linkinfo.dll 5.00.2134.1 15.77 KB (16,144 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\linkinfo.dll
powrprof.dll 5.00.3103.1000 13.27 KB (13,584 bytes) 9/24/2001 10:26:32 AM Microsoft Corporation c:\winnt\system32\powrprof.dll
batmeter.dll 5.00.3103.1000 20.27 KB (20,752 bytes) 9/24/2001 10:26:10 AM Microsoft Corporation c:\winnt\system32\batmeter.dll
stobject.dll 5.00.2195.2780 79.27 KB (81,168 bytes) 9/24/2001 10:26:36 AM Microsoft Corporation c:\winnt\system32\stobject.dll
msi.dll 1.11.2405.0 1.69 MB (1,767,184 bytes) 9/24/2001 10:26:23 AM Microsoft Corporation c:\winnt\system32\msi.dll
webcheck.dll 5.00.3315.1000 251.77 KB (257,808 bytes) 9/24/2001 10:26:38 AM Microsoft Corporation c:\winnt\system32\webcheck.dll
ntshrui.dll 5.00.2134.1 46.77 KB (47,888 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\ntshrui.dll
mydocs.dll 5.00.2920.0000 55.77 KB (57,104 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\mydocs.dll
browseui.dll 5.00.3315.2846 788.77 KB (807,696 bytes) 9/24/2001 10:26:10 AM Microsoft Corporation c:\winnt\system32\browseui.dll
shdocvw.dll 5.00.3315.2879 1.05 MB (1,104,144 bytes) 9/24/2001 10:26:34 AM Microsoft Corporation c:\winnt\system32\shdocvw.dll
explorer.exe 5.00.3315.2846 237.27 KB (242,960 bytes) 9/24/2001 10:26:39 AM Microsoft Corporation c:\winnt\explorer.exe
dfssvc.exe 5.00.2195.2841 88.27 KB (90,384 bytes) 9/24/2001 10:26:13 AM Microsoft Corporation c:\winnt\system32\dfssvc.exe
iislog.dll 5.00.0984 75.27 KB (77,072 bytes) 9/24/2001 10:27:34 AM Microsoft Corporation c:\winnt\system32\inetsrv\iislog.dll
httpext.dll 0.9.3940.21 435.27 KB (445,712 bytes) 9/24/2001 10:27:34 AM Microsoft Corporation c:\winnt\system32\inetsrv\httpext.dll
rpcproxy.dll 5.00.2195.2780 16.27 KB (16,656 bytes) 9/24/2001 10:27:26 AM Microsoft Corporation c:\winnt\system32\rpcproxy\rpcproxy.dll
fpexedll.dll 4.0.2.4324 20.06 KB (20,541 bytes) 9/24/2001 10:27:24 AM Microsoft Corporation c:\program files\common files\microsoft shared\web server extensions\40\bin\fpexedll.dll
md5filt.dll 5.00.0984 32.77 KB (33,552 bytes) 9/24/2001 10:27:35 AM Microsoft Corporation c:\winnt\system32\inetsrv\md5filt.dll
gzip.dll 5.00.0984 30.27 KB (30,992 bytes) 9/24/2001 10:27:34 AM Microsoft Corporation c:\winnt\system32\inetsrv\gzip.dll
compfilt.dll 5.00.0984 22.77 KB (23,312 bytes) 9/24/2001 10:27:33 AM Microsoft Corporation c:\winnt\system32\inetsrv\compfilt.dll
sspifilt.dll 5.00.0984 43.27 KB (44,304 bytes) 9/24/2001 10:27:35 AM Microsoft Corporation c:\winnt\system32\inetsrv\sspifilt.dll
iscomlog.dll 5.00.0984 24.77 KB (25,360 bytes) 9/24/2001 10:27:35 AM Microsoft Corporation c:\winnt\system32\inetsrv\iscomlog.dll
lonsint.dll 5.00.0984 11.77 KB (12,048 bytes) 9/24/2001 10:27:35 AM Microsoft Corporation c:\winnt\system32\inetsrv\lonsint.dll
inetsloc.dll 5.00.0984 20.27 KB (20,752 bytes) 9/24/2001 10:26:17 AM Microsoft Corporation c:\winnt\system32\inetsloc.dll
iisfecnv.dll 5.00.0984 7.27 KB (7,440 bytes) 9/17/2001 10:05:27 AM Microsoft Corporation c:\winnt\system32\inetsrv\iisfecnv.dll
isatq.dll 5.00.0984 60.27 KB (61,712 bytes) 9/24/2001 10:27:35 AM Microsoft Corporation c:\winnt\system32\inetsrv\isatq.dll
infocomm.dll 5.00.0984 238.27 KB (243,984 bytes) 9/24/2001 10:27:34 AM Microsoft Corporation c:\winnt\system32\inetsrv\infocomm.dll
w3svc.dll 5.00.0984 343.27 KB (351,504 bytes) 9/24/2001 10:27:36 AM Microsoft Corporation c:\winnt\system32\inetsrv\w3svc.dll
security.dll 5.00.2154.1 5.77 KB (5,904 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\security.dll
svcext.dll 5.00.0984 39.77 KB (40,720 bytes) 9/24/2001 10:27:35 AM Microsoft Corporation c:\winnt\system32\inetsrv\svcext.dll
admexs.dll 5.00.0984 27.77 KB (28,432 bytes) 9/24/2001 10:27:33 AM Microsoft Corporation c:\winnt\system32\inetsrv\admexs.dll
wamreg.dll 5.00.0984 45.77 KB (46,864 bytes) 9/24/2001 10:27:36 AM Microsoft Corporation c:\winnt\system32\inetsrv\wamreg.dll
metadata.dll 5.00.0984 68.77 KB (70,416 bytes) 9/24/2001 10:27:35 AM Microsoft Corporation c:\winnt\system32\inetsrv\metadata.dll
iismap.dll 5.00.0984 55.77 KB (57,104 bytes) 9/24/2001 10:26:17 AM Microsoft Corporation c:\winnt\system32\iismap.dll
nsepm.dll 5.00.0984 43.27 KB (44,304 bytes) 9/24/2001 10:27:35 AM Microsoft Corporation c:\winnt\system32\inetsrv\nsepm.dll
admwprox.dll 5.00.0984 31.77 KB (32,528 bytes) 9/17/2001 10:05:29 AM Microsoft Corporation c:\winnt\system32\admwprox.dll
coadmin.dll 5.00.0984 39.27 KB (40,208 bytes) 9/24/2001 10:27:33 AM Microsoft Corporation c:\winnt\system32\inetsrv\coadmin.dll
iisadmin.dll 5.00.0984 15.27 KB (15,632 bytes) 9/24/2001 10:27:34 AM Microsoft Corporation c:\winnt\system32\inetsrv\iisadmin.dll
rpcref.dll 5.00.0984 4.27 KB (4,368 bytes) 9/24/2001 10:27:35 AM Microsoft Corporation c:\winnt\system32\inetsrv\rpcref.dll
iisrtl.dll 5.00.0984 119.77 KB (122,640 bytes) 9/24/2001 10:26:17 AM Microsoft Corporation c:\winnt\system32\iisrtl.dll
inetinfo.exe 5.00.0984 14.27 KB (14,608 bytes) 9/24/2001 10:27:34 AM Microsoft Corporation c:\winnt\system32\inetsrv\inetinfo.exe
netui1.dll 5.00.2134.1 210.27 KB (215,312 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\netui1.dll
netui0.dll 5.00.2134.1 70.27 KB (71,952 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\netui0.dll
ntlanman.dll 5.00.2157.1 35.27 KB (36,112 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\ntlanman.dll
wshnetbs.dll 5.00.2134.1 7.77 KB (7,952 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\wshnetbs.dll
ntmarta.dll 5.00.2195.2862 98.77 KB (101,136 bytes) 9/24/2001 10:26:29 AM Microsoft Corporation c:\winnt\system32\ntmarta.dll
provthrd.dll 1.50.1085.0000 68.07 KB (69,708 bytes) 9/17/2001 2:09:22 PM Microsoft Corporation c:\winnt\system32\wbem\provthrd.dll
ntevt.dll 1.50.1085.0000 192.06 KB (196,669 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\wbem\ntevt.dll

