TPC Benchmark™ C
Full Disclosure Report
for
IBM® @server™ xSeries® 235
using
Microsoft® SQL Server 2000 Standard Edition
and
Microsoft Windows® Server 2003 Standard Edition

TPC-C Version 5.1

Submitted for Review
July 10, 2003

IBM®

First Edition - July 2003

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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 235 configured as a client/server system. This report documents the full disclosure information required by the TPC Benchmark™ C Standard Specification, Revision 5.1, including the methodology used to achieve the reported results. All testing fully complied with this revision level.

The software used on the x235 system includes Microsoft Windows Server 2003 Standard Edition 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.

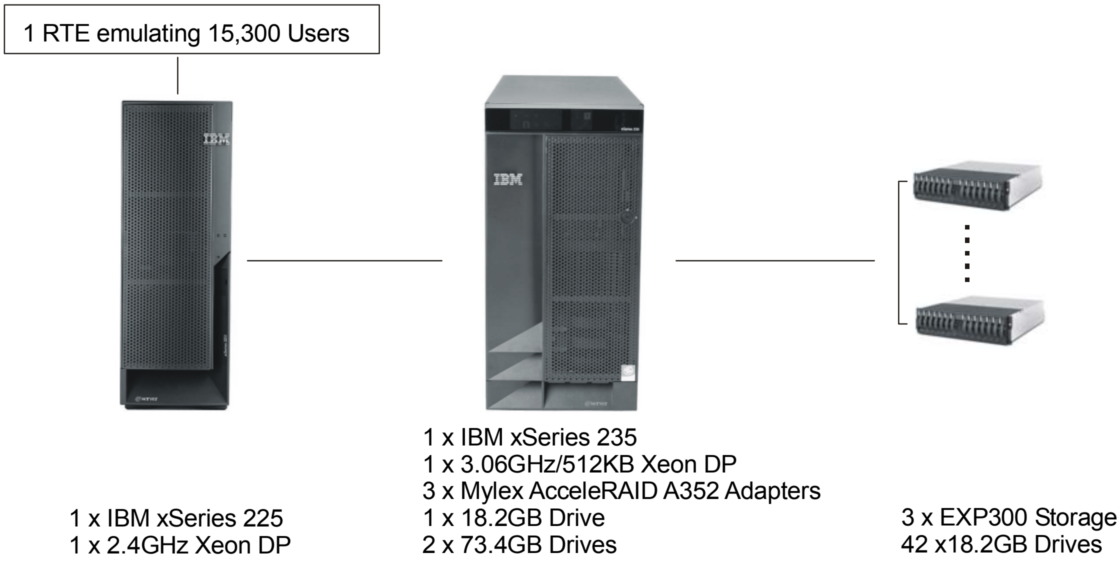
Hardware	Software	Total System Cost	tpmC	$/tpmC	Total Solution Availability Date
IBM @server xSeries 235	Microsoft SQL Server 2000 Standard Edition Microsoft Windows Server 2003 Standard Edition	$46,539	18,936.05	$2.46	July 10, 2003

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® 235 c/s With Microsoft® SQL Server 2000**	TPC-C Rev. 5.1 Report Date: July 10, 2003

Total System Cost	TPC-C Throughput	Price/Performance	Availability Date
$46,539	**18,936.05 tpmC**	**$2.46 / tpmC**	**July 10, 2003**

Processors	Database Manager	Operating System	Other Software	Number of Users
Database Server: 1 Intel® Xeon™ DP 3.06GHz **Client: 1 Xeon DP 2.4GHz**	**Microsoft SQL Server 2000 Standard Edition**	**Microsoft Windows® Server 2003 Standard Edition**	**Microsoft Visual C++** **Microsoft COM+**	**15,300**



System Component	Qty	Server	Qty	Client
Processors	**1**	**3.06GHz Xeon DP**	**1**	**2.4GHz Xeon DP**
Cache		**512KB L2 Cache**		**512KB L2 Cache**
Memory	**2**	**256MB**	**4**	**256MB**
	2	**1GB ECC SDRAM RDIMM**		
Disk Controllers	**3**	**Mylex AcceleRAID A352 Adapter with 32MB**	**1**	**Ultra320 SCSI Interface**
	1	**Integrated Ultra320 SCSI**		
Disk Drives	**42**	**18.2GB (15000 rpm)**	**1**	**18.2GB (10000 rpm)**
	2	**73.4GB (10000 rpm)**		
	1	**18.2GB (10000 rpm)**		
Total Storage		**863.43GB**		
Tape Drive	**1**	**20/40GB SCSI Tape Drive**		

IBM Corporation	**IBM @server xSeries 235 c/s** **with** **Microsoft SQL Server 2000**	TPC-C Rev. 5.1 Report Date: July 10, 2003

Description	Order Number	Third-Party		Unit	Qty	Ext. Price	3-Yr.
		Brand	Pricing	Price			Maint.*
Server Hardware							
xSeries 235 w/ 1 x 3.06GHz/512KB Xeon DP 2 x 256MB PC2100 ECC SDRAM Integrated Dual-Channel Ultra320 SCSI	8671-81X	IBM	1	$2,949	1	$2,949	$689
1GB ECC SDRAM RDIMM Memory Kit	33L5039	IBM	1	659	2	1,318	0
18.2GB 10K Ultra160 SCSI Drive	06P5754	IBM	1	275	1	275	0
Mylex AcceleRAID A352 SCSI Adapter (+2)	08P2420	Mylex	3	580	5	2,900	0
Netfinity 4.2M Ultra2 SCSI Cable	03K9311	IBM	1	105	6	630	0
E54 15" (13.8" Viewable) Color Monitor*	633147N	IBM	1	129	1	129	90
20/40GB Internal SCSI Tape Drive	00N7991	IBM	1	699	1	699	0
Storage Hardware							
EXP300 Rack Storage Enclosure*	3531-1RU	IBM	1	3,179	3	9,537	600
18.2GB 15K Ultra160 SCSI Drive	06P5767	IBM	1	329	42	13,818	0
73.4GB 10K Ultra160 SCSI Drive	06P5756	IBM	1	639	2	1,278	0
NetBAY11 Enterprise Rack*	9306110	IBM	1	519	1	519	168
					Subtotal	$34,052	$1,547
Server Software							
Microsoft SQL Server 2000 Standard Edition	228-01079	Microsoft	2	4,999	1	$4,999	$0
Microsoft Windows Server 2003 SE	P73-00295	Microsoft	2	738	1	738	0
Three-Year Maintenance for Software		Microsoft	2	1,950	3		5,850
					Subtotal	$5,737	$5,850
Client Hardware							
xSeries 225 / 2.4GHz/512KB Xeon DP* 2 x 256MB PC2100 ECC SDRAM	8647-3AX	IBM	1	1,269	1	$1,269	$689
256MB PC2100 ECC SDRAM RDIMM	33L5037	IBM	1	165	2	330	0
18.2GB 10K Ultra160 SCSI Drive	06P5754	IBM	1	275	1	275	0
IBM 10/100 Dual-Port Server Adapter	22P4901	IBM	1	209	2	418	0
E54 15" (13.8" Viewable) Color Monitor*	633147N	IBM	1	129	1	129	90
					Subtotal	$2,421	$779
Client Software							
Microsoft Windows 2000 Server with COM+	C11-00821	Microsoft	2	738	1	738	0
Microsoft Visual C++ Standard	254-00170	Microsoft	2	109	1	109	0
					Subtotal	$847	$0
User Connectivity							
Cross-over Cable (7 ft.)*** (+2)	CBLC5C7		4	2	3	6	0
					Subtotal	$6	$0
					Total	$43,063	$8,176
IBM hardware discount of 14%; prices vary if purchased separately.			1			$4,700	$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)
1 - IBM List Price, 1-866-426-0472; 2 - Microsoft Corp.; 3 - Computer Giants; 4 - LanAdapters.com
Audited by Bradley J. Askins of InfoSizing, Inc.

Three-Year Cost of Ownership:	$46,539
tpmC Rating:	18,936.05
$ / tpmC:	$2.46

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: 18,936.05 tpmC

Response Times (in seconds)	**90th Percentile**	**Average**	**Maximum**
New-Order	0.82	0.56	6.38
Payment	0.54	0.32	5.08
Delivery	0.41	0.21	1.03
Stock Level	4.54	2.54	6.92
Order Status	0.75	0.49	7.65
Delivery (Deferred)	1.85	1.25	4.75
Menu	0.42	0.22	1.08

Response Time Delay Added for Emulated Components: 0.1 Seconds

Transaction Mix (in percent of total transactions)	**Percent**
New-Order	44.87
Payment	43.00
Delivery	4.06
Stock-Level	4.03
Order Status	4.04

Keying/Think Times (in seconds)	**Minimum**	**Average**	**Maximum**
New Order	18.00 / 0.00	18.01 / 12.04	18.03 / 120.50
Payment	3.00 / 0.00	3.01 / 12.04	3.03 / 120.50
Delivery	2.00 / 0.00	2.01 / 5.03	2.04 / 50.50
Stock Level	2.00 / 0.00	2.01 / 5.03	2.03 / 50.50
Order Status	2.00 / 0.00	2.01 / 10.01	2.02 / 100.50

Test Duration	
Ramp-up time	30 minutes 15 seconds
Measurement interval	120 minutes
Number of checkpoints	4
Checkpoint interval	30 minutes
Number of transactions (all types) completed in measurement interval	5,270,282

Table of Contents

Preface

The TPC Benchmark^{TM} 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

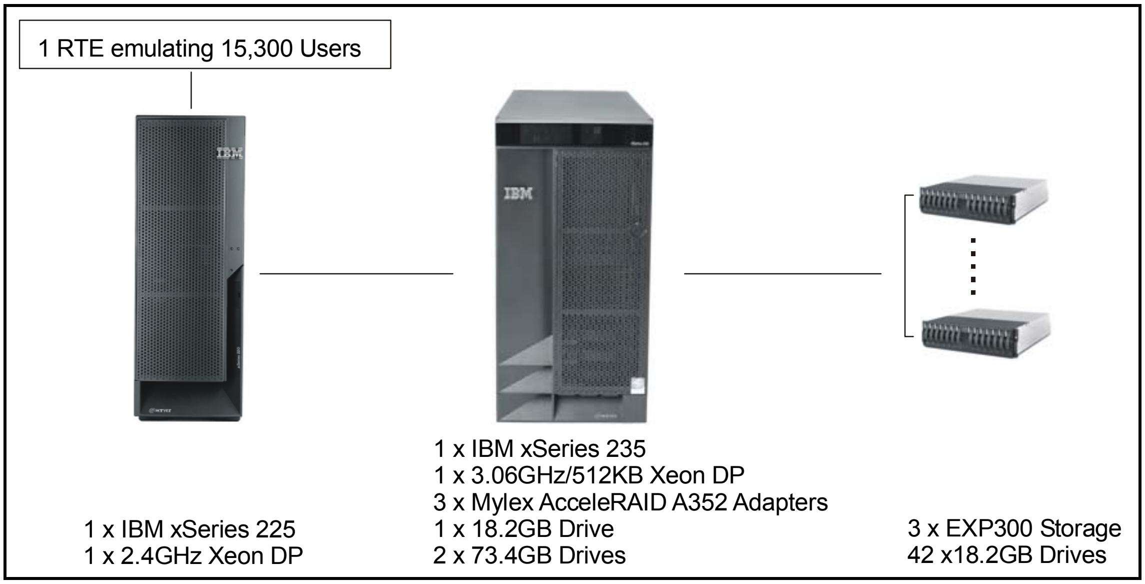
Diagrams of both measured and priced configurations must be provided, accompanied by a description of the differences.

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 225 system as the client, which executed the terminal I/O and submitted transactions to COM+ servers, which are 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 is the DBMS executing on the server

Measured and Priced Configuration



The measured and priced configurations were identical.

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 225 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 235 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	0.98
Average number of items per order	10.00
Payment	
Home warehouse payment transactions	85.06
Remote warehouse payment transactions	14.94
Non-Primary Key Access	
Payment transactions using C_LAST	60.03
Order-Status transactions using C_LAST	59.89
Delivery	
Delivery transactions skipped	0
Transaction Mix	
New-Order	44.87
Payment	43.00
Delivery	4.06
Stock Level	4.03
Order Status	4.04

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 shell script 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 shell scripts to issue queries to the database. Each script included timestamps to demonstrate the concurrency of operations. The results of the queries were captured 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 10 percent of the total 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.

Combined Loss of Log and Loss of System Test (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. The test started with a full load with all users submitting transactions. A checkpoint was issued, and the system continued to run for another 5 minutes.
3. One of the log disk drives was removed. Since the log disk was mirrored, SQL Server continued to process transactions without interruption.
4. The test continued for another 3 minutes.
5. The server under test was powered off, which removed power from the system and the memory.
6. The server was powered on again.
7. SQL Server was started to initiate automatic recovery from its log.
8. Step 1 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.

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 1,530 warehouses, and the audited run used all 1,530 warehouses.

Table 4-1. Initial Cardinality of Tables

Table Name	Rows
Warehouse	1,530
District	15,300
Item	100,000
New Order	13,770,000
History	45,900,000
Orders	45,900,000
Customer	45,900,000
Order Line	459,001,971
Stock	153,000,000
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
0	2 - 73.4GB	E:	45000MB	Logfile
1	14 - 18.2GB	F: G:	29200MB 14000MB	Customer and Stock Misc.
2	14 - 18.2GB	H: I: Y:	29200MB 14000MB 80000MB (NTFS)	Customer and Stock Misc. Backup 1
3	14 - 18.2GB	J: K: Z:	29200MB 14000MB 80000MB (NTFS)	Customer and Stock Misc. Backup 2

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 DBLIB 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: 18,936.05 tpmC
Price per tpmC: $2.46 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	0.56	6.38	0.82
Payment	0.32	5.08	0.54
Delivery	0.21	1.03	0.41
Stock Level	2.54	6.92	4.54
Order Status	0.49	7.65	0.75
Delivery (Deferred)	1.25	4.75	1.85
Menu	0.22	1.08	0.42

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 / 12.04	18.00 / 0.00	18.03 / 120.50
Payment	3.01 / 12.04	3.00 / 0.00	3.03 / 120.50
Delivery	2.01 / 5.03	2.00 / 0.00	2.04 / 50.50
Stock Level	2.01 / 5.03	2.00 / 0.00	2.03 / 50.50
Order Status	2.01 / 10.01	2.00 / 0.00	2.02 / 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

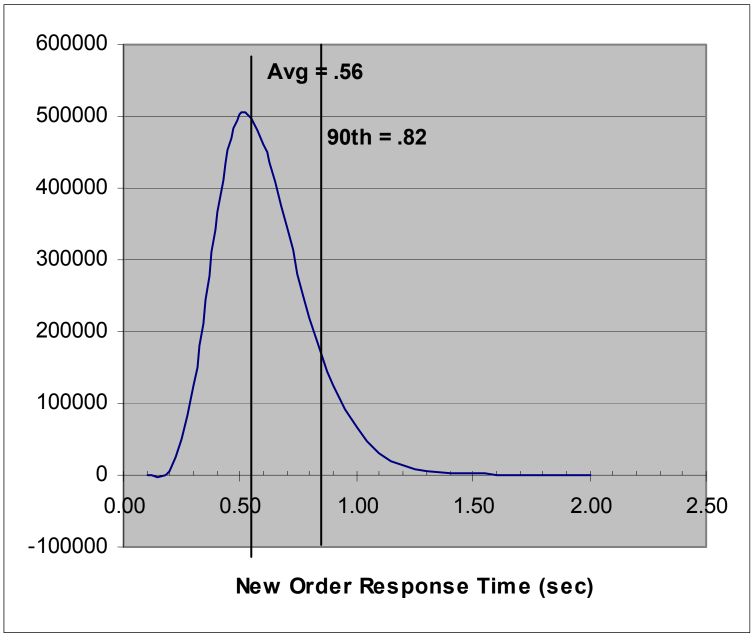


Figure 5-2. Payment Transaction - Response Time Frequency Distribution

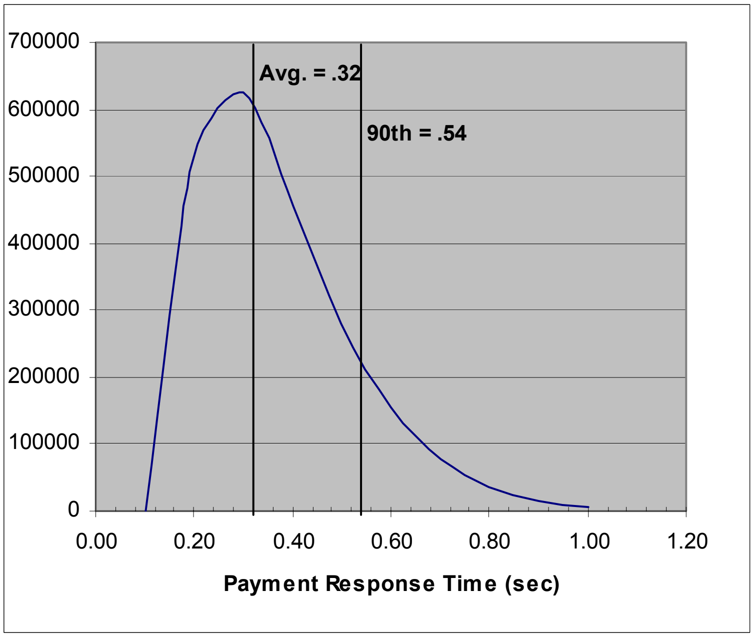


Figure 5-3. Order-Status Transaction - Response Time Frequency Distribution

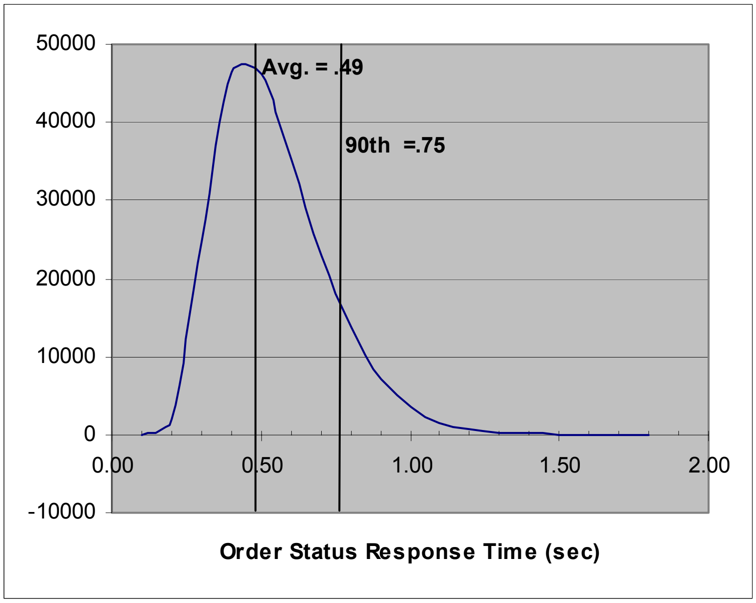


Figure 5-4. Delivery Transaction - Response Time Frequency Distribution

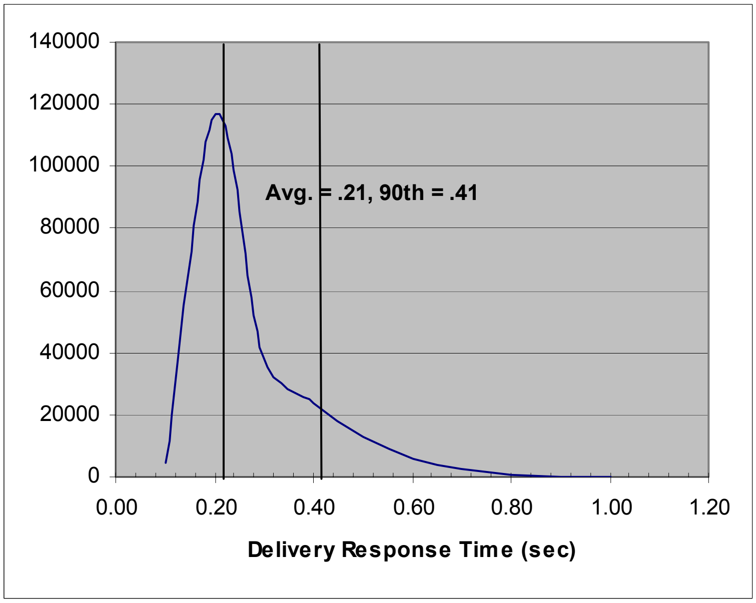
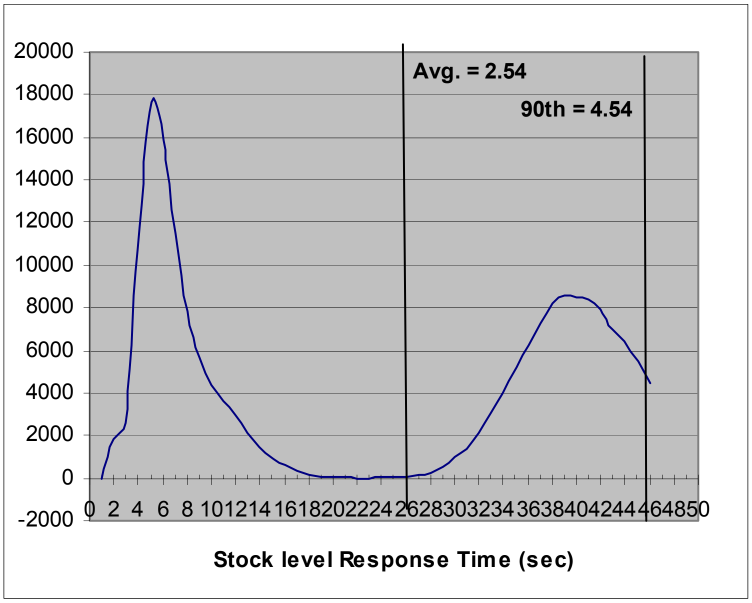


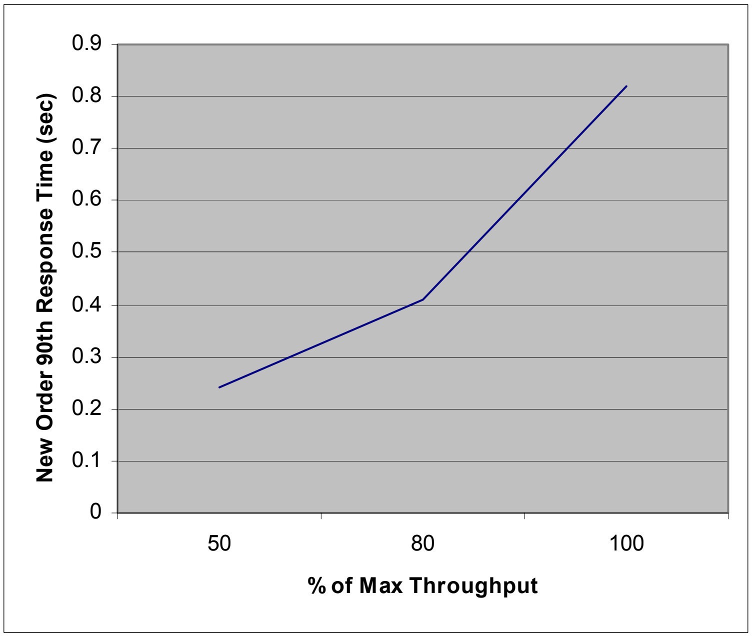
Figure 5-5. Stock-Level Transaction - Response Time Frequency Distribution



Performance Curve for Response Time vs. Throughput

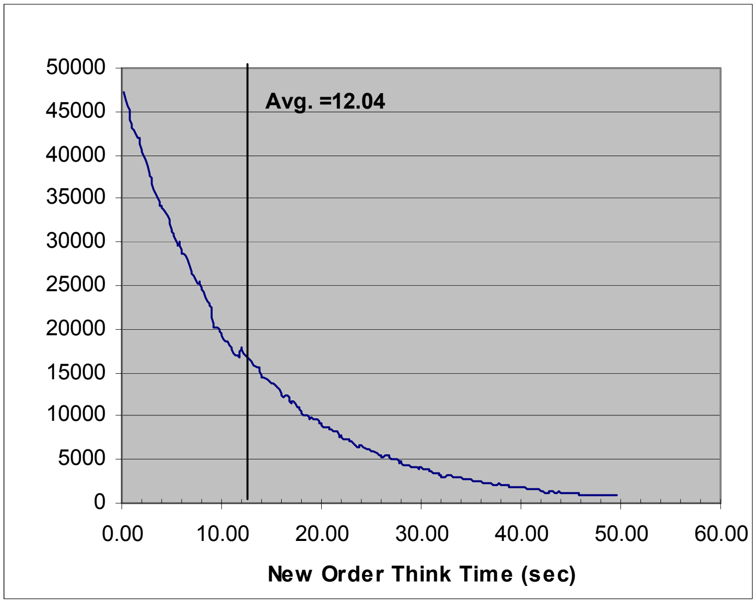
The performance curve for response time vs. throughput (see Clause 5.6.2) must be reported for the New-Order transaction.

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



New Order Think Time Distribution

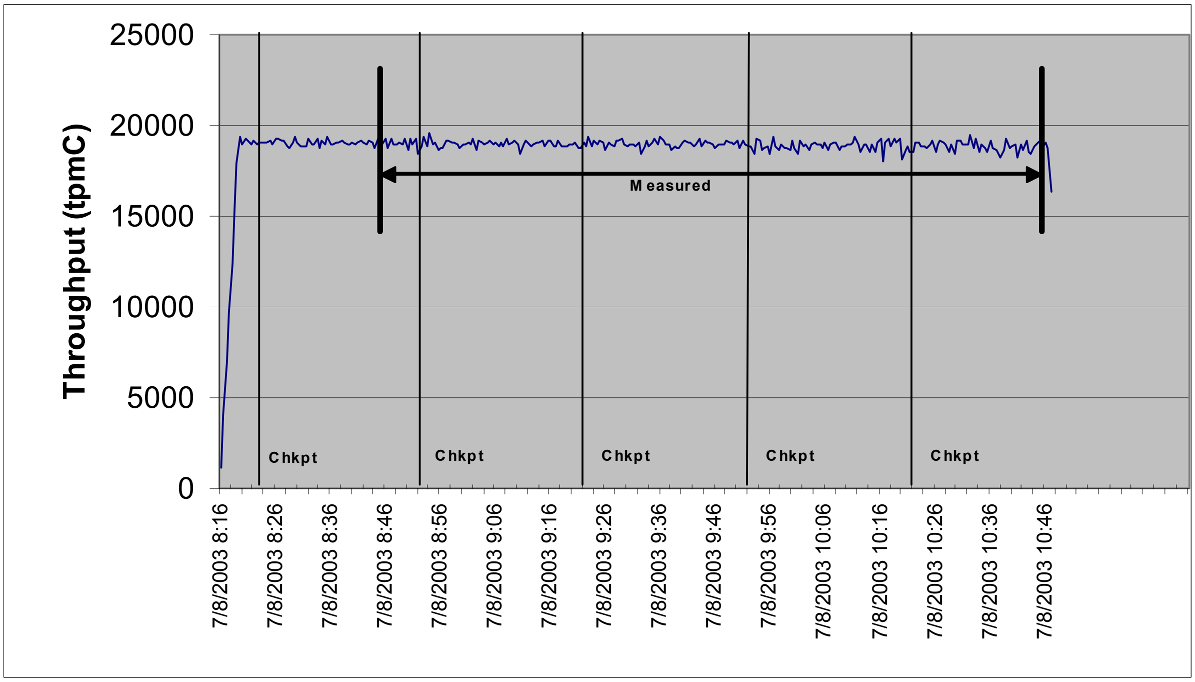
Figure 5-7. New-Order Think Time Distribution



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 DBLIB 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	0.98
Average number of items per order	10.00
Payment	
Home warehouse payment transactions	85.06
Remote warehouse payment transactions	14.94
Non-Primary Key Access	
Payment transactions using C_LAST	60.03
Order-Status transactions using C_LAST	59.89
Delivery	
Delivery transactions skipped	0
Transaction Mix	
New-Order	44.87
Payment	43.00
Delivery	4.06
Stock Level	4.03
Order-Status	4.04

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 5 minutes and 3 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	08:52:03 a.m.	14 minutes 38 seconds
2	09:22:01 a.m.	15 minutes 52 seconds
3	09:51:59 a.m.	16 minutes 49 seconds
4	10:21:57 a.m.	17 minutes 20 seconds

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 1.1.2 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 (pages 13 and 14) 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.

All hardware and software used in this benchmark are currently available.

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:	18,936.05 tpmC
♦ Price per tpmC:	$2.46 per tpmC
♦ Three-year cost of ownership:	$46,539

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:

- 1 Microsoft Windows Server 2003 Standard Edition
- 1 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^{TM}C," the Full Disclosure Report must have been submitted to the TPC Administrator as well as written permission obtained to distribute same.

The TPC Benchmark C Full Disclosure Report is available at www.tpc.org.

INFO SIZING

TPC TRANSACTION PROCESSING PERFORMANCE COUNCIL CERTIFIED AUDITOR

Benchmark Sponsor: Kamran Amini
Manager, xSeries Performance
IBM Systems Group
3039 Cornwallis Road
Research Triangle Park, NC 27709

July 9, 2003

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

Platform:	**IBM @server xSeries 235 c/s**
Operating system:	**Microsoft Windows Server 2003 Standard 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 235				
1 x Xeon DP (3.06GHz)	2.5 GB Main (512KB L2 Cache)	43 x 18.2 GB 2 x 73.4 GB	0.82 Seconds	**18,936.05**
Clients: One (1) IBM @server xSeries 225 (Specification for each)				
1 x Xeon DP (2.4 GHz)	1 GB Main (512 KB 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

Additional Audit Notes:

None.

Respectfully Yours,

François Raab, President

Bradley J. Askins, Auditor

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>";

                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}} */


/* Object interface: IUnknown, ver. 0.0,

GUID={0x00000000,0x0000,0x0000,{0xC0,0x00,0x00,0x00,0x00,0x00,0x00,0x46}} */


/* Object interface: ITPCC, ver. 0.0,

GUID={0xFEEE6AA2,0x84B1,0x11d2,{0xBA,0x47,0x00,0xC0,0x4F,0xBF,0xE0,0x8B}} */


extern const MIDL_STUB_DESC Object_StubDesc;


extern const MIDL_SERVER_INFO ITPCC_ServerInfo;

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

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

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

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

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

extern const USER_MARSHAL_ROUTINE_QUADRUPLE
UserMarshalRoutines[ WIRE_MARSHAL_TABLE_SIZE ];

static const MIDL_STUB_DESC Object_StubDesc =
   {
   0,
   NdrOleAllocate,
   NdrOleFree,
   0,
   0,
   0,
   0,
   0,
   __MIDL_TypeFormatString.Format,
   1, /* -error bounds_check flag */
   0x20000, /* Ndr library version */
   0,
   0x5030118, /* MIDL Version 5.3.280 */
   0,
   UserMarshalRoutines,
   0,  /* notify & notify_flag routine table */
   0x1, /* MIDL flag */
   0,  /* Reserved3 */
   0,  /* Reserved4 */
   0   /* Reserved5 */
   };

#pragma data_seg(".rdata")

static const USER_MARSHAL_ROUTINE_QUADRUPLE
UserMarshalRoutines[ WIRE_MARSHAL_TABLE_SIZE ] =
        {

          {
          VARIANT_UserSize
          ,VARIANT_UserMarshal
          ,VARIANT_UserUnmarshal
          ,VARIANT_UserFree
          }

        };


#if !defined(__RPC_WIN32__)
#error  Invalid build platform for this stub.
#endif

#if !(TARGET_IS_NT40_OR_LATER)
#error You need a Windows NT 4.0 or later to run this stub because it uses
these features:
#error   -Oif or -Oicf, [wire_marshal] or [user_marshal] attribute.
#error However, your C/C++ compilation flags indicate you intend to run this
app on earlier systems.
```

```
#error This app will die there with the RPC_X_WRONG_STUB_VERSION
error.
#endif


static const MIDL_PROC_FORMAT_STRING __MIDL_ProcFormatString =
    {
        0,
        {

            /* Procedure NewOrder */

                                0x33,                /*
FC_AUTO_HANDLE */
                                0x6c,                /* Old Flags:  object,
Oi2 */
/*  2 */    NdrFcLong( 0x0 ),      /* 0 */
/*  6 */    NdrFcShort( 0x3 ),     /* 3 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/*  8 */    NdrFcShort( 0x1c ),    /* x86 Stack size/offset = 28 */
#else
                                NdrFcShort( 0x20 ),  /*  MIPS Stack
size/offset = 32 */
#endif
#else
                                NdrFcShort( 0x20 ),  /* PPC Stack size/offset
= 32 */
#endif
#else
                                NdrFcShort( 0x28 ),  /* Alpha Stack
size/offset = 40 */
#endif
/* 10 */    NdrFcShort( 0x0 ),     /* 0 */
/* 12 */    NdrFcShort( 0x8 ),     /* 8 */
/* 14 */    0x7,                   /* Oi2 Flags:  srv must size, clt must size, has
return, */
                                0x3,                 /* 3 */

            /* Parameter txn_in */

/* 16 */    NdrFcShort( 0x8b ),    /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 18 */    NdrFcShort( 0x4 ),     /* x86 Stack size/offset = 4 */
#else
                                NdrFcShort( 0x8 ),   /*  MIPS Stack
size/offset = 8 */
#endif
#else
                                NdrFcShort( 0x8 ),   /* PPC Stack size/offset
= 8 */
#endif
#else
                                NdrFcShort( 0x8 ),   /* Alpha Stack
size/offset = 8 */
#endif
/* 20 */    NdrFcShort( 0x3c8 ),  /* Type Offset=968 */

            /* Parameter txn_out */

/* 22 */    NdrFcShort( 0x4113 ),           /* Flags:  must size, must free, out,
simple ref, srv alloc size=16 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
```

```
/* 24 */    NdrFcShort( 0x14 ),    /* x86 Stack size/offset = 20 */
#else
                                NdrFcShort( 0x18 ),  /*  MIPS Stack
size/offset = 24 */
#endif
#else
                                NdrFcShort( 0x18 ),  /* PPC Stack size/offset
= 24 */
#endif
#else
                                NdrFcShort( 0x18 ),  /* Alpha Stack
size/offset = 24 */
#endif
/* 26 */    NdrFcShort( 0x3da ),  /* Type Offset=986 */

            /* Return value */

/* 28 */    NdrFcShort( 0x70 ),    /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 30 */    NdrFcShort( 0x18 ),    /* x86 Stack size/offset = 24 */
#else
                                NdrFcShort( 0x1c ),  /*  MIPS Stack
size/offset = 28 */
#endif
#else
                                NdrFcShort( 0x1c ),  /* PPC Stack size/offset
= 28 */
#endif
#else
                                NdrFcShort( 0x20 ),  /* Alpha Stack
size/offset = 32 */
#endif
/* 32 */    0x8,                   /* FC_LONG */
                                0x0,                 /* 0 */

            /* Procedure Payment */

/* 34 */    0x33,                  /* FC_AUTO_HANDLE */
                                0x6c,                /* Old Flags:  object,
Oi2 */
/* 36 */    NdrFcLong( 0x0 ),      /* 0 */
/* 40 */    NdrFcShort( 0x4 ),     /* 4 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 42 */    NdrFcShort( 0x1c ),    /* x86 Stack size/offset = 28 */
#else
                                NdrFcShort( 0x20 ),  /*  MIPS Stack
size/offset = 32 */
#endif
#else
                                NdrFcShort( 0x20 ),  /* PPC Stack size/offset
= 32 */
#endif
#else
                                NdrFcShort( 0x28 ),  /* Alpha Stack
size/offset = 40 */
#endif
/* 44 */    NdrFcShort( 0x0 ),     /* 0 */
/* 46 */    NdrFcShort( 0x8 ),     /* 8 */
/* 48 */    0x7,                   /* Oi2 Flags:  srv must size, clt must size, has
return, */
                                0x3,                 /* 3 */

            /* Parameter txn_in */
/* 50 */    NdrFcShort( 0x8b ),   /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 52 */    NdrFcShort( 0x4 ),    /* x86 Stack size/offset = 4 */
#else
                                  NdrFcShort( 0x8 ),    /*  MIPS Stack
size/offset = 8 */
#endif
#else
                                  NdrFcShort( 0x8 ),    /* PPC Stack size/offset
= 8 */
#endif
#else
                                  NdrFcShort( 0x8 ),    /* Alpha Stack
size/offset = 8 */
#endif
/* 54 */    NdrFcShort( 0x3c8 ),  /* Type Offset=968 */

            /* Parameter txn_out */

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

            /* Return value */

/* 62 */    NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 64 */    NdrFcShort( 0x18 ),   /* x86 Stack size/offset = 24 */
#else
                                  NdrFcShort( 0x1c ),   /*  MIPS Stack
size/offset = 28 */
#endif
#else
                                  NdrFcShort( 0x1c ),   /* PPC Stack size/offset
= 28 */
#endif
#else
                                  NdrFcShort( 0x20 ),   /* Alpha Stack
size/offset = 32 */
#endif
/* 66 */    0x8,                  /* FC_LONG */
                                  0x0,                  /* 0 */

            /* Procedure Delivery */

/* 68 */    0x33,                 /* FC_AUTO_HANDLE */
                                  0x6c,                 /* Old Flags:  object,
Oi2 */
```

```
/* 70 */    NdrFcLong( 0x0 ),     /* 0 */
/* 74 */    NdrFcShort( 0x5 ),    /* 5 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 76 */    NdrFcShort( 0x1c ),   /* x86 Stack size/offset = 28 */
#else
                                  NdrFcShort( 0x20 ),   /*  MIPS Stack
size/offset = 32 */
#endif
#else
                                  NdrFcShort( 0x20 ),   /* PPC Stack size/offset
= 32 */
#endif
#else
                                  NdrFcShort( 0x28 ),   /* Alpha Stack
size/offset = 40 */
#endif
/* 78 */    NdrFcShort( 0x0 ),    /* 0 */
/* 80 */    NdrFcShort( 0x8 ),    /* 8 */
/* 82 */    0x7,                  /* Oi2 Flags:  srv must size, clt must size, has
return, */
                                  0x3,                  /* 3 */