perfos.dll 5.00.2155.1 21.27 KB (21,776 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\perfos.dll
psapi.dll 5.00.2134.1 28.27 KB (28,944 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\psapi.dll
framedyn.dll 1.50.1085.0000 164.05 KB (167,992 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\wbem\framedyn.dll
cimwin32.dll 1.50.1085.0038 1.02 MB (1,073,232 bytes) 9/24/2001 10:26:41 AM Microsoft Corporation c:\winnt\system32\wbem\cimwin32.dll
wbemsvc.dll 1.50.1085.0007 40.07 KB (41,036 bytes) 9/24/2001 10:26:43 AM Microsoft Corporation c:\winnt\system32\wbem\wbemsvc.dll
wbemess.dll 1.50.1085.0039 364.07 KB (372,804 bytes) 9/24/2001 10:26:43 AM Microsoft Corporation c:\winnt\system32\wbem\wbemess.dll
fastprox.dll 1.50.1085.0037 144.08 KB (147,536 bytes) 9/24/2001 10:26:42 AM Microsoft Corporation c:\winnt\system32\wbem\fastprox.dll
wbemcore.dll 1.50.1085.0036 628.07 KB (643,140 bytes) 9/24/2001 10:26:42 AM Microsoft Corporation c:\winnt\system32\wbem\wbemcore.dll
wbemcomn.dll 1.50.1085.0021 692.07 KB (708,675 bytes) 9/24/2001 10:26:42 AM Microsoft Corporation c:\winnt\system32\wbem\wbemcomn.dll
winmgmt.exe 1.50.1085.0029 192.08 KB (196,685 bytes) 9/24/2001 10:26:43 AM Microsoft Corporation c:\winnt\system32\wbem\winmgmt.exe
simptcp.dll 5.00.2134.1 19.27 KB (19,728 bytes) 9/17/2001 10:04:47 AM Microsoft Corporation c:\winnt\system32\simptcp.dll
tcpsvcs.exe 5.00.2134.1 24.77 KB (25,360 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\tcpsvcs.exe
msidle.dll 5.00.2920.0000 6.27 KB (6,416 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msidle.dll
mstask.exe 4.71.2195.1 115.27 KB (118,032 bytes) 9/24/2001 10:26:26 AM Microsoft Corporation c:\winnt\system32\mstask.exe
regsvc.exe 5.00.2195.2104 65.27 KB (66,832 bytes) 9/24/2001 10:26:33 AM Microsoft Corporation c:\winnt\system32\regsvc.exe
nmssvc.exe 1.64.0.0 1012.00 KB (1,036,288 bytes) 10/8/2001 4:31:07 PM Intel Corporation c:\winnt\system32\nmssvc.exe
llsrpc.dll 5.00.2149.1 45.77 KB (46,864 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\llsrpc.dll
llssrv.exe 5.00.2195.2649 114.27 KB (117,008 bytes) 5/4/2001 12:05:02 PM Microsoft Corporation c:\winnt\system32\llssrv.exe
rasdlg.dll 5.00.2195.2671 514.27 KB (526,608 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\rasdlg.dll
netcfgx.dll 5.00.2195.2228 534.77 KB (547,600 bytes) 9/24/2001 10:26:28 AM Microsoft Corporation c:\winnt\system32\netcfgx.dll
rasmans.dll 5.00.2195.2728 147.27 KB (150,800 bytes) 9/24/2001 10:26:32 AM Microsoft Corporation c:\winnt\system32\rasmans.dll
wmi.dll 5.00.2191.1 6.27 KB (6,416 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\wmi.dll
netshell.dll 5.00.2195.2779 457.27 KB (468,240 bytes) 9/24/2001 10:26:28 AM Microsoft Corporation c:\winnt\system32\netshell.dll
netman.dll 5.00.2195.2779 89.27 KB (91,408 bytes) 9/24/2001 10:26:28 AM Microsoft Corporation c:\winnt\system32\netman.dll
ntmsdba.dll 5.00.2195.2779 167.27 KB (171,280 bytes) 9/24/2001 10:26:29 AM Microsoft Corporation c:\winnt\system32\ntmsdba.dll
sens.dll 5.00.2163.1 36.77 KB (37,648 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\sens.dll
iashlpr.dll 5.00.2184.1 33.27 KB (34,064 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\iashlpr.dll
iasacct.dll 5.00.2134.1 28.27 KB (28,944 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\iasacct.dll
iasuserr.dll 5.00.2134.1 25.77 KB (26,384 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\iasuserr.dll
iasnap.dll 5.00.2195.2104 58.77 KB (60,176 bytes) 9/24/2001 10:26:16 AM Microsoft Corporation c:\winnt\system32\iasnap.dll
iaspipe.dll 5.00.2134.1 41.77 KB (42,768 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\iaspipe.dll
expsrv.dll 6.0.8540 370.27 KB (379,152 bytes) 9/24/2001 10:26:16 AM Microsoft Corporation c:\winnt\system32\expsrv.dll
vbajet32.dll 6.1.8268 30.27 KB (30,992 bytes) 9/24/2001 10:26:37 AM Microsoft Corporation c:\winnt\system32\vbajet32.dll
msjtes40.dll 4.00.4229.0 236.27 KB (241,936 bytes) 9/24/2001 10:26:25 AM Microsoft Corporation c:\winnt\system32\msjtes40.dll
oledb32r.dll 2.62.7926.0 68.27 KB (69,904 bytes) 2/15/2002 1:26:21 PM Microsoft Corporation c:\program files\common files\system\ole db\oledb32r.dll
comdlg32.dll 5.00.3103.1000 236.77 KB (242,448 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\comdlg32.dll
msdart.dll 2.62.7926.0 144.27 KB (147,728 bytes) 2/15/2002 1:26:19 PM Microsoft Corporation c:\winnt\system32\msdart.dll
oledb32.dll 2.62.7926.0 448.27 KB (459,024 bytes) 2/15/2002 1:26:21 PM Microsoft Corporation c:\program files\common files\system\ole db\oledb32.dll
msjint40.dll 4.00.2927.2 148.27 KB (151,824 bytes) 9/24/2001 10:26:25 AM Microsoft Corporation c:\winnt\system32\msjint40.dll
msjter40.dll 4.00.2927.2 52.27 KB (53,520 bytes) 9/24/2001 10:26:25 AM Microsoft Corporation c:\winnt\system32\msjter40.dll
mswstr10.dll 4.00.3829.2 600.27 KB (614,672 bytes) 9/24/2001 10:26:27 AM Microsoft Corporation c:\winnt\system32\mswstr10.dll
msjet40.dll 4.00.4431.3 1.43 MB (1,503,504 bytes) 9/24/2001 10:26:25 AM Microsoft Corporation c:\winnt\system32\msjet40.dll
msjetoledb40.dll 4.00.4331.4 340.27 KB (348,432 bytes) 9/24/2001 10:26:25 AM Microsoft Corporation c:\winnt\system32\msjetoledb40.dll
iasrad.dll 5.00.2139.1 94.27 KB (96,528 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\iasrad.dll
iassam.dll 5.00.2160.1 96.27 KB (98,576 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\iassam.dll
iasads.dll 5.00.2134.1 73.77 KB (75,536 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\iasads.dll

ntmssvc.dll 5.00.2195.2779 391.27 KB (400,656 bytes) 9/24/2001 10:26:29 AM Microsoft Corporation c:\winnt\system32\ntmssvc.dll
iaspolcy.dll 5.00.2134.1 25.27 KB (25,872 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\iaspolcy.dll
iassvcs.dll 5.00.2195.2104 58.77 KB (60,176 bytes) 9/24/2001 10:26:17 AM Microsoft Corporation c:\winnt\system32\iassvcs.dll
iassdo.dll 5.00.2195.2104 261.77 KB (268,048 bytes) 9/24/2001 10:26:16 AM Microsoft Corporation c:\winnt\system32\iassdo.dll
ias.dll 5.00.2134.1 7.27 KB (7,440 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\ias.dll
es.dll 2000.2.3471.1 222.27 KB (227,600 bytes) 9/24/2001 10:26:15 AM Microsoft Corporation c:\winnt\system32\es.dll
mtxoci.dll 2000.2.3471.1 101.77 KB (104,208 bytes) 9/24/2001 10:26:27 AM Microsoft Corporation c:\winnt\system32\mtxoci.dll
resutils.dll 5.00.2195.2787 39.77 KB (40,720 bytes) 9/24/2001 10:26:33 AM Microsoft Corporation c:\winnt\system32\resutils.dll
clusapi.dll 5.00.2195.2104 54.27 KB (55,568 bytes) 9/24/2001 10:26:11 AM Microsoft Corporation c:\winnt\system32\clusapi.dll
msvcp50.dll 5.00.7051 552.50 KB (565,760 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msvcp50.dll
xolehlp.dll 1999.9.3421.3 17.27 KB (17,680 bytes) 9/17/2001 10:04:53 AM Microsoft Corporation c:\winnt\system32\xolehlp.dll
msdtclog.dll 1999.9.3421.3 89.77 KB (91,920 bytes) 9/17/2001 10:04:52 AM Microsoft Corporation c:\winnt\system32\msdtclog.dll
mtxclu.dll 2000.2.3471.1 51.27 KB (52,496 bytes) 9/24/2001 10:26:27 AM Microsoft Corporation c:\winnt\system32\mtxclu.dll
msdtcprx.dll 2000.2.3471.1 665.77 KB (681,744 bytes) 9/24/2001 10:26:21 AM Microsoft Corporation c:\winnt\system32\msdtcprx.dll
txfaux.dll 2000.2.3471.1 374.27 KB (383,248 bytes) 9/24/2001 10:26:37 AM Microsoft Corporation c:\winnt\system32\txfaux.dll
msdtctm.dll 2000.2.3471.1 1.07 MB (1,120,528 bytes) 9/24/2001 10:26:21 AM Microsoft Corporation c:\winnt\system32\msdtctm.dll
msdtc.exe 1999.9.3421.3 6.77 KB (6,928 bytes) 9/17/2001 10:04:52 AM Microsoft Corporation c:\winnt\system32\msdtc.exe
inetpp.dll 5.00.2195.2842 65.27 KB (66,832 bytes) 9/24/2001 10:26:17 AM Microsoft Corporation c:\winnt\system32\inetpp.dll
win32spl.dll 5.00.2195.2780 92.27 KB (94,480 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\win32spl.dll
usbmon.dll 5.00.2195.2780 11.27 KB (11,536 bytes) 9/24/2001 10:26:37 AM Microsoft Corporation c:\winnt\system32\usbmon.dll
tcpmon.dll 5.00.2195.2780 40.77 KB (41,744 bytes) 9/24/2001 10:26:36 AM Microsoft Corporation c:\winnt\system32\tcpmon.dll
pjlmon.dll 5.00.2165.1 12.77 KB (13,072 bytes) 11/30/1999 6:39:36 PM Microsoft Corporation c:\winnt\system32\pjlmon.dll
cnbjmon.dll 5.00.2134.1 43.77 KB (44,816 bytes) 11/30/1999 6:38:48 PM Microsoft Corporation c:\winnt\system32\cnbjmon.dll
localspl.dll 5.00.2195.2793 246.77 KB (252,688 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\localspl.dll
spoolss.dll 5.00.2161.1 61.77 KB (63,248 bytes) 9/17/2001 9:39:14 AM Microsoft Corporation c:\winnt\system32\spoolss.dll
spoolsv.exe 5.00.2161.1 43.77 KB (44,816 bytes) 9/17/2001 9:39:14 AM Microsoft Corporation c:\winnt\system32\spoolsv.exe
rpcss.dll 5.00.2195.2815 231.27 KB (236,816 bytes) 9/24/2001 10:26:33 AM Microsoft Corporation c:\winnt\system32\rpcss.dll
svchost.exe 5.00.2134.1 7.77 KB (7,952 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\svchost.exe
dssenh.dll 5.00.2195.2228 142.77 KB (146,192 bytes) 9/24/2001 10:27:28 AM Microsoft Corporation c:\winnt\system32\dssenh.dll
oakley.dll 5.00.2195.2785 378.77 KB (387,856 bytes) 9/24/2001 10:26:30 AM Microsoft Corporation c:\winnt\system32\oakley.dll
mfc42u.dll 6.00.8665.0 972.05 KB (995,384 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\mfc42u.dll
polagent.dll 5.00.2183.1 108.27 KB (110,864 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\polagent.dll
scecli.dll 5.00.2195.2780 105.27 KB (107,792 bytes) 9/24/2001 10:26:33 AM Microsoft Corporation c:\winnt\system32\scecli.dll
atl.dll 3.00.8449 57.56 KB (58,938 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\atl.dll
certcli.dll 5.00.2195.2778 130.77 KB (133,904 bytes) 9/24/2001 10:26:11 AM Microsoft Corporation c:\winnt\system32\certcli.dll
esent.dll 6.0.3940.13 1.08 MB (1,135,376 bytes) 9/24/2001 10:26:15 AM Microsoft Corporation c:\winnt\system32\esent.dll
ntdsatq.dll 5.00.2195.2878 31.27 KB (32,016 bytes) 9/24/2001 10:26:29 AM Microsoft Corporation c:\winnt\system32\ntdsatq.dll
ntdsa.dll 5.00.2195.2899 990.77 KB (1,014,544 bytes) 9/24/2001 10:26:29 AM Microsoft Corporation c:\winnt\system32\ntdsa.dll
kdcsvc.dll 5.00.2195.2878 137.77 KB (141,072 bytes) 9/24/2001 10:26:19 AM Microsoft Corporation c:\winnt\system32\kdcsvc.dll
sfmapi.dll 5.00.2134.1 38.77 KB (39,696 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\sfmapi.dll
rassfm.dll 5.00.2195.2671 21.27 KB (21,776 bytes) 9/24/2001 10:26:32 AM Microsoft Corporation c:\winnt\system32\rassfm.dll
mpr.dll 5.00.2195.2779 53.27 KB (54,544 bytes) 9/24/2001 10:26:20 AM Microsoft Corporation c:\winnt\system32\mpr.dll
rsabase.dll 5.00.2195.2228 128.27 KB (131,344 bytes) 5/4/2001 12:05:02 PM Microsoft Corporation c:\winnt\system32\rsabase.dll
schannel.dll 5.00.2195.2922 138.27 KB (141,584 bytes) 5/4/2001 12:05:02 PM Microsoft Corporation c:\winnt\system32\schannel.dll
netlogon.dll 5.00.2195.2865 357.77 KB (366,352 bytes) 9/24/2001 10:26:28 AM Microsoft Corporation c:\winnt\system32\netlogon.dll
msv1_0.dll 5.00.2195.2900 111.77 KB (114,448 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msv1_0.dll

kerberos.dll 5.00.2195.2913 198.77 KB (203,536 bytes) 9/24/2001 10:26:19 AM Microsoft Corporation c:\winnt\system32\kerberos.dll
msprivs.dll 5.00.2154.1 41.50 KB (42,496 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msprivs.dll
samsrv.dll 5.00.2195.2918 369.77 KB (378,640 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\samsrv.dll
lsasrv.dll 5.00.2195.2964 492.77 KB (504,592 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\lsasrv.dll
lsass.exe 5.00.2195.2964 32.77 KB (33,552 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\lsass.exe
xactsrv.dll 5.00.2134.1 90.27 KB (92,432 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\xactsrv.dll
ntlsapi.dll 5.00.2134.1 6.77 KB (6,928 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\ntlsapi.dll
wmicore.dll 5.00.2195.2842 72.27 KB (74,000 bytes) 9/24/2001 10:26:39 AM Microsoft Corporation c:\winnt\system32\wmicore.dll
rasadhlp.dll 5.00.2168.1 7.27 KB (7,440 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\rasadhlp.dll
winrnr.dll 5.00.2160.1 18.77 KB (19,216 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\winrnr.dll
rnr20.dll 5.00.2195.2871 35.77 KB (36,624 bytes) 9/24/2001 10:26:33 AM Microsoft Corporation c:\winnt\system32\rnr20.dll
wshtcpip.dll 5.00.2195.2104 17.27 KB (17,680 bytes) 9/24/2001 10:26:39 AM Microsoft Corporation c:\winnt\system32\wshtcpip.dll
msafd.dll 5.00.2195.2779 106.77 KB (109,328 bytes) 9/24/2001 10:26:21 AM Microsoft Corporation c:\winnt\system32\msafd.dll
mswsock.dll 5.00.2195.2871 62.77 KB (64,272 bytes) 9/24/2001 10:26:27 AM Microsoft Corporation c:\winnt\system32\mswsock.dll
msgsvc.dll 5.00.2195.2939 34.27 KB (35,088 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\msgsvc.dll
browser.dll 5.00.2195.2778 48.27 KB (49,424 bytes) 9/24/2001 10:26:10 AM Microsoft Corporation c:\winnt\system32\browser.dll
alrsvc.dll 5.00.2134.1 17.77 KB (18,192 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\alrsvc.dll
trkwks.dll 5.00.2166.1 88.77 KB (90,896 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\trkwks.dll
seclogon.dll 5.00.2135.1 15.77 KB (16,144 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\seclogon.dll
psbase.dll 5.00.2195.2779 111.77 KB (114,448 bytes) 9/24/2001 10:26:32 AM Microsoft Corporation c:\winnt\system32\psbase.dll
cryptsvc.dll 5.00.2181.1 61.77 KB (63,248 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\cryptsvc.dll
cryptdll.dll 5.00.2135.1 41.27 KB (42,256 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\cryptdll.dll
wkssvc.dll 5.00.2195.2780 95.27 KB (97,552 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\wkssvc.dll
srvsvc.dll 5.00.2195.2904 79.27 KB (81,168 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\srvsvc.dll
cfgmgr32.dll 5.00.2134.1 16.77 KB (17,168 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\cfgmgr32.dll
dmserver.dll 2195.2778.297.3 11.77 KB (12,048 bytes) 9/24/2001 10:26:14 AM VERITAS Software Corp. c:\winnt\system32\dmserver.dll
winsta.dll 5.00.2195.2386 36.77 KB (37,648 bytes) 9/24/2001 10:26:38 AM Microsoft Corporation c:\winnt\system32\winsta.dll
lmhsvc.dll 5.00.2195.2778 9.77 KB (10,000 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\lmhsvc.dll
dnsrslvr.dll 5.00.2195.2778 88.77 KB (90,896 bytes) 9/24/2001 10:26:14 AM Microsoft Corporation c:\winnt\system32\dnsrslvr.dll
tapi32.dll 5.00.2182.1 123.27 KB (126,224 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\tapi32.dll
rasman.dll 5.00.2195.2780 54.77 KB (56,080 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\rasman.dll
rasapi32.dll 5.00.2195.2671 189.77 KB (194,320 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\rasapi32.dll
rtutils.dll 5.00.2168.1 43.77 KB (44,816 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\rtutils.dll
adsldpc.dll 5.00.2195.2842 127.27 KB (130,320 bytes) 9/24/2001 10:26:09 AM Microsoft Corporation c:\winnt\system32\adsldpc.dll
activeds.dll 5.00.2195.2778 174.77 KB (178,960 bytes) 9/24/2001 10:26:02 AM Microsoft Corporation c:\winnt\system32\activeds.dll
mprapi.dll 5.00.2181.1 79.27 KB (81,168 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\mprapi.dll
iphlpapi.dll 5.00.2173.2 67.77 KB (69,392 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\iphlpapi.dll
icmp.dll 5.00.2134.1 7.27 KB (7,440 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\icmp.dll
dhcpcsvc.dll 5.00.2195.2778 88.77 KB (90,896 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\dhcpcsvc.dll
eventlog.dll 5.00.2178.1 43.77 KB (44,816 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\eventlog.dll
ntdsapi.dll 5.00.2195.2661 55.77 KB (57,104 bytes) 9/24/2001 10:26:29 AM Microsoft Corporation c:\winnt\system32\ntdsapi.dll
scesrv.dll 5.00.2195.2780 226.27 KB (231,696 bytes) 9/24/2001 10:26:33 AM Microsoft Corporation c:\winnt\system32\scesrv.dll
umpnpmgr.dll 5.00.2182.1 86.27 KB (88,336 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\umpnpmgr.dll
services.exe 5.00.2195.2780 86.77 KB (88,848 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\services.exe
clbcatq.dll 2000.2.3471.1 496.77 KB (508,688 bytes) 9/24/2001 10:26:11 AM Microsoft Corporation c:\winnt\system32\clbcatq.dll
oleaut32.dll 2.40.4517 612.27 KB (626,960 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation c:\winnt\system32\oleaut32.dll