            /* Parameter txn_in */

/* 84 */    NdrFcShort( 0x8b ),   /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 86 */    NdrFcShort( 0x4 ),    /* x86 Stack size/offset = 4 */
#else
                                  NdrFcShort( 0x8 ),    /*  MIPS Stack
size/offset = 8 */
#endif
#else
                                  NdrFcShort( 0x8 ),    /* PPC Stack size/offset
= 8 */
#endif
#else
                                  NdrFcShort( 0x8 ),    /* Alpha Stack
size/offset = 8 */
#endif
/* 88 */    NdrFcShort( 0x3c8 ),  /* Type Offset=968 */

            /* Parameter txn_out */

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

            /* Return value */
/* 96 */     NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 98 */     NdrFcShort( 0x18 ),   /* x86 Stack size/offset = 24 */
#else
                                   NdrFcShort( 0x1c ),   /*  MIPS Stack
size/offset = 28 */
#endif
#else
                                   NdrFcShort( 0x1c ),   /* PPC Stack size/offset
= 28 */
#endif
#else
                                   NdrFcShort( 0x20 ),   /* Alpha Stack
size/offset = 32 */
#endif
/* 100 */    0x8,                  /* FC_LONG */
                                   0x0,                  /* 0 */

             /* Procedure StockLevel */

/* 102 */    0x33,                 /* FC_AUTO_HANDLE */
                                   0x6c,                 /* Old Flags:  object,
Oi2 */
/* 104 */    NdrFcLong( 0x0 ),     /* 0 */
/* 108 */    NdrFcShort( 0x6 ),    /* 6 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 110 */    NdrFcShort( 0x1c ),   /* x86 Stack size/offset = 28 */
#else
                                   NdrFcShort( 0x20 ),   /*  MIPS Stack
size/offset = 32 */
#endif
#else
                                   NdrFcShort( 0x20 ),   /* PPC Stack size/offset
= 32 */
#endif
#else
                                   NdrFcShort( 0x28 ),   /* Alpha Stack
size/offset = 40 */
#endif
/* 112 */    NdrFcShort( 0x0 ),    /* 0 */
/* 114 */    NdrFcShort( 0x8 ),    /* 8 */
/* 116 */    0x7,                  /* Oi2 Flags:  srv must size, clt must size, has
return, */
                                   0x3,                  /* 3 */

             /* Parameter txn_in */

/* 118 */    NdrFcShort( 0x8b ),   /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 120 */    NdrFcShort( 0x4 ),    /* x86 Stack size/offset = 4 */
#else
                                   NdrFcShort( 0x8 ),    /*  MIPS Stack
size/offset = 8 */
#endif
#else
                                   NdrFcShort( 0x8 ),    /* PPC Stack size/offset
= 8 */
#endif
#else
                                   NdrFcShort( 0x8 ),    /* Alpha Stack
size/offset = 8 */
```

```
#endif
/* 122 */    NdrFcShort( 0x3c8 ),  /* Type Offset=968 */

             /* Parameter txn_out */

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

             /* Return value */

/* 130 */    NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 132 */    NdrFcShort( 0x18 ),   /* x86 Stack size/offset = 24 */
#else
                                   NdrFcShort( 0x1c ),   /*  MIPS Stack
size/offset = 28 */
#endif
#else
                                   NdrFcShort( 0x1c ),   /* PPC Stack size/offset
= 28 */
#endif
#else
                                   NdrFcShort( 0x20 ),   /* Alpha Stack
size/offset = 32 */
#endif
/* 134 */    0x8,                  /* FC_LONG */
                                   0x0,                  /* 0 */

             /* Procedure OrderStatus */

/* 136 */    0x33,                 /* FC_AUTO_HANDLE */
                                   0x6c,                 /* Old Flags:  object,
Oi2 */
/* 138 */    NdrFcLong( 0x0 ),     /* 0 */
/* 142 */    NdrFcShort( 0x7 ),    /* 7 */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 144 */    NdrFcShort( 0x1c ),   /* x86 Stack size/offset = 28 */
#else
                                   NdrFcShort( 0x20 ),   /*  MIPS Stack
size/offset = 32 */
#endif
#else
                                   NdrFcShort( 0x20 ),   /* PPC Stack size/offset
= 32 */
#endif
#else
```

```
                              NdrFcShort( 0x28 ),   /* Alpha Stack
size/offset = 40 */
#endif
/* 146 */   NdrFcShort( 0x0 ),     /* 0 */
/* 148 */   NdrFcShort( 0x8 ),     /* 8 */
/* 150 */   0x7,                   /* Oi2 Flags:  srv must size, clt must size, has
return, */
                              0x3,                  /* 3 */

            /* Parameter txn_in */

/* 152 */   NdrFcShort( 0x8b ),  /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 154 */   NdrFcShort( 0x4 ),     /* x86 Stack size/offset = 4 */
#else
                              NdrFcShort( 0x8 ),     /*  MIPS Stack
size/offset = 8 */
#endif
#else
                              NdrFcShort( 0x8 ),     /* PPC Stack size/offset
= 8 */
#endif
#else
                              NdrFcShort( 0x8 ),     /* Alpha Stack
size/offset = 8 */
#endif
/* 156 */   NdrFcShort( 0x3c8 ), /* Type Offset=968 */

            /* Parameter txn_out */

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

            /* Return value */

/* 164 */   NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
#ifndef _PPC_
#if !defined(_MIPS_)
/* 166 */   NdrFcShort( 0x18 ),   /* x86 Stack size/offset = 24 */
#else
                              NdrFcShort( 0x1c ),   /*  MIPS Stack
size/offset = 28 */
#endif
#else
                              NdrFcShort( 0x1c ),   /* PPC Stack size/offset
= 28 */
#endif
#else
```

```
                              NdrFcShort( 0x20 ),   /* Alpha Stack
size/offset = 32 */
#endif
/* 168 */   0x8,                  /* FC_LONG */
                              0x0,                  /* 0 */

            /* Procedure CallSetComplete */

/* 170 */   0x33,                 /* FC_AUTO_HANDLE */
                              0x6c,                 /* Old Flags:  object,
Oi2 */
/* 172 */   NdrFcLong( 0x0 ),     /* 0 */
/* 176 */   NdrFcShort( 0x8 ),    /* 8 */
#ifndef _ALPHA_
/* 178 */   NdrFcShort( 0x8 ),    /* x86, MIPS, PPC Stack size/offset = 8 */
#else
                              NdrFcShort( 0x10 ),   /* Alpha Stack
size/offset = 16 */
#endif
/* 180 */   NdrFcShort( 0x0 ),    /* 0 */
/* 182 */   NdrFcShort( 0x8 ),    /* 8 */
/* 184 */   0x4,                  /* Oi2 Flags:  has return, */
                              0x1,                  /* 1 */

            /* Return value */

/* 186 */   NdrFcShort( 0x70 ),   /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 188 */   NdrFcShort( 0x4 ),    /* x86, MIPS, PPC Stack size/offset = 4 */
#else
                              NdrFcShort( 0x8 ),    /* Alpha Stack
size/offset = 8 */
#endif
/* 190 */   0x8,                  /* FC_LONG */
                              0x0,                  /* 0 */

                              0x0
        }
    };

static const MIDL_TYPE_FORMAT_STRING __MIDL_TypeFormatString =
    {
        0,
        {
                              NdrFcShort( 0x0 ),    /* 0 */
/*  2 */
                              0x12, 0x0, /* FC_UP */
/*  4 */    NdrFcShort( 0x3b0 ), /* Offset= 944 (948) */
/*  6 */
                              0x2b,                 /*
FC_NON_ENCAPSULATED_UNION */
                              0x9,                  /* FC_ULONG */
/*  8 */    0x7,                  /* Corr desc: FC_USHORT */
                              0x0,                  /*  */
/* 10 */    NdrFcShort( 0xfff8 ), /* -8 */
/* 12 */    NdrFcShort( 0x2 ),    /* Offset= 2 (14) */
/* 14 */    NdrFcShort( 0x10 ),   /* 16 */
/* 16 */    NdrFcShort( 0x2b ),   /* 43 */
/* 18 */    NdrFcLong( 0x3 ),     /* 3 */
/* 22 */    NdrFcShort( 0x8008 ),             /* Simple arm type: FC_LONG */
/* 24 */    NdrFcLong( 0x11 ),    /* 17 */
/* 28 */    NdrFcShort( 0x8001 ),             /* Simple arm type: FC_BYTE */
/* 30 */    NdrFcLong( 0x2 ),     /* 2 */
/* 34 */    NdrFcShort( 0x8006 ),             /* Simple arm type: FC_SHORT */
/* 36 */    NdrFcLong( 0x4 ),     /* 4 */
/* 40 */    NdrFcShort( 0x800a ),             /* Simple arm type: FC_FLOAT */
/* 42 */    NdrFcLong( 0x5 ),     /* 5 */
/* 46 */    NdrFcShort( 0x800c ),              /* Simple arm type: FC_DOUBLE
*/
/* 48 */    NdrFcLong( 0xb ),      /* 11 */
/* 52 */    NdrFcShort( 0x8006 ),              /* Simple arm type: FC_SHORT */
/* 54 */    NdrFcLong( 0xa ),      /* 10 */
/* 58 */    NdrFcShort( 0x8008 ),              /* Simple arm type: FC_LONG */
/* 60 */    NdrFcLong( 0x6 ),      /* 6 */
/* 64 */    NdrFcShort( 0xd6 ),   /* Offset= 214 (278) */
/* 66 */    NdrFcLong( 0x7 ),      /* 7 */
/* 70 */    NdrFcShort( 0x800c ),              /* Simple arm type: FC_DOUBLE
*/
/* 72 */    NdrFcLong( 0x8 ),      /* 8 */
/* 76 */    NdrFcShort( 0xd0 ),   /* Offset= 208 (284) */
/* 78 */    NdrFcLong( 0xd ),      /* 13 */
/* 82 */    NdrFcShort( 0xe2 ),   /* Offset= 226 (308) */
/* 84 */    NdrFcLong( 0x9 ),      /* 9 */
/* 88 */    NdrFcShort( 0xee ),   /* Offset= 238 (326) */
/* 90 */    NdrFcLong( 0x2000 ),               /* 8192 */
/* 94 */    NdrFcShort( 0xfa ),   /* Offset= 250 (344) */
/* 96 */    NdrFcLong( 0x24 ),    /* 36 */
/* 100 */   NdrFcShort( 0x308 ), /* Offset= 776 (876) */
/* 102 */   NdrFcLong( 0x4024 ),               /* 16420 */
/* 106 */   NdrFcShort( 0x302 ), /* Offset= 770 (876) */
/* 108 */   NdrFcLong( 0x4011 ),               /* 16401 */
/* 112 */   NdrFcShort( 0x300 ), /* Offset= 768 (880) */
/* 114 */   NdrFcLong( 0x4002 ),               /* 16386 */
/* 118 */   NdrFcShort( 0x2fe ), /* Offset= 766 (884) */
/* 120 */   NdrFcLong( 0x4003 ),               /* 16387 */
/* 124 */   NdrFcShort( 0x2fc ), /* Offset= 764 (888) */
/* 126 */   NdrFcLong( 0x4004 ),               /* 16388 */
/* 130 */   NdrFcShort( 0x2fa ), /* Offset= 762 (892) */
/* 132 */   NdrFcLong( 0x4005 ),               /* 16389 */
/* 136 */   NdrFcShort( 0x2f8 ), /* Offset= 760 (896) */
/* 138 */   NdrFcLong( 0x400b ),               /* 16395 */
/* 142 */   NdrFcShort( 0x2e6 ), /* Offset= 742 (884) */
/* 144 */   NdrFcLong( 0x400a ),               /* 16394 */
/* 148 */   NdrFcShort( 0x2e4 ), /* Offset= 740 (888) */
/* 150 */   NdrFcLong( 0x4006 ),               /* 16390 */
/* 154 */   NdrFcShort( 0x2ea ), /* Offset= 746 (900) */
/* 156 */   NdrFcLong( 0x4007 ),               /* 16391 */
/* 160 */   NdrFcShort( 0x2e0 ), /* Offset= 736 (896) */
/* 162 */   NdrFcLong( 0x4008 ),               /* 16392 */
/* 166 */   NdrFcShort( 0x2e2 ), /* Offset= 738 (904) */
/* 168 */   NdrFcLong( 0x400d ),               /* 16397 */
/* 172 */   NdrFcShort( 0x2e0 ), /* Offset= 736 (908) */
/* 174 */   NdrFcLong( 0x4009 ),               /* 16393 */
/* 178 */   NdrFcShort( 0x2de ), /* Offset= 734 (912) */
/* 180 */   NdrFcLong( 0x6000 ),               /* 24576 */
/* 184 */   NdrFcShort( 0x2dc ), /* Offset= 732 (916) */
/* 186 */   NdrFcLong( 0x400c ),               /* 16396 */
/* 190 */   NdrFcShort( 0x2da ), /* Offset= 730 (920) */
/* 192 */   NdrFcLong( 0x10 ),    /* 16 */
/* 196 */   NdrFcShort( 0x8002 ),              /* Simple arm type: FC_CHAR */
/* 198 */   NdrFcLong( 0x12 ),    /* 18 */
/* 202 */   NdrFcShort( 0x8006 ),              /* Simple arm type: FC_SHORT */
/* 204 */   NdrFcLong( 0x13 ),    /* 19 */
/* 208 */   NdrFcShort( 0x8008 ),              /* Simple arm type: FC_LONG */
/* 210 */   NdrFcLong( 0x16 ),    /* 22 */
/* 214 */   NdrFcShort( 0x8008 ),              /* Simple arm type: FC_LONG */
/* 216 */   NdrFcLong( 0x17 ),    /* 23 */
/* 220 */   NdrFcShort( 0x8008 ),              /* Simple arm type: FC_LONG */
/* 222 */   NdrFcLong( 0xe ),      /* 14 */
/* 226 */   NdrFcShort( 0x2be ), /* Offset= 702 (928) */
/* 228 */   NdrFcLong( 0x400e ),               /* 16398 */
/* 232 */   NdrFcShort( 0x2c4 ), /* Offset= 708 (940) */
/* 234 */   NdrFcLong( 0x4010 ),               /* 16400 */
/* 238 */   NdrFcShort( 0x2c2 ), /* Offset= 706 (944) */
/* 240 */   NdrFcLong( 0x4012 ),               /* 16402 */
```

```
/* 244 */   NdrFcShort( 0x280 ), /* Offset= 640 (884) */
/* 246 */   NdrFcLong( 0x4013 ),               /* 16403 */
/* 250 */   NdrFcShort( 0x27e ), /* Offset= 638 (888) */
/* 252 */   NdrFcLong( 0x4016 ),               /* 16406 */
/* 256 */   NdrFcShort( 0x278 ), /* Offset= 632 (888) */
/* 258 */   NdrFcLong( 0x4017 ),               /* 16407 */
/* 262 */   NdrFcShort( 0x272 ), /* Offset= 626 (888) */
/* 264 */   NdrFcLong( 0x0 ),     /* 0 */
/* 268 */   NdrFcShort( 0x0 ),    /* Offset= 0 (268) */
/* 270 */   NdrFcLong( 0x1 ),     /* 1 */
/* 274 */   NdrFcShort( 0x0 ),    /* Offset= 0 (274) */
/* 276 */   NdrFcShort( 0xffffffff ),          /* Offset= -1 (275) */
/* 278 */
                                   0x15,                /* FC_STRUCT */
                                   0x7,                 /* 7 */
/* 280 */   NdrFcShort( 0x8 ),    /* 8 */
/* 282 */   0xb,                   /* FC_HYPER */
                                   0x5b,                /* FC_END */
/* 284 */
                                   0x12, 0x0, /* FC_UP */
/* 286 */   NdrFcShort( 0xc ),    /* Offset= 12 (298) */
/* 288 */
                                   0x1b,                /* FC_CARRAY */
                                   0x1,                 /* 1 */
/* 290 */   NdrFcShort( 0x2 ),    /* 2 */
/* 292 */   0x9,                   /* Corr desc: FC_ULONG */
                                   0x0,                 /*  */
/* 294 */   NdrFcShort( 0xfffc ), /* -4 */
/* 296 */   0x6,                   /* FC_SHORT */
                                   0x5b,                /* FC_END */
/* 298 */
                                   0x17,                /* FC_CSTRUCT */
                                   0x3,                 /* 3 */
/* 300 */   NdrFcShort( 0x8 ),    /* 8 */
/* 302 */   NdrFcShort( 0xfffffff2 ),          /* Offset= -14 (288) */
/* 304 */   0x8,                   /* FC_LONG */
                                   0x8,                 /* FC_LONG */
/* 306 */   0x5c,                  /* FC_PAD */
                                   0x5b,                /* FC_END */
/* 308 */
                                   0x2f,                /* FC_IP */
                                   0x5a,                /*
FC_CONSTANT_IID */
/* 310 */   NdrFcLong( 0x0 ),     /* 0 */
/* 314 */   NdrFcShort( 0x0 ),    /* 0 */
/* 316 */   NdrFcShort( 0x0 ),    /* 0 */
/* 318 */   0xc0,                  /* 192 */
                                   0x0,                 /* 0 */
/* 320 */   0x0,                   /* 0 */
                                   0x0,                 /* 0 */
/* 322 */   0x0,                   /* 0 */
                                   0x0,                 /* 0 */
/* 324 */   0x0,                   /* 0 */
                                   0x46,                /* 70 */
/* 326 */
                                   0x2f,                /* FC_IP */
                                   0x5a,                /*
FC_CONSTANT_IID */
/* 328 */   NdrFcLong( 0x20400 ),              /* 132096 */
/* 332 */   NdrFcShort( 0x0 ),    /* 0 */
/* 334 */   NdrFcShort( 0x0 ),    /* 0 */
/* 336 */   0xc0,                  /* 192 */
                                   0x0,                 /* 0 */
/* 338 */   0x0,                   /* 0 */
                                   0x0,                 /* 0 */
/* 340 */   0x0,                   /* 0 */
                                   0x0,                 /* 0 */
/* 342 */   0x0,                   /* 0 */
```

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

                                0x8,                    /* FC_LONG */
/* 448 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 450 */
                                0x16,                   /* FC_PSTRUCT */
                                0x3,                    /* 3 */
/* 452 */   NdrFcShort( 0x8 ),  /* 8 */
/* 454 */
```

```
                                0x4b,                   /* FC_PP */
                                0x5c,                   /* FC_PAD */
/* 456 */
                                0x46,                   /* FC_NO_REPEAT */
                                0x5c,                   /* FC_PAD */
/* 458 */   NdrFcShort( 0x4 ),  /* 4 */
/* 460 */   NdrFcShort( 0x4 ),  /* 4 */
/* 462 */   0x11, 0x0, /* FC_RP */
/* 464 */   NdrFcShort( 0xffffffd4 ),           /* Offset= -44 (420) */
/* 466 */
                                0x5b,                   /* FC_END */

                                0x8,                    /* FC_LONG */
/* 468 */   0x8,                /* FC_LONG */
                                0x5b,                   /* FC_END */
/* 470 */
                                0x21,                   /*
FC_BOGUS_ARRAY */
                                0x3,                    /* 3 */
/* 472 */   NdrFcShort( 0x0 ),  /* 0 */
/* 474 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                    /*  */
/* 476 */   NdrFcShort( 0x0 ),  /* 0 */
/* 478 */   NdrFcLong( 0xffffffff ),            /* -1 */
/* 482 */   0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                    /* 0 */
/* 484 */   NdrFcShort( 0xffffff50 ),           /* Offset= -176 (308) */
/* 486 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 488 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x3,                    /* 3 */
/* 490 */   NdrFcShort( 0x8 ),  /* 8 */
/* 492 */   NdrFcShort( 0x0 ),  /* 0 */
/* 494 */   NdrFcShort( 0x6 ),  /* Offset= 6 (500) */
/* 496 */   0x8,                /* FC_LONG */
                                0x36,                   /* FC_POINTER */
/* 498 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 500 */
                                0x11, 0x0, /* FC_RP */
/* 502 */   NdrFcShort( 0xffffffe0 ),           /* Offset= -32 (470) */
/* 504 */
                                0x21,                   /*
FC_BOGUS_ARRAY */
                                0x3,                    /* 3 */
/* 506 */   NdrFcShort( 0x0 ),  /* 0 */
/* 508 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                    /*  */
/* 510 */   NdrFcShort( 0x0 ),  /* 0 */
/* 512 */   NdrFcLong( 0xffffffff ),            /* -1 */
/* 516 */   0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                    /* 0 */
/* 518 */   NdrFcShort( 0xffffff40 ),           /* Offset= -192 (326) */
/* 520 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
/* 522 */
                                0x1a,                   /*
FC_BOGUS_STRUCT */
                                0x3,                    /* 3 */
/* 524 */   NdrFcShort( 0x8 ),  /* 8 */
/* 526 */   NdrFcShort( 0x0 ),  /* 0 */
/* 528 */   NdrFcShort( 0x6 ),  /* Offset= 6 (534) */
/* 530 */   0x8,                /* FC_LONG */
                                0x36,                   /* FC_POINTER */
/* 532 */   0x5c,               /* FC_PAD */
                                0x5b,                   /* FC_END */
```

```
/* 534 */
                                0x11, 0x0,  /* FC_RP */
/* 536 */   NdrFcShort( 0xffffffe0 ),       /* Offset= -32 (504) */
/* 538 */
                                0x1b,               /* FC_CARRAY */
                                0x3,                /* 3 */
/* 540 */   NdrFcShort( 0x4 ),  /* 4 */
/* 542 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 544 */   NdrFcShort( 0x0 ),  /* 0 */
/* 546 */
                                0x4b,               /* FC_PP */
                                0x5c,               /* FC_PAD */
/* 548 */
                                0x48,               /*
FC_VARIABLE_REPEAT */
                                0x49,               /*
FC_FIXED_OFFSET */
/* 550 */   NdrFcShort( 0x4 ),  /* 4 */
/* 552 */   NdrFcShort( 0x0 ),  /* 0 */
/* 554 */   NdrFcShort( 0x1 ),  /* 1 */
/* 556 */   NdrFcShort( 0x0 ),  /* 0 */
/* 558 */   NdrFcShort( 0x0 ),  /* 0 */
/* 560 */   0x12, 0x0, /* FC_UP */
/* 562 */   NdrFcShort( 0x182 ), /* Offset= 386 (948) */
/* 564 */
                                0x5b,               /* FC_END */

                                0x8,                /* FC_LONG */
/* 566 */   0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 568 */
                                0x1a,               /*
FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 570 */   NdrFcShort( 0x8 ),  /* 8 */
/* 572 */   NdrFcShort( 0x0 ),  /* 0 */
/* 574 */   NdrFcShort( 0x6 ),  /* Offset= 6 (580) */
/* 576 */   0x8,                /* FC_LONG */
                                0x36,               /* FC_POINTER */
/* 578 */   0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 580 */
                                0x11, 0x0,  /* FC_RP */
/* 582 */   NdrFcShort( 0xffffffd4 ),       /* Offset= -44 (538) */
/* 584 */
                                0x2f,               /* FC_IP */
                                0x5a,               /*
FC_CONSTANT_IID */
/* 586 */   NdrFcLong( 0x2f ),  /* 47 */
/* 590 */   NdrFcShort( 0x0 ),  /* 0 */
/* 592 */   NdrFcShort( 0x0 ),  /* 0 */
/* 594 */   0xc0,               /* 192 */
                                0x0,                /* 0 */
/* 596 */   0x0,                /* 0 */
                                0x0,                /* 0 */
/* 598 */   0x0,                /* 0 */
                                0x0,                /* 0 */
/* 600 */   0x0,                /* 0 */
                                0x46,               /* 70 */
/* 602 */
                                0x1b,               /* FC_CARRAY */
                                0x0,                /* 0 */
/* 604 */   NdrFcShort( 0x1 ),  /* 1 */
/* 606 */   0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 608 */   NdrFcShort( 0x4 ),  /* 4 */
/* 610 */   0x1,                /* FC_BYTE */
```

```
                                0x5b,               /* FC_END */
/* 612 */
                                0x1a,               /*
FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 614 */   NdrFcShort( 0x10 ), /* 16 */
/* 616 */   NdrFcShort( 0x0 ),  /* 0 */
/* 618 */   NdrFcShort( 0xa ),  /* Offset= 10 (628) */
/* 620 */   0x8,                /* FC_LONG */
                                0x8,                /* FC_LONG */
/* 622 */   0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                /* 0 */
/* 624 */   NdrFcShort( 0xffffffd8 ),       /* Offset= -40 (584) */
/* 626 */   0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 628 */
                                0x12, 0x0,  /* FC_UP */
/* 630 */   NdrFcShort( 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( 0xffffff0c ),    /* Offset= -244 (470) */
/* 716 */
                        0x1b,           /* FC_CARRAY */
                        0x0,            /* 0 */
/* 718 */  NdrFcShort( 0x1 ),   /* 1 */
/* 720 */  0x19,        /* Corr desc:  field pointer, FC_ULONG */
                        0x0,            /*  */
/* 722 */  NdrFcShort( 0x0 ),   /* 0 */
/* 724 */  0x1,         /* FC_BYTE */
                        0x5b,           /* FC_END */
/* 726 */
                        0x16,           /* FC_PSTRUCT */
                        0x3,            /* 3 */
/* 728 */  NdrFcShort( 0x8 ),   /* 8 */
/* 730 */
                        0x4b,           /* FC_PP */
                        0x5c,           /* FC_PAD */
/* 732 */
                        0x46,           /* FC_NO_REPEAT */
                        0x5c,           /* FC_PAD */
/* 734 */  NdrFcShort( 0x4 ),   /* 4 */
/* 736 */  NdrFcShort( 0x4 ),   /* 4 */
/* 738 */  0x12, 0x0, /* FC_UP */
/* 740 */  NdrFcShort( 0xffffffe8 ),    /* Offset= -24 (716) */
/* 742 */
                        0x5b,           /* FC_END */

                        0x8,            /* FC_LONG */
/* 744 */  0x8,         /* FC_LONG */
                        0x5b,           /* FC_END */
/* 746 */
                        0x1b,           /* FC_CARRAY */
                        0x1,            /* 1 */
/* 748 */  NdrFcShort( 0x2 ),   /* 2 */
/* 750 */  0x19,        /* Corr desc:  field pointer, FC_ULONG */
                        0x0,            /*  */
/* 752 */  NdrFcShort( 0x0 ),   /* 0 */
/* 754 */  0x6,         /* FC_SHORT */
                        0x5b,           /* FC_END */
/* 756 */
                        0x16,           /* FC_PSTRUCT */
                        0x3,            /* 3 */
/* 758 */  NdrFcShort( 0x8 ),   /* 8 */
/* 760 */
                        0x4b,           /* FC_PP */
                        0x5c,           /* FC_PAD */
/* 762 */
                        0x46,           /* FC_NO_REPEAT */
                        0x5c,           /* FC_PAD */
/* 764 */  NdrFcShort( 0x4 ),   /* 4 */
/* 766 */  NdrFcShort( 0x4 ),   /* 4 */
/* 768 */  0x12, 0x0, /* FC_UP */
/* 770 */  NdrFcShort( 0xffffffe8 ),    /* Offset= -24 (746) */
/* 772 */
                        0x5b,           /* FC_END */

                        0x8,            /* FC_LONG */
/* 774 */  0x8,         /* FC_LONG */
                        0x5b,           /* FC_END */
/* 776 */
                        0x1b,           /* FC_CARRAY */
                        0x3,            /* 3 */
/* 778 */  NdrFcShort( 0x4 ),   /* 4 */
/* 780 */  0x19,        /* Corr desc:  field pointer, FC_ULONG */
                        0x0,            /*  */
/* 782 */  NdrFcShort( 0x0 ),   /* 0 */
/* 784 */  0x8,         /* FC_LONG */
                        0x5b,           /* FC_END */
/* 786 */
                        0x16,           /* FC_PSTRUCT */
                        0x3,            /* 3 */
/* 788 */  NdrFcShort( 0x8 ),   /* 8 */
/* 790 */
                        0x4b,           /* FC_PP */
                        0x5c,           /* FC_PAD */
/* 792 */
                        0x46,           /* FC_NO_REPEAT */
                        0x5c,           /* FC_PAD */
/* 794 */  NdrFcShort( 0x4 ),   /* 4 */
/* 796 */  NdrFcShort( 0x4 ),   /* 4 */
/* 798 */  0x12, 0x0, /* FC_UP */
/* 800 */  NdrFcShort( 0xffffffe8 ),    /* Offset= -24 (776) */
/* 802 */
                        0x5b,           /* FC_END */

                        0x8,            /* FC_LONG */
/* 804 */  0x8,         /* FC_LONG */
                        0x5b,           /* FC_END */
/* 806 */
                        0x1b,           /* FC_CARRAY */
                        0x7,            /* 7 */
/* 808 */  NdrFcShort( 0x8 ),   /* 8 */
/* 810 */  0x19,        /* Corr desc:  field pointer, FC_ULONG */
                        0x0,            /*  */
/* 812 */  NdrFcShort( 0x0 ),   /* 0 */
/* 814 */  0xb,         /* FC_HYPER */
                        0x5b,           /* FC_END */
/* 816 */
                        0x16,           /* FC_PSTRUCT */
                        0x3,            /* 3 */
/* 818 */  NdrFcShort( 0x8 ),   /* 8 */
/* 820 */
                        0x4b,           /* FC_PP */
                        0x5c,           /* FC_PAD */
/* 822 */
                        0x46,           /* FC_NO_REPEAT */
                        0x5c,           /* FC_PAD */
/* 824 */  NdrFcShort( 0x4 ),   /* 4 */
/* 826 */  NdrFcShort( 0x4 ),   /* 4 */
/* 828 */   0x12, 0x0,  /* FC_UP */
/* 830 */   NdrFcShort( 0xffffffe8 ),           /* Offset= -24 (806) */
/* 832 */
                                0x5b,               /* FC_END */

                                0x8,                /* FC_LONG */
/* 834 */   0x8,                /* FC_LONG */
                                0x5b,               /* FC_END */
/* 836 */
                                0x15,               /* FC_STRUCT */
                                0x3,                /* 3 */
/* 838 */   NdrFcShort( 0x8 ),  /* 8 */
/* 840 */   0x8,                /* FC_LONG */
                                0x8,                /* FC_LONG */
/* 842 */   0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 844 */
                                0x1b,               /* FC_CARRAY */
                                0x3,                /* 3 */
/* 846 */   NdrFcShort( 0x8 ),  /* 8 */
/* 848 */   0x7,                /* Corr desc: FC_USHORT */
                                0x0,                /*  */
/* 850 */   NdrFcShort( 0xffd8 ), /* -40 */
/* 852 */   0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                /* 0 */
/* 854 */   NdrFcShort( 0xffffffee ),           /* Offset= -18 (836) */
/* 856 */   0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 858 */
                                0x1a,               /*
FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 860 */   NdrFcShort( 0x28 ), /* 40 */
/* 862 */   NdrFcShort( 0xffffffee ),           /* Offset= -18 (844) */
/* 864 */   NdrFcShort( 0x0 ),  /* Offset= 0 (864) */
/* 866 */   0x6,                /* FC_SHORT */
                                0x6,                /* FC_SHORT */
/* 868 */   0x38,               /* FC_ALIGNM4 */
                                0x8,                /* FC_LONG */
/* 870 */   0x8,                /* FC_LONG */
                                0x4c,               /*
FC_EMBEDDED_COMPLEX */
/* 872 */   0x0,                /* 0 */
                                NdrFcShort( 0xfffffdf7 ),           /* Offset=
-521 (352) */
                                0x5b,               /* FC_END */
/* 876 */
                                0x12, 0x0,  /* FC_UP */
/* 878 */   NdrFcShort( 0xfffffef6 ),           /* Offset= -266 (612) */
/* 880 */
                                0x12, 0x8,  /* FC_UP [simple_pointer] */
/* 882 */   0x1,                /* FC_BYTE */
                                0x5c,               /* FC_PAD */
/* 884 */
                                0x12, 0x8,  /* FC_UP [simple_pointer] */
/* 886 */   0x6,                /* FC_SHORT */
                                0x5c,               /* FC_PAD */
/* 888 */
                                0x12, 0x8,  /* FC_UP [simple_pointer] */
/* 890 */   0x8,                /* FC_LONG */
                                0x5c,               /* FC_PAD */
/* 892 */
                                0x12, 0x8,  /* FC_UP [simple_pointer] */
/* 894 */   0xa,                /* FC_FLOAT */
                                0x5c,               /* FC_PAD */
/* 896 */
                                0x12, 0x8,  /* FC_UP [simple_pointer] */
/* 898 */   0xc,                /* FC_DOUBLE */
```

```
                                0x5c,               /* FC_PAD */
/* 900 */
                                0x12, 0x0,  /* FC_UP */
/* 902 */   NdrFcShort( 0xfffffd90 ),           /* Offset= -624 (278) */
/* 904 */
                                0x12, 0x10,         /* FC_UP
[pointer_deref] */
/* 906 */   NdrFcShort( 0xfffffd92 ),           /* Offset= -622 (284) */
/* 908 */
                                0x12, 0x10,         /* FC_UP
[pointer_deref] */
/* 910 */   NdrFcShort( 0xfffffda6 ),           /* Offset= -602 (308) */
/* 912 */
                                0x12, 0x10,         /* FC_UP
[pointer_deref] */
/* 914 */   NdrFcShort( 0xfffffdb4 ),           /* Offset= -588 (326) */
/* 916 */
                                0x12, 0x10,         /* FC_UP
[pointer_deref] */
/* 918 */   NdrFcShort( 0xfffffdc2 ),           /* Offset= -574 (344) */
/* 920 */
                                0x12, 0x10,         /* FC_UP
[pointer_deref] */
/* 922 */   NdrFcShort( 0x2 ),  /* Offset= 2 (924) */
/* 924 */
                                0x12, 0x0,  /* FC_UP */
/* 926 */   NdrFcShort( 0x16 ), /* Offset= 22 (948) */
/* 928 */
                                0x15,               /* FC_STRUCT */
                                0x7,                /* 7 */
/* 930 */   NdrFcShort( 0x10 ), /* 16 */
/* 932 */   0x6,                /* FC_SHORT */
                                0x1,                /* FC_BYTE */
/* 934 */   0x1,                /* FC_BYTE */
                                0x38,               /* FC_ALIGNM4 */
/* 936 */   0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 938 */   0xb,                /* FC_HYPER */
                                0x5b,               /* FC_END */
/* 940 */
                                0x12, 0x0,  /* FC_UP */
/* 942 */   NdrFcShort( 0xfffffff2 ),           /* Offset= -14 (928) */
/* 944 */
                                0x12, 0x8,  /* FC_UP [simple_pointer] */
/* 946 */   0x2,                /* FC_CHAR */
                                0x5c,               /* FC_PAD */
/* 948 */
                                0x1a,               /*
FC_BOGUS_STRUCT */
                                0x7,                /* 7 */
/* 950 */   NdrFcShort( 0x20 ), /* 32 */
/* 952 */   NdrFcShort( 0x0 ),  /* 0 */
/* 954 */   NdrFcShort( 0x0 ),  /* Offset= 0 (954) */
/* 956 */   0x8,                /* FC_LONG */
                                0x8,                /* FC_LONG */
/* 958 */   0x6,                /* FC_SHORT */
                                0x6,                /* FC_SHORT */
/* 960 */   0x6,                /* FC_SHORT */
                                0x6,                /* FC_SHORT */
/* 962 */   0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                /* 0 */
/* 964 */   NdrFcShort( 0xfffffc42 ),           /* Offset= -958 (6) */
/* 966 */   0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 968 */   0xb4,               /* FC_USER_MARSHAL */
                                0x83,               /* 131 */
/* 970 */   NdrFcShort( 0x0 ),  /* 0 */
/* 972 */   NdrFcShort( 0x10 ), /* 16 */
/* 974 */   NdrFcShort( 0x0 ),      /* 0 */
/* 976 */   NdrFcShort( 0xfffffc32 ),           /* Offset= -974 (2) */
/* 978 */
                                0x11, 0x4, /* FC_RP [alloced_on_stack] */
/* 980 */   NdrFcShort( 0x6 ),      /* Offset= 6 (986) */
/* 982 */
                                0x13, 0x0, /* FC_OP */
/* 984 */   NdrFcShort( 0xffffffdc ),           /* Offset= -36 (948) */
/* 986 */   0xb4,                   /* FC_USER_MARSHAL */
                                0x83,                   /* 131 */
/* 988 */   NdrFcShort( 0x0 ),      /* 0 */
/* 990 */   NdrFcShort( 0x10 ),     /* 16 */
/* 992 */   NdrFcShort( 0x0 ),      /* 0 */
/* 994 */   NdrFcShort( 0xfffffff4 ),           /* Offset= -12 (982) */

                                0x0
        }
    };

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

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

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


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

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

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

    return 0;
}

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

```

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


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

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



 /* File created by MIDL compiler version 5.03.0280 */
/* at 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,{0x00,0x00,0x00,0x00,0x00,0x00,0x00,0
x00}} */
```

```
/* Object interface: IUnknown, ver. 0.0,

GUID={0x00000000,0x0000,0x0000,{0xC0,0x00,0x00,0x00,0x00,0x00,0x00,
0x46}} */


/* Object interface: ITPCC, ver. 0.0,

GUID={0xFEEE6AA2,0x84B1,0x11d2,{0xBA,0x47,0x00,0xC0,0x4F,0xBF,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( 0xffffffe6 ),           /* Offset= -26 (760) */
/* 788 */
                                    0x1b,                   /* FC_CARRAY */
                                    0x7,                    /* 7 */
/* 790 */   NdrFcShort( 0x8 ),      /* 8 */
/* 792 */   0x19,                   /* Corr desc:  field pointer, FC_ULONG */
                                    0x0,                    /*  */
/* 794 */   NdrFcShort( 0x0 ),      /* 0 */
/* 796 */   NdrFcShort( 0x1 ),      /* Corr flags:  early, */
/* 798 */   0xb,                    /* FC_HYPER */
                                    0x5b,                   /* FC_END */
/* 800 */
                                    0x1a,                   /*
FC_BOGUS_STRUCT */
                                    0x3,                    /* 3 */
/* 802 */   NdrFcShort( 0x10 ),     /* 16 */
/* 804 */   NdrFcShort( 0x0 ),      /* 0 */
/* 806 */   NdrFcShort( 0x6 ),      /* Offset= 6 (812) */
/* 808 */   0x8,                    /* FC_LONG */
                                    0x39,                   /* FC_ALIGNM8 */
/* 810 */   0x36,                   /* FC_POINTER */
                                    0x5b,                   /* FC_END */
/* 812 */
                                    0x12, 0x0, /* FC_UP */
/* 814 */   NdrFcShort( 0xffffffe6 ),           /* Offset= -26 (788) */
/* 816 */
                                    0x15,                   /* FC_STRUCT */
                                    0x3,                    /* 3 */
/* 818 */   NdrFcShort( 0x8 ),      /* 8 */
/* 820 */   0x8,                    /* FC_LONG */
                                    0x8,                    /* FC_LONG */
/* 822 */   0x5c,                   /* FC_PAD */
                                    0x5b,                   /* FC_END */
/* 824 */
                                    0x1b,                   /* FC_CARRAY */
                                    0x3,                    /* 3 */
/* 826 */   NdrFcShort( 0x8 ),      /* 8 */
/* 828 */   0x7,                    /* Corr desc: FC_USHORT */
                                    0x0,                    /*  */
/* 830 */   NdrFcShort( 0xffc8 ), /* -56 */
/* 832 */   NdrFcShort( 0x1 ),      /* Corr flags:  early, */
/* 834 */   0x4c,                   /* FC_EMBEDDED_COMPLEX */
                                    0x0,                    /* 0 */
/* 836 */   NdrFcShort( 0xffffffec ),           /* Offset= -20 (816) */
/* 838 */   0x5c,                   /* FC_PAD */
                                    0x5b,                   /* FC_END */
/* 840 */
                                    0x1a,                   /*
FC_BOGUS_STRUCT */
                                    0x3,                    /* 3 */
/* 842 */   NdrFcShort( 0x38 ),     /* 56 */
/* 844 */   NdrFcShort( 0xffffffec ),           /* Offset= -20 (824) */
/* 846 */   NdrFcShort( 0x0 ),      /* Offset= 0 (846) */
```

```
/* 848 */   0x6,                    /* FC_SHORT */
                                    0x6,                    /* FC_SHORT */
/* 850 */   0x38,                   /* FC_ALIGNM4 */
                                    0x8,                    /* FC_LONG */
/* 852 */   0x8,                    /* FC_LONG */
                                    0x4c,                   /*
FC_EMBEDDED_COMPLEX */
/* 854 */   0x4,                    /* 4 */
                                    NdrFcShort( 0xfffffe0d ),           /* Offset=
-499 (356) */
                                    0x5b,                   /* FC_END */
/* 858 */
                                    0x12, 0x0, /* FC_UP */
/* 860 */   NdrFcShort( 0xffffff02 ),           /* Offset= -254 (606) */
/* 862 */
                                    0x12, 0x8, /* FC_UP [simple_pointer] */
/* 864 */   0x1,                    /* FC_BYTE */
                                    0x5c,                   /* FC_PAD */
/* 866 */
                                    0x12, 0x8, /* FC_UP [simple_pointer] */
/* 868 */   0x6,                    /* FC_SHORT */
                                    0x5c,                   /* FC_PAD */
/* 870 */
                                    0x12, 0x8, /* FC_UP [simple_pointer] */
/* 872 */   0x8,                    /* FC_LONG */
                                    0x5c,                   /* FC_PAD */
/* 874 */
                                    0x12, 0x8, /* FC_UP [simple_pointer] */
/* 876 */   0xa,                    /* FC_FLOAT */
                                    0x5c,                   /* FC_PAD */
/* 878 */
                                    0x12, 0x8, /* FC_UP [simple_pointer] */
/* 880 */   0xc,                    /* FC_DOUBLE */
                                    0x5c,                   /* FC_PAD */
/* 882 */
                                    0x12, 0x0, /* FC_UP */
/* 884 */   NdrFcShort( 0xfffffda4 ),           /* Offset= -604 (280) */
/* 886 */
                                    0x12, 0x10,             /* FC_UP
[pointer_deref] */
/* 888 */   NdrFcShort( 0xfffffda6 ),           /* Offset= -602 (286) */
/* 890 */
                                    0x12, 0x10,             /* FC_UP
[pointer_deref] */
/* 892 */   NdrFcShort( 0xfffffdbc ),           /* Offset= -580 (312) */
/* 894 */
                                    0x12, 0x10,             /* FC_UP
[pointer_deref] */
/* 896 */   NdrFcShort( 0xfffffdca ),           /* Offset= -566 (330) */
/* 898 */
                                    0x12, 0x10,             /* FC_UP
[pointer_deref] */
/* 900 */   NdrFcShort( 0xfffffdd8 ),           /* Offset= -552 (348) */
/* 902 */
                                    0x12, 0x10,             /* FC_UP
[pointer_deref] */
/* 904 */   NdrFcShort( 0x2 ),      /* Offset= 2 (906) */
/* 906 */
                                    0x12, 0x0, /* FC_UP */
/* 908 */   NdrFcShort( 0x16 ),     /* Offset= 22 (930) */
/* 910 */
                                    0x15,                   /* FC_STRUCT */
                                    0x7,                    /* 7 */
/* 912 */   NdrFcShort( 0x10 ),     /* 16 */
/* 914 */   0x6,                    /* FC_SHORT */
                                    0x1,                    /* FC_BYTE */
/* 916 */   0x1,                    /* FC_BYTE */
                                    0x38,                   /* FC_ALIGNM4 */
```

```
/* 918 */   0x8,                        /* FC_LONG */
                                        0x39,                   /* FC_ALIGNM8 */
/* 920 */   0xb,                        /* FC_HYPER */
                                        0x5b,                   /* FC_END */
/* 922 */
                                        0x12, 0x0, /* FC_UP */
/* 924 */   NdrFcShort( 0xfffffff2 ),           /* Offset= -14 (910) */
/* 926 */
                                        0x12, 0x8, /* FC_UP [simple_pointer] */
/* 928 */   0x2,                        /* FC_CHAR */
                                        0x5c,                   /* FC_PAD */
/* 930 */
                                        0x1a,                   /*
FC_BOGUS_STRUCT */
                                        0x7,                    /* 7 */
/* 932 */   NdrFcShort( 0x20 ),   /* 32 */
/* 934 */   NdrFcShort( 0x0 ),    /* 0 */
/* 936 */   NdrFcShort( 0x0 ),    /* Offset= 0 (936) */
/* 938 */   0x8,                        /* FC_LONG */
                                        0x8,                    /* FC_LONG */
/* 940 */   0x6,                        /* FC_SHORT */
                                        0x6,                    /* FC_SHORT */
/* 942 */   0x6,                        /* FC_SHORT */
                                        0x6,                    /* FC_SHORT */
/* 944 */   0x4c,                       /* FC_EMBEDDED_COMPLEX */
                                        0x0,                    /* 0 */
/* 946 */   NdrFcShort( 0xfffffc54 ),           /* Offset= -940 (6) */
/* 948 */   0x5c,                       /* FC_PAD */
                                        0x5b,                   /* FC_END */
/* 950 */   0xb4,                       /* FC_USER_MARSHAL */
                                        0x83,                   /* 131 */
/* 952 */   NdrFcShort( 0x0 ),    /* 0 */
/* 954 */   NdrFcShort( 0x18 ),   /* 24 */
/* 956 */   NdrFcShort( 0x0 ),    /* 0 */
/* 958 */   NdrFcShort( 0xfffffc44 ),           /* Offset= -956 (2) */
/* 960 */
                                        0x11, 0x4, /* FC_RP [alloced_on_stack] */
/* 962 */   NdrFcShort( 0x6 ),    /* Offset= 6 (968) */
/* 964 */
                                        0x13, 0x0, /* FC_OP */
/* 966 */   NdrFcShort( 0xffffffdc ),           /* Offset= -36 (930) */
/* 968 */   0xb4,                       /* FC_USER_MARSHAL */
                                        0x83,                   /* 131 */
/* 970 */   NdrFcShort( 0x0 ),    /* 0 */
/* 972 */   NdrFcShort( 0x18 ),   /* 24 */
/* 974 */   NdrFcShort( 0x0 ),    /* 0 */
/* 976 */   NdrFcShort( 0xfffffff4 ),           /* Offset= -12 (964) */

                                        0x0
        }
    };

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

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

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


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

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

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

    return 0;
}

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


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

tpcc_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

				// 012345678901234567890123456789
		wchar_t						szSqlTemplate[] =
L"{call tpcc_neworder(?,?,?,?,?,"

				 L"?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,"

				 L"?,?,?,?,?,?,?,?,?,?,?,?,?,?,?,"

				 L"?,?,?,?,?,?,?,?,?,?,?,?,?,?,?)}";

		m_hstmt = m_hstmtNewOrder;

		// associate the parameter and column bindings for this transaction
		if ( SQLSetStmtAttrW( m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descNewOrderCols1, SQL_IS_POINTER ) != SQL_SUCCESS )
				ThrowError(CODBCERR::eSetStmtAttr);

		// clip statement buffer based on number of parameters
		// fixed part is 29 chars and variable part is 6 chars per line item
		i = 29 + m_txn.NewOrder.o_ol_cnt*6;
		wcscpy( &szSqlTemplate[i], L")}" );

		// check whether any order lines are for a remote warehouse
		m_txn.NewOrder.o_all_local = 1;
		for (i = 0; i < m_txn.NewOrder.o_ol_cnt; i++)
		{
				if (m_txn.NewOrder.OL[i].ol_supply_w_id !=
m_txn.NewOrder.w_id)
				{
						m_txn.NewOrder.o_all_local = 0;  // at least
one remote warehouse
						break;
				}
		}

		while (TRUE)
		{
				try
				{
						m_BindOffset = 0;
						rc = SQLExecDirectW(m_hstmt,
(SQLWCHAR*)szSqlTemplate, SQL_NTS);
```

```
                                        if (rc != SQL_SUCCESS && rc !=
SQL_SUCCESS_WITH_INFO)

ThrowError(CODBCERR::eExecDirect);

                                        // Get order line results
                                        m_txn.NewOrder.total_amount = 0;
                                        for (i = 0; i<m_txn.NewOrder.o_ol_cnt; i++)
                                        {
                                                        // set the bind offset value...
                                                        m_BindOffset = i *
sizeof(m_txn.NewOrder.OL[0]);


                                                        if ( SQLFetch(m_hstmt) ==
SQL_ERROR)

ThrowError(CODBCERR::eFetch);

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

ThrowError(CODBCERR::eMoreResults);

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

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

ThrowError(CODBCERR::eSetStmtAttr);

                                        if ( SQLFetch(m_hstmt) == SQL_ERROR)

ThrowError(CODBCERR::eFetch);

                                        SQLFreeStmt(m_hstmt, SQL_CLOSE);

                                        if (m_no_commit_flag == 1)
                                        {
                                                        m_txn.NewOrder.total_amount *=
((1 + m_txn.NewOrder.w_tax + m_txn.NewOrder.d_tax) * (1 -
m_txn.NewOrder.c_discount));

m_txn.NewOrder.exec_status_code = eOK;
                                        }
                                        else

m_txn.NewOrder.exec_status_code = eInvalidItem;

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

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

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

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

                m_hstmt = m_hstmtPayment;

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


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

```
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.d_street_2,      sizeof(m_txn.Payment.d_street_2), NULL) !=
SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.d_city,                  sizeof(m_txn.Payment.d_city),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.d_state,                 sizeof(m_txn.Payment.d_state),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.d_zip,                   sizeof(m_txn.Payment.d_zip),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_first,                 sizeof(m_txn.Payment.c_first),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_middle,        sizeof(m_txn.Payment.c_middle), NULL) !=
SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_street_1,      sizeof(m_txn.Payment.c_street_1), NULL) !=
SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_street_2,      sizeof(m_txn.Payment.c_street_2), NULL) !=
SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_city,                  sizeof(m_txn.Payment.c_city),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_state,                 sizeof(m_txn.Payment.c_state),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_zip,                   sizeof(m_txn.Payment.c_zip),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_phone,                 sizeof(m_txn.Payment.c_phone),
NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i,
SQL_C_TYPE_TIMESTAMP, &m_txn.Payment.c_since,
0, NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_credit,        sizeof(m_txn.Payment.c_credit), NULL) !=
SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_DOUBLE,
&m_txn.Payment.c_credit_lim,0, NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_DOUBLE,
&m_txn.Payment.c_discount,      0, NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_DOUBLE,
&m_txn.Payment.c_balance,       0, NULL) != SQL_SUCCESS
                        || SQLBindCol(m_hstmt, ++i, SQL_C_CHAR,
&m_txn.Payment.c_data,                  sizeof(m_txn.Payment.c_data),
NULL) != SQL_SUCCESS
                        )
                        ThrowError(CODBCERR::eBindCol);
}

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

            m_hstmt = m_hstmtPayment;

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

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

ThrowError(CODBCERR::eExecDirect);

                                    if ( SQLFetch(m_hstmt) == SQL_ERROR)

ThrowError(CODBCERR::eFetch);

                                    SQLFreeStmt(m_hstmt, SQL_CLOSE);

                                    if (m_txn.Payment.c_id == 0)
                                                throw new CTPCC_ODBC_ERR(
CTPCC_ODBC_ERR::ERR_INVALID_CUST );
                                    else
                                                m_txn.Payment.exec_status_code
= eOK;

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

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

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

void CTPCC_ODBC::InitOrderStatusParams()
{
            if (    SQLAllocHandle(SQL_HANDLE_STMT, m_hdbc,
&m_hstmtOrderStatus) != SQL_SUCCESS
                        || SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc,
&m_descOrderStatusCols1) != SQL_SUCCESS
                        || SQLAllocHandle(SQL_HANDLE_DESC, m_hdbc,
&m_descOrderStatusCols2) != SQL_SUCCESS
                        )
                        ThrowError(CODBCERR::eAllocHandle);

            m_hstmt = m_hstmtOrderStatus;

            if (    SQLSetStmtAttrW( m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descOrderStatusCols1, SQL_IS_POINTER ) != SQL_SUCCESS )
                        ThrowError(CODBCERR::eSetStmtAttr);

            int i = 0;
            if (    SQLBindParameter(m_hstmt, ++i, SQL_PARAM_INPUT,
SQL_C_SSHORT, SQL_SMALLINT, 0, 0, &m_txn.OrderStatus.w_id, 0,
NULL) != SQL_SUCCESS
                        || SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_UTINYINT, SQL_TINYINT, 0, 0,
&m_txn.OrderStatus.d_id, 0, NULL) != SQL_SUCCESS
```

```
			|| SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_SLONG, SQL_INTEGER, 0, 0,
&m_txn.OrderStatus.c_id, 0, NULL) != SQL_SUCCESS
			|| SQLBindParameter(m_hstmt, ++i,
SQL_PARAM_INPUT, SQL_C_CHAR, SQL_CHAR,
sizeof(m_txn.OrderStatus.c_last), 0, &m_txn.OrderStatus.c_last,
sizeof(m_txn.OrderStatus.c_last), NULL) != SQL_SUCCESS
			)
			ThrowError(CODBCERR::eBindParam);

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

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


		if ( SQLSetStmtAttrW( m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descOrderStatusCols2, SQL_IS_POINTER ) != SQL_SUCCESS )
			ThrowError(CODBCERR::eSetStmtAttr);

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

void CTPCC_ODBC::OrderStatus()
{
```

```
	int
iTryCount = 0;
	RETCODE
rc;

	m_hstmt = m_hstmtOrderStatus;

	if ( SQLSetStmtAttrW( m_hstmt, SQL_ATTR_APP_ROW_DESC,
m_descOrderStatusCols1, SQL_IS_POINTER ) != SQL_SUCCESS )
		ThrowError(CODBCERR::eSetStmtAttr);

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

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

ThrowError(CODBCERR::eSetStmtAttr);

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

ThrowError(CODBCERR::eExecDirect);

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

ThrowError(CODBCERR::eSetStmtAttr);

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

ThrowError(CODBCERR::eFetchScroll);

			m_txn.OrderStatus.o_ol_cnt =
(short)m_RowsFetched;

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

ThrowError(CODBCERR::eSetStmtAttr);

				if ( SQLMoreResults(m_hstmt) ==
SQL_ERROR )

ThrowError(CODBCERR::eMoreResults);

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

ThrowError(CODBCERR::eFetch);
			}
```

```
                        SQLFreeStmt(m_hstmt, SQL_CLOSE);

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

m_txn.OrderStatus.exec_status_code = eOK;

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

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

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

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

        m_hstmt = m_hstmtDelivery;

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

        for (i=0;i<10;i++)
        {
                if ( SQLBindCol(m_hstmt, (UWORD)(i+1),
SQL_C_SLONG, &m_txn.Delivery.o_id[i], 0, NULL) != SQL_SUCCESS )
                        ThrowError(CODBCERR::eBindCol);
        }
}

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

        m_hstmt = m_hstmtDelivery;

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

ThrowError(CODBCERR::eExecDirect);

                        if ( SQLFetch(m_hstmt) == SQL_ERROR )

ThrowError(CODBCERR::eFetch);

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

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

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

tpcc_odbc.h

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

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

class CODBCERR : public CBaseErr
{
        public:
                enum ACTION
                {
```

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

                        CODBCERR(void)
                        {
                                m_eAction = eNone;
                                m_NativeError = 0;
                                m_bDeadLock = FALSE;
                                m_odbcerrstr = NULL;
                        };

                        ~CODBCERR()
                        {
                                if (m_odbcerrstr != NULL)
                                        delete [] m_odbcerrstr;
                        };

                        ACTION  m_eAction;
                        int             m_NativeError;
                        BOOL    m_bDeadLock;
                        char   *m_odbcerrstr;

                        int ErrorType() {return ERR_TYPE_ODBC;};
                        int ErrorNum() {return m_NativeError;};
                        char *ErrorText() {return m_odbcerrstr;};

};

class CTPCC_ODBC_ERR : public CBaseErr
{
        public:
                        enum TPCC_ODBC_ERRS
                        {
                                ERR_WRONG_SP_VERSION = 1,               //
"Wrong version of stored procs on database server"
                                ERR_INVALID_CUST,
// "Invalid Customer id,name."
                                ERR_NO_SUCH_ORDER,
// "No orders found for customer."
                                ERR_RETRIED_TRANS,
// "Retries before transaction succeeded."
                        };

                        CTPCC_ODBC_ERR( int iErr ) { m_errno = iErr;
m_iTryCount = 0; };

                        CTPCC_ODBC_ERR( int iErr, int iTryCount ) {
m_errno = iErr; m_iTryCount = iTryCount; };

                        int                     m_errno;
                        int                     m_iTryCount;

                        int ErrorType() {return ERR_TYPE_TPCC_ODBC;};
                        int ErrorNum() {return m_errno;};

                        char *ErrorText();
};

class DllDecl CTPCC_ODBC : public CTPCC_BASE
{
        private:
                        // declare variables and private functions here...
                        BOOL            m_bDeadlock;                    //
transaction was selected as deadlock victim
                        int                             m_MaxRetries;
// retry count on deadlock

                        SQLHENV                 m_henv;
        // ODBC environment handle
                        SQLHDBC                 m_hdbc;
                        SQLHSTMT        m_hstmt;                        //
the current hstmt

                        SQLHSTMT        m_hstmtNewOrder;
                        SQLHSTMT        m_hstmtPayment;
                        SQLHSTMT        m_hstmtDelivery;
                        SQLHSTMT        m_hstmtOrderStatus;
                        SQLHSTMT        m_hstmtStockLevel;

                        SQLHDESC        m_descNewOrderCols1;
                        SQLHDESC        m_descNewOrderCols2;
                        SQLHDESC        m_descOrderStatusCols1;
                        SQLHDESC        m_descOrderStatusCols2;

                        // new-order specific fields
                        SQLUINTEGER     m_BindOffset;
                        SQLUINTEGER     m_RowsFetched;
                        int                     m_no_commit_flag;

                        void ThrowError( CODBCERR::ACTION eAction );

                        void InitNewOrderParams();
                        void InitPaymentParams();
                        void InitDeliveryParams();
                        void InitStockLevelParams();
                        void InitOrderStatusParams();

                        union
                        {
                                NEW_ORDER_DATA
NewOrder;
                                PAYMENT_DATA            Payment;
                                DELIVERY_DATA           Delivery;
                                STOCK_LEVEL_DATA        StockLevel;
                                ORDER_STATUS_DATA       OrderStatus;
```

```
                }                                       m_txn;

        public:
                CTPCC_ODBC(LPCSTR szServer, LPCSTR szUser,
LPCSTR szPassword, LPCSTR szHost, LPCSTR szDatabase);
                ~CTPCC_ODBC(void);

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

                void NewOrder                   ();
                void Payment                    ();
                void Delivery                   ();
                void StockLevel                 ();
                void OrderStatus        ();

};


// wrapper routine for class constructor
extern "C" DllDecl CTPCC_ODBC* CTPCC_ODBC_new
        ( LPCSTR szServer, LPCSTR szUser, LPCSTR szPassword,
LPCSTR szHost, LPCSTR szDatabase );

typedef CTPCC_ODBC* (TYPE_CTPCC_ODBC)(LPCSTR, LPCSTR,
LPCSTR, LPCSTR, LPCSTR);
```

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 advantage is that these
-- stored procs place almost no load on SQL Server and do not require a
database.
--
-- The purpose of these stored procs is to size and test the web client without the
need of a fully
-- scaled database.
--
drop proc tpcc_delivery
drop proc tpcc_neworder
drop proc tpcc_orderstatus
drop proc tpcc_payment
drop proc tpcc_stocklevel
drop proc tpcc_version
drop table order_line_null
go

create proc tpcc_delivery             @w_id          smallint,


@o_carrier_id   smallint
as

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

declare @delaytime varchar(30)

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

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


GO

create proc tpcc_neworder
                                                      @w_id          smallint,
                                                      @d_id          tinyint,
                                                      @c_id          int,
                                                      @o_ol_cnt      tinyint,
                                                      @o_all_local   tinyint,
                                                      @i_id1  int = 0,
@s_w_id1 smallint = 0, @ol_qty1 smallint = 0,
                                                      @i_id2  int = 0,
@s_w_id2 smallint = 0, @ol_qty2 smallint = 0,
                                                      @i_id3  int = 0,
@s_w_id3 smallint = 0, @ol_qty3 smallint = 0,
                                                      @i_id4  int = 0,
@s_w_id4 smallint = 0, @ol_qty4 smallint = 0,
                                                      @i_id5  int = 0,
@s_w_id5 smallint = 0, @ol_qty5 smallint = 0,
                                                      @i_id6  int = 0,
@s_w_id6 smallint = 0, @ol_qty6 smallint = 0,
                                                      @i_id7  int = 0,
@s_w_id7 smallint = 0, @ol_qty7 smallint = 0,
                                                      @i_id8  int = 0,
@s_w_id8 smallint = 0, @ol_qty8 smallint = 0,
                                                      @i_id9  int = 0,
@s_w_id9 smallint = 0, @ol_qty9 smallint = 0,
                                                      @i_id10 int = 0,
@s_w_id10 smallint = 0, @ol_qty10 smallint = 0,
                                                                @i_id11 int = 0,
@s_w_id11 smallint = 0, @ol_qty11 smallint = 0,
                                                                @i_id12 int = 0,
@s_w_id12 smallint = 0, @ol_qty12 smallint = 0,
                                                                @i_id13 int = 0,
@s_w_id13 smallint = 0, @ol_qty13 smallint = 0,
                                                                @i_id14 int = 0,
@s_w_id14 smallint = 0, @ol_qty14 smallint = 0,
                                                                @i_id15 int = 0,
@s_w_id15 smallint = 0, @ol_qty15 smallint = 0


as
declare     @w_tax          numeric(4,4),
      @d_tax          numeric(4,4),
      @c_last         char(16),
      @c_credit       char(2),
      @c_discount     numeric(4,4),
      @i_price        numeric(5,2),
      @i_name         char(24),
      @o_entry_d      datetime,
            @li_no          int,
            @o_id                       int,
            @commit_flag    tinyint,
      @li_id          int,
      @li_qty         smallint

declare @delaytime varchar(30)

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

   --  process orderlines

            select @commit_flag = 1, @li_no = 0

   while (@li_no < @o_ol_cnt)
            begin

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


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

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

            end

--  return order data to client

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

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

end

GO

create proc tpcc_orderstatus @w_id                          smallint,

@d_id                   tinyint,


@c_id                   int,

@c_last     char(16) = ''

as

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

declare @delaytime varchar(30)


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

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

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

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

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


GO

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

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

```
        @d_ytd          numeric(12,2),
        @cnt            smallint,
        @val            smallint,
        @screen_data    char(200),
                        @d_id_local             tinyint,
                        @w_id_local             smallint,
                        @c_id_local             int

declare @delaytime varchar(30)

   -- uniform random delay of 0 - 0.3 second; avg = 0.15
   select @delaytime = '00:00:0' + cast(cast((rand()*0.30) as decimal(4,3)) as
char(5))
   waitfor delay @delaytime

   select @screen_data = ''


--  get customer info and update balances

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

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

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

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



--  return data to client

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


GO

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

declare @delaytime varchar(30)

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

  select 49

GO

create proc tpcc_version
as
declare @version        char(8)

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

GO

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

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

GO
```

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','Y:\tpccback3.dmp'
go
exec sp_addumpdevice 'disk','tpccback4','Y:\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                = "Y:\MSSQL_tpcc_root.mdf",
                SIZE                    = 8MB,
                FILEGROWTH              =0),
FILEGROUP               MSSQL_misc_fg
(               NAME                    = MSSQL_misc1,
                FILENAME                = "G:",
                SIZE                    = 14000MB,
                FILEGROWTH              = 0),
(               NAME                    = MSSQL_misc2,
                FILENAME                = "I:",
                SIZE                    = 14000MB,
                FILEGROWTH              = 0),
(               NAME                    = MSSQL_misc3,
                FILENAME                = "K:",
                SIZE                    = 14000MB,
                FILEGROWTH              = 0),
FILEGROUP               MSSQL_cs_fg
(               NAME                    = MSSQL_cs1,
                FILENAME                = "F:",
                SIZE                    = 29200MB,
                FILEGROWTH              = 0),
(               NAME                    = MSSQL_cs2,
                FILENAME                = "H:",
                SIZE                    = 29200MB,
                FILEGROWTH              = 0),
(               NAME                    = MSSQL_cs3,
                FILENAME                = "J:",
                SIZE                    = 29200MB,
                FILEGROWTH              = 0)
LOG ON
(               NAME                    =MSSQL_tpcc_log,
                FILENAME                ="E:",
                SIZE                    =45000MB,
                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 SQL Server 2000

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

Server Configuration Parameters

Microsoft Windows Server 2003 Standard Edition Configuration
The following services were set as manual on the server:

- Alerter
- Automatic Updates
- Computer Browser
- Cryptographic Services
- DHCP Client
- Distributed File System
- Distributed Link Tracking Client
- DNS Client
- Help and Support
- IPSEC Policy Agent
- MSSQLSERVER
- Print Spooler
- Remote Registry Service
- System Event Notification
- Task Scheduler
- Wireless Configuration

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 " "

 ------------------------------
 Jul  7 2003  7:55:58:140AM

(1 row affected)

1> 2> 3>
select @@version
```

```
 -------------------------------------------------------------------------------
             ----------------------------------------------------------------------
             ----------------------------------------------------------------------
             ------------------------------------
 Microsoft SQL Server  2000 - 8.00.760 (Intel X86)
             Dec 17 2002 14:22:05
             Cop
             yright (c) 1988-2003 Microsoft Corporation
             Standard Edition on Windows
              NT 5.2 (Build 3790: )



(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 " "

 ------------------------------
 Jul  7 2003  7:55:59:090AM

(1 row affected)

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

sp_configure "show advanced",1
1> 2> reconfigure with override
1> 2> sp_configure
 name                                                        minimum     maximum
config_value run_value
 --------------------------------------------------------------------- ----------- -----------
------------ -----------
 affinity mask                                            -2147483648  2147483647
     3          3
 allow updates                                                      0          1          0
0
 awe enabled                                                        0          1          0
0
 c2 audit mode                                                      0          1          0
0
 cost threshold for parallelism                                     0      32767
5          5
 Cross DB Ownership Chaining                                        0          1
 0          0
 cursor threshold                                                  -1  2147483647
-1         -1
 default full-text language                                         0  2147483647
1033       1033
 default language                                                   0       9999          0
     0
 fill factor (%)                                                    0        100          0
0
 index create memory (KB)                                         704  2147483647
       0          0
 lightweight pooling                                                0          1          1
   1
 locks                                                   5000  2147483647          0
       0
 max degree of parallelism                                    0         32          0
       0
 max server memory (MB)                                          4  2147483647
2147483647  2147483647
 max text repl size (B)                                    0  2147483647
65536       65536
 max worker threads                                        32       32767
300         300
 media retention                                        0         365          0
   0
 min memory per query (KB)                                   512  2147483647
        512         512
 min server memory (MB)                                      0  2147483647
      0          0
 nested triggers                                       0          1           1
1
 network packet size (B)                                  512       65536
1024        1024
 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
84          84
 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 Server 2003

System Information Report for the x235

```
System Information report written at: 07/07/03 19:42:14
System Name: IBMSERVER3
[System Summary]

Item        Value
OS Name   Microsoft(R) Windows(R) Server 2003, Standard Edition
Version    5.2.3790  Build 3790
OS Manufacturer       Microsoft Corporation
Activation Status      Activation Pending (2 days remaining)
System Name            IBMSERVER3
System Manufacturer IBM
System Model           eserver xSeries 235 -[867173Z]-
System Type            X86-based PC
Processor   x86 Family 15 Model 2 Stepping 7 GenuineIntel ~3059 Mhz
Processor   x86 Family 15 Model 2 Stepping 7 GenuineIntel ~3059 Mhz
BIOS Version/Date    IBM -[GRE138AUS-1.06]-, 3/10/2003
SMBIOS Version        2.3
Windows Directory    C:\WINDOWS
System Directory      C:\WINDOWS\system32
Boot Device             \Device\HarddiskVolume4
Locale       United States
Hardware Abstraction Layer         Version = "5.2.3790.0
(srv03_rtm.030324-2048)"
User NameIBMSERVER3\Administrator
Time Zone Eastern Daylight Time
Total Physical Memory              2,560.00 MB
Available Physical Memory         2.20 GB
Total Virtual Memory 6.83 GB
Available Virtual Memory           6.38 GB
Page File Space           4.34 GB
Page File    C:\pagefile.sys

[Hardware Resources]



[Conflicts/Sharing]

Resource   Device
I/O Port 0x00000000-0x000003AF              PCI bus
I/O Port 0x00000000-0x000003AF              Direct memory access controller

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

IRQ 5        Microsoft ACPI-Compliant System
IRQ 5        ServerWorks (RCC) PCI to USB Open Host Controller

I/O Port 0x00002300-0x000024FF              PCI bus
I/O Port 0x00002300-0x000024FF              LSI Logic PCI-X Ultra320 SCSI
Host Adapter

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

Memory Address 0xF8000000-0xF9FFFFFFPCI bus
Memory Address 0xF8000000-0xF9FFFFFFMylex AcceleRAID 352 Controller
(Accelerated)

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


[DMA]

Resource   Device       Status
Channel 2  Standard floppy disk controller   OK
Channel 4  Direct memory access controller  OK

[Forced Hardware]

Device       PNP Device ID

[I/O]
```

```
Resource   Device       Status
0x00000000-0x000003AF          PCI bus     OK
0x00000000-0x000003AF          Direct memory access controller  OK
0x000003B0-0x000003BB          PCI bus     OK
0x000003B0-0x000003BB          RAGE XL PCI Family (Microsoft
Corporation)            OK
0x000003BC-0x000003BF          PCI bus     OK
0x000003C0-0x000003DF          PCI bus     OK
0x000003C0-0x000003DF          RAGE XL PCI Family (Microsoft
Corporation)            OK
0x000003E0-0x000022FF          PCI bus     OK
0x00002200-0x000022FF          RAGE XL PCI Family (Microsoft
Corporation)            OK
0x00000900-0x0000093F          Motherboard resources            OK
0x00000510-0x00000517          Motherboard resources            OK
0x00000504-0x00000507          Motherboard resources            OK
0x00000500-0x00000503          Motherboard resources            OK
0x00000520-0x0000053F          Motherboard resources            OK
0x00000420-0x00000427          Motherboard resources            OK
0x00000460-0x00000461          Motherboard resources            OK
0x0000002E-0x0000002F          Motherboard resources            OK
0x00000064-0x00000064          Standard 101/102-Key or Microsoft Natural
PS/2 Keyboard           OK
0x00000060-0x00000060          Standard 101/102-Key or Microsoft Natural
PS/2 Keyboard           OK
0x000003F0-0x000003F5          Standard floppy disk controller   OK
0x000003F7-0x000003F7          Standard floppy disk controller   OK
0x00000378-0x0000037B          Printer Port (LPT1)    OK
0x000003F8-0x000003FF          Communications Port (COM1)     OK
0x00000020-0x00000021          Advanced programmable interrupt controller
OK
0x000000A0-0x000000A1          Advanced programmable interrupt controller
OK
0x00000080-0x0000008F          Direct memory access controller  OK
0x000000C0-0x000000DF          Direct memory access controller  OK
0x00000040-0x00000043          System timer           OK
0x00000070-0x00000073          System CMOS/real time clock      OK
0x00000061-0x00000061          System speaker         OK
0x000000F0-0x000000FF          Numeric data processor           OK
0x00000092-0x00000092          Motherboard resources            OK
0x000000EB-0x000000EC          Motherboard resources            OK
0x000001EC-0x000001EF          Motherboard resources            OK
0x00000400-0x000004FE          Motherboard resources            OK
0x00000600-0x00000600          Motherboard resources            OK
0x00000800-0x0000080F          Motherboard resources            OK
0x00000C00-0x00000CFE          Motherboard resources            OK
0x00000F50-0x00000F58          Motherboard resources            OK
0x00000700-0x0000070F          CSB5 IDE Controller OK
0x000001F0-0x000001F7          Primary IDE Channel OK
0x000003F6-0x000003F6          Primary IDE Channel OK
0x00000170-0x00000177          Secondary IDE Channel            OK
0x00000376-0x00000376          Secondary IDE Channel            OK
0x00000A79-0x00000A79          ISAPNP Read Data Port            OK
0x00000279-0x00000279          ISAPNP Read Data Port            OK
0x00000274-0x00000277          ISAPNP Read Data Port            OK
0x00002300-0x000024FF          PCI bus     OK
0x00002300-0x000024FF          LSI Logic PCI-X Ultra320 SCSI Host
Adapter     OK
0x00002400-0x000024FF          LSI Logic PCI-X Ultra320 SCSI Host
Adapter     OK
0x00002500-0x00009FFF          PCI bus     OK
0x0000A000-0x0000FFFF          PCI bus     OK

[IRQs]

Resource   Device       Status
IRQ 5      Microsoft ACPI-Compliant System              OK
IRQ 5      ServerWorks (RCC) PCI to USB Open Host Controller  OK
IRQ 26     RAGE XL PCI Family (Microsoft Corporation)            OK
IRQ 1      Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
OK
IRQ 12     PS/2 Compatible Mouse             OK
IRQ 6      Standard floppy disk controller   OK
IRQ 4      Communications Port (COM1)    OK
IRQ 0      System timer            OK
IRQ 8      System CMOS/real time clock     OK
IRQ 13     Numeric data processor            OK
IRQ 14     Primary IDE Channel OK
IRQ 18     Mylex AcceleRAID 352 Controller (Accelerated)         OK
IRQ 29     Broadcom NetXtreme Gigabit Ethernet        OK
IRQ 27     LSI Logic PCI-X Ultra320 SCSI Host Adapter            OK
IRQ 28     LSI Logic PCI-X Ultra320 SCSI Host Adapter            OK
IRQ 24     Mylex AcceleRAID 352 Controller (Accelerated)         OK
IRQ 31     Mylex AcceleRAID 352 Controller (Accelerated)         OK

[Memory]

Resource   Device       Status
0xA0000-0xBFFFF    PCI bus     OK
0xA0000-0xBFFFF    RAGE XL PCI Family (Microsoft Corporation)
OK
0xFC000000-0xFFFFFFFF          PCI bus     OK
0xFD000000-0xFDFFFFFF          RAGE XL PCI Family (Microsoft
Corporation)            OK
0xFEBFF000-0xFEBFFFFF          RAGE XL PCI Family (Microsoft
Corporation)            OK
0xFEC00000-0xFFFFFFFF          Motherboard resources            OK
0xFEBFE000-0xFEBFEFFF          ServerWorks (RCC) PCI to USB Open Host
Controller  OK
0xF8000000-0xF9FFFFFF          PCI bus     OK
0xF8000000-0xF9FFFFFF          Mylex AcceleRAID 352 Controller
(Accelerated)           OK
0xFA000000-0xFBFFFFFF          PCI bus     OK
0xFBFF0000-0xFBFFFFFF          Broadcom NetXtreme Gigabit Ethernet
OK
0xF6000000-0xF7FFFFFF          PCI bus     OK
0xF7FF0000-0xF7FFFFFF          LSI Logic PCI-X Ultra320 SCSI Host
Adapter     OK
0xF7FE0000-0xF7FEFFFF          LSI Logic PCI-X Ultra320 SCSI Host
Adapter     OK
0xF7FD0000-0xF7FDFFFF          LSI Logic PCI-X Ultra320 SCSI Host
Adapter     OK
0xF7FC0000-0xF7FCFFFF          LSI Logic PCI-X Ultra320 SCSI Host
Adapter     OK
0xF1C00000-0xF4BFFFFF          PCI bus     OK
0xF4C00000-0xF5FFFFFF          PCI bus     OK
0xF2000000-0xF3FFFFFF          Mylex AcceleRAID 352 Controller
(Accelerated)           OK
0xEBC00000-0xEDBFFFFF          PCI bus     OK
0xEDC00000-0xF1BFFFFF          PCI bus     OK
0xEE000000-0xEFFFFFFF          Mylex AcceleRAID 352 Controller
(Accelerated)           OK