cscui.dll 5.00.2195.2959 228.27 KB (233,744 bytes) 9/24/2001 10:26:12 AM Microsoft Corporation
c:\winnt\system32\cscui.dll
winspool.drv 5.00.2195.2780 109.77 KB (112,400 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\winspool.drv
winscard.dll 5.00.2134.1 77.27 KB (79,120 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\winscard.dll
wlnotify.dll 5.00.2195.2780 53.77 KB (55,056 bytes) 9/24/2001 10:26:39 AM Microsoft Corporation
c:\winnt\system32\wlnotify.dll
cscdll.dll 5.00.2195.2401 98.27 KB (100,624 bytes) 9/24/2001 10:26:12 AM Microsoft Corporation
c:\winnt\system32\cscdll.dll
lz32.dll 5.00.2134.1 9.77 KB (10,000 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\lz32.dll
version.dll 5.00.2134.1 15.77 KB (16,144 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\version.dll
rsaenh.dll 5.00.2195.2228 130.77 KB (133,904 bytes) 9/24/2001 10:27:28 AM Microsoft Corporation
c:\winnt\system32\rsaenh.dll
mscat32.dll 5.131.2134.1 7.77 KB (7,952 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\mscat32.dll
ole32.dll 5.00.2195.2887 969.77 KB (993,040 bytes) 9/24/2001 10:26:31 AM Microsoft Corporation
c:\winnt\system32\ole32.dll
imagehlp.dll 5.00.2195.2778 125.77 KB (128,784 bytes) 5/4/2001 12:05:02 PM Microsoft Corporation
c:\winnt\system32\imagehlp.dll
msasn1.dll 5.00.2134.1 51.27 KB (52,496 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\msasn1.dll
crypt32.dll 5.131.2195.2833 451.27 KB (462,096 bytes) 9/24/2001 10:26:12 AM Microsoft Corporation
c:\winnt\system32\crypt32.dll
wintrust.dll 5.131.2195.2779 162.27 KB (166,160 bytes) 9/24/2001 10:26:38 AM Microsoft Corporation
c:\winnt\system32\wintrust.dll
setupapi.dll 5.00.2195.2663 555.77 KB (569,104 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\setupapi.dll
winmm.dll 5.00.2161.1 184.77 KB (189,200 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\winmm.dll
comctl32.dll 5.81 537.77 KB (550,672 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\comctl32.dll
shlwapi.dll 5.00.3315.1000 282.77 KB (289,552 bytes) 9/24/2001 10:26:35 AM Microsoft Corporation
c:\winnt\system32\shlwapi.dll
shell32.dll 5.00.3315.2902 2.25 MB (2,359,056 bytes) 9/24/2001 10:26:35 AM Microsoft Corporation
c:\winnt\system32\shell32.dll
msgina.dll 5.00.2195.2779 324.27 KB (332,048 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\msgina.dll
wsock32.dll 5.00.2195.2871 21.27 KB (21,776 bytes) 9/24/2001 10:26:39 AM Microsoft Corporation
c:\winnt\system32\wsock32.dll
dnsapi.dll 5.00.2195.2785 130.77 KB (133,904 bytes) 9/24/2001 10:26:14 AM Microsoft Corporation
c:\winnt\system32\dnsapi.dll
wldap32.dll 5.00.2195.2797 125.27 KB (128,272 bytes) 9/24/2001 10:26:38 AM Microsoft Corporation
c:\winnt\system32\wldap32.dll
ws2help.dll 5.00.2134.1 17.77 KB (18,192 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\ws2help.dll
ws2_32.dll 5.00.2195.2780 67.77 KB (69,392 bytes) 9/24/2001 10:26:39 AM Microsoft Corporation
c:\winnt\system32\ws2_32.dll
samlib.dll 5.00.2195.2780 49.77 KB (50,960 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\samlib.dll
netrap.dll 5.00.2134.1 11.27 KB (11,536 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\netrap.dll
netapi32.dll 5.00.2195.2808 303.77 KB (311,056 bytes) 9/24/2001 10:26:28 AM Microsoft Corporation
c:\winnt\system32\netapi32.dll
profmap.dll 5.00.2181.1 29.27 KB (29,968 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\profmap.dll
secur32.dll 5.00.2195.2862 46.77 KB (47,888 bytes) 9/24/2001 10:26:34 AM Microsoft Corporation
c:\winnt\system32\secur32.dll
sfc.dll 5.00.2195.2896 92.11 KB (94,320 bytes) 9/24/2001 10:26:34 AM Microsoft Corporation
c:\winnt\system32\sfc.dll
nddeapi.dll 5.00.2137.1 15.27 KB (15,632 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\nddeapi.dll
userenv.dll 5.00.2195.2780 361.77 KB (370,448 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\userenv.dll
user32.dll 5.00.2195.2821 392.77 KB (402,192 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\user32.dll
gdi32.dll 5.00.2195.2778 228.77 KB (234,256 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\gdi32.dll
rpcrt4.dll 5.00.2195.2832 437.27 KB (447,760 bytes) 9/24/2001 10:26:33 AM Microsoft Corporation
c:\winnt\system32\rpcrt4.dll
advapi32.dll 5.00.2195.2867 351.77 KB (360,208 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\advapi32.dll
kernel32.dll 5.00.2195.2778 714.77 KB (731,920 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\kernel32.dll
msvcrt.dll 6.10.8924.0 284.05 KB (290,869 bytes) 5/4/2001 12:05:02 PM Microsoft Corporation
c:\winnt\system32\msvcrt.dll
winlogon.exe 5.00.2195.2953 173.77 KB (177,936 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\winlogon.exe
sfcfiles.dll 5.00.2195.2967 948.27 KB (971,024 bytes) 9/24/2001 10:26:34 AM Microsoft Corporation
c:\winnt\system32\sfcfiles.dll
ntdll.dll 5.00.2195.2779 478.77 KB (490,256 bytes) 5/4/2001 12:05:02 PM Microsoft Corporation
c:\winnt\system32\ntdll.dll
smss.exe 5.00.2195.2901 44.27 KB (45,328 bytes) 12/7/1999 7:00:00 AM Microsoft Corporation
c:\winnt\system32\smss.exe

[Services]

Display Name Name State Start ModeService Type
Path Error Control Start NameTag ID