[Components]



[Multimedia]



[Audio Codecs]

CODEC      Manufacturer        Description         Status      File
Version    Size        Creation Date
```

```
c:\windows\system32\msaud32.acm          Microsoft Corporation
Windows Media Audio Codec     OK
C:\WINDOWS\system32\MSAUD32.ACM  8.00.00.4487          288.00 KB
(294,912 bytes)         3/25/2003 7:00 AM
c:\windows\system32\sl_anet.acm          Sipro Lab Telecom Inc.
Sipro Lab Telecom Audio Codec OK
C:\WINDOWS\system32\SL_ANET.ACM  3.02        84.00 KB (86,016
bytes)      3/25/2003 7:00 AM
c:\windows\system32\l3codeca.acm         Fraunhofer Institut Integrierte
Schaltungen IIS       Fraunhofer IIS MPEG Layer-3 Codec        OK
C:\WINDOWS\system32\L3CODECA.ACM            1, 9, 0, 0305
284.00 KB (290,816 bytes)       3/25/2003 7:00 AM
c:\windows\system32\msadp32.acm          Microsoft Corporation
OK          C:\WINDOWS\system32\MSADP32.ACM  5.2.3790.0
(srv03_rtm.030324-2048)          14.50 KB (14,848 bytes)          3/25/2003
7:00 AM
c:\windows\system32\tssoft32.acm         DSP GROUP, INC.
OK          C:\WINDOWS\system32\TSSOFT32.ACM  1.01         9.50 KB
(9,728 bytes)          3/25/2003 7:00 AM
c:\windows\system32\msg711.acm           Microsoft Corporation
OK          C:\WINDOWS\system32\MSG711.ACM    5.2.3790.0
(srv03_rtm.030324-2048)          10.00 KB (10,240 bytes)          3/25/2003
7:00 AM
c:\windows\system32\imaadp32.acm         Microsoft Corporation
OK          C:\WINDOWS\system32\IMAADP32.ACM5.2.3790.0
(srv03_rtm.030324-2048)          15.50 KB (15,872 bytes)          3/25/2003
7:00 AM
c:\windows\system32\msg723.acm           Microsoft Corporation
OK          C:\WINDOWS\system32\MSG723.ACM    4.4.4000   116.00 KB
(118,784 bytes)         6/9/2003 12:45 PM
c:\windows\system32\msgsm32.acm          Microsoft Corporation
OK          C:\WINDOWS\system32\MSGSM32.ACM  5.2.3790.0
(srv03_rtm.030324-2048)          20.50 KB (20,992 bytes)          3/25/2003
7:00 AM

[Video Codecs]

CODEC    Manufacturer          Description           Status      File
Version  Size          Creation Date
c:\windows\system32\msh261.drv           Microsoft Corporation
OK          C:\WINDOWS\system32\MSH261.DRV    4.4.4000   180.00 KB
(184,320 bytes)         6/9/2003 12:45 PM
c:\windows\system32\msrle32.dllMicrosoft Corporation
OK          C:\WINDOWS\system32\MSRLE32.DLL   5.2.3790.0
(srv03_rtm.030324-2048)          10.50 KB (10,752 bytes)          3/25/2003
7:00 AM
c:\windows\system32\iyuv_32.dll          Microsoft Corporation
OK          C:\WINDOWS\system32\IYUV_32.DLL   5.2.3790.0
(srv03_rtm.030324-2048)          45.00 KB (46,080 bytes)          3/24/2003
8:49 PM
c:\windows\system32\msyuv.dll  Microsoft Corporation
OK          C:\WINDOWS\system32\MSYUV.DLL     5.2.3790.0
(srv03_rtm.030324-2048)          16.50 KB (16,896 bytes)          3/24/2003
8:49 PM
c:\windows\system32\msvidc32.dll         Microsoft Corporation
OK          C:\WINDOWS\system32\MSVIDC32.DLL  5.2.3790.0
(srv03_rtm.030324-2048)          26.50 KB (27,136 bytes)          3/25/2003
7:00 AM
c:\windows\system32\tsbyuv.dll  Microsoft Corporation
OK          C:\WINDOWS\system32\TSBYUV.DLL    5.2.3790.0
(srv03_rtm.030324-2048)          8.00 KB (8,192 bytes)3/24/2003 8:50 PM
c:\windows\system32\msh263.drv           Microsoft Corporation
OK          C:\WINDOWS\system32\MSH263.DRV    4.4.4000   284.00 KB
(290,816 bytes)         3/24/2003 8:46 PM

[CD-ROM]

Item        Value
```

```
Drive       D:
Description            CD-ROM Drive
Media Loaded           No
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______________________2.01____\5
&FB0C83D&0&0.0.0
Driver      c:\windows\system32\drivers\cdrom.sys (5.2.3790.0
(srv03_rtm.030324-2048), 49.50 KB (50,688 bytes), 3/25/2003 7:00 AM)

[Sound Device]

Item        Value

[Display]

Item        Value
Name        RAGE XL PCI Family (Microsoft Corporation)
PNP Device ID
PCI\VEN_1002&DEV_4752&SUBSYS_02401014&REV_27\3&267A616A&
0&48
Adapter Type           ATI RAGE XL PCI (B41), ATI Technologies Inc.
compatible
Adapter Description    RAGE XL PCI Family (Microsoft Corporation)
Adapter RAM            8.00 MB (8,388,608 bytes)
Installed Drivers      ati2drad.dll
Driver Version         5.10.3663.6013
INF File    atiixpad.inf (ati2mpad section)
Color Planes           1
Color Table Entries    4294967296
Resolution 800 x 600 x 60 hertz
Bits/Pixel  32
Memory Address         0xFD000000-0xFDFFFFFF
I/O Port    0x00002200-0x000022FF
Memory Address         0xFEBFF000-0xFEBFFFFF
IRQ Channel            IRQ 26
I/O Port    0x000003B0-0x000003BB
I/O Port    0x000003C0-0x000003DF
Memory Address         0xA0000-0xBFFFF
Driver      c:\windows\system32\drivers\ati2mpad.sys (5.10.3663.6013, 335.38
KB (343,424 bytes), 6/9/2003 8:29 AM)

[Infrared]

Item        Value

[Input]



[Keyboard]

Item        Value
Description            Standard 101/102-Key or Microsoft Natural PS/2
Keyboard
Name        Enhanced (101- or 102-key)
Layout      00000409
PNP Device ID          ACPI\PNP0303\4&35118DFF&0
Number of Function Keys           12
IRQ Channel            IRQ 1
I/O Port    0x00000064-0x00000064
I/O Port    0x00000060-0x00000060
```

```
Driver      c:\windows\system32\drivers\i8042prt.sys (5.2.3790.0
(srv03_rtm.030324-2048), 68.50 KB (70,144 bytes), 3/25/2003 7:00 AM)

[Pointing Device]

Item        Value
Hardware Type       PS/2 Compatible Mouse
Number of Buttons   3
Status      OK
PNP Device ID       ACPI\PNP0F13\4&35118DFF&0
Power Management Supported     No
Double Click Threshold          6
Handedness          Right Handed Operation
IRQ Channel         IRQ 12
Driver      c:\windows\system32\drivers\i8042prt.sys (5.2.3790.0
(srv03_rtm.030324-2048), 68.50 KB (70,144 bytes), 3/25/2003 7:00 AM)

[Modem]

Item        Value

[Network]



[Adapter]

Item        Value
Name        [00000001] Broadcom NetXtreme Gigabit Ethernet
Adapter Type        Ethernet 802.3
Product Type        Broadcom NetXtreme Gigabit Ethernet
Installed   Yes
PNP Device ID
PCI\VEN_14E4&DEV_16A7&SUBSYS_026F1014&REV_02\3&13C0B0C5
&0&40
Last Reset 7/7/2003 2:51 PM
Index       1
Service Name        b57w2k
IP Address 192.168.132.200
IP Subnet  255.255.255.0
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained         Not Available
MAC Address         00:02:55:07:8A:8A
Memory Address      0xFBFF0000-0xFBFFFFFF
IRQ Channel         IRQ 29
Driver      c:\windows\system32\drivers\b57xp32.sys (2.91.0.0 built by:
WinDDK, 137.00 KB (140,288 bytes), 6/9/2003 8:29 AM)

Name        [00000002] RAS Async Adapter
Adapter Type        Not Available
Product Type        RAS Async Adapter
Installed   Yes
PNP Device ID       Not Available
Last Reset 7/7/2003 2:51 PM
Index       2
Service Name        AsyncMac
IP Address Not Available
IP Subnet  Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained         Not Available
MAC Address         Not Available
```

```
Name        [00000003] WAN Miniport (L2TP)
Adapter Type        Not Available
Product Type        WAN Miniport (L2TP)
Installed   Yes
PNP Device ID       ROOT\MS_L2TPMINIPORT\0000
Last Reset 7/7/2003 2:51 PM
Index       3
Service Name        Rasl2tp
IP Address Not Available
IP Subnet  Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained         Not Available
MAC Address         Not Available
Driver      c:\windows\system32\drivers\rasl2tp.sys (5.2.3790.0
(srv03_rtm.030324-2048), 77.00 KB (78,848 bytes), 3/25/2003 7:00 AM)

Name        [00000004] WAN Miniport (PPTP)
Adapter Type        Wide Area Network (WAN)
Product Type        WAN Miniport (PPTP)
Installed   Yes
PNP Device ID       ROOT\MS_PPTPMINIPORT\0000
Last Reset 7/7/2003 2:51 PM
Index       4
Service Name        PptpMiniport
IP Address Not Available
IP Subnet  Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained         Not Available
MAC Address         50:50:54:50:30:30
Driver      c:\windows\system32\drivers\raspptp.sys (5.2.3790.0
(srv03_rtm.030324-2048), 70.50 KB (72,192 bytes), 3/25/2003 7:00 AM)

Name        [00000005] WAN Miniport (PPPOE)
Adapter Type        Wide Area Network (WAN)
Product Type        WAN Miniport (PPPOE)
Installed   Yes
PNP Device ID       ROOT\MS_PPPOEMINIPORT\0000
Last Reset 7/7/2003 2:51 PM
Index       5
Service Name        RasPppoe
IP Address Not Available
IP Subnet  Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained         Not Available
MAC Address         33:50:6F:45:30:30
Driver      c:\windows\system32\drivers\raspppoe.sys (5.2.3790.0
(srv03_rtm.030324-2048), 38.00 KB (38,912 bytes), 3/25/2003 7:00 AM)

Name        [00000006] Direct Parallel
Adapter Type        Not Available
Product Type        Direct Parallel
Installed   Yes
PNP Device ID       ROOT\MS_PTIMINIPORT\0000
Last Reset 7/7/2003 2:51 PM
Index       6
Service Name        Raspti
IP Address Not Available
IP Subnet  Not Available
Default IP Gateway  Not Available
```

```
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained             Not Available
MAC Address         Not Available
Driver      c:\windows\system32\drivers\raspti.sys (5.2.3790.0
(srv03_rtm.030324-2048), 18.50 KB (18,944 bytes), 3/25/2003 7:00 AM)

Name        [00000007] WAN Miniport (IP)
Adapter Type        Not Available
Product Type        WAN Miniport (IP)
Installed   Yes
PNP Device ID       ROOT\MS_NDISWANIP\0000
Last Reset 7/7/2003 2:51 PM
Index       7
Service Name        NdisWan
IP Address Not Available
IP Subnet   Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained             Not Available
MAC Address         Not Available
Driver      c:\windows\system32\drivers\ndiswan.sys (5.2.3790.0
(srv03_rtm.030324-2048), 96.50 KB (98,816 bytes), 3/25/2003 7:00 AM)

Name        [00000008] IBM Netfinity 10/100 Ethernet Adapter
Adapter Type        Not Available
Product Type        IBM Netfinity 10/100 Ethernet Adapter
Installed   Yes
PNP Device ID       Not Available
Last Reset 7/7/2003 2:51 PM
Index       8
Service Name        E100B
IP Address Not Available
IP Subnet   Not Available
Default IP Gateway  Not Available
DHCP Enabled        No
DHCP Server         Not Available
DHCP Lease Expires  Not Available
DHCP Lease Obtained             Not Available
MAC Address         Not Available

[Protocol]

Item        Value
Name        MSAFD Tcpip [TCP/IP]
Connectionless Service          No
Guarantees Delivery  Yes
Guarantees Sequencing           Yes
Maximum Address Size            16 bytes
Maximum Message Size            0 bytes
Message Oriented     No
Minimum Address Size            16 bytes
Pseudo Stream Oriented          No
Supports Broadcasting           No
Supports Connect Data           No
Supports Disconnect Data        No
Supports Encryption  No
Supports Expedited Data         Yes
Supports Graceful Closing       Yes
Supports Guaranteed Bandwidth  No
Supports Multicasting No

Name        MSAFD Tcpip [UDP/IP]
Connectionless Service          Yes
Guarantees Delivery  No
```

```
Guarantees Sequencing           No
Maximum Address Size            16 bytes
Maximum Message Size            63.93 KB (65,467 bytes)
Message Oriented     Yes
Minimum Address Size            16 bytes
Pseudo Stream Oriented          No
Supports Broadcasting           Yes
Supports Connect Data           No
Supports Disconnect Data        No
Supports Encryption  No
Supports Expedited Data         No
Supports Graceful Closing       No
Supports Guaranteed Bandwidth  No
Supports Multicasting Yes

Name        RSVP UDP Service Provider
Connectionless Service          Yes
Guarantees Delivery  No
Guarantees Sequencing           No
Maximum Address Size            16 bytes
Maximum Message Size            63.93 KB (65,467 bytes)
Message Oriented     Yes
Minimum Address Size            16 bytes
Pseudo Stream Oriented          No
Supports Broadcasting           Yes
Supports Connect Data           No
Supports Disconnect Data        No
Supports Encryption  Yes
Supports Expedited Data         No
Supports Graceful Closing       No
Supports Guaranteed Bandwidth  No
Supports Multicasting Yes

Name        RSVP TCP Service Provider
Connectionless Service          No
Guarantees Delivery  Yes
Guarantees Sequencing           Yes
Maximum Address Size            16 bytes
Maximum Message Size            0 bytes
Message Oriented     No
Minimum Address Size            16 bytes
Pseudo Stream Oriented          No
Supports Broadcasting           No
Supports Connect Data           No
Supports Disconnect Data        No
Supports Encryption  Yes
Supports Expedited Data         Yes
Supports Graceful Closing       Yes
Supports Guaranteed Bandwidth  No
Supports Multicasting No

Name        MSAFD NetBIOS
[\Device\NetBT_Tcpip_{7A67E8EE-C587-4A6C-8DAC-869CD5CB7314}]
SEQPACKET 3
Connectionless Service          No
Guarantees Delivery  Yes
Guarantees Sequencing           Yes
Maximum Address Size            20 bytes
Maximum Message Size            62.50 KB (64,000 bytes)
Message Oriented     Yes
Minimum Address Size            20 bytes
Pseudo Stream Oriented          No
Supports Broadcasting           No
Supports Connect Data           No
Supports Disconnect Data        No
Supports Encryption  No
Supports Expedited Data         No
Supports Graceful Closing       No
Supports Guaranteed Bandwidth  No
Supports Multicasting No

Name       MSAFD NetBIOS
[\Device\NetBT_Tcpip_{7A67E8EE-C587-4A6C-8DAC-869CD5CB7314}]
DATAGRAM 3
Connectionless Service         Yes
Guarantees Delivery   No
Guarantees Sequencing          No
Maximum Address Size           20 bytes
Maximum Message Size           62.50 KB (64,000 bytes)
Message Oriented       Yes
Minimum Address Size           20 bytes
Pseudo Stream Oriented         No
Supports Broadcasting          Yes
Supports Connect Data          No
Supports Disconnect Data       No
Supports Encryption   No
Supports Expedited Data        No
Supports Graceful Closing      No
Supports Guaranteed Bandwidth  No
Supports Multicasting No

Name       MSAFD NetBIOS
[\Device\NetBT_Tcpip_{88B09A25-8F51-4EAC-A3E3-425FA99266F7}]
SEQPACKET 0
Connectionless Service         No
Guarantees Delivery   Yes
Guarantees Sequencing          Yes
Maximum Address Size           20 bytes
Maximum Message Size           62.50 KB (64,000 bytes)
Message Oriented       Yes
Minimum Address Size           20 bytes
Pseudo Stream Oriented         No
Supports Broadcasting          No
Supports Connect Data          No
Supports Disconnect Data       No
Supports Encryption   No
Supports Expedited Data        No
Supports Graceful Closing      No
Supports Guaranteed Bandwidth  No
Supports Multicasting No

Name       MSAFD NetBIOS
[\Device\NetBT_Tcpip_{88B09A25-8F51-4EAC-A3E3-425FA99266F7}]
DATAGRAM 0
Connectionless Service         Yes
Guarantees Delivery   No
Guarantees Sequencing          No
Maximum Address Size           20 bytes
Maximum Message Size           62.50 KB (64,000 bytes)
Message Oriented       Yes
Minimum Address Size           20 bytes
Pseudo Stream Oriented         No
Supports Broadcasting          Yes
Supports Connect Data          No
Supports Disconnect Data       No
Supports Encryption   No
Supports Expedited Data        No
Supports Graceful Closing      No
Supports Guaranteed Bandwidth  No
Supports Multicasting No

Name       MSAFD NetBIOS
[\Device\NetBT_Tcpip_{22FFBB96-7A17-4B97-B00C-04AF0657D964}]
SEQPACKET 1
Connectionless Service         No
Guarantees Delivery   Yes
Guarantees Sequencing          Yes
Maximum Address Size           20 bytes
Maximum Message Size           62.50 KB (64,000 bytes)
Message Oriented       Yes
Minimum Address Size           20 bytes
Pseudo Stream Oriented         No
Supports Broadcasting          No
Supports Connect Data          No
Supports Disconnect Data       No
Supports Encryption   No
Supports Expedited Data        No
Supports Graceful Closing      No
Supports Guaranteed Bandwidth  No
Supports Multicasting No

Name       MSAFD NetBIOS
[\Device\NetBT_Tcpip_{22FFBB96-7A17-4B97-B00C-04AF0657D964}]
DATAGRAM 1
Connectionless Service         Yes
Guarantees Delivery   No
Guarantees Sequencing          No
Maximum Address Size           20 bytes
Maximum Message Size           62.50 KB (64,000 bytes)
Message Oriented       Yes
Minimum Address Size           20 bytes
Pseudo Stream Oriented         No
Supports Broadcasting          Yes
Supports Connect Data          No
Supports Disconnect Data       No
Supports Encryption   No
Supports Expedited Data        No
Supports Graceful Closing      No
Supports Guaranteed Bandwidth  No
Supports Multicasting No

Name       MSAFD NetBIOS
[\Device\NetBT_Tcpip_{A0109638-F722-4EEF-96BC-58A66E11CAFF}]
SEQPACKET 2
Connectionless Service         No
Guarantees Delivery   Yes
Guarantees Sequencing          Yes
Maximum Address Size           20 bytes
Maximum Message Size           62.50 KB (64,000 bytes)
Message Oriented       Yes
Minimum Address Size           20 bytes
Pseudo Stream Oriented         No
Supports Broadcasting          No
Supports Connect Data          No
Supports Disconnect Data       No
Supports Encryption   No
Supports Expedited Data        No
Supports Graceful Closing      No
Supports Guaranteed Bandwidth  No
Supports Multicasting No

Name       MSAFD NetBIOS
[\Device\NetBT_Tcpip_{A0109638-F722-4EEF-96BC-58A66E11CAFF}]
DATAGRAM 2
Connectionless Service         Yes
Guarantees Delivery   No
Guarantees Sequencing          No
Maximum Address Size           20 bytes
Maximum Message Size           62.50 KB (64,000 bytes)
Message Oriented       Yes
Minimum Address Size           20 bytes
Pseudo Stream Oriented         No
Supports Broadcasting          Yes
Supports Connect Data          No
Supports Disconnect Data            No
Supports Encryption   No
Supports Expedited Data             No
Supports Graceful Closing           No
Supports Guaranteed Bandwidth  No
Supports Multicasting No

[WinSock]

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

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

[Ports]



[Serial]

Item        Value
Name        Communications Port (COM1)
Status      OK
PNP Device ID          ACPI\PNP0501\1
Maximum Input Buffer Size        0
Maximum Output Buffer Size       No
Settable Baud Rate     Yes
Settable Data Bits     Yes
Settable Flow Control Yes
Settable Parity        Yes
Settable Parity Check  Yes
Settable Stop Bits     Yes
Settable RLSD          Yes
Supports RLSD          Yes
Supports 16 Bit Mode No
Supports Special Characters      No
Baud Rate 9600
Bits/Byte   8
Stop Bits   1
Parity      None
Busy        No
Abort Read/Write on Error        No
Binary Mode Enabled Yes
Continue XMit on XOff            No
CTS Outflow Control No
Discard NULL Bytes  No
DSR Outflow Control 0
DSR Sensitivity        0
DTR Flow Control Type            Enable
EOF Character          0
Error Replace Character          0
Error Replacement Enabled        No
Event Character        0
Parity Check Enabled No
RTS Flow Control Type            Enable
XOff Character         19
XOffXMit Threshold  512
XOn Character          17
XOnXMit Threshold   2048
XOnXOff InFlow Control           0
XOnXOff OutFlow Control          0
IRQ Channel            IRQ 4
I/O Port    0x000003F8-0x000003FF
```

```
Driver      c:\windows\system32\drivers\serial.sys (5.2.3790.0
(srv03_rtm.030324-2048), 76.00 KB (77,824 bytes), 3/25/2003 7:00 AM)

[Parallel]

Item        Value
Name        LPT1
PNP Device ID          ACPI\PNP0400\1
I/O Port    0x00000378-0x0000037B
Driver      c:\windows\system32\drivers\parport.sys (5.2.3790.0
(srv03_rtm.030324-2048), 76.50 KB (78,336 bytes), 3/24/2003 6:04 PM)

[Storage]



[Drives]

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

Drive       C:
Description            Local Fixed Disk
Compressed             No
File System            NTFS
Size        16.94 GB (18,186,059,776 bytes)
Free Space 13.31 GB (14,296,236,032 bytes)
Volume Name
Volume Serial Number             885F2549

Drive       D:
Description            CD-ROM Disc

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

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

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

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

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

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

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

Drive       X:
Description         Network Connection
Provider Name       \\192.168.132.253\e$

Drive       Y:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size        78.13 GB (83,889,594,368 bytes)
Free Space  21.72 GB (23,324,512,256 bytes)
Volume Name         Backup_cool1
Volume Serial Number          A8FC56D7

Drive       Z:
Description         Local Fixed Disk
Compressed          No
File System         NTFS
Size        78.13 GB (83,889,594,368 bytes)
Free Space  21.73 GB (23,332,900,864 bytes)
Volume Name         Backup_cool2
Volume Serial Number          240D2182

[Disks]

Item        Value
Description         Disk drive
Manufacturer        (Standard disk drives)
Model       IBM-ESXS ST318305LC    !# SCSI Disk Device
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions  1
SCSI Bus  0
SCSI Logical Unit   0
SCSI Port  2
SCSI Target ID      0
Sectors/Track       63
Size        16.94 GB (18,194,319,360 bytes)
Total Cylinders     2,212
Total Sectors       35,535,780
Total Tracks        564,060
Tracks/Cylinder     255
Partition   Disk #0, Partition #0
Partition Size      16.94 GB (18,186,061,824 bytes)
Partition Starting Offset     32,256 bytes

Description         Disk drive
Manufacturer        (Standard disk drives)
Model       LSILOGIC 1030 IM SCSI Disk Device
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions  1
SCSI Bus  0
SCSI Logical Unit   0
SCSI Port  2
SCSI Target ID      2
Sectors/Track       63
Size        68.24 GB (73,270,794,240 bytes)
Total Cylinders     8,908
Total Sectors       143,107,020
Total Tracks        2,271,540
Tracks/Cylinder     255
Partition   Disk #1, Partition #0
Partition Size      44.00 GB (47,245,976,064 bytes)
Partition Starting Offset     8,257,536 bytes

Description         Mylex RAID Disk Device
Manufacturer        Mylex
Model       MYLEX AcceleRAID 352 SCSI Disk Device
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions  3
SCSI Bus  2
SCSI Logical Unit   0
SCSI Port  5
SCSI Target ID      0
Sectors/Track       63
Size        237.01 GB (254,490,163,200 bytes)
Total Cylinders     30,940
Total Sectors       497,051,100
Total Tracks        7,889,700
Tracks/Cylinder     255
Partition   Disk #3, Partition #0
Partition Size      28.54 GB (30,647,361,024 bytes)
Partition Starting Offset     8,257,536 bytes
Partition   Disk #3, Partition #1
Partition Size      13.73 GB (14,739,669,504 bytes)
Partition Starting Offset     30,655,650,816 bytes
Partition   Disk #3, Partition #2
Partition Size      78.13 GB (83,889,598,464 bytes)
Partition Starting Offset     45,395,352,576 bytes

Description         Mylex RAID Disk Device
Manufacturer        Mylex
Model       MYLEX AcceleRAID 352 SCSI Disk Device
Bytes/Sector        512
Media Loaded        Yes
Media Type          Fixed hard disk
Partitions  3
SCSI Bus  2
SCSI Logical Unit   0
SCSI Port  4
SCSI Target ID      0
Sectors/Track       63
Size        237.01 GB (254,490,163,200 bytes)
```

```
Total Cylinders         30,940
Total Sectors           497,051,100
Total Tracks            7,889,700
Tracks/Cylinder         255
Partition    Disk #2, Partition #0
Partition Size          28.54 GB (30,647,361,024 bytes)
Partition Starting Offset         8,257,536 bytes
Partition    Disk #2, Partition #1
Partition Size          13.73 GB (14,739,669,504 bytes)
Partition Starting Offset         30,655,650,816 bytes
Partition    Disk #2, Partition #2
Partition Size          78.13 GB (83,889,598,464 bytes)
Partition Starting Offset         45,395,352,576 bytes

Description             Mylex RAID Disk Device
Manufacturer            Mylex
Model      MYLEX AcceleRAID 352 SCSI Disk Device
Bytes/Sector            512
Media Loaded            Yes
Media Type              Fixed hard disk
Partitions  2
SCSI Bus  2
SCSI Logical Unit       0
SCSI Port  6
SCSI Target ID          0
Sectors/Track           63
Size       237.01 GB (254,490,163,200 bytes)
Total Cylinders         30,940
Total Sectors           497,051,100
Total Tracks            7,889,700
Tracks/Cylinder         255
Partition    Disk #4, Partition #0
Partition Size          28.54 GB (30,647,361,024 bytes)
Partition Starting Offset         8,257,536 bytes
Partition    Disk #4, Partition #1
Partition Size          13.73 GB (14,739,669,504 bytes)
Partition Starting Offset         30,655,650,816 bytes

[SCSI]

Item       Value
Name       Mylex AcceleRAID 352 Controller (Accelerated)
Manufacturer            Mylex
Status     OK
PNP Device ID
PCI\VEN_1069&DEV_0050&SUBSYS_00501069&REV_02\3&13C0B0C5&
0&08
Memory Address          0xF8000000-0xF9FFFFFF
IRQ Channel             IRQ 18
Driver     c:\windows\system32\drivers\dac2w2k.sys (7.05-01 built by:
WinDDK, 173.00 KB (177,152 bytes), 5/1/2003 5:13 PM)

Name       LSI Logic PCI-X Ultra320 SCSI Host Adapter
Manufacturer            LSI Logic Inc.
Status     OK
PNP Device ID
PCI\VEN_1000&DEV_0030&SUBSYS_026C1014&REV_07\3&1070020&0
&38
I/O Port    0x00002300-0x000024FF
Memory Address          0xF7FF0000-0xF7FFFFFF
Memory Address          0xF7FE0000-0xF7FEFFFF
IRQ Channel             IRQ 27
Driver     c:\windows\system32\drivers\symmpi.sys (1.08.18.00
(NT.021001-2000), 25.88 KB (26,496 bytes), 3/25/2003 7:00 AM)

Name       LSI Logic PCI-X Ultra320 SCSI Host Adapter
Manufacturer            LSI Logic Inc.
Status     OK
```

```
PNP Device ID
PCI\VEN_1000&DEV_0030&SUBSYS_026C1014&REV_07\3&1070020&0
&39
I/O Port    0x00002400-0x000024FF
Memory Address          0xF7FD0000-0xF7FDFFFF
Memory Address          0xF7FC0000-0xF7FCFFFF
IRQ Channel             IRQ 28
Driver     c:\windows\system32\drivers\symmpi.sys (1.08.18.00
(NT.021001-2000), 25.88 KB (26,496 bytes), 3/25/2003 7:00 AM)

Name       Mylex AcceleRAID 352 Controller (Accelerated)
Manufacturer            Mylex
Status     OK
PNP Device ID
PCI\VEN_1069&DEV_0050&SUBSYS_00501069&REV_02\3&29E81982&0
&28
Memory Address          0xF2000000-0xF3FFFFFF
IRQ Channel             IRQ 24
Driver     c:\windows\system32\drivers\dac2w2k.sys (7.05-01 built by:
WinDDK, 173.00 KB (177,152 bytes), 5/1/2003 5:13 PM)

Name       Mylex AcceleRAID 352 Controller (Accelerated)
Manufacturer            Mylex
Status     OK
PNP Device ID
PCI\VEN_1069&DEV_0050&SUBSYS_00501069&REV_02\3&172E68DD&
0&30
Memory Address          0xEE000000-0xEFFFFFFF
IRQ Channel             IRQ 31
Driver     c:\windows\system32\drivers\dac2w2k.sys (7.05-01 built by:
WinDDK, 173.00 KB (177,152 bytes), 5/1/2003 5:13 PM)

[IDE]

Item       Value
Name       CSB5 IDE Controller
Manufacturer            ServerWorks
Status     OK
PNP Device ID
PCI\VEN_1166&DEV_0212&SUBSYS_02121166&REV_93\3&267A616A&
0&79
I/O Port    0x00000700-0x0000070F
Driver     c:\windows\system32\drivers\pciide.sys (5.2.3790.0
(srv03_rtm.030324-2048), 5.50 KB (5,632 bytes), 3/25/2003 7:00 AM)

Name       Primary IDE Channel
Manufacturer            (Standard IDE ATA/ATAPI controllers)
Status     OK
PNP Device ID           PCIIDE\IDECHANNEL\4&1024D5C6&0&0
I/O Port    0x000001F0-0x000001F7
I/O Port    0x000003F6-0x000003F6
IRQ Channel             IRQ 14
Driver     c:\windows\system32\drivers\atapi.sys (5.2.3790.0
(srv03_rtm.030324-2048), 89.00 KB (91,136 bytes), 3/25/2003 7:00 AM)

Name       Secondary IDE Channel
Manufacturer            (Standard IDE ATA/ATAPI controllers)
Status     OK
PNP Device ID           PCIIDE\IDECHANNEL\4&1024D5C6&0&1
I/O Port    0x00000170-0x00000177
I/O Port    0x00000376-0x00000376
Driver     c:\windows\system32\drivers\atapi.sys (5.2.3790.0
(srv03_rtm.030324-2048), 89.00 KB (91,136 bytes), 3/25/2003 7:00 AM)

[Printing]

Name       Driver      Port Name Server Name
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[Problem Devices]

Device      PNP Device ID          Error Code
Not Available         ACPI\IBM37D4\2&DABA3FF&0               The drivers
for this device are not installed.

[USB]

Device      PNP Device ID
ServerWorks (RCC) PCI to USB Open Host Controller
PCI\VEN_1166&DEV_0220&SUBSYS_02201166&REV_05\3&267A616A&
0&7A
USB Root Hub          USB\ROOT_HUB\4&AF5358C&0

[Software Environment]



[System Drivers]

Name        Description         File        Type        Started     Start Mode
State       Status      Error Control       Accept Pause            Accept Stop
abiosdsk    Abiosdsk    Not Available       Kernel Driver           No
Disabled    Stopped     OK          Ignore      No          No
acpi        Microsoft ACPI Driver
c:\windows\system32\drivers\acpi.sys        Kernel Driver           Yes
Boot        Running     OK          Normal      No          Yes
acpiec      ACPIEC      c:\windows\system32\drivers\acpiec.sys      Kernel
Driver      No          Disabled    Stopped     OK          Normal      No
No
adpu160m adpu160m Not Available             Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
adpu320     adpu320     Not Available       Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
afcnt       afcnt       Not Available       Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
afd         AFD Networking Support Environment
c:\windows\system32\drivers\afd.sys         Kernel Driver           Yes
Auto        Running     OK          Normal      No          Yes
aha154x     Aha154x     Not Available       Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
aic78u2     aic78u2     Not Available       Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
aic78xx     aic78xx     Not Available       Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
aliide      AliIde      Not Available       Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
asyncmac  RAS Asynchronous Media Driver
c:\windows\system32\drivers\asyncmac.sys  Kernel Driver             No
Manual      Stopped     OK          Normal      No          No
atapi       Standard IDE/ESDI Hard Disk Controller
c:\windows\system32\drivers\atapi.sys       Kernel Driver           Yes
Boot        Running     OK          Normal      No          Yes
atdisk      Atdisk      Not Available       Kernel Driver           No
Disabled    Stopped     OK          Ignore      No          No
ati2mpad    ati2mpad    c:\windows\system32\drivers\ati2mpad.sys    Kernel
Driver      Yes         Manual      Running     OK          Ignore      No
Yes
atmarpc     ATM ARP Client Protocol
c:\windows\system32\drivers\atmarpc.sys     Kernel Driver           No
Manual      Stopped     OK          Normal      No          No
audstub     Audio Stub Driver       c:\windows\system32\drivers\audstub.sys
Kernel Driver           Yes         Manual      Running     OK          Normal
No          Yes
b57w2k      Broadcom NetXtreme Gigabit Ethernet
c:\windows\system32\drivers\b57xp32.sys     Kernel Driver           Yes
Manual      Running     OK          Normal      No          Yes
```

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beep        Beep        c:\windows\system32\drivers\beep.sys        Kernel
Driver      Yes         System      Running     OK          Normal      No
Yes
cbidf2k     cbidf2k     c:\windows\system32\drivers\cbidf2k.sys     Kernel
Driver      No          Disabled    Stopped     OK          Normal      No
No
cd20xrnt    cd20xrnt    Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
cdfs        Cdfs        c:\windows\system32\drivers\cdfs.sys        File System
Driver      Yes         Disabled    Running     OK          Normal      No
Yes
cdrom       CD-ROM Driver           c:\windows\system32\drivers\cdrom.sys
Kernel Driver           Yes         System      Running     OK          Normal
No          Yes
changer     Changer     Not Available           Kernel Driver           No
System      Stopped     OK          Ignore      No          No
clusdisk    Cluster Disk Driver     c:\windows\system32\drivers\clusdisk.sys
Kernel Driver           No          Disabled    Stopped     OK          Normal
No          No
cmdide      CmdIde      Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
cpqarray    Cpqarray    Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
cpqarry2    cpqarry2    Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
cpqcissm    cpqcissm    Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
cpqfcalm    cpqfcalm    Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
crcdisk     CRC Disk Filter Driver
c:\windows\system32\drivers\crcdisk.sys     Kernel Driver           Yes
Boot        Running     OK          Normal      No          Yes
dac2w2k     dac2w2k     c:\windows\system32\drivers\dac2w2k.sys     Kernel
Driver      Yes         Boot        Running     OK          Normal      No
Yes
dac960nt    dac960nt    Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
dellcerc    dellcerc    Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
dfsdriver   DfsDriver   c:\windows\system32\drivers\dfs.sys         File System
Driver      Yes         Boot        Running     OK          Normal      No
Yes
disk        Disk Driver             c:\windows\system32\drivers\disk.sys
Kernel Driver           Yes         Boot        Running     OK          Normal
No          Yes
dmboot      dmboot      c:\windows\system32\drivers\dmboot.sys      Kernel
Driver      No          Disabled    Stopped     OK          Normal      No
No
dmio        Logical Disk Manager Driver
c:\windows\system32\drivers\dmio.sys        Kernel Driver           Yes
Boot        Running     OK          Normal      No          Yes
dmload      dmload      c:\windows\system32\drivers\dmload.sys      Kernel
Driver      Yes         Boot        Running     OK          Normal      No
Yes
dpti2o      dpti2o      Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
e100b       Intel(R) PRO Adapter Driver
c:\windows\system32\drivers\e100b325.sys  Kernel Driver             No
Manual      Stopped     OK          Normal      No          No
fastfat     Fastfat     c:\windows\system32\drivers\fastfat.sys     File System
Driver      No          Disabled    Stopped     OK          Normal      No
No
fdc         Floppy Disk Controller Driver
c:\windows\system32\drivers\fdc.sys         Kernel Driver           Yes
Manual      Running     OK          Normal      No          Yes
fips        Fips        c:\windows\system32\drivers\fips.sys        Kernel
Driver      Yes         System      Running     OK          Normal      No
Yes
```

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flpydisk    Floppy Disk Driver    c:\windows\system32\drivers\flpydisk.sys
Kernel Driver         Yes         Manual      Running     OK          Normal
No          Yes
ftdisk      Volume Manager Driver
c:\windows\system32\drivers\ftdisk.sys        Kernel Driver           Yes
Boot        Running     OK          Normal      No          Yes
gpc         Generic Packet Classifier
c:\windows\system32\drivers\msgpc.sys         Kernel Driver           Yes
Manual      Running     OK          Normal      No          Yes
hpn         hpn         Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
hpt3xx      hpt3xx      Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
http        HTTP        c:\windows\system32\drivers\http.sys            Kernel
Driver      No          Manual      Stopped     OK          Normal      No
No
i2omgmt     i2omgmt     Not Available           Kernel Driver           No
System      Stopped     OK          Normal      No          No
i2omp       i2omp       Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
i8042prt    i8042 Keyboard and PS/2 Mouse Port Driver
c:\windows\system32\drivers\i8042prt.sys      Kernel Driver           Yes
System      Running     OK          Normal      No          Yes
ibmhpa      IBMHPA      c:\windows\system32\drivers\ibmhpa.sys          Kernel
Driver      Yes         Manual      Running     OK          Normal      No
Yes
ibmhpf      IBM Active PCI Filter Driver
c:\windows\system32\drivers\ibmhpf.sys        Kernel Driver           Yes
Boot        Running     OK          Normal      No          Yes
iirsp       iirsp       Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
imapi       CD-Burning Filter Driver
c:\windows\system32\drivers\imapi.sys         Kernel Driver           No
System      Stopped     OK          Normal      No          No
intelide    IntelIde    Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
ipfilterdriver          IP Traffic Filter Driver
c:\windows\system32\drivers\ipfltdrv.sys      Kernel Driver           No
Manual      Stopped     OK          Normal      No          No
ipinip      IP in IP Tunnel Driverc:\windows\system32\drivers\ipinip.sys
Kernel Driver         No          Manual      Stopped     OK          Normal
No          No
ipnat       IP Network Address Translator
c:\windows\system32\drivers\ipnat.sys         Kernel Driver           No
Manual      Stopped     OK          Normal      No          No
ipsec       IPSEC driver          c:\windows\system32\drivers\ipsec.sys
Kernel Driver         Yes         System      Running     OK          Normal
No          Yes
ipsraidn    ipsraidn    Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
irenum      IR Enumerator Service
c:\windows\system32\drivers\irenum.sys        Kernel Driver           No
Manual      Stopped     OK          Normal      No          No
isapnp      PnP ISA/EISA Bus Driver
c:\windows\system32\drivers\isapnp.sys        Kernel Driver           Yes
Boot        Running     OK          Critical    No          Yes
kbdclass    Keyboard Class Driver
c:\windows\system32\drivers\kbdclass.sys      Kernel Driver           Yes
System      Running     OK          Normal      No          Yes
ksecdd      KSecDD      c:\windows\system32\drivers\ksecdd.sys          Kernel
Driver      Yes         Boot        Running     OK          Normal      No
Yes
lp6nds35    lp6nds35    Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
macxp32     macxp32     c:\windows\system32\drivers\macxp32.sys         Kernel
Driver      Yes         Boot        Running     OK          Normal      No
Yes
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mnmdd       mnmdd       c:\windows\system32\drivers\mnmdd.sys           Kernel
Driver      Yes         System      Running     OK          Ignore      No
Yes
modem       Modem       c:\windows\system32\drivers\modem.sys           Kernel
Driver      No          Manual      Stopped     OK          Ignore      No
No
mouclass    Mouse Class Driver    c:\windows\system32\drivers\mouclass.sys
Kernel Driver         Yes         System      Running     OK          Normal
No          Yes
mountmgr    Mount Point Manager c:\windows\system32\drivers\mountmgr.sys
Kernel Driver         Yes         Boot        Running     OK          Normal
No          Yes
mraid35x    mraid35x    Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
mrxdav      WebDav Client Redirector
c:\windows\system32\drivers\mrxdav.sys        File System Driver      No
Manual      Stopped     OK          Normal      No          No
mrxsmb      MRXSMB c:\windows\system32\drivers\mrxsmb.sys          File System
Driver      Yes         System      Running     OK          Normal      No
Yes
msfs        Msfs        c:\windows\system32\drivers\msfs.sys            File System
Driver      Yes         System      Running     OK          Normal      No
Yes
mup         Mup         c:\windows\system32\drivers\mup.sys             File System
Driver      Yes         Boot        Running     OK          Normal      No
Yes
nal         Nal Service           \??\c:\windows\system32\drivers\iqvw32.sys
Kernel Driver         No          Manual      Stopped     OK          Normal
No          No
ndis        NDIS System Driver    c:\windows\system32\drivers\ndis.sys
Kernel Driver         Yes         Boot        Running     OK          Normal
No          Yes
ndistapi    Remote Access NDIS TAPI Driver
c:\windows\system32\drivers\ndistapi.sys      Kernel Driver           Yes
Manual      Running     OK          Normal      No          Yes
ndisuio     NDIS Usermode I/O Protocol
c:\windows\system32\drivers\ndisuio.sys       Kernel Driver           No
Manual      Stopped     OK          Normal      No          No
ndiswan     Remote Access NDIS WAN Driver
c:\windows\system32\drivers\ndiswan.sys       Kernel Driver           Yes
Manual      Running     OK          Normal      No          Yes
ndproxy     NDIS Proxy            c:\windows\system32\drivers\ndproxy.sys
Kernel Driver         Yes         Manual      Running     OK          Normal
No          Yes
netbios     NetBIOS Interface     c:\windows\system32\drivers\netbios.sys
File System Driver    Yes         System      Running     OK          Normal
No          Yes
netbt       NetBios over Tcpip    c:\windows\system32\drivers\netbt.sys
Kernel Driver         Yes         System      Running     OK          Normal
No          Yes
nfrd6m      IBM ServeRAID 6M Device Driver
c:\windows\system32\drivers\nfrd6m.sys        Kernel Driver           Yes
Boot        Running     OK          Normal      No          Yes
nfrd6mpf    IBM ServeRAID 6M Performance Driver
c:\windows\system32\drivers\nfrd6mpf.sys      Kernel Driver           Yes
Boot        Running     OK          Normal      No          Yes
nfrd960     IBM ServeRAID 4M/4Mx/4L/4Lx/5i/6M/6i Device Driver
c:\windows\system32\drivers\nfrd960.sys       Kernel Driver           Yes
Boot        Running     OK          Normal      No          Yes
npfs        Npfs        c:\windows\system32\drivers\npfs.sys            File System
Driver      Yes         System      Running     OK          Normal      No
Yes
ntfs        Ntfs        c:\windows\system32\drivers\ntfs.sys            File System
Driver      Yes         Disabled    Running     OK          Normal      No
Yes
null        Null        c:\windows\system32\drivers\null.sys            Kernel
Driver      Yes         System      Running     OK          Normal      No
Yes
```

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parport     Parallel port driver     c:\windows\system32\drivers\parport.sys
Kernel Driver         Yes         Manual      Running     OK          Normal
No          Yes
partmgr     Partition Manager        c:\windows\system32\drivers\partmgr.sys
Kernel Driver         Yes         Boot        Running     OK          Normal
No          Yes
parvdm      Parvdm      c:\windows\system32\drivers\parvdm.sys        Kernel
Driver      Yes         Auto        Running     OK          Ignore      No
Yes
pci         PCI Bus Driver           c:\windows\system32\drivers\pci.sys
Kernel Driver         Yes         Boot        Running     OK          Critical
No          Yes
pciide      PCIIde      c:\windows\system32\drivers\pciide.sys        Kernel
Driver      Yes         Boot        Running     OK          Normal      No
Yes
pcmcia      Pcmcia      c:\windows\system32\drivers\pcmcia.sys        Kernel
Driver      No          Disabled    Stopped     OK          Normal      No
No
pdcomp      PDCOMP  Not Available           Kernel Driver           No
Manual      Stopped     OK          Ignore      No          No
pdframe     PDFRAME                 Not Available           Kernel Driver
No          Manual      Stopped     OK          Ignore      No          No
pdreli      PDRELI      Not Available           Kernel Driver           No
Manual      Stopped     OK          Ignore      No          No
pdrframe    PDRFRAME                Not Available           Kernel Driver
No          Manual      Stopped     OK          Ignore      No          No
perc2       perc2       Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
perc2hib    perc2hib    Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
pptpminiport            WAN Miniport (PPTP)
c:\windows\system32\drivers\raspptp.sys         Kernel Driver           Yes
Manual      Running     OK          Normal      No          Yes
processor   Processor Driver         c:\windows\system32\drivers\processr.sys
Kernel Driver         Yes         Manual      Running     OK          Normal
No          Yes
ptilink     Direct Parallel Link Driver
c:\windows\system32\drivers\ptilink.sys         Kernel Driver           Yes
Manual      Running     OK          Normal      No          Yes
ql1080      ql1080      Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
ql10wnt     Ql10wnt     Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
ql12160     ql12160     Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
ql1240      ql1240      Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
ql1280      ql1280      Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
ql2100      ql2100      Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
ql2200      ql2200      Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
ql2300      ql2300      Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
rasacd      Remote Access Auto Connection Driver
c:\windows\system32\drivers\rasacd.sys          Kernel Driver           Yes
System      Running     OK          Normal      No          Yes
rasl2tp     WAN Miniport (L2TP)
c:\windows\system32\drivers\rasl2tp.sys         Kernel Driver           Yes
Manual      Running     OK          Normal      No          Yes
raspppoe    Remote Access PPPOE Driver
c:\windows\system32\drivers\raspppoe.sys        Kernel Driver           Yes
Manual      Running     OK          Normal      No          Yes
raspti      Direct Parallel          c:\windows\system32\drivers\raspti.sys
Kernel Driver         Yes         Manual      Running     OK          Normal
No          Yes
```

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rdbss       Rdbss       c:\windows\system32\drivers\rdbss.sys         File System
Driver      Yes         System      Running     OK          Normal      No
Yes
rdpcdd      RDPCDD  c:\windows\system32\drivers\rdpcdd.sys            Kernel
Driver      Yes         System      Running     OK          Ignore      No
Yes
rdpdr       Terminal Server Device Redirector Driver
c:\windows\system32\drivers\rdpdr.sys           Kernel Driver           Yes
Manual      Running     OK          Normal      No          Yes
rdpwd       RDPWD   c:\windows\system32\drivers\rdpwd.sys             Kernel
Driver      No          Manual      Stopped     OK          Ignore      No
No
redbook     Digital CD Audio Playback Filter Driver
c:\windows\system32\drivers\redbook.sys         Kernel Driver           Yes
System      Running     OK          Normal      No          Yes
secdrv      Secdrv      c:\windows\system32\drivers\secdrv.sys        Kernel
Driver      No          Manual      Stopped     OK          Normal      No
No
serenum     Serenum Filter Driver c:\windows\system32\drivers\serenum.sys
Kernel Driver         Yes         Manual      Running     OK          Normal
No          Yes
serial      Serial port driver      c:\windows\system32\drivers\serial.sys
Kernel Driver         Yes         System      Running     OK          Ignore
No          Yes
sfloppy     Sfloppy     c:\windows\system32\drivers\sfloppy.sys       Kernel
Driver      No          System      Stopped     OK          Ignore      No
No
simbad      Simbad      Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
sparrow     Sparrow     Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
srv         Srv         c:\windows\system32\drivers\srv.sys           File System
Driver      Yes         Manual      Running     OK          Normal      No
Yes
swenum      Software Bus Driver     c:\windows\system32\drivers\swenum.sys
Kernel Driver         Yes         Manual      Running     OK          Normal
No          Yes
symc810     symc810     Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
symc8xx     symc8xx     Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
symmpi      symmpi      c:\windows\system32\drivers\symmpi.sys        Kernel
Driver      Yes         Boot        Running     OK          Normal      No
Yes
sym_hi      sym_hi      Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
sym_u3      sym_u3      Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
tcpip       TCP/IP Protocol Driver
c:\windows\system32\drivers\tcpip.sys           Kernel Driver           Yes
System      Running     OK          Normal      No          Yes
tdpipe      TDPIPE      c:\windows\system32\drivers\tdpipe.sys        Kernel
Driver      No          Manual      Stopped     OK          Ignore      No
No
tdtcp       TDTCP       c:\windows\system32\drivers\tdtcp.sys         Kernel
Driver      No          Manual      Stopped     OK          Ignore      No
No
termdd      Terminal Device Driver
c:\windows\system32\drivers\termdd.sys          Kernel Driver           Yes
System      Running     OK          Normal      No          Yes
toside      TosIde      Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
udfs        Udfs        c:\windows\system32\drivers\udfs.sys          File System
Driver      No          Disabled    Stopped     OK          Normal      No
No
ultra       ultra       Not Available           Kernel Driver           No
Disabled    Stopped     OK          Normal      No          No
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update      Microcode Update Driver
c:\windows\system32\drivers\update.sys      Kernel Driver       Yes
Manual      Running     OK      Normal      No      Yes
usbhub      USB2 Enabled Hub    c:\windows\system32\drivers\usbhub.sys
Kernel Driver       Yes     Manual      Running     OK      Normal
No      Yes
usbohci     Microsoft USB Open Host Controller Miniport Driver
c:\windows\system32\drivers\usbohci.sys     Kernel Driver       Yes
Manual      Running     OK      Normal      No      Yes
vgasave     VGA Display Controller.
c:\windows\system32\drivers\vga.sys     Kernel Driver       Yes
System      Running     OK      Ignore      No      Yes
viaide      ViaIde      Not Available       Kernel Driver       No
Disabled    Stopped     OK      Normal      No      No
volsnap     Storage volumes     c:\windows\system32\drivers\volsnap.sys
Kernel Driver       Yes     Boot        Running     OK      Normal
No      Yes
wanarp      Remote Access IP ARP Driver
c:\windows\system32\drivers\wanarp.sys      Kernel Driver       Yes
Manual      Running     OK      Normal      No      Yes
wdica       WDICA       Not Available       Kernel Driver       No
Manual      Stopped     OK      Ignore      No      No
wlbs        Network Load Balancing
c:\windows\system32\drivers\wlbs.sys        Kernel Driver       No
Manual      Stopped     OK      Normal      No      No

[Signed Drivers]

Device Name         Signed      Device Class        Driver Version
Driver Date         Manufacturer        INF Name Driver Name
Device ID
Not Available       Not Available       Not Available       Not
Available  Not Available        Not Available       Not Available
Not Available       HTREE\ROOT\0
ACPI Multiprocessor PC      No      COMPUTER        5.2.3790.0
10/1/2002  (Standard computers) hal.inf     Not Available
ROOT\ACPI_HAL\0000
Microsoft ACPI-Compliant System     No      SYSTEM  5.2.3790.0
10/1/2002  Microsoft  acpi.inf      Not Available
ACPI_HAL\PNP0C08\0
Processor  No       PROCESSOR       5.2.3790.0 10/1/2002  (Standard
processor types)    cpu.inf     Not Available
ACPI\GENUINEINTEL_-_X86_FAMILY_15_MODEL_2\_0
Processor  No       PROCESSOR       5.2.3790.0 10/1/2002  (Standard
processor types)    cpu.inf     Not Available
ACPI\GENUINEINTEL_-_X86_FAMILY_15_MODEL_2\_1
PCI bus     No      SYSTEM  5.2.3790.0 10/1/2002  (Standard system
devices)    machine.inf     Not Available       ACPI\PNP0A03\0
ServerWorks (RCC) CMIC_LE Processor to PCI Bridge(*)        No
SYSTEM  5.2.3790.0 10/1/2002  ServerWorks (RCC)    machine.inf
Not Available
PCI\VEN_1166&DEV_0014&SUBSYS_00000000&REV_31\3&267A616A&
0&00
ServerWorks (RCC) CMIC_LE Processor to PCI Bridge(*)        No
SYSTEM  5.2.3790.0 10/1/2002  ServerWorks (RCC)    machine.inf
Not Available
PCI\VEN_1166&DEV_0014&SUBSYS_00000000&REV_00\3&267A616A&
0&01
ServerWorks (RCC) CMIC_LE Processor to PCI Bridge(*)        No
SYSTEM  5.2.3790.0 10/1/2002  ServerWorks (RCC)    machine.inf
Not Available
PCI\VEN_1166&DEV_0014&SUBSYS_00000000&REV_00\3&267A616A&
0&02
RAGE XL PCI Family (Microsoft Corporation)      No      DISPLAY
5.10.2600.6014      8/8/2001    ATI Technologies Inc.       atiixpad.inf
Not Available
PCI\VEN_1002&DEV_4752&SUBSYS_02401014&REV_27\3&267A616A&
0&48
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Default Monitor     No      MONITOR         5.1.2001.0 6/6/2001
(Standard monitor types)    monitor.inf     Not Available
DISPLAY\DEFAULT_MONITOR\4&2C2F1CF7&0&80000000&00&09
ServerWorks Champion CSB5 - SouthBridge 5       No      SYSTEM
5.2.3790.0 10/1/2002  ServerWorks (RCC)    machine.inf     Not
Available
PCI\VEN_1166&DEV_0201&SUBSYS_00000000&REV_93\3&267A616A&
0&78
Motherboard resources       No      SYSTEM  5.2.3790.0 10/1/2002
(Standard system devices)   machine.inf     Not Available
ACPI\PNP0C02\2
Standard 101/102-Key or Microsoft Natural PS/2 Keyboard     No
KEYBOARD        5.2.3790.0 10/1/2002  (Standard keyboards)  keyboard.inf
Not Available       ACPI\PNP0303\4&35118DFF&0
PS/2 Compatible Mouse       No      MOUSE   5.2.3790.0 10/1/2002
Microsoft  msmouse.inf      Not Available
ACPI\PNP0F13\4&35118DFF&0
Standard floppy disk controller  No     FDC     5.2.3790.0 10/1/2002
(Standard floppy disk controllers)      fdc.inf     Not Available
ACPI\PNP0700\4&35118DFF&0
Floppy disk drive       No      FLOPPYDISK      5.2.3790.0 10/1/2002
(Standard floppy disk drives)   flpydisk.inf    Not Available
FDC\GENERIC_FLOPPY_DRIVE\5&28649E28&0&0
Printer Port        No      PORTS   5.2.3790.0 10/1/2002  (Standard
port types) msports.inf     Not Available       ACPI\PNP0400\1
Printer Port Logical Interface      No      SYSTEM  5.2.3790.0 10/1/2002
(Standard system devices)   machine.inf     Not Available
LPTENUM\MICROSOFTRAWPORT\5&1D62032D&0&LPT1
Communications Port No      PORTS   5.2.3790.0 10/1/2002  (Standard
port types) msports.inf     Not Available       ACPI\PNP0501\1
Advanced programmable interrupt controllerNo        SYSTEM  5.2.3790.0
10/1/2002  (Standard system devices)        machine.inf     Not
Available  ACPI\PNP0003\4&35118DFF&0
Direct memory access controller  No     SYSTEM  5.2.3790.0 10/1/2002
(Standard system devices)   machine.inf     Not Available
ACPI\PNP0200\4&35118DFF&0
System timer        No      SYSTEM  5.2.3790.0 10/1/2002  (Standard
system devices)     machine.inf     Not Available
ACPI\PNP0100\4&35118DFF&0
System CMOS/real time clock     No      SYSTEM  5.2.3790.0 10/1/2002
(Standard system devices)   machine.inf     Not Available
ACPI\PNP0B00\4&35118DFF&0
System speaker      No      SYSTEM  5.2.3790.0 10/1/2002  (Standard
system devices)     machine.inf     Not Available
ACPI\PNP0800\4&35118DFF&0
Numeric data processor      No      SYSTEM  5.2.3790.0 10/1/2002
(Standard system devices)   machine.inf     Not Available
ACPI\PNP0C04\4&35118DFF&0
Motherboard resources       No      SYSTEM  5.2.3790.0 10/1/2002
(Standard system devices)   machine.inf     Not Available
ACPI\PNP0C02\3
CSB5 IDE Controller No      HDC     5.2.3790.0 10/1/2002
ServerWorks     mshdc.inf  Not Available
PCI\VEN_1166&DEV_0212&SUBSYS_02121166&REV_93\3&267A616A&
0&79
Primary IDE Channel No      HDC     5.2.3790.0 10/1/2002  (Standard
IDE ATA/ATAPI controllers)      mshdc.inf  Not Available
PCIIDE\IDECHANNEL\4&1024D5C6&0&0
CD-ROM Drive        No      CDROM   5.2.3790.0 10/1/2002  (Standard
CD-ROM drives)      cdrom.inf  Not Available
IDE\CDROMLG_CD-ROM_CRD-8484B_____________________2.01____\5
&FB0C83D&0&0.0.0
Secondary IDE Channel       No      HDC     5.2.3790.0 10/1/2002
(Standard IDE ATA/ATAPI controllers)    mshdc.inf  Not Available
PCIIDE\IDECHANNEL\4&1024D5C6&0&1
ServerWorks (RCC) PCI to USB Open Host Controller  No       USB
5.2.3790.0 10/1/2002  ServerWorks (RCC)    usbport.infNot Available
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PCI\VEN_1166&DEV_0220&SUBSYS_02201166&REV_05\3&267A616A&
0&7A
USB Root Hub	No	USB	5.2.3790.0 10/1/2002	(Standard
USB Host Controller) usbport.inf Not Available
USB\ROOT_HUB\4&AF5358C&0
Serverworks Champion CSB5 - SouthBridge 5 LPC	No	SYSTEM
5.2.3790.0 10/1/2002	ServerWorks (RCC)	machine.inf	Not
Available
PCI\VEN_1166&DEV_0225&SUBSYS_00000000&REV_00\3&267A616A&
0&7B
ISAPNP Read Data Port	No	SYSTEM	5.2.3790.0 10/1/2002
(Standard system devices)	machine.inf	Not Available
ISAPNP\READDATAPORT\0
ServerWorks Grand Champion CIOB_X2 - I/O Bridge 133 Mhz	No
SYSTEM	5.2.3790.0 10/1/2002	ServerWorks (RCC)	machine.inf
Not Available
PCI\VEN_1166&DEV_0101&SUBSYS_00000000&REV_03\3&267A616A&
0&80
ServerWorks Grand Champion CIOB_X2 - I/O Bridge 133 Mhz	No
SYSTEM	5.2.3790.0 10/1/2002	ServerWorks (RCC)	machine.inf
Not Available
PCI\VEN_1166&DEV_0101&SUBSYS_00000000&REV_03\3&267A616A&
0&82
ServerWorks Grand Champion CIOB_X2 - I/O Bridge 133 Mhz	No
SYSTEM	5.2.3790.0 10/1/2002	ServerWorks (RCC)	machine.inf
Not Available
PCI\VEN_1166&DEV_0101&SUBSYS_00000000&REV_03\3&267A616A&
0&88
ServerWorks Grand Champion CIOB_X2 - I/O Bridge 133 Mhz	No
SYSTEM	5.2.3790.0 10/1/2002	ServerWorks (RCC)	machine.inf
Not Available
PCI\VEN_1166&DEV_0101&SUBSYS_00000000&REV_03\3&267A616A&
0&8A
PCI bus	No	SYSTEM	5.2.3790.0 10/1/2002	(Standard system
devices)	machine.inf	Not Available	ACPI\PNP0A03\1
Mylex AcceleRAID 352 Controller (Accelerated)	No
SCSIADAPTER	7.5.1.0	12/13/2002	Mylex	oem7.inf
Not Available
PCI\VEN_1069&DEV_0050&SUBSYS_00501069&REV_02\3&13C0B0C5&
0&08
SCSI Processor Device	No	SYSTEM	5.2.3790.0 10/1/2002
IBM	scsidev.inf Not Available
SCSI\PROCESSOR&VEN_IBM&PROD_EXP300___S160&REV_D014\4&3
8A862AB&0&0F0
SCSI Processor Device	No	SYSTEM	5.2.3790.0 10/1/2002
IBM	scsidev.inf Not Available
SCSI\PROCESSOR&VEN_IBM&PROD_EXP300___S160&REV_D014\4&3
8A862AB&0&1F0
Mylex RAID Disk Device	No	DISKDRIVE	5.2.3790.0
10/1/2002	Mylex	disk.inf	Not Available
SCSI\DISK&VEN_MYLEX&PROD_ACCELERAID_352&REV_0701\4&38
A862AB&0&200
Mylex GAM Device	No	SYSTEM	5.2.3790.0 10/1/2002	Mylex
scsidev.inf Not Available
SCSI\PROCESSOR&VEN_MYLEX&PROD_GAM_DEVICE&REV_\4&38A
862AB&0&460
Broadcom NetXtreme Gigabit Ethernet	No	NET	2.91.0.0
10/1/2002	Broadcom netb57xp.inf	Not Available
PCI\VEN_14E4&DEV_16A7&SUBSYS_026F1014&REV_02\3&13C0B0C5
&0&40
PCI bus	No	SYSTEM	5.2.3790.0 10/1/2002	(Standard system
devices)	machine.inf	Not Available	ACPI\PNP0A03\2
LSI Logic PCI-X Ultra320 SCSI Host Adapter	No
SCSIADAPTER	5.2.3790.0 10/1/2002	LSI Logic Inc.	pnpscsi.inf
Not Available
PCI\VEN_1000&DEV_0030&SUBSYS_026C1014&REV_07\3&1070020&0
&38
```

```
Disk drive No	DISKDRIVE	5.2.3790.0 10/1/2002	(Standard
disk drives)	disk.inf	Not Available
SCSI\DISK&VEN_IBM-ESXS&PROD_ST318305LC____!#&REV_B244\4&
30BEF77E&0&000
Disk drive No	DISKDRIVE	5.2.3790.0 10/1/2002	(Standard
disk drives)	disk.inf	Not Available
SCSI\DISK&VEN_LSILOGIC&PROD_1030_IM&REV_1000\4&30BEF77E
&0&020
SCSI Processor Device	No	SYSTEM	5.2.3790.0 10/1/2002
IBM	scsidev.inf Not Available
SCSI\PROCESSOR&VEN_IBM&PROD_02R0962A_S320__1&REV_1\4&30
BEF77E&0&080
IBM Dummy Device	No	SYSTEM	5.2.3790.0 10/1/2002	IBM
scsidev.inf Not Available
SCSI\BRIDGE&VEN_IBM&PROD_DUMMY_DEVICE&REV_4.80\4&30B
EF77E&0&100
LSI Logic PCI-X Ultra320 SCSI Host Adapter	No
SCSIADAPTER	5.2.3790.0 10/1/2002	LSI Logic Inc.	pnpscsi.inf
Not Available
PCI\VEN_1000&DEV_0030&SUBSYS_026C1014&REV_07\3&1070020&0
&39
IBM Dummy Device	No	SYSTEM	5.2.3790.0 10/1/2002	IBM
scsidev.inf Not Available
SCSI\BRIDGE&VEN_IBM&PROD_DUMMY_DEVICE&REV_4.80\4&7DD
DE1C&0&100
PCI bus	No	SYSTEM	5.2.3790.0 10/1/2002	(Standard system
devices)	machine.inf	Not Available	ACPI\PNP0A03\3
Mylex AcceleRAID 352 Controller (Accelerated)	No
SCSIADAPTER	7.5.1.0	12/13/2002	Mylex	oem7.inf
Not Available
PCI\VEN_1069&DEV_0050&SUBSYS_00501069&REV_02\3&29E81982&0
&28
SCSI Processor Device	No	SYSTEM	5.2.3790.0 10/1/2002
IBM	scsidev.inf Not Available
SCSI\PROCESSOR&VEN_IBM&PROD_EXP300___S160&REV_D014\4&8
B4695D&0&0F0
SCSI Processor Device	No	SYSTEM	5.2.3790.0 10/1/2002
IBM	scsidev.inf Not Available
SCSI\PROCESSOR&VEN_IBM&PROD_EXP300___S160&REV_D014\4&8
B4695D&0&1F0
Mylex RAID Disk Device	No	DISKDRIVE	5.2.3790.0
10/1/2002	Mylex	disk.inf	Not Available
SCSI\DISK&VEN_MYLEX&PROD_ACCELERAID_352&REV_0701\4&8B
4695D&0&200
Mylex GAM Device	No	SYSTEM	5.2.3790.0 10/1/2002	Mylex
scsidev.inf Not Available
SCSI\PROCESSOR&VEN_MYLEX&PROD_GAM_DEVICE&REV_\4&8B4
695D&0&460
PCI bus	No	SYSTEM	5.2.3790.0 10/1/2002	(Standard system
devices)	machine.inf	Not Available	ACPI\PNP0A03\4
Mylex AcceleRAID 352 Controller (Accelerated)	No
SCSIADAPTER	7.5.1.0	12/13/2002	Mylex	oem7.inf
Not Available
PCI\VEN_1069&DEV_0050&SUBSYS_00501069&REV_02\3&172E68DD&
0&30
SCSI Processor Device	No	SYSTEM	5.2.3790.0 10/1/2002
IBM	scsidev.inf Not Available
SCSI\PROCESSOR&VEN_IBM&PROD_EXP300___S160&REV_D014\4&3
4FC159&0&0F0
SCSI Processor Device	No	SYSTEM	5.2.3790.0 10/1/2002
IBM	scsidev.inf Not Available
SCSI\PROCESSOR&VEN_IBM&PROD_EXP300___S160&REV_D014\4&3
4FC159&0&1F0
Mylex RAID Disk Device	No	DISKDRIVE	5.2.3790.0
10/1/2002	Mylex	disk.inf	Not Available
SCSI\DISK&VEN_MYLEX&PROD_ACCELERAID_352&REV_0701\4&34
FC159&0&200
```

```
Mylex GAM Device   No          SYSTEM  5.2.3790.0 10/1/2002  Mylex
scsidev.inf Not Available
SCSI\PROCESSOR&VEN_MYLEX&PROD_GAM_DEVICE&REV_\4&34F
C159&0&460
Not Available          Not Available          Not Available          Not
Available  Not Available          Not Available          Not Available
Not Available          ACPI\IBM37D4\2&DABA3FF&0
IBM Active PCI Device          No          SYSTEM  5.1.1.1      2/7/2003
IBM Corporation        oem1.inf  Not Available
ACPI\ASF0001\2&DABA3FF&0
ACPI Fixed Feature Button          No          SYSTEM  5.2.3790.0 10/1/2002
(Standard system devices)          machine.inf              Not Available
ACPI\FIXEDBUTTON\2&DABA3FF&0
Logical Disk ManagerNo          SYSTEM  5.2.3790.0 10/1/2002  (Standard
system devices)        machine.inf              Not Available
ROOT\DMIO\0000
Volume Manager         No          SYSTEM  5.2.3790.0 10/1/2002  (Standard
system devices)        machine.inf              Not Available
ROOT\FTDISK\0000
Generic volume         No          VOLUME 5.2.3790.0 10/1/2002  Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATURE3F2CE4BAOFFSET7E
0000LENGTH722B99E00
Generic volume         No          VOLUME 5.2.3790.0 10/1/2002  Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATURE3F2CE4BAOFFSET72
3381C00LENGTH36E8D8200
Generic volume         No          VOLUME 5.2.3790.0 10/1/2002  Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATURE3F2CE4BAOFFSETA9
1C61C00LENGTH138835B000
Generic volume         No          VOLUME 5.2.3790.0 10/1/2002  Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATURE1CC73790OFFSET7E
00LENGTH43BF94800
Generic volume         No          VOLUME 5.2.3790.0 10/1/2002  Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATURE1OFFSET7E0000LEN
GTHB00146200
Generic volume         No          VOLUME 5.2.3790.0 10/1/2002  Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATURE3F2CE4BCOFFSET7E
0000LENGTH722B99E00
Generic volume         No          VOLUME 5.2.3790.0 10/1/2002  Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATURE3F2CE4BCOFFSET72
3381C00LENGTH36E8D8200
Generic volume         No          VOLUME 5.2.3790.0 10/1/2002  Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATURE3F2CE4BBOFFSET7E
0000LENGTH722B99E00
Generic volume         No          VOLUME 5.2.3790.0 10/1/2002  Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATURE3F2CE4BBOFFSET72
3381C00LENGTH36E8D8200
Generic volume         No          VOLUME 5.2.3790.0 10/1/2002  Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATURE3F2CE4BBOFFSETA9
1C61C00LENGTH138835B000
AFD Networking Support Environment          Not Available
LEGACYDRIVER     Not Available          Not Available          Not
Available  Not Available          Not Available
ROOT\LEGACY_AFD\0000
Beep        Not Available          LEGACYDRIVER     Not Available
Not Available          Not Available          Not Available          Not
Available  ROOT\LEGACY_BEEP\0000
```

```
CRC Disk Filter Driver            Not Available            LEGACYDRIVER
Not Available          Not Available          Not Available          Not
Available  Not Available          ROOT\LEGACY_CRCDISK\0000
dmboot     Not Available          LEGACYDRIVER     Not Available
Not Available          Not Available          Not Available          Not
Available  ROOT\LEGACY_DMBOOT\0000
dmload     Not Available          LEGACYDRIVER     Not Available
Not Available          Not Available          Not Available          Not
Available  ROOT\LEGACY_DMLOAD\0000
Fips        Not Available          LEGACYDRIVER     Not Available
Not Available          Not Available          Not Available          Not
Available  ROOT\LEGACY_FIPS\0000
Generic Packet Classifier          Not Available            LEGACYDRIVER
Not Available          Not Available          Not Available          Not
Available  Not Available          ROOT\LEGACY_GPC\0000
IPSEC driver           Not Available          LEGACYDRIVER     Not
Available  Not Available          Not Available          Not Available
Not Available          ROOT\LEGACY_IPSEC\0000
ksecdd     Not Available          LEGACYDRIVER     Not Available
Not Available          Not Available          Not Available          Not
Available  ROOT\LEGACY_KSECDD\0000
macxp32  Not Available          LEGACYDRIVER     Not Available
Not Available          Not Available          Not Available          Not
Available  ROOT\LEGACY_MACXP32\0000
mnmdd     Not Available          LEGACYDRIVER     Not Available
Not Available          Not Available          Not Available          Not
Available  ROOT\LEGACY_MNMDD\0000
mountmgr Not Available          LEGACYDRIVER     Not Available
Not Available          Not Available          Not Available          Not
Available  ROOT\LEGACY_MOUNTMGR\0000
Nal Service            Not Available          LEGACYDRIVER     Not
Available  Not Available          Not Available          Not Available
Not Available          ROOT\LEGACY_NAL\0000
NDIS System Driver  Not Available          LEGACYDRIVER     Not
Available  Not Available          Not Available          Not Available
Not Available          ROOT\LEGACY_NDIS\0000
Remote Access NDIS TAPI Driver            Not Available
LEGACYDRIVER     Not Available          Not Available          Not
Available  Not Available          Not Available
ROOT\LEGACY_NDISTAPI\0000
NDIS Usermode I/O Protocol       Not Available            LEGACYDRIVER
Not Available          Not Available          Not Available          Not
Available  Not Available          ROOT\LEGACY_NDISUIO\0000
NDProxy  Not Available          LEGACYDRIVER     Not Available
Not Available          Not Available          Not Available          Not
Available  ROOT\LEGACY_NDPROXY\0000
NetBios over Tcpip   Not Available          LEGACYDRIVER     Not
Available  Not Available          Not Available          Not Available
Not Available          ROOT\LEGACY_NETBT\0000
IBM ServeRAID 6M Device Driver            Not Available
LEGACYDRIVER     Not Available          Not Available          Not
Available  Not Available          Not Available
ROOT\LEGACY_NFRD6M\0000
IBM ServeRAID 6M Performance Driver     Not Available
LEGACYDRIVER     Not Available          Not Available          Not
Available  Not Available          Not Available
ROOT\LEGACY_NFRD6MPF\0000
IBM ServeRAID 4M/4Mx/4L/4Lx/5i/6M/6i Device Driver            Not
Available  LEGACYDRIVER     Not Available          Not Available
Not Available          Not Available          Not Available
ROOT\LEGACY_NFRD960\0000
Null        Not Available          LEGACYDRIVER     Not Available
Not Available          Not Available          Not Available          Not
Available  ROOT\LEGACY_NULL\0000
Partition Manager      Not Available          LEGACYDRIVER     Not
Available  Not Available          Not Available          Not Available
Not Available          ROOT\LEGACY_PARTMGR\0000
```

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Parvdm	Not Available		LEGACYDRIVER	Not Available
Not Available		Not Available		Not Available		Not
Available	ROOT\LEGACY_PARVDM\0000
Remote Access Auto Connection Driver	Not Available
LEGACYDRIVER	Not Available		Not Available		Not
Available	Not Available		Not Available
ROOT\LEGACY_RASACD\0000
RDPCDD	Not Available		LEGACYDRIVER	Not Available
Not Available		Not Available		Not Available		Not
Available	ROOT\LEGACY_RDPCDD\0000
TCP/IP Protocol Driver		Not Available		LEGACYDRIVER
Not Available		Not Available		Not Available		Not
Available	Not Available		ROOT\LEGACY_TCPIP\0000
VGA Display Controller.		Not Available		LEGACYDRIVER
Not Available		Not Available		Not Available		Not
Available	Not Available		ROOT\LEGACY_VGASAVE\0000
volsnap	Not Available		LEGACYDRIVER	Not Available
Not Available		Not Available		Not Available		Not
Available	ROOT\LEGACY_VOLSNAP\0000
Remote Access IP ARP Driver	Not Available		LEGACYDRIVER
Not Available		Not Available		Not Available		Not
Available	Not Available		ROOT\LEGACY_WANARP\0000
Audio Codecs		No		MEDIA	5.2.3790.0 10/1/2002	(Standard
system devices)		wave.inf	Not Available
ROOT\MEDIA\MS_MMACM
Legacy Audio Drivers	No		MEDIA	5.2.3790.0 10/1/2002	(Standard
system devices)		wave.inf	Not Available
ROOT\MEDIA\MS_MMDRV
Media Control Devices		No		MEDIA	5.2.3790.0 10/1/2002
(Standard system devices)	wave.inf	Not Available
ROOT\MEDIA\MS_MMMCI
Legacy Video Capture Devices	No		MEDIA	5.2.3790.0 10/1/2002
(Standard system devices)	wave.inf	Not Available
ROOT\MEDIA\MS_MMVCD
Video Codecs		No		MEDIA	5.2.3790.0 10/1/2002	(Standard
system devices)		wave.inf	Not Available
ROOT\MEDIA\MS_MMVID
WAN Miniport (L2TP)		No		NET		5.2.3790.0 10/1/2002
Microsoft	netrasa.inf Not Available
ROOT\MS_L2TPMINIPORT\0000
WAN Miniport (IP)	No		NET		5.2.3790.0 10/1/2002	Microsoft
netrasa.inf Not Available		ROOT\MS_NDISWANIP\0000
WAN Miniport (PPPOE)		No		NET		5.2.3790.0 10/1/2002
Microsoft	netrasa.inf Not Available
ROOT\MS_PPPOEMINIPORT\0000
WAN Miniport (PPTP)		No		NET		5.2.3790.0 10/1/2002
Microsoft	netrasa.inf Not Available
ROOT\MS_PPTPMINIPORT\0000
Direct Parallel		No		NET		5.2.3790.0 10/1/2002	Microsoft
netrasa.inf Not Available		ROOT\MS_PTIMINIPORT\0000
Terminal Server Device Redirector		No		SYSTEM	5.2.3790.0
10/1/2002	(Standard system devices)		machine.inf		Not
Available	ROOT\RDPDR\0000
Terminal Server Keyboard Driver		No		SYSTEM	5.2.3790.0
10/1/2002	(Standard system devices)		machine.inf		Not
Available	ROOT\RDP_KBD\0000
Terminal Server Mouse Driver	No		SYSTEM	5.2.3790.0 10/1/2002
(Standard system devices)	machine.inf		Not Available
ROOT\RDP_MOU\0000
Plug and Play Software Device Enumerator	No		SYSTEM	5.2.3790.0
10/1/2002	(Standard system devices)		machine.inf		Not
Available	ROOT\SYSTEM\0000
Microcode Update Device		No		SYSTEM	5.2.3790.0 10/1/2002
(Standard system devices)	machine.inf		Not Available
ROOT\SYSTEM\0001

[Environment Variables]

Variable	Value		User Name
ClusterLog		C:\WINDOWS\Cluster\cluster.log		<SYSTEM>
ComSpec	%SystemRoot%\system32\cmd.exe		<SYSTEM>
NUMBER_OF_PROCESSORS	2		<SYSTEM>
OS		Windows_NT		<SYSTEM>
Path
%SystemRoot%\system32;%SystemRoot%;%SystemRoot%\System32\Wbem;
C:\Program Files\Microsoft SQL Server\MSSQL\BINN;C:\Program
Files\Microsoft SQL Server\80\Tools\BINN <SYSTEM>
PATHEXT
.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH		<SYSTEM>
PROCESSOR_ARCHITECTURE		x86		<SYSTEM>
PROCESSOR_IDENTIFIER		x86 Family 15 Model 2 Stepping 7,
GenuineIntel		<SYSTEM>
PROCESSOR_LEVEL			15		<SYSTEM>
PROCESSOR_REVISION		0207		<SYSTEM>
TEMP		%SystemRoot%\TEMP		<SYSTEM>
TMP		%SystemRoot%\TEMP		<SYSTEM>
windir		%SystemRoot%		<SYSTEM>
TEMP		%USERPROFILE%\Local Settings\Temp	NT
AUTHORITY\SYSTEM
TMP		%USERPROFILE%\Local Settings\Temp	NT
AUTHORITY\SYSTEM
TEMP		%USERPROFILE%\Local Settings\Temp	NT
AUTHORITY\LOCAL SERVICE
TMP		%USERPROFILE%\Local Settings\Temp	NT
AUTHORITY\LOCAL SERVICE
TEMP		%USERPROFILE%\Local Settings\Temp	NT
AUTHORITY\NETWORK SERVICE
TMP		%USERPROFILE%\Local Settings\Temp	NT
AUTHORITY\NETWORK SERVICE
TEMP		%USERPROFILE%\Local Settings\Temp
IBMSERVER3\Administrator
TMP		%USERPROFILE%\Local Settings\Temp
IBMSERVER3\Administrator

[Print Jobs]

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

[Network Connections]

Local Name		Remote Name		Type		Status		User Name
X:		\\192.168.132.253\e$	Disk		Current Connection
IBMSERVER3\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		Not Available
Not Available		Not Available
system		Not Available		4		8		0		1413120
Not Available		Not Available		Not Available		Not
Available
smss.exe	Not Available		344		11		204800		1413120
7/7/2003 2:51 PM	Not Available		Not Available		Not
Available
csrss.exe	Not Available		468		13		Not Available
Not Available		7/7/2003 2:51 PM	Not Available		Not
Available	Not Available
winlogon.exe		c:\windows\system32\winlogon.exe		492
13		204800		1413120	7/7/2003 2:51 PM	5.2.3790.0
```