Alerter Alerter Running Auto Share Process
c:\winnt\system32\services.exe Normal LocalSystem 0
Application Management AppMgmt Stopped Manual Share
Process c:\winnt\system32\services.exe Normal LocalSystem 0
Computer Browser Browser Running Auto Share Process
c:\winnt\system32\services.exe Normal LocalSystem 0
Indexing Service cisvc Stopped Manual Share Process
c:\winnt\system32\cisvc.exe Normal LocalSystem 0
ClipBook ClipSrv Stopped Manual Own Process
c:\winnt\system32\clipsrv.exe Normal LocalSystem 0
Distributed File System Dfs Running Auto Own
Process c:\winnt\system32\dfssvc.exe Normal LocalSystem 0
DHCP Client Dhcp Running Auto Share Process
c:\winnt\system32\services.exe Normal LocalSystem 0
Logical Disk Manager Administrative Service dmadmin Stopped
Manual Share Process c:\winnt\system32\dmadmin.exe /com
Normal LocalSystem 0
Logical Disk Managerdmserver Running Auto Share Process
c:\winnt\system32\services.exe Normal LocalSystem 0
DNS Client Dnscache Running Auto Share Process
c:\winnt\system32\services.exe Normal LocalSystem 0
Event Log Eventlog Running Auto Share Process
c:\winnt\system32\services.exe Normal LocalSystem 0
COM+ Event System EventSystem Running Manual Share
Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Fax Service Fax Stopped Manual Own Process
c:\winnt\system32\faxsvc.exe Normal LocalSystem 0
Internet Authentication Service IAS Running Auto Share
Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
IIS Admin Service IISADMIN Running Auto Share
Process c:\winnt\system32\inetsrv\inetinfo.exe Normal
LocalSystem 0
Intersite Messaging IsmServ Stopped Disabled Own Process
c:\winnt\system32\ismserv.exe Normal LocalSystem 0
Kerberos Key Distribution Center kdc Stopped Disabled
Share Process c:\winnt\system32\lsass.exe Normal
LocalSystem 0
Server lanmanserver Running Auto Share Process
c:\winnt\system32\services.exe Normal LocalSystem 0
Workstation lanmanworkstation Running Auto Share
Process c:\winnt\system32\services.exe Normal LocalSystem 0
License Logging Service LicenseService Running Auto
Own Process c:\winnt\system32\llssrv.exe Normal
LocalSystem 0
TCP/IP NetBIOS Helper Service LmHosts Running Auto Share
Process c:\winnt\system32\services.exe Normal LocalSystem 0
Messenger Messenger Running Auto Share Process
c:\winnt\system32\services.exe Normal LocalSystem 0
NetMeeting Remote Desktop Sharing mnmsrvc Stopped Manual
Own Process c:\winnt\system32\mnmsrvc.exe Normal
LocalSystem 0
Distributed Transaction Coordinator MSDTC Running Auto
Own Process c:\winnt\system32\msdtc.exe Normal
LocalSystem 0
Windows Installer MSIServer Stopped Manual Share Process
c:\winnt\system32\msiexec.exe /v Normal LocalSystem 0
Network DDE NetDDE Stopped Manual Share Process
c:\winnt\system32\netdde.exe Normal LocalSystem 0
Network DDE DSDM NetDDEdsdm Stopped Manual Share
Process c:\winnt\system32\netdde.exe Normal LocalSystem 0
Net Logon Netlogon Stopped Manual Share Process
c:\winnt\system32\lsass.exe Normal LocalSystem 0
Network Connections Netman Running Manual Share Process
c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem 0
NMS Service NMSSvc Running Auto Own Process
c:\winnt\system32\nmssvc.exe Normal LocalSystem 0
File Replication NtFrs Stopped Manual Own Process
c:\winnt\system32\ntfrs.exe Ignore LocalSystem 0
NT LM Security Support Provider NtLmSsp Stopped Manual
Share Process c:\winnt\system32\lsass.exe Normal
LocalSystem 0
Removable Storage NtmsSvc Running Auto Share Process
c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Plug and Play PlugPlay Running Auto Share Process
c:\winnt\system32\services.exe Normal LocalSystem 0
IPSEC Policy Agent PolicyAgent Running Auto Share
Process c:\winnt\system32\lsass.exe Normal LocalSystem 0
Protected Storage ProtectedStorage Running Auto Share
Process c:\winnt\system32\services.exe Normal LocalSystem 0
Remote Access Auto Connection Manager RasAuto Stopped Manual
Share Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Remote Access Connection Manager RasMan Stopped Manual
Share Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Routing and Remote Access RemoteAccess Stopped Disabled
Share Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Remote Registry Service RemoteRegistry Running Auto
Own Process c:\winnt\system32\regsvc.exe Normal
LocalSystem 0
Remote Procedure Call (RPC) Locator RpcLocator Stopped
Manual Own Process c:\winnt\system32\locator.exe Normal
LocalSystem 0
Remote Procedure Call (RPC) RpcSs Running Auto Share
Process c:\winnt\system32\svchost -k rpcss Normal
LocalSystem 0
QoS Admission Control (RSVP) RSVP Running Auto Own
Process c:\winnt\system32\rsvp.exe -s Normal LocalSystem 0
Security Accounts Manager SamSs Running Auto Share
Process c:\winnt\system32\lsass.exe Normal LocalSystem 0
Smart Card Helper SCardDrv Stopped Manual Share Process
c:\winnt\system32\scardsvr.exe Ignore LocalSystem 0
Smart Card SCardSvr Stopped Manual Share Process
c:\winnt\system32\scardsvr.exe Ignore LocalSystem 0
Task Scheduler Schedule Running Auto Share Process
c:\winnt\system32\mstask.exe Normal LocalSystem 0
RunAs Service seclogon Running Auto Share Process
c:\winnt\system32\services.exe Ignore LocalSystem 0
System Event Notification SENS Running Auto Share
Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Internet Connection Sharing SharedAccess Stopped Manual
Share Process c:\winnt\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Simple TCP/IP Services SimpTcp Running Auto Share
Process c:\winnt\system32\tcpsvcs.exe Normal LocalSystem 0
Print Spooler Spooler Running Auto Own Process
c:\winnt\system32\spoolsv.exe Normal LocalSystem 0
Performance Logs and Alerts SysmonLog Stopped Manual
Own Process c:\winnt\system32\smlogsvc.exe Normal
LocalSystem 0
Telephony TapiSrv Running Manual Share Process
c:\winnt\system32\svchost.exe -k tapisrv Normal LocalSystem 0
Terminal Services TermService Stopped Disabled Own
Process c:\winnt\system32\termsrv.exe Normal LocalSystem 0
Telnet TlntSvr Stopped Manual Own Process
c:\winnt\system32\tlntsvr.exe Normal LocalSystem 0
Distributed Link Tracking Server TrkSvr Stopped Manual Share
Process c:\winnt\system32\services.exe Normal LocalSystem 0
Distributed Link Tracking Client TrkWks Running Auto Share
Process c:\winnt\system32\services.exe Normal LocalSystem 0
Uninterruptible Power Supply UPS Stopped Manual Own
Process c:\winnt\system32\ups.exe Normal LocalSystem 0

Utility Manager UtilMan Stopped Manual Own Process
c:\winnt\system32\utilman.exe Normal LocalSystem 0
Windows Time W32Time Stopped Manual Share Process
c:\winnt\system32\services.exe Normal LocalSystem 0
World Wide Web Publishing Service W3SVC Running Auto
Share Process c:\winnt\system32\inetsrv\inetinfo.exe Normal
LocalSystem 0
Windows Management Instrumentation WinMgmt Running Auto
Own Process c:\winnt\system32\wbem\winmgmt.exe Ignore
LocalSystem 0
Windows Management Instrumentation Driver Extensions Wmi
Running Manual Share Process c:\winnt\system32\services.exe
Normal LocalSystem 0

[Program Groups]

Group Name Name User Name
Accessories Default User:Accessories Default User
Accessories\Accessibility Default User:Accessories\Accessibility
Default User
Accessories\Entertainment Default User:Accessories\Entertainment
Default User
Accessories\System Tools Default User:Accessories\System Tools
Default User
Startup Default User:Startup Default User
Accessories All Users:Accessories All Users
Accessories\Accessibility All Users:Accessories\Accessibility
All Users
Accessories\Communications All Users:Accessories\Communications
All Users
Accessories\Entertainment All Users:Accessories\Entertainment
All Users
Accessories\Games All Users:Accessories\Games All Users
Accessories\Microsoft Script Debugger All Users:Accessories\Microsoft
Script Debugger All Users
Accessories\System Tools All Users:Accessories\System Tools
All Users
Administrative Tools All Users:Administrative Tools All Users
Microsoft SQL Server All Users:Microsoft SQL Server All Users
Startup All Users:Startup All Users
Accessories CLIENT10\Administrator:Accessories
CLIENT10\Administrator
Accessories\Accessibility
CLIENT10\Administrator:Accessories\Accessibility
CLIENT10\Administrator
Accessories\Entertainment
CLIENT10\Administrator:Accessories\Entertainment
CLIENT10\Administrator
Accessories\System Tools CLIENT10\Administrator:Accessories\System
Tools CLIENT10\Administrator
Administrative Tools CLIENT10\Administrator:Administrative Tools
CLIENT10\Administrator
Startup CLIENT10\Administrator:Startup
CLIENT10\Administrator

[Startup Programs]