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(srv03_rtm.030324-2048)          536.50 KB (549,376 bytes)         3/25/2003
7:00 AM
services.exe          c:\windows\system32\services.exe          536          9
204800     1413120     7/7/2003 2:51 PM     5.2.3790.0
(srv03_rtm.030324-2048)          102.00 KB (104,448 bytes)         3/25/2003
7:00 AM
lsass.exe     c:\windows\system32\lsass.exe     548          9          204800
1413120     7/7/2003 2:51 PM     5.2.3790.0 (srv03_rtm.030324-2048)
13.00 KB (13,312 bytes)          3/25/2003 7:00 AM
svchost.exe          c:\windows\system32\svchost.exe          680          8
204800     1413120     7/7/2003 2:51 PM     5.2.3790.0
(srv03_rtm.030324-2048)          13.00 KB (13,312 bytes)          3/25/2003
7:00 AM
svchost.exe          c:\windows\system32\svchost.exe          748          8
204800     1413120     7/7/2003 2:51 PM     5.2.3790.0
(srv03_rtm.030324-2048)          13.00 KB (13,312 bytes)          3/25/2003
7:00 AM
svchost.exe          Not Available          880          8          Not
Available  Not Available          7/7/2003 2:51 PM     Not Available
Not Available          Not Available
svchost.exe          c:\windows\system32\svchost.exe          912          8
204800     1413120     7/7/2003 2:51 PM     5.2.3790.0
(srv03_rtm.030324-2048)          13.00 KB (13,312 bytes)          3/25/2003
7:00 AM
msdtc.exe  Not Available          1004          8          Not Available
Not Available          7/7/2003 2:51 PM     Not Available          Not
Available  Not Available
svchost.exe          c:\windows\system32\svchost.exe          1108          8
204800     1413120     7/7/2003 2:51 PM     5.2.3790.0
(srv03_rtm.030324-2048)          13.00 KB (13,312 bytes)          3/25/2003
7:00 AM
ibmhpasv.exe          c:\windows\system32\ibmhpasv.exe          1120          8
204800     1413120     7/7/2003 2:51 PM     5.1.1.1     14.50 KB (14,848
bytes)     6/9/2003 1:38 PM
explorer.exe          c:\windows\explorer.exe          1420          8
204800     1413120     7/7/2003 2:52 PM     6.00.3790.0
(srv03_rtm.030324-2048)          1,008.50 KB (1,032,704 bytes)     3/25/2003
7:00 AM
pronomgr.exe          c:\program files\intel\ncs\proset\pronomgr.exe
1480          8          204800     1413120     7/7/2003 2:52 PM     6.2.35.0
84.00 KB (86,016 bytes)          3/11/2003 3:24 PM
cmd.exe     c:\windows\system32\cmd.exe     1596          8          204800
1413120     7/7/2003 2:52 PM     5.2.3790.0 (srv03_rtm.030324-2048)
374.00 KB (382,976 bytes)          3/25/2003 7:00 AM
wmiprvse.exe          Not Available          1804          8          Not
Available  Not Available          7/7/2003 2:53 PM     Not Available
Not Available          Not Available
cmd.exe     c:\windows\system32\cmd.exe     1912          8          204800
1413120     7/7/2003 3:03 PM     5.2.3790.0 (srv03_rtm.030324-2048)
374.00 KB (382,976 bytes)          3/25/2003 7:00 AM
wpabaln.exe          c:\windows\system32\wpabaln.exe          396          8
204800     1413120     7/7/2003 6:54 PM     5.2.3790.0
(srv03_rtm.030324-2048)          31.00 KB (31,744 bytes)          3/25/2003
7:00 AM
sqlservr.exe          c:\program files\microsoft sql
server\mssql\binn\sqlservr.exe     1256          13          204800     1413120
7/7/2003 7:35 PM     2000.080.0760.00     7.17 MB (7,520,337 bytes)
6/9/2003 1:08 PM
isqlw.exe   c:\program files\microsoft sql server\80\tools\binn\isqlw.exe
1752          8          204800     1413120     7/7/2003 7:35 PM
2000.080.0760.00     344.56 KB (352,828 bytes)          6/9/2003 1:08 PM
helpctr.exe c:\windows\pchealth\helpctr\binaries\helpctr.exe          1552          8
204800     1413120     7/7/2003 7:41 PM     5.2.3790.0
(srv03_rtm.030324-2048)          764.00 KB (782,336 bytes)          6/9/2003
12:46 PM
wmiprvse.exe          Not Available          1588          8          Not
Available  Not Available          7/7/2003 7:41 PM     Not Available
Not Available          Not Available
```

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helpsvc.exe          c:\windows\pchealth\helpctr\binaries\helpsvc.exe
1608          8          204800     1413120     7/7/2003 7:41 PM     5.2.3790.0
(srv03_rtm.030324-2048)          720.00 KB (737,280 bytes)          6/9/2003
12:46 PM

[Loaded Modules]

Name       Version     Size       File Date  Manufacturer          Path
winlogon   5.2.3790.0 (srv03_rtm.030324-2048)          536.50 KB (549,376
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\winlogon.exe
ntdll      5.2.3790.0 (srv03_rtm.030324-2048)          722.50 KB (739,840
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\ntdll.dll
kernel32   5.2.3790.0 (srv03_rtm.030324-2048)          965.00 KB (988,160
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\kernel32.dll
msvcrt     7.0.3790.0 (srv03_rtm.030324-2048)          319.50 KB (327,168
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\msvcrt.dll
advapi32   5.2.3790.0 (srv03_rtm.030324-2048)          559.50 KB (572,928
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\advapi32.dll
rpcrt4     5.2.3790.0 (srv03_rtm.030324-2048)          643.50 KB (658,944
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\rpcrt4.dll
user32     5.2.3790.0 (srv03_rtm.030324-2048)          562.00 KB (575,488
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\user32.dll
gdi32      5.2.3790.0 (srv03_rtm.030324-2048)          263.00 KB (269,312
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\gdi32.dll
userenv    5.2.3790.0 (srv03_rtm.030324-2048)          732.50 KB (750,080
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\userenv.dll
nddeapi    5.2.3790.0 (srv03_rtm.030324-2048)          16.00 KB (16,384
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\nddeapi.dll
crypt32    5.131.3790.0 (srv03_rtm.030324-2048)        598.00 KB (612,352
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\crypt32.dll
msasn1     5.2.3790.0 (srv03_rtm.030324-2048)          58.00 KB (59,392
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\msasn1.dll
secur32    5.2.3790.0 (srv03_rtm.030324-2048)          63.00 KB (64,512
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\secur32.dll
winsta     5.2.3790.0 (srv03_rtm.030324-2048)          51.00 KB (52,224
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\winsta.dll
netapi32   5.2.3790.0 (srv03_rtm.030324-2048)          317.00 KB (324,608
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\netapi32.dll
profmap    5.2.3790.0 (srv03_rtm.030324-2048)          22.00 KB (22,528
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\profmap.dll
regapi     5.2.3790.0 (srv03_rtm.030324-2048)          48.50 KB (49,664
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\regapi.dll
ws2_32     5.2.3790.0 (srv03_rtm.030324-2048)          87.50 KB (89,600
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\ws2_32.dll
ws2help    5.2.3790.0 (srv03_rtm.030324-2048)          19.50 KB (19,968
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\ws2help.dll
psapi      5.2.3790.0 (srv03_rtm.030324-2048)          21.50 KB (22,016
bytes)     3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\psapi.dll
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version     5.2.3790.0 (srv03_rtm.030324-2048)          17.00 KB (17,408
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\version.dll
setupapi    5.2.3790.0 (srv03_rtm.030324-2048)          1,014.50 KB
(1,038,848 bytes)     3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\setupapi.dll
msgina      5.2.3790.0 (srv03_rtm.030324-2048)          1.14 MB (1,191,936
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\msgina.dll
shsvcs      6.00.3790.0 (srv03_rtm.030324-2048)         121.50 KB (124,416
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\shsvcs.dll
shlwapi     6.00.3790.0 (srv03_rtm.030324-2048)         281.00 KB (287,744
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\shlwapi.dll
sfc         5.2.3790.0 (srv03_rtm.030324-2048)          4.50 KB (4,608 bytes)
3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\sfc.dll
sfc_os      5.2.3790.0 (srv03_rtm.030324-2048)          133.00 KB (136,192
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\sfc_os.dll
wintrust    5.131.3790.0 (srv03_rtm.030324-2048)        161.50 KB (165,376
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\wintrust.dll
ole32       5.2.3790.0 (srv03_rtm.030324-2048)          1.13 MB (1,187,328
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\ole32.dll
imagehlp    5.2.3790.0 (srv03_rtm.030324-2048)          142.50 KB (145,920
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\imagehlp.dll
comctl32    6.0 (srv03_rtm.030324-2048)     907.00 KB (928,768 bytes)
6/9/2003 8:24 AM     Microsoft Corporation
c:\windows\winsxs\x86_microsoft.windows.common-controls_6595b64144ccf1
df_6.0.100.0_x-ww_8417450b\comctl32.dll
winscard    5.2.3790.0 (srv03_rtm.030324-2048)          98.50 KB (100,864
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\winscard.dll
wtsapi32    5.2.3790.0 (srv03_rtm.030324-2048)          17.50 KB (17,920
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\wtsapi32.dll
winmm       5.2.3790.0 (srv03_rtm.030324-2048)          166.00 KB (169,984
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\winmm.dll
sxs         5.2.3790.0 (srv03_rtm.030324-2048)          733.00 KB (750,592
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\sxs.dll
shell32     6.00.3790.0 (srv03_rtm.030324-2048)         7.79 MB (8,166,400
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\shell32.dll
wldap32     5.2.3790.0 (srv03_rtm.030324-2048)          158.00 KB (161,792
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\wldap32.dll
cscdll      5.2.3790.0 (srv03_rtm.030324-2048)          99.00 KB (101,376
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\cscdll.dll
wlnotify    5.2.3790.0 (srv03_rtm.030324-2048)          87.50 KB (89,600
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\wlnotify.dll
winspool    5.2.3790.0 (srv03_rtm.030324-2048)          140.00 KB (143,360
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\winspool.drv
mpr         5.2.3790.0 (srv03_rtm.030324-2048)          56.00 KB (57,344
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\mpr.dll
rsaenh      5.2.3790.0 (srv03_rtm.030324-2048)          176.83 KB (181,072
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\rsaenh.dll
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comctl32    5.82 (srv03_rtm.030324-2048)    561.00 KB (574,464 bytes)
6/9/2003 8:24 AM     Microsoft Corporation
c:\windows\winsxs\x86_microsoft.windows.common-controls_6595b64144ccf1
df_5.82.0.0_x-ww_8a69ba05\comctl32.dll
uxtheme     6.00.3790.0 (srv03_rtm.030324-2048)         196.00 KB (200,704
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\uxtheme.dll
samlib      5.2.3790.0 (srv03_rtm.030324-2048)          49.00 KB (50,176
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\samlib.dll
mprapi      5.2.3790.0 (srv03_rtm.030324-2048)          81.00 KB (82,944
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\mprapi.dll
activeds    5.2.3790.0 (srv03_rtm.030324-2048)          189.00 KB (193,536
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\activeds.dll
adsldpc     5.2.3790.0 (srv03_rtm.030324-2048)          142.50 KB (145,920
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\adsldpc.dll
credui      5.2.3790.0 (srv03_rtm.030324-2048)          159.00 KB (162,816
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\credui.dll
atl         3.05.2283  83.00 KB (84,992 bytes)          3/25/2003 7:00 AM
Microsoft Corporation             c:\windows\system32\atl.dll
oleaut32    5.2.3790.0 486.00 KB (497,664 bytes)        3/25/2003 7:00 AM
Microsoft Corporation             c:\windows\system32\oleaut32.dll
rtutils     5.2.3790.0 (srv03_rtm.030324-2048)          32.00 KB (32,768
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\rtutils.dll
cscui       5.2.3790.0 (srv03_rtm.030324-2048)          305.00 KB (312,320
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\cscui.dll
clbcatq     2001.12.4720.0 (srv03_rtm.030324-2048)    481.00 KB (492,544
bytes)      6/9/2003 12:42 PM    Microsoft Corporation
c:\windows\system32\clbcatq.dll
comres      2001.12.4720.0 (srv03_rtm.030324-2048)    778.00 KB (796,672
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\comres.dll
ntmarta     5.2.3790.0 (srv03_rtm.030324-2048)          114.00 KB (116,736
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\ntmarta.dll
wbemprox 5.2.3790.0 (srv03_rtm.030324-2048)             17.50 KB (17,920
bytes)      6/9/2003 12:42 PM    Microsoft Corporation
c:\windows\system32\wbem\wbemprox.dll
wbemcomn                5.2.3790.0 (srv03_rtm.030324-2048)          211.50 KB
(216,576 bytes)     3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\wbem\wbemcomn.dll
wbemsvc     5.2.3790.0 (srv03_rtm.030324-2048)          42.50 KB (43,520
bytes)      6/9/2003 12:42 PM    Microsoft Corporation
c:\windows\system32\wbem\wbemsvc.dll
fastprox    5.2.3790.0 (srv03_rtm.030324-2048)          443.00 KB (453,632
bytes)      6/9/2003 12:42 PM    Microsoft Corporation
c:\windows\system32\wbem\fastprox.dll
msvcp60     6.05.2144.0             388.00 KB (397,312 bytes)         3/25/2003
7:00 AM   Microsoft Corporation             c:\windows\system32\msvcp60.dll
ntdsapi     5.2.3790.0 (srv03_rtm.030324-2048)          76.00 KB (77,824
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\ntdsapi.dll
dnsapi      5.2.3790.0 (srv03_rtm.030324-2048)          147.50 KB (151,040
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\dnsapi.dll
services    5.2.3790.0 (srv03_rtm.030324-2048)          102.00 KB (104,448
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\services.exe
scesrv      5.2.3790.0 (srv03_rtm.030324-2048)          316.50 KB (324,096
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\scesrv.dll
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authz       5.2.3790.0 (srv03_rtm.030324-2048)          67.00 KB (68,608
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\authz.dll
umpnpmgr 5.2.3790.0 (srv03_rtm.030324-2048)             121.50 KB (124,416
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\umpnpmgr.dll
ncobjapi    5.2.3790.0 (srv03_rtm.030324-2048)          34.50 KB (35,328
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\ncobjapi.dll
eventlog    5.2.3790.0 (srv03_rtm.030324-2048)          60.50 KB (61,952
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\eventlog.dll
lsass       5.2.3790.0 (srv03_rtm.030324-2048)          13.00 KB (13,312
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\lsass.exe
lsasrv      5.2.3790.0 (srv03_rtm.030324-2048)          780.50 KB (799,232
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\lsasrv.dll
samsrv      5.2.3790.0 (srv03_rtm.030324-2048)          452.00 KB (462,848
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\samsrv.dll
cryptdll    5.2.3790.0 (srv03_rtm.030324-2048)          34.00 KB (34,816
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\cryptdll.dll
msprivs     5.2.3790.0 (srv03_rtm.030324-2048)          46.50 KB (47,616
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\msprivs.dll
kerberos    5.2.3790.0 (srv03_rtm.030324-2048)          332.50 KB (340,480
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\kerberos.dll
msv1_0      5.2.3790.0 (srv03_rtm.030324-2048)          127.00 KB (130,048
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\msv1_0.dll
netlogon    5.2.3790.0 (srv03_rtm.030324-2048)          409.00 KB (418,816
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\netlogon.dll
w32time     5.2.3790.0 (srv03_rtm.030324-2048)          216.00 KB (221,184
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\w32time.dll
iphlpapi    5.2.3790.0 (srv03_rtm.030324-2048)          82.50 KB (84,480
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\iphlpapi.dll
schannel    5.2.3790.0 (srv03_rtm.030324-2048)          149.50 KB (153,088
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\schannel.dll
wdigest     5.2.3790.0 (srv03_rtm.030324-2048)          61.00 KB (62,464
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\wdigest.dll
rassfm      5.2.3790.0 (srv03_rtm.030324-2048)          20.50 KB (20,992
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\rassfm.dll
kdcsvc      5.2.3790.0 (srv03_rtm.030324-2048)          221.00 KB (226,304
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\kdcsvc.dll
ntdsa       5.2.3790.0 (srv03_rtm.030324-2048)          1.45 MB (1,520,640
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\ntdsa.dll
ntdsatq     5.2.3790.0 (srv03_rtm.030324-2048)          32.00 KB (32,768
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\ntdsatq.dll
mswsock     5.2.3790.0 (srv03_rtm.030324-2048)          254.00 KB (260,096
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\mswsock.dll
esent       5.2.3790.0 (srv03_rtm.030324-2048)          1.01 MB (1,056,256
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\esent.dll
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scecli      5.2.3790.0 (srv03_rtm.030324-2048)          179.50 KB (183,808
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\scecli.dll
wshtcpip    5.2.3790.0 (srv03_rtm.030324-2048)          18.00 KB (18,432
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\wshtcpip.dll
pstorsvc    5.2.3790.0 (srv03_rtm.030324-2048)          24.00 KB (24,576
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\pstorsvc.dll
psbase      5.2.3790.0 (srv03_rtm.030324-2048)          81.00 KB (82,944
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\psbase.dll
dssenh      5.2.3790.0 (srv03_rtm.030324-2048)          131.33 KB (134,480
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\dssenh.dll
svchost     5.2.3790.0 (srv03_rtm.030324-2048)          13.00 KB (13,312
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\svchost.exe
rpcss       5.2.3790.0 (srv03_rtm.030324-2048)          276.50 KB (283,136
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\rpcss.dll
termsrv     5.2.3790.0 (srv03_rtm.030324-2048)          216.50 KB (221,696
bytes)      6/9/2003 12:42 PM    Microsoft Corporation
c:\windows\system32\termsrv.dll
icaapi      5.2.3790.0 (srv03_rtm.030324-2048)          10.50 KB (10,752
bytes)      6/9/2003 12:42 PM    Microsoft Corporation
c:\windows\system32\icaapi.dll
mstlsapi    5.2.3790.0 (srv03_rtm.030324-2048)          104.50 KB (107,008
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\mstlsapi.dll
audiosrv    5.2.3790.0 (srv03_rtm.030324-2048)          38.00 KB (38,912
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\audiosrv.dll
wkssvc      5.2.3790.0 (srv03_rtm.030324-2048)          125.00 KB (128,000
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\wkssvc.dll
wiarpc      5.2.3790.0 (srv03_rtm.030324-2048)          30.00 KB (30,720
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\wiarpc.dll
dmserver    5.2.3790.0 (srv03_rtm.030324-2048)          24.00 KB (24,576
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\dmserver.dll
srvsvc      5.2.3790.0 (srv03_rtm.030324-2048)          89.00 KB (91,136
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\srvsvc.dll
seclogon    5.2.3790.0 (srv03_rtm.030324-2048)          16.50 KB (16,896
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\seclogon.dll
wmisvc      5.2.3790.0 (srv03_rtm.030324-2048)          131.00 KB (134,144
bytes)      6/9/2003 12:42 PM    Microsoft Corporation
c:\windows\system32\wbem\wmisvc.dll
vssapi      5.2.3790.0 (srv03_rtm.030324-2048)          528.00 KB (540,672
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\vssapi.dll
winrnr      5.2.3790.0 (srv03_rtm.030324-2048)          15.00 KB (15,360
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\winrnr.dll
netman      5.2.3790.0 (srv03_rtm.030324-2048)          209.00 KB (214,016
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\netman.dll
rasapi32    5.2.3790.0 (srv03_rtm.030324-2048)          227.50 KB (232,960
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\rasapi32.dll
rasman      5.2.3790.0 (srv03_rtm.030324-2048)          56.50 KB (57,856
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\rasman.dll
```

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tapi32	5.2.3790.0 (srv03_rtm.030324-2048)	175.00 KB (179,200
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\tapi32.dll
wzcsvc	5.2.3790.0 (srv03_rtm.030324-2048)	272.50 KB (279,040
bytes)	3/25/2003 7:15 AM	Microsoft Corporation
c:\windows\system32\wzcsvc.dll
wmi	5.2.3790.0 (srv03_rtm.030324-2048)	6.50 KB (6,656 bytes)
3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\wmi.dll
dhcpcsvc	5.2.3790.0 (srv03_rtm.030324-2048)	101.50 KB (103,936
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\dhcpcsvc.dll
wzcsapi	5.2.3790.0 (srv03_rtm.030324-2048)	24.50 KB (25,088
bytes)	3/25/2003 7:15 AM	Microsoft Corporation
c:\windows\system32\wzcsapi.dll
es	2001.12.4720.0 (srv03_rtm.030324-2048)	221.50 KB (226,816
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\es.dll
comsvcs	2001.12.4720.0 (srv03_rtm.030324-2048)	1.14 MB (1,199,616
bytes)	6/9/2003 12:42 PM	Microsoft Corporation
c:\windows\system32\comsvcs.dll
sens	5.2.3790.0 (srv03_rtm.030324-2048)	35.50 KB (36,352
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\sens.dll
rasadhlp	5.2.3790.0 (srv03_rtm.030324-2048)	6.50 KB (6,656 bytes)
3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\rasadhlp.dll
wbemcore	5.2.3790.0 (srv03_rtm.030324-2048)	457.00 KB (467,968
bytes)	6/9/2003 12:42 PM	Microsoft Corporation
c:\windows\system32\wbem\wbemcore.dll
esscli	5.2.3790.0 (srv03_rtm.030324-2048)	235.50 KB (241,152
bytes)	6/9/2003 12:42 PM	Microsoft Corporation
c:\windows\system32\wbem\esscli.dll
wmiutils	5.2.3790.0 (srv03_rtm.030324-2048)	90.50 KB (92,672
bytes)	6/9/2003 12:42 PM	Microsoft Corporation
c:\windows\system32\wbem\wmiutils.dll
repdrvfs	5.2.3790.0 (srv03_rtm.030324-2048)	165.00 KB (168,960
bytes)	6/9/2003 12:42 PM	Microsoft Corporation
c:\windows\system32\wbem\repdrvfs.dll
wmiprvsd	5.2.3790.0 (srv03_rtm.030324-2048)	405.50 KB (415,232
bytes)	6/9/2003 12:42 PM	Microsoft Corporation
c:\windows\system32\wbem\wmiprvsd.dll
wbemess	5.2.3790.0 (srv03_rtm.030324-2048)	256.50 KB (262,656
bytes)	6/9/2003 12:42 PM	Microsoft Corporation
c:\windows\system32\wbem\wbemess.dll
netshell	5.2.3790.0 (srv03_rtm.030324-2048)	1.67 MB (1,747,456
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\netshell.dll
clusapi	5.2.3790.0 (srv03_rtm.030324-2048)	56.00 KB (57,344
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\clusapi.dll
hnetcfg	5.2.3790.0 (srv03_rtm.030324-2048)	243.50 KB (249,344
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\hnetcfg.dll
wininet	6.00.3790.0 (srv03_rtm.030324-2048)	609.00 KB (623,616
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\wininet.dll
rasdlg	5.2.3790.0 (srv03_rtm.030324-2048)	642.00 KB (657,408
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\rasdlg.dll
ncprov	5.2.3790.0 (srv03_rtm.030324-2048)	43.00 KB (44,032
bytes)	6/9/2003 12:42 PM	Microsoft Corporation
c:\windows\system32\wbem\ncprov.dll
wbemcons 5.2.3790.0 (srv03_rtm.030324-2048)	69.00 KB (70,656
bytes)	6/9/2003 12:42 PM	Microsoft Corporation
c:\windows\system32\wbem\wbemcons.dll
pchsvc	5.2.3790.0 (srv03_rtm.030324-2048)	31.50 KB (32,256
bytes)	6/9/2003 12:46 PM	Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\pchsvc.dll
ersvc	5.2.3790.0 (srv03_rtm.030324-2048)	22.00 KB (22,528
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\ersvc.dll
ibmhpasv	5.1.1.1	14.50 KB (14,848 bytes)	6/9/2003 1:38 PM
IBM Corporation	c:\windows\system32\ibmhpasv.exe
explorer	6.00.3790.0 (srv03_rtm.030324-2048)	1,008.50 KB
(1,032,704 bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\explorer.exe
browseui	6.00.3790.0 (srv03_rtm.030324-2048)	1.01 MB (1,057,280
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\browseui.dll
shdocvw	6.00.3790.0 (srv03_rtm.030324-2048)	1.33 MB (1,393,664
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\shdocvw.dll
apphelp	5.2.3790.0 (srv03_rtm.030324-2048)	122.00 KB (124,928
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\apphelp.dll
themeui	6.00.3790.0 (srv03_rtm.030324-2048)	360.50 KB (369,152
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\themeui.dll
msimg32	5.2.3790.0 (srv03_rtm.030324-2048)	4.50 KB (4,608 bytes)
3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\msimg32.dll
actxprxy	6.00.3790.0 (srv03_rtm.030324-2048)	95.00 KB (97,280
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\actxprxy.dll
linkinfo	5.2.3790.0 (srv03_rtm.030324-2048)	16.50 KB (16,896
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\linkinfo.dll
ntshrui	6.00.3790.0 (srv03_rtm.030324-2048)	136.00 KB (139,264
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\ntshrui.dll
urlmon	6.00.3790.0 (srv03_rtm.030324-2048)	501.50 KB (513,536
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\urlmon.dll
webcheck	6.00.3790.0 (srv03_rtm.030324-2048)	261.50 KB (267,776
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\webcheck.dll
wsock32	5.2.3790.0 (srv03_rtm.030324-2048)	22.00 KB (22,528
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\wsock32.dll
stobject	5.2.3790.0 (srv03_rtm.030324-2048)	117.50 KB (120,320
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\stobject.dll
batmeter	6.00.3790.0 (srv03_rtm.030324-2048)	28.50 KB (29,184
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\batmeter.dll
powrprof	6.00.3790.0 (srv03_rtm.030324-2048)	14.50 KB (14,848
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\powrprof.dll
printui	5.2.3790.0 (srv03_rtm.030324-2048)	536.50 KB (549,376
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\printui.dll
cfgmgr32	5.2.3790.0 (srv03_rtm.030324-2048)	17.50 KB (17,920
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\cfgmgr32.dll
drprov	5.2.3790.0 (srv03_rtm.030324-2048)	12.50 KB (12,800
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\drprov.dll
ntlanman	5.2.3790.0 (srv03_rtm.030324-2048)	41.00 KB (41,984
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\ntlanman.dll
netui0	5.2.3790.0 (srv03_rtm.030324-2048)	75.50 KB (77,312
bytes)	3/25/2003 7:00 AM	Microsoft Corporation
c:\windows\system32\netui0.dll
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netui1      5.2.3790.0 (srv03_rtm.030324-2048)          184.00 KB (188,416
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\netui1.dll
davclnt     5.2.3790.0 (srv03_rtm.030324-2048)          23.50 KB (24,064
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\davclnt.dll
browselc    6.00.3790.0 (srv03_rtm.030324-2048)         62.00 KB (63,488
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\browselc.dll
shdoclc     6.00.3790.0 (srv03_rtm.030324-2048)         588.50 KB (602,624
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\shdoclc.dll
mprui       5.2.3790.0 (srv03_rtm.030324-2048)          49.00 KB (50,176
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\mprui.dll
netui2      5.2.3790.0 (srv03_rtm.030324-2048)          309.50 KB (316,928
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\netui2.dll
comdlg32  6.00.3790.0 (srv03_rtm.030324-2048)           261.00 KB (267,264
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\comdlg32.dll
netmsg      5.2.3790.0 (srv03_rtm.030324-2048)          178.00 KB (182,272
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\netmsg.dll
netplwiz    5.2.3790.0 (srv03_rtm.030324-2048)          843.00 KB (863,232
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\netplwiz.dll
zipfldr     6.00.3790.0 (srv03_rtm.030324-2048)         316.00 KB (323,584
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\zipfldr.dll
pronomgr  6.2.35.0     84.00 KB (86,016 bytes)          3/11/2003 3:24 PM
Intel(R) Corporation    c:\program files\intel\ncs\proset\pronomgr.exe
enupguir   6.2.35.0     340.00 KB (348,160 bytes)       3/11/2003 3:15 PM
Intel(R) Corporation    c:\program files\intel\ncs\proset\enupguir.dll
pnc802_3  6.2.35.0     84.00 KB (86,016 bytes)          3/11/2003 3:33 PM
Intel(R) Corporation    c:\program files\intel\ncs\proset\8023\pnc802_3.dll
enupcmrs  6.2.35.0     344.07 KB (352,325 bytes)        3/11/2003 3:20 PM
Intel(R) Corporation    c:\program files\intel\ncs\proset\8023\enupcmrs.dll
cmd         5.2.3790.0 (srv03_rtm.030324-2048)          374.00 KB (382,976
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\cmd.exe
wpabaln     5.2.3790.0 (srv03_rtm.030324-2048)          31.00 KB (31,744
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\wpabaln.exe
sqlservr    2000.080.0760.00      7.17 MB (7,520,337 bytes)       6/9/2003
1:08 PM     Microsoft Corporation           c:\program files\microsoft sql
server\mssql\binn\sqlservr.exe
opends60   2000.080.0194.00      24.06 KB (24,639 bytes)          6/9/2003
1:08 PM     Microsoft Corporation           c:\program files\microsoft sql
server\mssql\binn\opends60.dll
ums         2000.080.0760.00      52.55 KB (53,808 bytes)          6/9/2003
1:08 PM     Microsoft Corporation           c:\program files\microsoft sql
server\mssql\binn\ums.dll
sqlsort     2000.080.0760.00      576.56 KB (590,396 bytes)        6/9/2003
1:08 PM     Microsoft Corporation           c:\program files\microsoft sql
server\mssql\binn\sqlsort.dll
msvcirt     7.0.3790.0 (srv03_rtm.030324-2048)          50.00 KB (51,200
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\msvcirt.dll
sqlevn70   2000.080.0760.00      28.00 KB (28,672 bytes)          6/9/2003
1:08 PM     Microsoft Corporation           c:\program files\microsoft sql
server\mssql\binn\resources\1033\sqlevn70.rll
xolehlp     2001.12.4720.0 (srv03_rtm.030324-2048)     8.50 KB (8,704 bytes)
6/9/2003 12:42 PM     Microsoft Corporation
c:\windows\system32\xolehlp.dll
msdtcprx   2001.12.4720.0 (srv03_rtm.030324-2048)     427.50 KB (437,760
bytes)      6/9/2003 12:42 PM    Microsoft Corporation
c:\windows\system32\msdtcprx.dll
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mtxclu      2001.12.4720.0 (srv03_rtm.030324-2048)     74.50 KB (76,288
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\mtxclu.dll
resutils    5.2.3790.0 (srv03_rtm.030324-2048)          59.00 KB (60,416
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\resutils.dll
mfc42u      6.05.3014.0           960.00 KB (983,040 bytes)        3/25/2003
7:00 AM     Microsoft Corporation           c:\windows\system32\mfc42u.dll
ssnetlib    2000.080.0766.00      80.56 KB (82,492 bytes)          6/9/2003
1:08 PM     Microsoft Corporation           c:\program files\microsoft sql
server\mssql\binn\ssnetlib.dll
ssnmpn70  2000.080.0534.00      24.56 KB (25,148 bytes)          6/9/2003
1:08 PM     Microsoft Corporation           c:\program files\microsoft sql
server\mssql\binn\ssnmpn70.dll
security    5.2.3790.0 (srv03_rtm.030324-2048)          5.50 KB (5,632 bytes)
3/25/2003 7:00 AM     Microsoft Corporation
c:\windows\system32\security.dll
ssmslpcn   2000.080.0760.00      28.56 KB (29,244 bytes)          6/9/2003
1:08 PM     Microsoft Corporation           c:\program files\microsoft sql
server\mssql\binn\ssmslpcn.dll
isqlw       2000.080.0760.00      344.56 KB (352,828 bytes)        6/9/2003
1:08 PM     Microsoft Corporation           c:\program files\microsoft sql
server\80\tools\binn\isqlw.exe
sqlunirl    2000.080.0728.00      176.56 KB (180,800 bytes)        3/25/2003
7:00 AM     Microsoft Corporation           c:\windows\system32\sqlunirl.dll
sqlresld    2000.080.0382.00      28.56 KB (29,248 bytes)          6/9/2003
1:09 PM     Microsoft Corporation           c:\program files\microsoft sql
server\80\tools\binn\sqlresld.dll
sqlgui      2000.080.0760.00      444.56 KB (455,232 bytes)        6/9/2003
1:09 PM     Microsoft Corporation           c:\program files\microsoft sql
server\80\tools\binn\sqlgui.dll
w95scm      2000.080.0760.00      48.56 KB (49,728 bytes)          6/9/2003
1:09 PM     Microsoft Corporation           c:\program files\microsoft sql
server\80\tools\binn\w95scm.dll
odbc32      3.525.1022.0 (srv03_rtm.030324-2048)        232.00 KB (237,568
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\odbc32.dll
sqlsvc      2000.080.0760.00      92.56 KB (94,784 bytes)          6/9/2003
1:09 PM     Microsoft Corporation           c:\program files\microsoft sql
server\80\tools\binn\sqlsvc.dll
odbcbcp    2000.085.1022.00 (srv03_rtm.030324-2048) 24.00 KB (24,576
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\odbcbcp.dll
imm32       5.2.3790.0 (srv03_rtm.030324-2048)          105.50 KB (108,032
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\imm32.dll
sqlqry      2000.080.0760.00      392.56 KB (401,984 bytes)        6/9/2003
1:08 PM     Microsoft Corporation           c:\program files\microsoft sql
server\80\tools\binn\sqlqry.dll
pfutil80    2000.080.0760.00      272.56 KB (279,104 bytes)        6/9/2003
1:09 PM     Microsoft Corporation           c:\program files\microsoft sql
server\80\tools\binn\pfutil80.dll
semsfc      2000.080.0760.00      228.56 KB (234,048 bytes)        6/9/2003
1:09 PM     Microsoft Corporation           c:\program files\microsoft sql
server\80\tools\binn\semsfc.dll
pfclnt80    2000.080.0760.00      404.56 KB (414,272 bytes)        6/9/2003
1:09 PM     Microsoft Corporation           c:\program files\microsoft sql
server\80\tools\binn\pfclnt80.dll
odbcint     3.525.1022.0 (srv03_rtm.030324-2048)        92.00 KB (94,208
bytes)      3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\odbcint.dll
sqlsvc      2000.080.0194.00      24.00 KB (24,576 bytes)          6/9/2003
1:09 PM     Microsoft Corporation           c:\program files\microsoft sql
server\80\tools\binn\resources\1033\sqlsvc.rll
sqlgui      2000.080.0194.00      56.00 KB (57,344 bytes)          6/9/2003
1:09 PM     Microsoft Corporation           c:\program files\microsoft sql
server\80\tools\binn\resources\1033\sqlgui.rll
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semsfc    2000.080.0194.00    24.00 KB (24,576 bytes)        6/9/2003
1:09 PM   Microsoft Corporation          c:\program files\microsoft sql
server\80\tools\binn\resources\1033\semsfc.rll
pfclnt80  2000.080.0194.00    28.00 KB (28,672 bytes)        6/9/2003
1:09 PM   Microsoft Corporation          c:\program files\microsoft sql
server\80\tools\binn\resources\1033\pfclnt80.rll
pfutil80  2000.080.0382.00    144.00 KB (147,456 bytes)      6/9/2003
1:09 PM   Microsoft Corporation          c:\program files\microsoft sql
server\80\tools\binn\resources\1033\pfutil80.rll
sqlqry    2000.080.0194.00    180.00 KB (184,320 bytes)      6/9/2003
1:08 PM   Microsoft Corporation          c:\program files\microsoft sql
server\80\tools\binn\resources\1033\sqlqry.rll
isqlw     2000.080.0382.00    240.00 KB (245,760 bytes)      6/9/2003
1:08 PM   Microsoft Corporation          c:\program files\microsoft sql
server\80\tools\binn\resources\1033\isqlw.rll
odbccp32  3.525.1022.0 (srv03_rtm.030324-2048)      100.00 KB (102,400
bytes)    3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\odbccp32.dll
objmgr    2000.080.0760.00    308.56 KB (315,968 bytes)      6/9/2003
1:08 PM   Microsoft Corporation          c:\program files\microsoft sql
server\80\tools\binn\objmgr.dll
objmgr    2000.080.0760.00    56.00 KB (57,344 bytes)        6/9/2003
1:08 PM   Microsoft Corporation          c:\program files\microsoft sql
server\80\tools\binn\resources\1033\objmgr.rll
sqllex    2000.080.0194.00    148.06 KB (151,616 bytes)      6/9/2003
1:09 PM   Microsoft Corporation          c:\program files\microsoft sql
server\80\tools\binn\sqllex.dll
sqlsrv32  2000.085.1022.00 (srv03_rtm.030324-2048)404.00 KB (413,696
bytes)    3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\sqlsrv32.dll
sqlsrv32  2000.085.1022.00 (srv03_rtm.030324-2048)88.00 KB (90,112
bytes)    3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\sqlsrv32.rll
dbnetlib  2000.085.1022 (srv03_rtm.030324-2048)     76.00 KB (77,824
bytes)    3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\dbnetlib.dll
dbmslpcn  2000.080.0760.00    28.56 KB (29,244 bytes)        6/9/2003
1:08 PM   Microsoft Corporation          c:\windows\system32\dbmslpcn.dll
helpctr   5.2.3790.0 (srv03_rtm.030324-2048)        764.00 KB (782,336
bytes)    6/9/2003 12:46 PM    Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\helpctr.exe
hcappres  5.2.3790.0 (srv03_rtm.030324-2048)        6.50 KB (6,656 bytes)
6/9/2003 12:46 PM    Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\hcappres.dll
itss      5.2.3790.0 (srv03_rtm.030324-2048)        119.50 KB (122,368
bytes)    3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\itss.dll
msxml3    8.40.9419.0         1.28 MB (1,337,344 bytes)      3/25/2003
7:00 AM   Microsoft Corporation          c:\windows\system32\msxml3.dll
pchshell  5.2.3790.0 (srv03_rtm.030324-2048)        100.50 KB (102,912
bytes)    6/9/2003 12:46 PM    Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\pchshell.dll
mlang     6.00.3790.0 (srv03_rtm.030324-2048)       570.00 KB (583,680
bytes)    3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\mlang.dll
mshtml    6.00.3790.0 (srv03_rtm.030324-2048)       2.78 MB (2,916,352
bytes)    3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\mshtml.dll
msimtf    5.2.3790.0 (srv03_rtm.030324-2048)        149.00 KB (152,576
bytes)    3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\msimtf.dll
msctf     5.2.3790.0 (srv03_rtm.030324-2048)        287.00 KB (293,888
bytes)    3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\msctf.dll
jscript   5.6.0.8515 436.00 KB (446,464 bytes)      3/25/2003 7:00 AM
Microsoft Corporation          c:\windows\system32\jscript.dll
msls31    3.10.349.0 147.00 KB (150,528 bytes)      3/25/2003 7:00 AM
Microsoft Corporation          c:\windows\system32\msls31.dll
mshtmled  6.00.3790.0 (srv03_rtm.030324-2048)       443.50 KB (454,144
bytes)    3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\mshtmled.dll
vbscript  5.6.0.8515 404.00 KB (413,696 bytes)      3/25/2003 7:00 AM
Microsoft Corporation          c:\windows\system32\vbscript.dll
mfc42     6.05.3014.0         960.00 KB (983,040 bytes)      3/25/2003
7:00 AM   Microsoft Corporation          c:\windows\system32\mfc42.dll
msinfo    5.2.3790.0 (srv03_rtm.030324-2048)        358.50 KB (367,104
bytes)    6/9/2003 12:46 PM    Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\msinfo.dll
riched32  5.2.3790.0 (srv03_rtm.030324-2048)        3.50 KB (3,584 bytes)
3/25/2003 7:00 AM    Microsoft Corporation
c:\windows\system32\riched32.dll
riched20  5.31.23.1218        406.00 KB (415,744 bytes)      3/25/2003
7:00 AM   Microsoft Corporation          c:\windows\system32\riched20.dll
helpsvc   5.2.3790.0 (srv03_rtm.030324-2048)        720.00 KB (737,280
bytes)    6/9/2003 12:46 PM    Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\helpsvc.exe

[Services]

Display Name        Name      State     Start ModeService Type
Path      Error Control       Start NameTag ID
Alerter   Alerter   Stopped   Disabled  Share Process
c:\windows\system32\svchost.exe -k localservice      Normal    NT
AUTHORITY\LocalService     0
Application Layer Gateway Service        ALG       Stopped   Manual
Own Process         c:\windows\system32\alg.exe     Normal    NT
AUTHORITY\LocalService     0
Application Management              AppMgmt Stopped     Manual    Share
Process   c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem         0
Windows Audio       AudioSrv  Running   Auto      Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal    LocalSystem         0
Background Intelligent Transfer Service  BITS      Stopped   Manual
Share Process       c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem         0
Computer Browser    Browser   Stopped   Manual    Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal    LocalSystem         0
Indexing Service    CiSvc     Stopped   Disabled  Share Process
c:\windows\system32\cisvc.exe   Normal    LocalSystem         0
ClipBook  ClipSrv   Stopped   Disabled  Own Process
c:\windows\system32\clipsrv.exe Normal    LocalSystem         0
COM+ System Application             COMSysApp           Stopped   Manual
Own Process         c:\windows\system32\dllhost.exe
/processid:{02d4b3f1-fd88-11d1-960d-00805fc79235} Normal
LocalSystem         0
Cryptographic Services              CryptSvc  Stopped   Manual    Share
Process   c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem         0
Distributed File System             Dfs       Stopped   Manual    Own
Process   c:\windows\system32\dfssvc.exe Normal     LocalSystem         0
DHCP Client         Dhcp      Stopped   Manual    Share Process
c:\windows\system32\svchost.exe -k networkservice    Normal    NT
AUTHORITY\NetworkService   0
Logical Disk Manager Administrative Service        dmadmin   Stopped
Manual    Share Process       c:\windows\system32\dmadmin.exe /com
Normal    LocalSystem         0
Logical Disk Managerdmserver  Running   Auto      Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal    LocalSystem         0
DNS Client          Dnscache  Stopped   Manual    Share Process
c:\windows\system32\svchost.exe -k networkservice    Normal    NT
AUTHORITY\NetworkService   0
Error Reporting Service             ERSvc     Running   Auto      Share
Process   c:\windows\system32\svchost.exe -k winerr Ignore
LocalSystem         0
Event Log Eventlog  Running   Auto      Share Process
c:\windows\system32\services.exe         Normal    LocalSystem         0
```

```
COM+ Event System  EventSystem         Running   Manual    Share
Process     c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem         0
Mylex Global Array Manager Server      gamscm    Stopped   Manual
Own Process         system32\gamserv\gamscm.exe   Normal
LocalSystem         0
Help and Support    helpsvc   Running   Manual    Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal  LocalSystem        0
Human Interface Device Access  HidServ  Stopped   Disabled  Share
Process     c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem         0
HTTP SSLHTTPFilter            Stopped   Manual    Share Process
c:\windows\system32\lsass.exe Normal    LocalSystem         0
IBM Active PCI Alert Service  IBMHPS    Running   Auto      Own
Process     c:\windows\system32\ibmhpasv.exe          Normal
LocalSystem         0
IMAPI CD-Burning COM Service            ImapiService        Stopped
Disabled    Own Process       c:\windows\system32\imapi.exe  Normal
LocalSystem         0
Intersite Messaging IsmServ   Stopped   Disabled  Own Process
c:\windows\system32\ismserv.exe         Normal    LocalSystem         0
Kerberos Key Distribution Center        kdc       Stopped   Disabled
Share Process       c:\windows\system32\lsass.exe  Normal
LocalSystem         0
Server      lanmanserver      Running   Auto      Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal  LocalSystem        0
Workstation         lanmanworkstation   Running   Auto      Share
Process     c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem         0
License Logging     LicenseService      Stopped   Disabled  Own
Process     c:\windows\system32\llssrv.exe  Normal    NT
AUTHORITY\NetworkService  0
TCP/IP NetBIOS Helper         LmHosts   Running   Auto      Share
Process     c:\windows\system32\svchost.exe -k localservice     Normal
NT AUTHORITY\LocalService  0
Messenger Messenger Stopped   Disabled  Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal  LocalSystem        0
NetMeeting Remote Desktop Sharing       mnmsrvc   Stopped   Disabled
Own Process         c:\windows\system32\mnmsrvc.exe         Normal
LocalSystem         0
Distributed Transaction Coordinator     MSDTC     Running   Auto
Own Process         c:\windows\system32\msdtc.exe  Normal    NT
AUTHORITY\NetworkService  0
Windows Installer   MSIServer Stopped   Manual    Share Process
c:\windows\system32\msiexec.exe /v      Normal    LocalSystem         0
MSSQLSERVER         MSSQLSERVER         Stopped   Manual    Own
Process     c:\progra~1\micros~1\mssql\binn\sqlservr.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   Disabled  Share Process
c:\windows\system32\netdde.exe Normal   LocalSystem         0
Network DDE DSDM NetDDEdsdm             Stopped   Disabled  Share
Process     c:\windows\system32\netdde.exe Normal   LocalSystem         0
Net Logon Netlogon  Stopped   Manual    Share Process
c:\windows\system32\lsass.exe Normal    LocalSystem         0
Network Connections Netman    Running   Manual    Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal  LocalSystem        0
Intel NCS NetService NetSvc   Stopped   Manual    Own Process
c:\program files\intel\ncs\sync\netsvc.exe        Normal    LocalSystem         0
Network Location Awareness (NLA)        Nla       Running   Manual
Share Process       c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem         0
File Replication    NtFrs     Stopped   Manual    Own Process
c:\windows\system32\ntfrs.exe Ignore    LocalSystem         0
```

```
NT LM Security Support Provider         NtLmSsp   Stopped   Manual
Share Process       c:\windows\system32\lsass.exe  Normal
LocalSystem         0
Removable Storage   NtmsSvc   Stopped   Manual    Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal  LocalSystem        0
Plug and Play       PlugPlay  Running   Auto      Share Process
c:\windows\system32\services.exe        Normal    LocalSystem         0
IPSEC Services      PolicyAgent         Stopped   Manual    Share
Process     c:\windows\system32\lsass.exe  Normal    LocalSystem      0
Protected Storage   ProtectedStorage    Running   Auto      Share
Process     c:\windows\system32\lsass.exe  Normal    LocalSystem      0
Remote Access Auto Connection Manager   RasAuto   Stopped   Manual
Share Process       c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem         0
Remote Access Connection Manager        RasMan    Stopped   Manual
Share Process       c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem         0
Remote Desktop Help Session Manager     RDSessMgr           Stopped
Manual      Own Process       c:\windows\system32\sessmgr.exe
Normal      LocalSystem       0
Routing and Remote Access     RemoteAccess        Stopped   Disabled
Share Process       c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem         0
Remote Registry     RemoteRegistry      Stopped   Manual    Share
Process     c:\windows\system32\svchost.exe -k regsvc  Normal    NT
AUTHORITY\LocalService  0
Remote Procedure Call (RPC) Locator     RpcLocator          Stopped
Manual      Own Process       c:\windows\system32\locator.exe Normal
NT AUTHORITY\NetworkService             0
Remote Procedure Call (RPC)   RpcSs     Running   Auto      Share
Process     c:\windows\system32\svchost -k rpcss        Normal
LocalSystem         0
Resultant Set of Policy Provider  RSoPProv Stopped  Manual    Share
Process     c:\windows\system32\rsopprov.exe          Normal
LocalSystem         0
Special Administration Console Helper   sacsvr    Stopped   Manual
Share Process       c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem         0
Security Accounts Manager     SamSs     Running   Auto      Share
Process     c:\windows\system32\lsass.exe  Normal    LocalSystem      0
Smart Card          SCardSvr  Stopped   Manual    Share Process
c:\windows\system32\scardsvr.exe        Ignore    NT
AUTHORITY\LocalService        0
Task Scheduler      Schedule  Stopped   Manual    Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal  LocalSystem        0
Secondary Logon     seclogon  Running   Auto      Share Process
c:\windows\system32\svchost.exe -k netsvcs Ignore  LocalSystem        0
System Event Notification     SENS      Running   Manual    Share
Process     c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem         0
ServeRAID Manager Agent       ServeRAIDManagerAgent         Stopped
Manual      Own Process       c:\program files\raidman\raidserv.exe
Normal      LocalSystem       0
Internet Connection Firewall (ICF) / Internet Connection Sharing (ICS)
SharedAccess        Stopped   Disabled  Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal  LocalSystem        0
Shell Hardware Detection      ShellHWDetection    Running   Auto
Share Process       c:\windows\system32\svchost.exe -k netsvcs Ignore
LocalSystem         0
Print Spooler       Spooler   Stopped   Manual    Own Process
c:\windows\system32\spoolsv.exe         Normal    LocalSystem         0
SQLSERVERAGENT      SQLSERVERAGENT      Stopped
Manual      Own Process       c:\progra~1\micros~1\mssql\binn\sqlagent.exe
Normal      LocalSystem       0
Windows Image Acquisition (WIA)         stisvc    Stopped   Disabled
Share Process       c:\windows\system32\svchost.exe -k imgsvc Normal
NT AUTHORITY\LocalService  0
```

```
Microsoft Software Shadow Copy Provider  swprv      Stopped    Manual
Own Process        c:\windows\system32\svchost.exe -k swprv    Normal
LocalSystem        0
Performance Logs and Alerts     SysmonLog          Stopped    Manual
Own Process        c:\windows\system32\smlogsvc.exe           Normal
NT Authority\NetworkService     0
Telephony TapiSrv     Stopped    Manual     Share Process
c:\windows\system32\svchost.exe -k tapisrv Normal     LocalSystem          0
Terminal Services     TermService         Running    Manual     Share
Process    c:\windows\system32\svchost.exe -k termsvcs          Normal
LocalSystem        0
Themes     Themes     Stopped    Disabled   Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal     LocalSystem          0
Telnet     TlntSvr    Stopped    Disabled   Own Process
c:\windows\system32\tlntsvr.exe Normal     NT AUTHORITY\LocalService  0
Distributed Link Tracking Server TrkSvr    Stopped    Disabled   Share
Process    c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem        0
Distributed Link Tracking Client  TrkWks    Stopped    Manual     Share
Process    c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem        0
Terminal Services Session Directory       Tssdis     Stopped    Disabled
Own Process        c:\windows\system32\tssdis.exe   Normal
LocalSystem        0
Upload Manager        uploadmgr Stopped    Manual     Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal     LocalSystem          0
Uninterruptible Power Supply    UPS        Stopped    Manual     Own
Process    c:\windows\system32\ups.exe     Normal     NT
AUTHORITY\LocalService     0
Virtual Disk Service  vds        Stopped    Manual     Own Process
c:\windows\system32\vds.exe     Normal     LocalSystem          0
Volume Shadow Copy              VSS        Stopped    Manual     Own
Process    c:\windows\system32\vssvc.exe   Normal     LocalSystem          0
Windows Time          W32Time  Running    Auto       Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal     LocalSystem          0
WebClient WebClient Stopped    Disabled   Share Process
c:\windows\system32\svchost.exe -k localservice       Normal     NT
AUTHORITY\LocalService     0
WinHTTP Web Proxy Auto-Discovery Service           WinHttpAutoProxySvc
Stopped    Manual     Share Process        c:\windows\system32\svchost.exe
-k localservice       Normal     NT AUTHORITY\LocalService  0
Windows Management Instrumentation        winmgmt  Running    Auto
Share Process         c:\windows\system32\svchost.exe -k netsvcs Ignore
LocalSystem        0
Portable Media Serial Number Service      WmdmPmSN             Stopped
Manual     Share Process         c:\windows\system32\svchost.exe -k netsvcs
Normal     LocalSystem          0
Windows Management Instrumentation Driver Extensions           Wmi
Stopped    Manual     Share Process        c:\windows\system32\svchost.exe
-k netsvcs  Normal    LocalSystem          0
WMI Performance Adapter         WmiApSrv             Stopped    Manual
Own Process        c:\windows\system32\wbem\wmiapsrv.exe   Normal
LocalSystem        0
Automatic Updates     wuauserv   Stopped    Manual     Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal     LocalSystem          0
Wireless Configuration          WZCSVC  Stopped    Manual     Share
Process    c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem        0

[Program Groups]

Group Name            Name       User Name
Accessories           Default User:Accessories           Default User
Accessories\Accessibility        Default User:Accessories\Accessibility
Default User
Accessories\Entertainment        Default User:Accessories\Entertainment
Default User
Startup    Default User:Startup  Default User
```

```
Accessories              All Users:Accessories All Users
Accessories\Accessibility          All Users:Accessories\Accessibility
All Users
Accessories\Communications      All Users:Accessories\Communications
All Users
Accessories\Entertainment        All Users:Accessories\Entertainment
All Users
Accessories\System Tools         All Users:Accessories\System Tools
All Users
Administrative Tools  All Users:Administrative Tools   All Users
Intel Network Adapters           All Users:Intel Network AdaptersAll Users
Microsoft SQL ServerAll Users:Microsoft SQL Server  All Users
ServeRAID Manager  All Users:ServeRAID Manager    All Users
Startup      All Users:Startup       All Users
Accessories              NT AUTHORITY\SYSTEM:Accessories      NT
AUTHORITY\SYSTEM
Accessories\Accessibility          NT
AUTHORITY\SYSTEM:Accessories\Accessibility       NT
AUTHORITY\SYSTEM
Accessories\Entertainment          NT
AUTHORITY\SYSTEM:Accessories\Entertainment      NT
AUTHORITY\SYSTEM
Startup      NT AUTHORITY\SYSTEM:Startup            NT
AUTHORITY\SYSTEM
Accessories              IBMSERVER3\Administrator:Accessories
IBMSERVER3\Administrator
Accessories\Accessibility
IBMSERVER3\Administrator:Accessories\Accessibility
IBMSERVER3\Administrator
Accessories\Entertainment
IBMSERVER3\Administrator:Accessories\Entertainment
IBMSERVER3\Administrator
Startup      IBMSERVER3\Administrator:Startup
IBMSERVER3\Administrator

[Startup Programs]

Program    Command  User NameLocation
desktop    desktop.ini NT AUTHORITY\SYSTEM       Startup
desktop    desktop.ini IBMSERVER3\Administrator     Startup
desktop    desktop.ini .DEFAULT              Startup
desktop    desktop.ini All Users   Common Startup
PRONoMgr.exe         c:\program files\intel\ncs\proset\pronomgr.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
WordPad Document   "%programfiles%\windows nt\accessories\wordpad.exe"
Windows Media Services DRM Storage object            Not Available
Bitmap Image          mspaint.exe

[Windows Error Reporting]

Time         Type         Details

[Internet Settings]



[Internet Explorer]
```

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

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

Cipher Strength         128-bit
Content Advisor         Disabled
IEAK Install            No

[File Versions]

File      Version   Size      Date      Path      Company
actxprxy.dll        6.0.3790.0 95 KB    3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
advpack.dll         6.0.3790.0 94 KB    3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
asctrls.ocx 6.0.3790.0 90 KB  3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
browselc.dll        6.0.3790.0 62 KB    3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
browseui.dll        6.0.3790.0 1,033 KB  3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
cdfview.dll         6.0.3790.0 144 KB   3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
comctl32.dll        5.82.3790.0         561 KB    3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
dxtrans.dll 6.3.3790.0 198 KB 3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
dxtmsft.dll 6.3.3790.0 344 KB 3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
iecont.dll  <File Missing>    Not Available       Not Available
Not Available       Not Available
iecontlc.dll<File Missing>    Not Available       Not Available
Not Available       Not Available
iedkcs32.dll        16.0.3790.0         300 KB    3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
iepeers.dll 6.0.3790.0 230 KB 3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
iesetup.dll 6.0.3790.0 59 KB  3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
ieuinit.inf  Not Available    20 KB     3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Not Available
iexplore.exe        6.0.3790.0 90 KB    3/25/2003 8:00:00 AM
C:\Program Files\Internet Explorer      Microsoft Corporation
imgutil.dll 5.2.3790.0 35 KB  3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
inetcpl.cpl 6.0.3790.0 303 KB 3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
inetcplc.dll6.0.3790.0 109 KB 3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
inseng.dll  6.0.3790.0 72 KB  3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
mlang.dll   6.0.3790.0 570 KB 3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
msencode.dll        2002.10.4.0         112 KB    3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Not Available
mshta.exe  6.0.3790.0 26 KB   3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
mshtml.dll 6.0.3790.0 2,848 KB  3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
mshtml.tlb 6.0.3790.0 1,319 KB  3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
```

```
mshtmled.dll        6.0.3790.0 444 KB   3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
mshtmler.dll        6.0.3790.0 55 KB    3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
msident.dll6.0.3790.0 47 KB   3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
msidntld.dll        6.0.3790.0 15 KB    3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
msieftp.dll 6.0.3790.0 230 KB 3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
msrating.dll        6.0.3790.0 132 KB   3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
mstime.dll 6.0.3790.0 491 KB  3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
occache.dll         6.0.3790.0 89 KB    3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
proctexe.ocx        6.3.3790.0 78 KB    3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Intel Corporation
sendmail.dll        6.0.3790.0 52 KB    3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
shdoclc.dll 6.0.3790.0 589 KB 3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
shdocvw.dll         6.0.3790.0 1,361 KB  3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
shfolder.dll        6.0.3790.0 23 KB    3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
shlwapi.dll 6.0.3790.0 281 KB 3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
tdc.ocx     1.3.0.3130 58 KB  3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
url.dll     6.0.3790.0 36 KB  3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
urlmon.dll 6.0.3790.0 502 KB  3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
webcheck.dll        6.0.3790.0 262 KB   3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation
wininet.dll 6.0.3790.0 609 KB 3/25/2003 8:00:00 AM
C:\WINDOWS\system32           Microsoft Corporation

[Connectivity]

Item      Value
Connection Preference         Never dial

LAN Settings

AutoConfigProxy     Not Available
AutoProxyDetectMode           Disabled
AutoConfigURL
Proxy     Disabled
ProxyServer
ProxyOverride

[Cache]

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

Item      Value
Page Refresh Type   Automatic
Temporary Internet Files Folder  C:\Documents and
Settings\NetworkService\Local Settings\Temporary Internet Files
Total Disk Space    Not Available
Available Disk Space Not Available
Maximum Cache Size Not Available
Available Cache Size Not Available

[List of Objects]
```

```
Program File            Status      CodeBase
No cached object information available

[Content]

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

Item        Value
Content Advisor         Disabled

[Personal Certificates]

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

[Other People Certificates]

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

[Publishers]

Name
No publisher information available

[Security]

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

Disk Controller Configuration Parameters

Integrated Ultra320 Interface

```
July 8, 2003 7:23:35 AM EDT

Configuration summary
--------------------------

Server name.....................ibmserver3
ServeRAID Manager agent.........6.10.13 (1195)
ServeRAID Manager console.......6.10.13 (1195)
Number of controllers...........2
Operating system................Windows 2003

Configuration information for controller 1
------------------------------------------------------
Controller type.................LSI 1030
BIOS version....................5.03.09.00
Firmware version................1.00.14.00
Device driver version...........1.08.18.00
Hot-swap rebuild................Enabled
Data scrubbing..................Enabled
Auto-synchronization............Enabled
Unattended mode.................Enabled
Number of arrays................1
Number of logical drives........1
Number of hot-spare drives......0
Number of ready drives..........1
```

```
Array A
--------------------
Array identifier................A
Array size......................140012 MB
Free space......................0 MB
Number of logical drives........1
Number of physical drives.......2

Logical drives in array A
--------------------------------
Logical drive...................1
Array letter....................A
State...........................Okay
RAID level......................1
Data space......................69878 MB
Parity space....................69878 MB


Physical drives in array A
--------------------------------
Type............................Hard disk drive
Vendor..........................IBM-ESXS
Product or model number.........ST373307LC
FRU part number.................32P0730
Serial number...................3HZ03BRC
Firmware level..................B258
Channel.........................1
SCSI ID.........................2
Size............................70006 MB
State...........................Online
Array letter....................A
Mirror role.....................Primary
PFA error.......................No
Partitioned.....................No
Write-cache mode................Write through

Type............................Hard disk drive
Vendor..........................IBM-ESXS
Product or model number.........ST373307LC
FRU part number.................06P5760
Serial number...................3HZ038PZ
Firmware level..................B258
Channel.........................1
SCSI ID.........................4
Size............................70006 MB
State...........................Online
Array letter....................A
Mirror role.....................Secondary
PFA error.......................No
Partitioned.....................No
Write-cache mode................Write through


SCSI channel 1
------------------
Number of drives................3
SCSI initiator ID...............7

Type............................Hard disk drive
Vendor..........................IBM-ESXS
Product or model number.........ST318305LC
FRU part number.................06P5369
Serial number...................3JK001V1
Firmware level..................B244
Channel.........................1
SCSI ID.........................0
Size............................17357 MB
```

```
State...........................Ready
PFA error.......................No
Partitioned.....................Yes
Write-cache mode................Write back

Type............................Hard disk drive
Vendor..........................IBM-ESXS
Product or model number.........ST373307LC
FRU part number.................32P0730
Serial number...................3HZ03BRC
Firmware level..................B258
Channel.........................1
SCSI ID.........................2
Size............................70006 MB
State...........................Online
Array letter....................A
Mirror role.....................Primary
PFA error.......................No
Partitioned.....................No
Write-cache mode................Write through

Type............................Hard disk drive
Vendor..........................IBM-ESXS
Product or model number.........ST373307LC
FRU part number.................06P5760
Serial number...................3HZ038PZ
Firmware level..................B258
Channel.........................1
SCSI ID.........................4
Size............................70006 MB
State...........................Online
Array letter....................A
Mirror role.....................Secondary
PFA error.......................No
Partitioned.....................No
Write-cache mode................Write through

Type............................Enclosure
Vendor..........................IBM
Product or model number.........02R0962a S320
Firmware level..................1
Channel.........................1
SCSI ID.........................8


End of the configuration information for controller 1
-------------------------------------------------------

Configuration information for controller 2
-------------------------------------------------------
Controller type.................LSI 1030
BIOS version....................5.03.09.00
Firmware version................1.00.14.00
Device driver version...........1.08.18.00
Hot-swap rebuild................Enabled
Data scrubbing..................Enabled
Auto-synchronization............Enabled
Unattended mode.................Enabled
Number of arrays................0
Number of logical drives........0
Number of hot-spare drives......0
Number of ready drives..........0


SCSI channel 1
------------------
Number of drives................0
SCSI initiator ID...............7


End of the configuration information for controller 2
-------------------------------------------------------
```

Mylex AcceleRAID A352 Adapter 1

```
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=0, Target=6, Size=17340MB,
State=Online,
				TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
		PhysicalDevice7 = Channel=1, Target=8, Size=17340MB,
State=Online,
				TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
		PhysicalDevice8 = Channel=1, Target=9, Size=17340MB,
State=Online,
				TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
		PhysicalDevice9 = Channel=1, Target=10, Size=17340MB,
State=Online,
				TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
		PhysicalDevice10 = Channel=1, Target=11, Size=17340MB,
State=Online,
				TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
		PhysicalDevice11 = Channel=1, Target=12, Size=17340MB,
State=Online,
				TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
		PhysicalDevice12 = Channel=1, Target=13, Size=17340MB,
State=Online,
				TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
		PhysicalDevice13 = Channel=1, Target=14, Size=17340MB,
State=Online,
				TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
		LogicalDevice0 = StripeSize=64KB, Raid=0, WriteThrough=1,
Size=242704MB, BIOSGeometry=8GB,
                    (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);
 EndGroup
 BeginControllerParameter
          ControllerName = AcceleRAID 352  ;
          ControllerType = 30;
          FirmwareVersion = 7.01;
          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 AcceleRAID A352 Adapter 2

```
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=0, Target=6, Size=17340MB,
State=Online,
                    TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
          PhysicalDevice7 = Channel=1, Target=8, Size=17340MB,
State=Online,
                    TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
          PhysicalDevice8 = Channel=1, Target=9, Size=17340MB,
State=Online,
                    TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
          PhysicalDevice9 = Channel=1, Target=10, Size=17340MB,
State=Online,
                    TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
          PhysicalDevice10 = Channel=1, Target=11, Size=17340MB,
State=Online,
                    TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
          PhysicalDevice11 = Channel=1, Target=12, Size=17340MB,
State=Online,
                    TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
          PhysicalDevice12 = Channel=1, Target=13, Size=17340MB,
State=Online,
                    TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
          PhysicalDevice13 = Channel=1, Target=14, Size=17340MB,
State=Online,
                    TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
          LogicalDevice0 = StripeSize=64KB, Raid=0, WriteThrough=1,
Size=242704MB, BIOSGeometry=8GB,
                    (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);
 EndGroup
 BeginControllerParameter
        ControllerName = AcceleRAID 352  ;
        ControllerType = 30;
        FirmwareVersion = 7.01;
        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 AcceleRAID A352 Adapter 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=0, Target=6, Size=17340MB,
State=Online,
                TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
        PhysicalDevice7 = Channel=1, Target=8, Size=17340MB,
State=Online,
                TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
        PhysicalDevice8 = Channel=1, Target=9, Size=17340MB,
State=Online,
                TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
        PhysicalDevice9 = Channel=1, Target=10, Size=17340MB,
State=Online,
                TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
        PhysicalDevice10 = Channel=1, Target=11, Size=17340MB,
State=Online,
                TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
        PhysicalDevice11 = Channel=1, Target=12, Size=17340MB,
State=Online,
                TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
        PhysicalDevice12 = Channel=1, Target=13, Size=17340MB,
State=Online,
                TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
        PhysicalDevice13 = Channel=1, Target=14, Size=17340MB,
State=Online,
                TransferSpeed=80MHz, TransferWidth=16Bit,
MaxTag=16;
        LogicalDevice0 = StripeSize=64KB, Raid=0, WriteThrough=1,
Size=242704MB, BIOSGeometry=8GB,
                (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);
 EndGroup
 BeginControllerParameter
          ControllerName = AcceleRAID 352  ;
          ControllerType = 30;
          FirmwareVersion = 7.01;
          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
```

Microsoft Windows 2000 Server with COM+

Client Configuration Parameters

Client Configuration Parameters

COM+ Settings

```
TPCC.AllTxns:
   Activation:
      Enable Object Pooling selected
      Minimum Pool Size: 250
      Maximum Pool Size: 250
      Creating Timeout: 60,000
      Enable Object Construction
      Enable Just in Time Activation
   Concurrency:
      Concurrency Required
```

TPCC Application Registry Parameters

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\TPCC]
"Path"="c:\\inetpub\\wwwroot\\"
"NumberOfDeliveryThreads"=dword:0x20
"MaxConnections"=dword:0x3c8c
"MaxPendingDeliveries"=dword:0x6a4
"DB_Protocol"="ODBC"
"TxnMonitor"="COM"
"DbServer"="ibmserver3"
"DbName"="tpcc"
"DbUser"="sa"
"DbPassword"=""
"COM_SinglePool"="YES"
```

Microsoft Internet Information Service Registry Parameters

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo\P
arameters]
"ListenBackLog"=dword:0x19
"DispatchEntries"=hex(7):4c,00,44,00,41,00,50,00,53,00,56,00,43,00,00,00,00,
00
"PoolThreadLimit"=dword:0xbe
"ThreadTimeout"=dword:0x15180

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo\P
erformance]
"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

```
[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\P
arameters]
"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,00,00,00,14,00,00,00,30,00,00,00,02,\
  00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00,00,00,00,00,01,00,00,\
  00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00,01,01,00,00,00,00,00,\
  05,12,00,00,00,74,00,6f,00,00,00,1c,00,ff,01,0f,00,01,02,00,00,00,00,00,05,\
  20,00,00,00,20,02,00,00,72,00,73,00,00,00,18,00,8d,01,02,00,01,01,00,00,00,\
  00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02,00,01,02,00,00,00,00,\
  00,05,20,00,00,00,23,02,00,00,72,00,73,00,01,01,00,00,00,00,00,05,12,00,00,\
  00,01,01,00,00,00,00,00,05,12,00,00,00