Program Command User NameLocation
Promon.exe promon.exe All Users
HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Run

[OLE Registration]

Object Local Server
Sound (OLE2) sndrec32.exe
Media Clip mplay32.exe
Video Clip mplay32.exe /avi
MIDI Sequence mplay32.exe /mid
Sound Not Available
Media Clip Not Available
Image Document "C:\Program Files\Windows
NT\Accessories\ImageVue\KodakImg.exe"
WordPad Document "%ProgramFiles%\Windows
NT\Accessories\WORDPAD.EXE"
Windows Media Services DRM Storage object Not Available
Bitmap Image mspaint.exe

[Internet Explorer 5]

[Following are sub-categories of this main category]

[Summary]

Item Value
Version 5.00.3315.1000
Build 53315.1000
Product ID 51876-270-7339724-05107
Application Path C:\Program Files\Internet Explorer
Language English (United States)
Active Printer Not Available

Cipher Strength 168-bit
Content Advisor Disabled
IEAK Install No

[File Versions]

File Version Size Date Path Company
advapi32.dll 5.0.2195.2867 352 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
advpack.dll 5.0.3103.1000 87 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
browselc.dll 5.0.3315.2846 35 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
browseui.dll 5.0.3315.2846 789 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
ckcnv.exe 5.0.2189.1 9 KB 12/7/1999 7:00:00 AM
C:\WINNT\system32 Microsoft Corporation
comctl32.dll 5.81.3103.1000 538 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
crypt32.dll 5.131.2195.2833 451 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
enhsig.dll <File Missing> Not Available Not Available
Not Available Not Available
iemigrat.dll <File Missing> Not Available Not
Available Not Available Not Available
iesetup.dll 5.0.3103.1000 57 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
iexplore.exe 5.0.2920.0 59 KB 12/7/1999 7:00:00 AM
C:\Program Files\Internet Explorer Microsoft Corporation
imagehlp.dll 5.0.2195.2778 126 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
imghelp.dll <File Missing> Not Available Not
Available Not Available Not Available
inseng.dll 5.0.3103.1000 72 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
jobexec.dll 5.0.0.1 47 KB 12/7/1999 7:00:00 AM
C:\WINNT\system32 Microsoft Corporation
jscript.dll 5.1.0.5907 476 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
jsproxy.dll 5.0.2920.0 13 KB 12/7/1999 7:00:00 AM
C:\WINNT\system32 Microsoft Corporation
msaahtml.dll <File Missing> Not Available Not
Available Not Available Not Available
mshtml.dll 5.0.3315.2870 2290 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation

msjava.dll 5.0.3802.0 923 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
msoss.dll <File Missing> Not Available Not Available
Not Available Not Available
msxml.dll 8.0.5718.1 493 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
occache.dll 5.0.3103.1000 86 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
ole32.dll 5.0.2195.2887 970 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
oleaut32.dll 2.40.4517.0 612 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
olepro32.dll 5.0.4517.0 160 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
rsabase.dll 5.0.2195.2228 128 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
rsaenh.dll 5.0.2195.2228 131 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
rsapi32.dll <File Missing> Not Available Not Available
Not Available Not Available
rsasig.dll <File Missing> Not Available Not Available
Not Available Not Available
schannel.dll 5.1.2195.0 138 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
shdoc401.dll <File Missing> Not Available Not
Available Not Available Not Available
shdocvw.dll 5.0.3315.2879 1078 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
shell32.dll 5.0.3315.2902 2304 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
shlwapi.dll 5.0.3315.1000 283 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
url.dll 5.0.2920.0 82 KB 12/7/1999 7:00:00 AM
C:\WINNT\system32 Microsoft Corporation
urlmon.dll 5.0.3315.1000 441 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
vbscript.dll 5.1.0.5907 428 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
webcheck.dll 5.0.3315.1000 252 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
win.com 5.0.2134.1 24 KB 12/7/1999 7:00:00 AM
C:\WINNT\system32 Microsoft Corporation
wininet.dll 5.0.3315.1000 457 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
winsock.dll 3.10.0.103 3 KB 12/7/1999 7:00:00 AM
C:\WINNT\system32 Microsoft Corporation
wintrust.dll 5.131.2195.2779 162 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
wsock.vxd <File Missing> Not Available Not Available
Not Available Not Available
wsock32.dll 5.0.2195.2871 21 KB 5/4/2001 11:05:02 AM
C:\WINNT\system32 Microsoft Corporation
wsock32n.dll <File Missing> Not Available Not
Available Not Available Not Available

[Connectivity]

Item Value
Connection Preference Never dial
EnableHttp1.1 1
ProxyHttp1.1 0

LAN Settings

AutoConfigProxy wininet.dll
AutoProxyDetectMode Enabled
AutoConfigURL
Proxy Disabled
ProxyServer
ProxyOverride

[Cache]

[Following are sub-categories of this main category]

[Summary]

Item Value
Page Refresh Type Automatic
Temporary Internet Files Folder C:\Documents and
Settings\Administrator\Local Settings\Temporary Internet Files
Total Disk Space 8667 MB
Available Disk Space 5973 MB
Maximum Cache Size 270 MB
Available Cache Size 271 MB

[List of Objects]

Program File Status CodeBase
No cached object information available

[Content]

[Following are sub-categories of this main category]

[Summary]

Item Value
Content Advisor Disabled

[Personal Certificates]

Issued To Issued By Validity Signature Algorithm
Administrator Administrator 9/17/2001 to 8/24/2101
sha1RSA

[Other People Certificates]

Issued To Issued By Validity Signature Algorithm
No other people certificate information available

[Publishers]

Name
No publisher information available

[Security]

Zone Security Level
Local intranet Medium-low
Trusted sites Low
Internet Medium
Restricted sites High

COM+ Settings

COM+ Settings

TPCC.AllTxns:
Activation:
Enable Object Pooling selected
Minimum Pool Size: 190
Maximum Pool Size: 190
Creating Timeout: 60,000
Enable Object Construction

Enable Just in Time Activation
Concurrency:
Concurrency Required

TPCC Application Registry Parameters

TPCC Application Registry Parameters

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\TPCC]
"Path"="c:\\inetpub\\wwwroot\\"
"NumberOfDeliveryThreads"=dword:0x16
"MaxConnections"=dword:0x4a38
"MaxPendingDeliveries"=dword:0x7d0
"DB_Protocol"="ODBC"
"TxnMonitor"="COM"
"DbServer"="tpcc-2way"
"DbName"="tpcc"
"DbUser"="sa"
"DbPassword"=""
"COM_SinglePool"="YES"
```

Microsoft Internet Information Service Registry Parameters

Microsoft Internet Information Service Registry Parameters

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo\Parameters]
"ListenBackLog"=dword:0x19
"DispatchEntries"=hex(7):4c,00,44,00,41,00,50,00,53,00,56,00,43,00,00,00,00,00,
00
"PoolThreadLimit"=dword:0xbe
"ThreadTimeout"=dword:0x15180

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo\Performance]
"Library"="infoctrs.dll"
"Open"="OpenINFOPerformanceData"
"Close"="CloseINFOPerformanceData"
"Collect"="CollectINFOPerformanceData"
"Last Counter"=dword:0x842
"Last Help"=dword:0x843
"First Counter"=dword:0x802
```

World Wide Web Service Registry Parameters

World Wide Web Service Registry Parameters

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC]
"Type"=dword:0x20
"Start"=dword:0x2
"ErrorControl"=dword:0x1
"ImagePath"=hex(2):43,00,3a,00,5c,00,57,00,49,00,4e,00,4e,00,54,00,5c,00,53,
00,\
  79,00,73,00,74,00,65,00,6d,00,33,00,32,00,5c,00,69,00,6e,00,65,00,74,00,73,\
  00,72,00,76,00,5c,00,69,00,6e,00,65,00,74,00,69,00,6e,00,66,00,6f,00,2e,00,\
  65,00,78,00,65,00,00,00
"DisplayName"="World Wide Web Publishing Service"
"DependOnService"=hex(7):49,00,49,00,53,00,41,00,44,00,4d,00,49,00,4e,00,0
0,00,\
  00,00
"DependOnGroup"=hex(7):00,00
"ObjectName"="LocalSystem"
"Description"="Provides Web connectivity and administration through the
Internet Information Services snap-in."

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\
ASP]
"NOTE"="This is for backward compatibility only."

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\
ASP\Parameters]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters]
"MajorVersion"=dword:00000005
"MinorVersion"=dword:00000000
"InstallPath"="C:\\WINNT\\System32\\inetsrv"
"CertMapList"="C:\\WINNT\\System32\\inetsrv\\iiscrmap.dll"
"AccessDeniedMessage"="Error: Access is Denied."
"Filter DLLs"=""
"LogFileDirectory"="C:\\WINNT\\System32\\LogFiles"
"AcceptExOutstanding"=dword:00000028

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\ADCLaunch]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\ADCLaunch\AdvancedDataFactory]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\ADCLaunch\RDSServer.DataFactory]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\Script Map]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\Virtual Roots]
"/"="c:\\inetpub\\wwwroot,,205"
"/Scripts"="c:\\inetpub\\scripts,,1"
"/IISAdmin"="C:\\WINNT\\System32\\inetsrv\\iisadmin,,1"
"/IISSamples"="c:\\inetpub\\iissamples,,1"
"/MSADC"="c:\\program files\\common files\\system\\msadc,,1"
"/IISHelp"="c:\\winnt\\help\\iishelp,,1"
"/_vti_bin"="C:\\Program Files\\Common Files\\Microsoft Shared\\Web Server
Extensions\\40\\isapi,,1"
"/Rpc"="C:\\WINNT\\System32\\RpcProxy,,1"
"/Printers"="C:\\WINNT\\web\\printers,,201"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Performance]
"Library"="w3ctrs.dll"
"Open"="OpenW3PerformanceData"
"Close"="CloseW3PerformanceData"
"Collect"="CollectW3PerformanceData"
"Last Counter"=dword:000008f2
"Last Help"=dword:000008f3
"First Counter"=dword:00000850
"First Help"=dword:00000851

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Security]
"Security"=hex:01,00,14,80,a0,00,00,00,ac,00,00,00,14,00,00,00,30,00,00,00,0
2,\
  00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00,00,00,00,00,01,00,00,\
  00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00,01,01,00,00,00,00,00,\
  05,12,00,00,00,74,00,6f,00,00,00,1c,00,ff,01,0f,00,01,02,00,00,00,00,00,05,\
  20,00,00,00,20,02,00,00,72,00,73,00,00,00,18,00,8d,01,02,00,01,01,00,00,00,\
```

00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02,00,01,02,00,00,00,00,\
00,05,20,00,00,00,23,02,00,00,72,00,73,00,01,01,00,00,00,00,00,05,12,00,00,\
00,01,01,00,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Enum]
"0"="Root\\LEGACY_W3SVC\\0000"
"Count"=dword:00000001
"NextInstance"=dword:00000001

RTE Input Parameters

Profile: 1870w_20rte
File Path: C:\benchcrf\profile\1870w_20rte.pro
Version: 1.0.1

Number of Engines: 20

Name: DRIVER1
Description: rte11
Directory: c:\benchcrf\log\driver1
Machine: rtes2
Parameter Set: ~Default
Index: 0
Seed: 25744
Configured Users: 940
Pipe Name: DRIVER13910218
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER10
Description: rte32
Directory: c:\benchcrf\log\driver10
Machine: rtes2
Parameter Set: ~Default
Index: 900000000
Seed: 25744
Configured Users: 940
Pipe Name: DRIVER105368953
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 1

Name: DRIVER11
Description: rte33
Directory: c:\benchcrf\log\driver11
Machine: rtes2
Parameter Set: ~Default
Index: 1000000000
Seed: 25744
Configured Users: 930
Pipe Name: DRIVER115414703
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 2

Name: DRIVER12
Description: rte34
Directory: c:\benchcrf\log\driver12
Machine: rtes2
Parameter Set: ~Default
Index: 1100000000
Seed: 25744
Configured Users: 930
Pipe Name: DRIVER125445828
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 3

Name: DRIVER13
Description: rte41
Directory: c:\benchcrf\log\driver13
Machine: rtes2
Parameter Set: ~Default
Index: 1200000000
Seed: 25744
Configured Users: 930
Pipe Name: DRIVER135478015
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER14
Description: rte42
Directory: c:\benchcrf\log\driver14
Machine: rtes2
Parameter Set: ~Default
Index: 1300000000
Seed: 25744
Configured Users: 930
Pipe Name: DRIVER145517468
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 1

Name: DRIVER15
Description: rte43
Directory: c:\benchcrf\log\driver15
Machine: rtes2
Parameter Set: ~Default
Index: 1400000000
Seed: 25744
Configured Users: 930
Pipe Name: DRIVER155550687
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 2

Name: DRIVER16
Description: rte44
Directory: c:\benchcrf\log\driver16
Machine: rtes2
Parameter Set: ~Default
Index: 1500000000
Seed: 25744
Configured Users: 930
Pipe Name: DRIVER165594984
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 3

Name: DRIVER17
Description: rte15
Directory: c:\benchcrf\log\driver17
Machine: rtes2
Parameter Set: ~Default

Index: 1600000000
Seed: 25744
Configured Users: 930
Pipe Name: DRIVER178253984
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER18
Description: rte25
Directory: c:\benchcrf\log\driver18
Machine: rtes2
Parameter Set: ~Default
Index: 1700000000
Seed: 25744
Configured Users: 930
Pipe Name: DRIVER188295625
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 1

Name: DRIVER19
Description: rte35
Directory: c:\benchcrf\log\driver19
Machine: rtes2
Parameter Set: ~Default
Index: 1800000000
Seed: 25744
Configured Users: 930
Pipe Name: DRIVER198333625
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 2

Name: DRIVER2
Description: rte12
Directory: c:\benchcrf\log\driver2
Machine: rtes2
Parameter Set: ~Default
Index: 100000000
Seed: 25744
Configured Users: 940
Pipe Name: DRIVER24802593
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 1

Name: DRIVER20
Description: rte45
Directory: c:\benchcrf\log\driver20
Machine: rtes2
Parameter Set: ~Default
Index: 1900000000
Seed: 25744
Configured Users: 930
Pipe Name: DRIVER20122968234
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 3

Name: DRIVER3
Description: rte13
Directory: c:\benchcrf\log\driver3
Machine: rtes2
Parameter Set: ~Default
Index: 200000000
Seed: 25744
Configured Users: 940
Pipe Name: DRIVER34857234
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 2

Name: DRIVER4
Description: rte14
Directory: c:\benchcrf\log\driver4
Machine: rtes2
Parameter Set: ~Default
Index: 300000000
Seed: 25744
Configured Users: 940
Pipe Name: DRIVER45155671
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 3

Name: DRIVER5
Description: rte21
Directory: c:\benchcrf\log\driver5
Machine: rtes2
Parameter Set: ~Default
Index: 400000000
Seed: 25744
Configured Users: 940
Pipe Name: DRIVER55193562
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Name: DRIVER6
Description: rte22
Directory: c:\benchcrf\log\driver6
Machine: rtes2
Parameter Set: ~Default
Index: 500000000
Seed: 25744
Configured Users: 940
Pipe Name: DRIVER65224953
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 1

Name: DRIVER7
Description: rte23
Directory: c:\benchcrf\log\driver7
Machine: rtes2
Parameter Set: ~Default
Index: 600000000
Seed: 25744
Configured Users: 940
Pipe Name: DRIVER75257406
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 2

Name: DRIVER8

Description: rte24
Directory: c:\benchcrf\log\driver8
Machine: rtes2
Parameter Set: ~Default
Index: 700000000
Seed: 25744
Configured Users: 940
Pipe Name: DRIVER85300468
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 3

Name: DRIVER9
Description: rte31
Directory: c:\benchcrf\log\driver9
Machine: rtes2
Parameter Set: ~Default
Index: 800000000
Seed: 25744
Configured Users: 940
Pipe Name: DRIVER95332359
Connect Rate: 400
Start Rate: 0
CLIENT_NURAND: 233
CPU: 0

Number of User groups: 20

Driver Engine: DRIVER1
IIS Server: client1
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 1 - 94
w_id Max Warehouse: 1870
Scale: Normal
User Count: 940
District id: 1
Scale Down: No

Driver Engine: DRIVER2
IIS Server: client1
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 95 - 188
w_id Max Warehouse: 1870
Scale: Normal
User Count: 940
District id: 1
Scale Down: No

Driver Engine: DRIVER16
IIS Server: client4
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 1406 - 1498
w_id Max Warehouse: 1870
Scale: Normal
User Count: 930
District id: 1
Scale Down: No

Driver Engine: DRIVER5
IIS Server: client2
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 377 - 470
w_id Max Warehouse: 1870
Scale: Normal
User Count: 940
District id: 1
Scale Down: No

Driver Engine: DRIVER3
IIS Server: client1
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 189 - 282
w_id Max Warehouse: 1870
Scale: Normal
User Count: 940
District id: 1
Scale Down: No

Driver Engine: DRIVER4
IIS Server: client1
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 283 - 376
w_id Max Warehouse: 1870
Scale: Normal
User Count: 940
District id: 1
Scale Down: No

Driver Engine: DRIVER18
IIS Server: client2
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 1592 - 1684
w_id Max Warehouse: 1870
Scale: Normal
User Count: 930
District id: 1
Scale Down: No

Driver Engine: DRIVER17
IIS Server: client1
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 1499 - 1591
w_id Max Warehouse: 1870
Scale: Normal
User Count: 930
District id: 1
Scale Down: No

Driver Engine: DRIVER19
IIS Server: client3
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 1685 - 1777
w_id Max Warehouse: 1870
Scale: Normal
User Count: 930
District id: 1
Scale Down: No

Driver Engine: DRIVER7
IIS Server: client2
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 565 - 658
w_id Max Warehouse: 1870
Scale: Normal
User Count: 940
District id: 1
Scale Down: No

Driver Engine: DRIVER6
IIS Server: client2
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 471 - 564
w_id Max Warehouse: 1870
Scale: Normal
User Count: 940
District id: 1
Scale Down: No

Driver Engine: DRIVER10
IIS Server: client3
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 847 - 940
w_id Max Warehouse: 1870
Scale: Normal
User Count: 940
District id: 1
Scale Down: No

Driver Engine: DRIVER8
IIS Server: client2
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 659 - 752
w_id Max Warehouse: 1870
Scale: Normal
User Count: 940
District id: 1
Scale Down: No

Driver Engine: DRIVER9
IIS Server: client3
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 753 - 846
w_id Max Warehouse: 1870
Scale: Normal
User Count: 940
District id: 1
Scale Down: No

Driver Engine: DRIVER12
IIS Server: client3
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 1034 - 1126
w_id Max Warehouse: 1870
Scale: Normal
User Count: 930
District id: 1
Scale Down: No

Driver Engine: DRIVER11
IIS Server: client3
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 941 - 1033
w_id Max Warehouse: 1870
Scale: Normal
User Count: 930
District id: 1
Scale Down: No

Driver Engine: DRIVER20
IIS Server: client4
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 1778 - 1870
w_id Max Warehouse: 1870
Scale: Normal
User Count: 930
District id: 1
Scale Down: No

Driver Engine: DRIVER13
IIS Server: client4
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 1127 - 1219
w_id Max Warehouse: 1870
Scale: Normal
User Count: 930
District id: 1
Scale Down: No

Driver Engine: DRIVER14
IIS Server: client4
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 1220 - 1312
w_id Max Warehouse: 1870
Scale: Normal
User Count: 930
District id: 1
Scale Down: No

Driver Engine: DRIVER15
IIS Server: client4
SQL Server: tpcc-2way
User: sa
Protocol: Html
w_id Range: 1313 - 1405
w_id Max Warehouse: 1870
Scale: Normal
User Count: 930
District id: 1
Scale Down: No

Number of Parameter Sets: 1

~Default
Default Parameter Set

		Txn Weight	Think Time	Key Time	RT Delay	RT Fence	Menu Delay
New Order		44.88	12.05	18.01	0.10		
5.00	0.10						
Payment		43.03	12.05	3.01	0.10		
5.00	0.10						
Delivery		4.03	5.05	2.01	0.10		
5.00	0.10						
Stock Level		4.03	5.05	2.01	0.10		
20.00	0.10						
Order Status		4.03	10.05	2.01	0.10		
5.00	0.10						

Appendix D: 60-Day Space

TPC-C 60-Day Space Requirements						
Warehouses	1,870				tpmC	23,027.07
Table	Rows	Data KB	Index KB	Extra 5% KB	8HR Space	Total Space KB
Warehouse	1,870	200	16	10.80		226.80
District	18,700	2,080	16	104.80		2,200.80
Item	100,000	9,528	32	478.00		10,038.00
New-Order	16,830,000	266,088	616		149,600.00	416,304.00
History	56,100,000	3,116,680	40		614,090.51	3,730,810.51
Orders	56,100,000	1,719,544	781,920		492,865.99	2,994,329.99
Customer	56,100,000	40,800,000	2,432,920	2,161,646.00		45,394,566.00
Order-Line	560,998,691	35,062,424	74,224		6,923,009.46	42,059,657.46
Stock	187,000,000	59,840,000	111,864	2,997,593.20		62,949,457.20
Totals		140,816,544	3,401,648	5,159,832.80	8,179,565.96	157,557,590.76
Segment	LogDev Cnt.	Segment Size	Needed	Overhead		Not Needed
misc	1	62,914,560	49,213,568	492,136		13,208,856.77
big	1	125,829,120	108,344,023	1,083,440		16,401,656.57
master, msdb,model	1	13,312	13,312			
tpcc_root	1	8,192	8,192			
tempdb	1	8,704	8,704			
Totals		188,773,888.00	157,587,798.76	1,575,575.91		29,610,513.33
Dynamic Space	39,898,648.00	Sum of Data for Order, Order-Line and History				
Static Space	111,054,952.71	Data + Index + 5% Space + Overhead - Dynamic Space				
Free Space	8,209,773.96	Total Segment Size - Dynamic Space - Static Space - Not needed				
Daily Growth	7,861,271.15	(Dynamic Space/W * 62.5)* tpmC				
Daily Spread	(3,582,132.77)	Free Space - 1.5 * Daily Growth (Zero If Negative)				
60-Day Space (KB)	582,731,221.96	Static Space + 60 (Daily Growth + Daily Spread)				
60-Day Space (GB)	555.74	60-Day Space in GB (Excludes OS,Paging and RDBMS Logs)				
Available (GB)	1,794.58	Total storage configured and available for database, minus logs, in RAID-0 configuration.				
Log File Storage Requirement						
Log Size (MB)	50,000.00	Total Size of Log File				
% Log Used	31.0975	% of Log File Used During Entire Run				
Total N-O Txn	3,273,004.00	Total Count of New-Order Transactions during Entire Run				
Log / N-O Txn	4.86	KB of Log per New-Order Transaction				
8 Hour Log (GB)	51.28	8 Hours of Log in GB (Excluding Space for Redundancy)				
Log Configured (GB)	67.72					
Disk Capacity	MB	GB				
18.2GB	17,736	16.93				
36.4GB	35,472	33.86				
Space Usage	GB Needed		Disks Priced	Disk Size	GB Priced	GB Usable
60-Day (RAID-0)	555.74		106	18.2GB	1,794.58	1,794.58
Total DB						1,794.58
8hr Log (RAID-1)	51.28		4	18.2GB	67.72	33.86
			2	36.4GB	67.72	33.86
Total Log						67.72
OS, SQL Server	4.00		1	18.2GB	16.93	16.93
Total Space	611.02		113		1,946.95	1,879.23

Appendix E: Third-Party Quotations

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

Tel 425 882 8080
Fax 425 936 7329
http://www.microsoft.com/

Microsoft

March 4, 2002

IBM Corporation
Chris King
3039 Cornwallis Road
Research Triangle Park,
NC 27709

Chris:

Here is the information you requested regarding pricing for several Microsoft products to be used in conjunction with your TPC-C benchmark testing.

All pricing shown is in US Dollars ($).

Part Number	Description	Unit Price	Quantity	Price
228-01079	**SQL Server 2000 Standard Edition** *Per processor licensing*	$4,999	2	$9,998
C11-00821	**Windows 2000 Server** *Server license only - No CALs* *Discount schedule: Open Program - No Level*	$738	2	$1,476
048-00317	**Visual C++ Professional 6.0 Win32**	$ 549	1	$ 549
	3-year maintenance for above software	$2,095	1	$6,285

All products are currently orderable through Microsoft's normal distribution channels.

This quote is valid for the next 90 days.

If we can be of any further assistance, please contact Jamie Reding at (425) 703-0510 or jamiere@microsoft.com.

Reference ID: PCchki0204038040
Please include this Reference ID in any correspondence regarding this price quote.

ComputerGiants.com
21084 Bake Parkway., Suite 104
Lake Forest, CA 92630
949-460-0066 Fax 949-460-9595

Date: 3/4/2002 16:18

Quote #21699A

q u o t e

ComputerGiants.com is Pleased to Quote the Following:

Quote To: **IBM**

Attn: Chris King
Phone: 919-543-8799

Salesman	Ship Via	Terms
Justin Briggs	Fedex 3day	Net30

Item	CTD Number	Units	Description	Unit PR	Total
					$ -
1	08P3834	1 TO 5	MYLEX EXTREMERAID 2000 2INT CHAN 4EXT	$ 1,302.00	
			UHD CH U160 SCSI 32MB		$ -
			Fedex 3day	$ 20.00	$ -
	08P3834	6 TO 9	MYLEX EXTREMERAID 2000 2INT CHAN 4EXT	$ 1,293.00	
			UHD CH U160 SCSI 32MB		
			Fedex 3day	$ 25.00	$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -

Delivery:
Federal Tax ID # 11-3482159
F.O.B. Lake Forest
Quote Valid for 90 Days

SUBTOTAL	$ -
FREIGHT	
MISC	
TOTAL	

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Signature: *Justin Briggs*
Justin Briggs

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LanAdapters.com

7ft Cat 5 Network Patch Cables.

7ft Category 5 and (Cat5e)Enhanced Network patch cables MOLDED. 35(RJ45/RJ45 Twist Pair supports fast ethernet. These cat 5 e cables are ba(compatible with cat 5 qty discount on orders above 30

Availability: Usually ships the same business day.

CBLC57 **$2.00, 31/$39.06** Color: ANYjustSHIPasap Order