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

Client System Information Report

```
System Information report written at: 07/07/2003 07:41:00 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	-[8647xxx]-
System Type	X86-based PC
Processor	x86 Family 15 Model 2 Stepping 7 GenuineIntel ~37419 Mhz
Processor	x86 Family 15 Model 2 Stepping 7 GenuineIntel ~37419 Mhz
BIOS Version	)Phoenix - Award WorkstationBIOS v6.00PG
Windows Directory	C:\WINNT
System Directory	C:\WINNT\System32
Boot Device	\Device\Harddisk0\Partition1
Locale	United States
User Name	CLIENT10\Administrator
Time Zone	Eastern Daylight Time
Total Physical Memory	1,048,044 KB
Available Physical Memory	881,364 KB
Total Virtual Memory	4,092,700 KB
Available Virtual Memory	3,851,972 KB
Page File Space	3,044,656 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
4	Direct memory access controller	OK
2	Standard floppy disk controller	OK

[Forced Hardware]

Device	PNP Device ID
No Forced Hardware

[I/O]

Address Range	Device	Status
0x0000-0x0CF7	PCI bus	OK
0x0000-0x0CF7	Direct memory access controller	OK
0x0D00-0x40B7	PCI bus	OK
0x40B9-0xFFFF	PCI bus	OK
0x9000-0xBFFF	PCI standard PCI-to-PCI bridge	OK
0x9000-0xBFFF	PCI standard PCI-to-PCI bridge	OK
0x9000-0xBFFF	PCI standard PCI-to-PCI bridge	OK
0x9000-0xBFFF	Intel(R) PRO/100 S Dual Port Server Adapter #5	OK
0xB000-0xBFFF	PCI standard PCI-to-PCI bridge	OK
0xB000-0xBFFF	PCI standard PCI-to-PCI bridge	OK
0xB000-0xBFFF	Intel(R) PRO/100 S Dual Port Server Adapter #3	OK
0xB400-0xB43F	Intel(R) PRO/100 S Dual Port Server Adapter #4	OK
0x9400-0x943F	Intel(R) PRO/100 S Dual Port Server Adapter #6	OK
0xA000-0xA0FF	LSI Logic 1020/1030 Ultra320 SCSI Adapter	OK
```

```
0xA400-0xA4FF      LSI Logic 1020/1030 Ultra320 SCSI Adapter
OK
0xC000-0xC0FF      ATI Technologies Inc. RAGE XL PCI        OK
0x03B0-0x03BB      ATI Technologies Inc. RAGE XL PCI        OK
0x03C0-0x03DF      ATI Technologies Inc. RAGE XL PCI        OK
0x0A79-0x0A79      ISAPNP Read Data Port            OK
0x0279-0x0279      ISAPNP Read Data Port            OK
0x0274-0x0277      ISAPNP Read Data Port            OK
0xF000-0xF00F      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
0x5000-0x501F      PCI Device             OK
0x4000-0x40BF      Motherboard resources            OK
0x0010-0x001F      Motherboard resources            OK
0x0022-0x003F      Motherboard resources            OK
0x0044-0x005F      Motherboard resources            OK
0x0062-0x0063      Motherboard resources            OK
0x0065-0x006F      Motherboard resources            OK
0x0074-0x007F      Motherboard resources            OK
0x0091-0x0093      Motherboard resources            OK
0x00A2-0x00BF      Motherboard resources            OK
0x00E0-0x00EF      Motherboard resources            OK
0x04D0-0x04D1      Motherboard resources            OK
0x0800-0x087F      Motherboard resources            OK
0x0020-0x0021      Programmable interrupt controller        OK
0x00A0-0x00A1      Programmable interrupt controller        OK
0x0080-0x0090      Direct memory access controller  OK
0x0094-0x009F      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
0x03F2-0x03F5      Standard floppy disk controller  OK
0x03F7-0x03F7      Standard floppy disk controller  OK
0x03F8-0x03FF      Communications Port (COM1)       OK
0x02F8-0x02FF      Communications Port (COM2)       OK
0x0378-0x037F      Printer Port (LPT1)    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
0x40B8-0x40B8      Not Available          OK

[IRQs]

IRQ Number         Device
9          Microsoft ACPI-Compliant System
48         Broadcom NetXtreme Gigabit Ethernet
52         Intel(R) PRO/100 S Dual Port Server Adapter #3
53         Intel(R) PRO/100 S Dual Port Server Adapter #4
28         Intel(R) PRO/100 S Dual Port Server Adapter #5
29         Intel(R) PRO/100 S Dual Port Server Adapter #6
32         LSI Logic 1020/1030 Ultra320 SCSI Adapter
33         LSI Logic 1020/1030 Ultra320 SCSI Adapter
22         ATI Technologies Inc. RAGE XL PCI
14         Primary IDE Channel
10         PCI Device
8          System CMOS/real time clock
13         Numeric data processor
6          Standard floppy disk controller
4          Communications Port (COM1)
3          Communications Port (COM2)
12         PS/2 Compatible Mouse
1          Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
```

```
[Memory]

Range       Device      Status
0xC8000-0xCBFFF   System board        OK
0xF0000-0xF7FFF   System board        OK
0xF8000-0xFBFFF   System board        OK
0xFC000-0xFFFFF   System board        OK
0x3FFF0000-0x3FFFFFFF         System board        OK
0x0000-0x9FFFF    System board        OK
0x100000-0x3FFEFFFF           System board        OK
0xFEC00000-0xFECFFFFF         System board        OK
0xFEE00000-0xFEEFFFFF         System board        OK
0xFFB00000-0xFFB7FFFF         System board        OK
0xFFF00000-0xFFFFFFFF         System board        OK
0xE0000-0xEFFFF   System board        OK
0xFFB80000-0xFFBFFFFF         Intel(r) 82802 Firmware Hub Device
OK
0xA0000-0xBFFFF   PCI bus     OK
0xA0000-0xBFFFF   ATI Technologies Inc. RAGE XL PCI         OK
0xC0000-0xDFFFF   PCI bus     OK
0x40000000-0xFEBFFFFF         PCI bus     OK
0xEC000000-0xEFFFFFFF         PCI standard PCI-to-PCI bridge  OK
0xF0000000-0xF2FFFFFF         PCI standard PCI-to-PCI bridge  OK
0xF0000000-0xF2FFFFFF         PCI standard PCI-to-PCI bridge  OK
0xF2201000-0xF2201FFF         System Interrupt Controller     OK
0xF2000000-0xF21FFFFF         PCI standard PCI-to-PCI bridge  OK
0xF2000000-0xF21FFFFF         PCI standard PCI-to-PCI bridge  OK
0xF2000000-0xF21FFFFF         Intel(R) PRO/100 S Dual Port Server Adapter
#3          OK
0xF2100000-0xF210FFFF         Broadcom NetXtreme Gigabit Ethernet
OK
0xF2041000-0xF2041FFF         Intel(R) PRO/100 S Dual Port Server Adapter
#3          OK
0xF2040000-0xF2040FFF         Intel(R) PRO/100 S Dual Port Server Adapter
#4          OK
0xF2020000-0xF203FFFF         Intel(R) PRO/100 S Dual Port Server Adapter
#4          OK
0xF2200000-0xF2200FFF         System Interrupt Controller     OK
0xF1000000-0xF10FFFFF         PCI standard PCI-to-PCI bridge  OK
0xF1000000-0xF10FFFFF         Intel(R) PRO/100 S Dual Port Server Adapter
#5          OK
0xF1041000-0xF1041FFF         Intel(R) PRO/100 S Dual Port Server Adapter
#5          OK
0xF1040000-0xF1040FFF         Intel(R) PRO/100 S Dual Port Server Adapter
#6          OK
0xF1020000-0xF103FFFF         Intel(R) PRO/100 S Dual Port Server Adapter
#6          OK
0xF1110000-0xF111FFFF         LSI Logic 1020/1030 Ultra320 SCSI Adapter
OK
0xF1100000-0xF110FFFF         LSI Logic 1020/1030 Ultra320 SCSI Adapter
OK
0xF1120000-0xF112FFFF         LSI Logic 1020/1030 Ultra320 SCSI Adapter
OK
0xF1130000-0xF113FFFF         LSI Logic 1020/1030 Ultra320 SCSI Adapter
OK
0xF3000000-0xF3FFFFFF         ATI Technologies Inc. RAGE XL PCI
OK
0xF5000000-0xF5000FFF         ATI Technologies Inc. RAGE XL PCI
OK
0xFEBFFC00-0xFEBFFFFF         Standard Dual Channel PCI IDE 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\msg723.acm   Microsoft Corporation
OK          C:\WINNT\System32\MSG723.ACM          4.4.3385    106.77 KB
(109,328 bytes)         2/10/2003 5:01:31 PM
c:\winnt\system32\lhacm.acm    Microsoft Corporation
OK          C:\WINNT\System32\LHACM.ACM           4.4.3385    33.27 KB
(34,064 bytes)          2/10/2003 5:01:32 PM
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\msg711.acm   Microsoft Corporation
OK          C:\WINNT\System32\MSG711.ACM          5.00.2134.1
10.27 KB (10,512 bytes)            12/7/1999 7:00:00 AM
c:\winnt\system32\imaadp32.acmMicrosoft 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\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\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

[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)         2/10/2003 5:01:31 PM
c:\winnt\system32\msh263.drv   Microsoft Corporation
OK          C:\WINNT\System32\MSH263.DRV          4.4.3385    252.27 KB
(258,320 bytes)         2/10/2003 5:01:10 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\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\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        HL-DT-ST CD-ROM GCR-8480B
Manufacturer            (Standard CD-ROM drives)
Status      OK
Transfer Rate           Not Available
```

```
SCSI Target ID          0
PNP Device ID
IDE\CDROMHL-DT-ST_CD-ROM_GCR-8480B________________1.02____\
5&74A80B&0&0.0.0


[Sound Device]

Item        Value
No sound devices

[Display]

Item        Value
Name        ATI Technologies Inc. RAGE XL PCI
PNP Device ID
PCI\VEN_1002&DEV_4752&SUBSYS_02401014&REV_27\4&1A671D0C&
0&08F0
Adapter Type            ATI RAGE XL PCI, ATI Technologies Inc. compatible
Adapter Description     ATI Technologies Inc. RAGE XL PCI
Adapter RAM             8.00 MB (8,388,608 bytes)
Installed Drivers       atidrab.dll
Driver Version          5.00.2179.1
INF File    display.inf (atirage3 section)
Color Planes            1
Color Table Entries     65536
Resolution 1024 x 768 x 60 hertz
Bits/Pixel  16


[Infrared]

Item        Value
No infrared devices

[Input]

[ Following are sub-categories of this main category ]

[Keyboard]

Item        Value
Description             Standard 101/102-Key or Microsoft Natural PS/2
Keyboard
Name        Enhanced (101- or 102-key)
Layout      00000409
PNP Device ID           ACPI\PNP0303\3&13C0B0C5&0
NumberOfFunctionKeys              12


[Pointing Device]

Item        Value
Hardware Type           PS/2 Compatible Mouse
Number of Buttons       3
Status      OK
PNP Device ID           ACPI\PNP0F13\3&13C0B0C5&0
Power Management Supported    False
Double Click Threshold            6
Handedness              Right Handed Operation


[Modem]

Item        Value
No modems

[Network]
```

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

[Adapter]

Item		Value
Name		[00000000] RAS Async Adapter
Adapter Type		Not Available
Product Name		RAS Async Adapter
Installed	True
PNP Device ID		Not Available
Last Reset 7/7/2003 3:36:55 PM
Index		0
Service Name		AsyncMac
IP Address	Not Available
IP Subnet	Not Available
Default IP Gateway	Not Available
DHCP Enabled		False
DHCP Server		Not Available
DHCP Lease Expires	Not Available
DHCP Lease Obtained		Not Available
MAC Address		Not Available
Service Name		Not Available

Name		[00000001] WAN Miniport (L2TP)
Adapter Type		Not Available
Product Name		WAN Miniport (L2TP)
Installed	True
PNP Device ID		ROOT\MS_L2TPMINIPORT\0000
Last Reset 7/7/2003 3:36:55 PM
Index		1
Service Name		Rasl2tp
IP Address	Not Available
IP Subnet	Not Available
Default IP Gateway	Not Available
DHCP Enabled		False
DHCP Server		Not Available
DHCP Lease Expires	Not Available
DHCP Lease Obtained		Not Available
MAC Address		Not Available
Service Name		Rasl2tp
Driver	c:\winnt\system32\drivers\rasl2tp.sys (50800, 5.00.2179.1)

Name		[00000002] WAN Miniport (PPTP)
Adapter Type		Wide Area Network (WAN)
Product Name		WAN Miniport (PPTP)
Installed	True
PNP Device ID		ROOT\MS_PPTPMINIPORT\0000
Last Reset 7/7/2003 3:36:55 PM
Index		2
Service Name		PptpMiniport
IP Address	Not Available
IP Subnet	Not Available
Default IP Gateway	Not Available
DHCP Enabled		False
DHCP Server		Not Available
DHCP Lease Expires	Not Available
DHCP Lease Obtained		Not Available
MAC Address		50:50:54:50:30:30
Service Name		PptpMiniport
Driver	c:\winnt\system32\drivers\raspptp.sys (47856, 5.00.2160.1)

Name		[00000003] Direct Parallel
Adapter Type		Not Available
Product Name		Direct Parallel
Installed	True
PNP Device ID		ROOT\MS_PTIMINIPORT\0000
Last Reset 7/7/2003 3:36:55 PM
Index		3
Service Name		Raspti
IP Address	Not Available
IP Subnet	Not Available
Default IP Gateway	Not Available
DHCP Enabled		False
DHCP Server		Not Available
DHCP Lease Expires	Not Available
DHCP Lease Obtained		Not Available
MAC Address		Not Available
Service Name		Raspti
Driver	c:\winnt\system32\drivers\raspti.sys (16880, 5.00.2146.1)

Name		[00000004] WAN Miniport (IP)
Adapter Type		Not Available
Product Name		WAN Miniport (IP)
Installed	True
PNP Device ID		ROOT\MS_NDISWANIP\0000
Last Reset 7/7/2003 3:36:55 PM
Index		4
Service Name		NdisWan
IP Address	Not Available
IP Subnet	Not Available
Default IP Gateway	Not Available
DHCP Enabled		False
DHCP Server		Not Available
DHCP Lease Expires	Not Available
DHCP Lease Obtained		Not Available
MAC Address		Not Available
Service Name		NdisWan
Driver	c:\winnt\system32\drivers\ndiswan.sys (90096, 5.00.2195.2779)

Name		[00000005] Broadcom NetXtreme Gigabit Ethernet
Adapter Type		Ethernet 802.3
Product Name		Broadcom NetXtreme Gigabit Ethernet
Installed	True
PNP Device ID
PCI\VEN_14E4&DEV_16A7&SUBSYS_026F1014&REV_02\5&121CC7C2
&0&08E810
Last Reset 7/7/2003 3:36:55 PM
Index		5
Service Name		b57w2k
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		00:10:DC:76:E2:B3
Service Name		b57w2k
IRQ Number		48
Driver	c:\winnt\system32\drivers\b57w2k.sys (78352, 2.78.0.0)

Name		[00000008] Intel(R) PRO/100 S Dual Port Server Adapter
Adapter Type		Ethernet 802.3
Product Name		Intel(R) PRO/100 S Dual Port Server Adapter
Installed	True
PNP Device ID
PCI\VEN_8086&DEV_1229&SUBSYS_10158086&REV_0D\6&27CA6BFE
&0&2010E810
Last Reset 7/7/2003 3:36:55 PM
Index		8
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         00:02:B3:A8:B1:DB
Service Name        E100B
IRQ Number          52
I/O Port    0xB000-0xBFFF
Driver      c:\winnt\system32\drivers\e100bnt5.sys (141584, 6.04.14.0000)

Name        [00000009] Intel(R) PRO/100 S Dual Port Server Adapter
Adapter Type        Ethernet 802.3
Product Name        Intel(R) PRO/100 S Dual Port Server Adapter
Installed   True
PNP Device ID
PCI\VEN_8086&DEV_1229&SUBSYS_10158086&REV_0D\6&27CA6BFE
&0&2810E810
Last Reset 7/7/2003 3:36:55 PM
Index       9
Service Name        E100B
IP Address192.168.110.10
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         00:02:B3:A8:B1:DC
Service Name        E100B
IRQ Number          53
I/O Port    0xB400-0xB43F
Driver      c:\winnt\system32\drivers\e100bnt5.sys (141584, 6.04.14.0000)

Name        [00000010] Intel(R) PRO/100 S Dual Port Server Adapter
Adapter Type        Ethernet 802.3
Product Name        Intel(R) PRO/100 S Dual Port Server Adapter
Installed   True
PNP Device ID
PCI\VEN_8086&DEV_1229&SUBSYS_10158086&REV_0D\6&34E7E7F4&
0&2010F810
Last Reset 7/7/2003 3:36:55 PM
Index       10
Service Name        E100B
IP Address192.168.140.10
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         00:02:B3:B8:F9:AD
Service Name        E100B
IRQ Number          28
I/O Port    0x9000-0xBFFF
Driver      c:\winnt\system32\drivers\e100bnt5.sys (141584, 6.04.14.0000)

Name        [00000011] Intel(R) PRO/100 S Dual Port Server Adapter
Adapter Type        Ethernet 802.3
Product Name        Intel(R) PRO/100 S Dual Port Server Adapter
Installed   True
PNP Device ID
PCI\VEN_8086&DEV_1229&SUBSYS_10158086&REV_0D\6&34E7E7F4&
0&2810F810
Last Reset 7/7/2003 3:36:55 PM
Index       11
Service Name        E100B
IP Address192.168.130.10
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         00:02:B3:B8:F9:AE
Service Name        E100B
IRQ Number          29
I/O Port    0x9400-0x943F
Driver      c:\winnt\system32\drivers\e100bnt5.sys (141584, 6.04.14.0000)


[Protocol]

Item        Value
Name        MSAFD Tcpip [TCP/IP]
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  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
MinimumAddressSize16 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_{46C9A0D6-E62D-4DBF-958D-3332D7E2724D}]
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_{46C9A0D6-E62D-4DBF-958D-3332D7E2724D}]
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_{CCEF995F-88D1-4909-B081-227DA339588C}]
SEQPACKET 8
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_{CCEF995F-88D1-4909-B081-227DA339588C}]
DATAGRAM 8
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_{429A8AF4-651D-45B3-BB0C-2B8ADDFB0687}]
SEQPACKET 7
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_{429A8AF4-651D-45B3-BB0C-2B8ADDFB0687}]
DATAGRAM 7
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_{0AE55295-FD97-4F03-8CE0-2962253F5166}]
SEQPACKET 6
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_{0AE55295-FD97-4F03-8CE0-2962253F5166}]
DATAGRAM 6
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_{863ED3FC-3C10-4E07-A1A7-C4300734A1C1}]
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_{863ED3FC-3C10-4E07-A1A7-C4300734A1C1}]
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_{BAD679FF-C376-4B6F-ABCE-3FA6DEA10679}]
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_{BAD679FF-C376-4B6F-ABCE-3FA6DEA10679}]
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_{746F2941-9397-47E7-8C77-C78A77DFC894}]
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_{746F2941-9397-47E7-8C77-C78A77DFC894}]
DATAGRAM 2
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


[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\3&13C0B0C5&0


[Storage]

[ Following are sub-categories of this main category ]

[Drives]

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

Drive       C:
Description         Local Fixed Disk
Compressed          False
File System         NTFS
Size        16.94 GB (18,194,284,544 bytes)
Free Space 13.01 GB (13,971,148,800 bytes)
Volume Name
Volume Serial Number        08674715
Partition   Disk #0, Partition #0
Partition Size      16.94 GB (18,194,287,104 bytes)
Starting Offset     32256 bytes
Drive Description   Disk drive
Drive Manufacturer  (Standard disk drives)
Drive Model         IBM-PSG ST318203LC    !# 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  5
Drive SectorsPerTrack       63
Drive Size 18194319360 bytes
Drive TotalCylinders 2212
Drive TotalSectors  35535780
Drive TotalTracks   564060
Drive TracksPerCylinder     255

Drive       E:
Description         Network Connection
Provider Name       \\192.168.132.253\e$


[SCSI]

Item        Value
Name        LSI Logic 1020/1030 Ultra320 SCSI Adapter
Caption     LSI Logic 1020/1030 Ultra320 SCSI Adapter
Driver      SYMMPI
Status      OK
PNP Device ID
PCI\VEN_1000&DEV_0030&SUBSYS_10001014&REV_07\5&21593F33&0
&18F810
Device ID
PCI\VEN_1000&DEV_0030&SUBSYS_10001014&REV_07\5&21593F33&0
&18F810
Device Map          Not Available
Index       Not Available
Max Number Controlled       Not Available
IRQ Number          32
I/O Port    0xA000-0xA0FF
```

```
Driver      c:\winnt\system32\drivers\symmpi.sys (38512, 1.08.22.00)

Name        LSI Logic 1020/1030 Ultra320 SCSI Adapter
Caption     LSI Logic 1020/1030 Ultra320 SCSI Adapter
Driver      SYMMPI
Status      OK
PNP Device ID
PCI\VEN_1000&DEV_0030&SUBSYS_10001014&REV_07\5&21593F33&0
&19F810
Device ID
PCI\VEN_1000&DEV_0030&SUBSYS_10001014&REV_07\5&21593F33&0
&19F810
Device Map          Not Available
Index       Not Available
Max Number Controlled       Not Available
IRQ Number          33
I/O Port    0xA400-0xA4FF
Driver      c:\winnt\system32\drivers\symmpi.sys (38512, 1.08.22.00)


[Printing]

Name        Port Name Server Name
No printing information

[Problem Devices]

Device      PNP Device ID       Error Code
PCI Device
PCI\VEN_8086&DEV_2551&SUBSYS_25511014&REV_03\3&13C0B0C5&
0&01        28
System Interrupt Controller
PCI\VEN_8086&DEV_1461&SUBSYS_00000000&REV_03\4&4E4AD31&0
&E010       28
System Interrupt Controller
PCI\VEN_8086&DEV_1461&SUBSYS_00000000&REV_03\4&4E4AD31&0
&F010       28
PCI Device
PCI\VEN_8086&DEV_2554&SUBSYS_25541014&REV_03\3&13C0B0C5&
0&11        28
PCI Device
PCI\VEN_8086&DEV_24C3&SUBSYS_027A1014&REV_02\3&13C0B0C5
&0&FB       28
Not Available       ACPI\IBM37D6\2&DABA3FF&0            28
Not Available       ACPI\ASF0001\2&DABA3FF&0            28

[USB]

Device      PNP Device ID
No USB Devices

[Software Environment]

[ Following are sub-categories of this main category ]

[Drivers]

Name        Description         File        Type        Started     Start Mode
State       Status      Error Control       Accept Pause        Accept Stop
abiosdsk    Abiosdsk    Not Available       Kernel Driver       False
Disabled    Stopped     OK          Ignore      False       False
abp480n5    abp480n5    Not Available       Kernel Driver       False
Disabled    Stopped     OK          Normal      False       False
acpi        Microsoft ACPI Driver           c:\winnt\system32\drivers\acpi.sys
Kernel Driver       True        Boot        Running     OK          Normal
False       True
```

```
acpiec    ACPIEC    c:\winnt\system32\drivers\acpiec.sys          Kernel
Driver    False     Disabled  Stopped   OK        Normal    False
False
adpu160m  adpu160m  Not Available       Kernel Driver       False
Disabled  Stopped   OK        Normal    False     False
afd       AFD Networking Support Environment
c:\winnt\system32\drivers\afd.sys Kernel Driver     True      Auto
Running   OK        Normal    False     True
aha154x   Aha154x   Not Available       Kernel Driver       False
Disabled  Stopped   OK        Normal    False     False
aic116x   aic116x   Not Available       Kernel Driver       False
Disabled  Stopped   OK        Normal    False     False
aic78u2   aic78u2   Not Available       Kernel Driver       False
Disabled  Stopped   OK        Normal    False     False
aic78xx   aic78xx   Not Available       Kernel Driver       False
Disabled  Stopped   OK        Normal    False     False
ami0nt    ami0nt    Not Available       Kernel Driver       False
Disabled  Stopped   OK        Normal    False     False
amsint    amsint    Not Available       Kernel Driver       False
Disabled  Stopped   OK        Normal    False     False
asc       asc       Not Available       Kernel Driver       False
Disabled  Stopped   OK        Normal    False     False
asc3350p  asc3350p  Not Available       Kernel Driver       False
Disabled  Stopped   OK        Normal    False     False
asc3550   asc3550   Not Available       Kernel Driver       False
Disabled  Stopped   OK        Normal    False     False
asyncmac  RAS Asynchronous Media Driver
c:\winnt\system32\drivers\asyncmac.sys  Kernel Driver       False
Manual    Stopped   OK        Normal    False     False
atapi     Standard IDE/ESDI Hard Disk Controller
c:\winnt\system32\drivers\atapi.sys     Kernel Driver       True
Boot      Running   OK        Normal    False     True
atdisk    Atdisk    Not Available       Kernel Driver       False
Disabled  Stopped   OK        Ignore    False     False
atirage3  atirage3  c:\winnt\system32\drivers\atimpab.sys         Kernel
Driver    True      Manual    Running   OK        Ignore    False
True
atmarpc   ATM ARP Client Protocol
c:\winnt\system32\drivers\atmarpc.sys   Kernel Driver       False
Manual    Stopped   OK        Normal    False     False
audstub   Audio Stub Driver   c:\winnt\system32\drivers\audstub.sys
Kernel Driver       True      Manual    Running   OK        Normal
False     True
b57w2k    Broadcom NetXtreme Gigabit Ethernet
c:\winnt\system32\drivers\b57w2k.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 Driverc:\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
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
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
symmpi    symmpi    c:\winnt\system32\drivers\symmpi.sys      Kernel
Driver    True      Boot      Running    OK         Normal    False
True
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
vgasave   VgaSave   c:\winnt\system32\drivers\vga.sys         Kernel
Driver    True      System    Running    OK         Ignore    False
True
wanarp    Remote Access IP ARP Driver
c:\winnt\system32\drivers\wanarp.sys     Kernel Driver        True
Manual    Running   OK        Normal     False      True
wdica     WDICA     Not Available        Kernel Driver        False
Manual    Stopped   OK        Ignore     False      False

[Environment Variables]

Variable  Value     User Name
ComSpec   %SystemRoot%\system32\cmd.exe            <SYSTEM>
Os2LibPath          %SystemRoot%\system32\os2\dll;            <SYSTEM>
Path
%SystemRoot%\system32;%SystemRoot%;%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     15        <SYSTEM>
PROCESSOR_IDENTIFIER          x86 Family 15 Model 2 Stepping 7,
GenuineIntel        <SYSTEM>
PROCESSOR_REVISION  0207      <SYSTEM>
NUMBER_OF_PROCESSORS          2         <SYSTEM>
PATHEXT
.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH              <SYSTEM>
TEMP      %SystemRoot%\TEMP             <SYSTEM>
TMP       %SystemRoot%\TEMP             <SYSTEM>
TEMP      %USERPROFILE%\Local Settings\Temp
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   7/7/2003 7:37:18 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       7/7/2003 7:37:22 PM  Unknown  Unknown  Unknown
winlogon.exe        c:\winnt\system32\winlogon.exe  184      13
204800    1413120   7/7/2003 7:37:24 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   7/7/2003 7:37:25 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   7/7/2003 7:37:25 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   416      8
204800    1413120   7/7/2003 7:37:29 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   7/7/2003 7:37:30 PM  5.00.2161.1       43.77 KB
(44,816 bytes)      2/10/2003 11:47:14 AM
msdtc.exe c:\winnt\system32\msdtc.exe   476      8        204800
1413120   7/7/2003 7:37:30 PM  1999.9.3421.3     6.77 KB (6,928 bytes)
2/10/2003 11:57:24 AM
svchost.exe         c:\winnt\system32\svchost.exe   608      8
204800    1413120   7/7/2003 7:37:33 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  636      9        204800
1413120   7/7/2003 7:37:33 PM  5.00.2195.2649    114.27 KB (117,008
bytes)    5/4/2001 1:05:02 PM
regsvc.exe c:\winnt\system32\regsvc.exe 680      8        204800
1413120   7/7/2003 7:37:34 PM  5.00.2195.2104    65.27 KB (66,832
bytes)    2/10/2003 5:30:11 PM
rsys.exe  Not Available       784      8        Not Available
Not Available       7/7/2003 7:37:35 PM  Unknown  Unknown  Unknown
rsvp.exe  c:\winnt\system32\rsvp.exe    696      8        204800
1413120   7/7/2003 7:37:50 PM  5.00.2167.1       172.77 KB (176,912
bytes)    12/7/1999 7:00:00 AM
mstask.exec:\winnt\system32\mstask.exe  852      8        204800
1413120   7/7/2003 7:37:50 PM  4.71.2195.1       115.27 KB (118,032
bytes)    2/10/2003 5:30:05 PM
tcpsvcs.exe         c:\winnt\system32\tcpsvcs.exe   884      8
204800    1413120   7/7/2003 7:37:50 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       920      8
204800    1413120   7/7/2003 7:37:50 PM  1.50.1085.0029    192.08 KB
(196,685 bytes)     2/10/2003 5:30:22 PM
inetinfo.exe        c:\winnt\system32\inetsrv\inetinfo.exe   952      8
204800    1413120   7/7/2003 7:37:50 PM  5.00.0984  14.27 KB (14,608
bytes)    2/10/2003 5:31:05 PM
dfssvc.exe c:\winnt\system32\dfssvc.exe     1020     8        204800
1413120   7/7/2003 7:37:52 PM  5.00.2195.2841    88.27 KB (90,384
bytes)    2/10/2003 5:29:52 PM
explorer.exe        c:\winnt\explorer.exe  1144     8        204800
1413120   7/7/2003 7:38:22 PM  5.00.3315.2846    237.27 KB (242,960
bytes)    2/10/2003 5:30:17 PM
mdm.exe   c:\winnt\system32\mdm.exe     1268     8        204800
1413120   7/7/2003 7:38:46 PM  6.00.8424  121.29 KB (124,200 bytes)
2/10/2003 11:59:09 AM
mmc.exe   c:\winnt\system32\mmc.exe     1316     8        204800
1413120   7/7/2003 7:38:53 PM  5.00.2195.2301    589.27 KB (603,408
bytes)    2/10/2003 5:29:59 PM
svchost.exe         c:\winnt\system32\svchost.exe  364      8
204800    1413120   7/7/2003 7:39:03 PM  5.00.2134.1       7.77 KB
(7,952 bytes)       12/7/1999 7:00:00 AM

[Loaded Modules]

Name      Version   Size      File Date Manufacturer      Path
tapisrv.dll  5.00.2195.2955   169.27 KB (173,328 bytes)   2/10/2003
5:30:15 PM          Microsoft Corporation
c:\winnt\system32\tapisrv.dll
wbemprox.dll        1.50.1085.0045      40.08 KB (41,040 bytes)
2/10/2003 5:30:22 PM          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)   2/10/2003
5:29:48 PM          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)
2/10/2003 5:29:58 PM          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)
2/10/2003 5:29:55 PM          Microsoft Corporation
c:\winnt\system32\filemgmt.dll
pdh.dll   5.00.2195.2739      147.77 KB (151,312 bytes)   2/10/2003
5:30:10 PM          Microsoft Corporation
c:\winnt\system32\pdh.dll
smlogcfg.dll        5.00.2195.2485      273.27 KB (279,824 bytes)
2/10/2003 5:30:14 PM          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)
2/10/2003 5:01:28 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)
2/10/2003 5:30:11 PM          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.dll1.50.1085.0000          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)
2/10/2003 5:29:52 PM          Executive Software International, Inc.
c:\winnt\system32\dfrgsnap.dll
dmdskres.dll          2195.2104.297.3          119.50 KB (122,368 bytes)
2/10/2003 5:29:52 PM          Microsoft Corp., VERITAS Software
c:\winnt\system32\dmdskres.dll
dmutil.dll  2195.2104.297.3          42.27 KB (43,280 bytes)            2/10/2003
5:29:52 PM          VERITAS Software Corp.
c:\winnt\system32\dmutil.dll
ntmsapi.dll5.00.1948.1          51.77 KB (53,008 bytes)            2/10/2003
5:30:08 PM          Microsoft Corporation
c:\winnt\system32\ntmsapi.dll
dmdskmgr.dll          2215.2215.297.3          160.27 KB (164,112 bytes)
2/10/2003 5:29:52 PM          Microsoft Corp., VERITAS Software
c:\winnt\system32\dmdskmgr.dll
mycomput.dll          5.00.2134.1          107.77 KB (110,352 bytes)
12/7/1999 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)            2/10/2003
5:29:59 PM          Microsoft Corporation
c:\winnt\system32\mmc.exe
mdm.exe   6.00.8424  121.29 KB (124,200 bytes)          2/10/2003 11:59:09
AM          Microsoft Corporation          c:\winnt\system32\mdm.exe
imm32.dll  5.00.2195.2821          94.27 KB (96,528 bytes)            2/10/2003
5:29:56 PM          Microsoft Corporation
c:\winnt\system32\imm32.dll
netplwiz.dll          5.00.2195.2370          169.77 KB (173,840 bytes)
2/10/2003 5:30:07 PM          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)            2/10/2003
5:29:59 PM          Microsoft Corporation
c:\winnt\system32\mprui.dll
imgutil.dll 5.00.3315.2870          30.77 KB (31,504 bytes)            2/10/2003
5:29:56 PM          Microsoft Corporation
c:\winnt\system32\imgutil.dll
webvw.dll 5.00.2920.0000          1.06 MB (1,115,408 bytes)            12/7/1999
7:00:00 AM          Microsoft Corporation
c:\winnt\system32\webvw.dll
msls31.dll  3.10.337.0 145.27 KB (148,752 bytes)          12/7/1999 7:00:00 AM
Microsoft Corporation          c:\winnt\system32\msls31.dll
wininet.dll 5.00.3315.1000          456.77 KB (467,728 bytes)            2/10/2003
5:30:16 PM          Microsoft Corporation
c:\winnt\system32\wininet.dll
msdbg.dll  6.00.8424  67.50 KB (69,120 bytes)          2/10/2003 11:59:10
AM          Microsoft Corporation          c:\winnt\system32\msdbg.dll
shdoclc.dll5.00.3315.2879          324.50 KB (332,288 bytes)            2/10/2003
5:30:13 PM          Microsoft Corporation
c:\winnt\system32\shdoclc.dll
pdm.dll       6.00.8424  179.27 KB (183,574 bytes)          2/10/2003 11:59:10
AM          Microsoft Corporation          c:\winnt\system32\pdm.dll
```

```
mshtml.dll 5.00.3315.2870          2.24 MB (2,345,232 bytes)            2/10/2003
5:30:00 PM          Microsoft Corporation
c:\winnt\system32\mshtml.dll
mlang.dll   5.00.3103.1000          510.77 KB (523,024 bytes)            2/10/2003
5:29:59 PM          Microsoft Corporation
c:\winnt\system32\mlang.dll
urlmon.dll 5.00.3315.1000          441.27 KB (451,856 bytes)            2/10/2003
5:30:15 PM          Microsoft Corporation
c:\winnt\system32\urlmon.dll
linkinfo.dll5.00.2134.1          15.77 KB (16,144 bytes)            12/7/1999
7:00:00 AM          Microsoft Corporation
c:\winnt\system32\linkinfo.dll
msi.dll       2.0.2600.0 1.90 MB (1,991,168 bytes)          2/10/2003 5:30:01 PM
Microsoft Corporation          c:\winnt\system32\msi.dll
faxshell.dll5.00.2134.1          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.dll5.00.2134.1          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
hhsetup.dll4.74.8702  66.27 KB (67,856 bytes)          12/7/1999 7:00:00 AM
Microsoft Corporation          c:\winnt\system32\hhsetup.dll
mmcshext.dll          5.00.2153.1          24.27 KB (24,848 bytes)
12/7/1999 7:00:00 AM          Microsoft Corporation
c:\winnt\system32\mmcshext.dll
browselc.dll          5.00.3315.2846          34.50 KB (35,328 bytes)
2/10/2003 5:29:48 PM          Microsoft Corporation
c:\winnt\system32\browselc.dll
powrprof.dll          5.00.3103.1000          13.27 KB (13,584 bytes)
2/10/2003 5:30:10 PM          Microsoft Corporation
c:\winnt\system32\powrprof.dll
batmeter.dll          5.00.3103.1000          20.27 KB (20,752 bytes)
2/10/2003 5:29:48 PM          Microsoft Corporation
c:\winnt\system32\batmeter.dll
stobject.dll5.00.2195.2780          79.27 KB (81,168 bytes)            2/10/2003
5:30:14 PM          Microsoft Corporation
c:\winnt\system32\stobject.dll
webcheck.dll          5.00.3315.1000          251.77 KB (257,808 bytes)
2/10/2003 5:30:16 PM          Microsoft Corporation
c:\winnt\system32\webcheck.dll
ntshrui.dll  5.00.2134.1          46.77 KB (47,888 bytes)            12/7/1999
7:00:00 AM          Microsoft Corporation
c:\winnt\system32\ntshrui.dll
mydocs.dll5.00.2920.0000          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)
2/10/2003 5:29:48 PM          Microsoft Corporation
c:\winnt\system32\browseui.dll
shdocvw.dll          5.00.3315.2879          1.05 MB (1,104,144 bytes)
2/10/2003 5:30:13 PM          Microsoft Corporation
c:\winnt\system32\shdocvw.dll
explorer.exe          5.00.3315.2846          237.27 KB (242,960 bytes)
2/10/2003 5:30:17 PM          Microsoft Corporation
c:\winnt\explorer.exe
dfssvc.exe 5.00.2195.2841          88.27 KB (90,384 bytes)            2/10/2003
5:29:52 PM          Microsoft Corporation
c:\winnt\system32\dfssvc.exe
iislog.dll   5.00.0984  75.27 KB (77,072 bytes)          2/10/2003 5:31:05 PM
Microsoft Corporation          c:\winnt\system32\inetsrv\iislog.dll
```

```
httpext.dll  0.9.3940.21          435.27 KB (445,712 bytes)          2/10/2003
5:31:04 PM              Microsoft Corporation
c:\winnt\system32\inetsrv\httpext.dll
rpcproxy.dll            5.00.2195.2780          16.27 KB (16,656 bytes)
2/10/2003 5:30:58 PM              Microsoft Corporation
c:\winnt\system32\rpcproxy\rpcproxy.dll
fpexedll.dll            4.0.2.4324 20.06 KB (20,541 bytes)          2/10/2003
5:30:57 PM              Microsoft Corporation              c:\program
files\common files\microsoft shared\web server extensions\40\bin\fpexedll.dll
md5filt.dll 5.00.0984  32.77 KB (33,552 bytes)          2/10/2003 5:31:05 PM
Microsoft Corporation              c:\winnt\system32\inetsrv\md5filt.dll
gzip.dll     5.00.0984  30.27 KB (30,992 bytes)          2/10/2003 5:31:04 PM
Microsoft Corporation              c:\winnt\system32\inetsrv\gzip.dll
compfilt.dll            5.00.0984  22.77 KB (23,312 bytes)          2/10/2003
5:31:04 PM              Microsoft Corporation
c:\winnt\system32\inetsrv\compfilt.dll
sspifilt.dll  5.00.0984  43.27 KB (44,304 bytes)          2/10/2003 5:31:06 PM
Microsoft Corporation              c:\winnt\system32\inetsrv\sspifilt.dll
iscomlog.dll            5.00.0984  24.77 KB (25,360 bytes)          2/10/2003
5:31:05 PM              Microsoft Corporation
c:\winnt\system32\inetsrv\iscomlog.dll
lonsint.dll  5.00.0984  11.77 KB (12,048 bytes)          2/10/2003 5:31:05 PM
Microsoft Corporation              c:\winnt\system32\inetsrv\lonsint.dll
inetsloc.dll5.00.0984  20.27 KB (20,752 bytes)          2/10/2003 5:29:56 PM
Microsoft Corporation              c:\winnt\system32\inetsloc.dll
iisfecnv.dll5.00.0984  7.27 KB (7,440 bytes)2/10/2003 11:57:51 AM
Microsoft Corporation              c:\winnt\system32\inetsrv\iisfecnv.dll
isatq.dll     5.00.0984  60.27 KB (61,712 bytes)          2/10/2003 5:31:05 PM
Microsoft Corporation              c:\winnt\system32\inetsrv\isatq.dll
infocomm.dll            5.00.0984  238.27 KB (243,984 bytes)          2/10/2003
5:31:05 PM              Microsoft Corporation
c:\winnt\system32\inetsrv\infocomm.dll
w3svc.dll   5.00.0984  343.27 KB (351,504 bytes)          2/10/2003 5:31:06 PM
Microsoft Corporation              c:\winnt\system32\inetsrv\w3svc.dll
security.dll5.00.2154.1              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)          2/10/2003 5:31:06 PM
Microsoft Corporation              c:\winnt\system32\inetsrv\svcext.dll
admexs.dll 5.00.0984  27.77 KB (28,432 bytes)          2/10/2003 5:31:04 PM
Microsoft Corporation              c:\winnt\system32\inetsrv\admexs.dll
wamreg.dll5.00.0984  45.77 KB (46,864 bytes)          2/10/2003 5:31:06 PM
Microsoft Corporation              c:\winnt\system32\inetsrv\wamreg.dll
metadata.dll            5.00.0984  68.77 KB (70,416 bytes)          2/10/2003
5:31:05 PM              Microsoft Corporation
c:\winnt\system32\inetsrv\metadata.dll
iismap.dll  5.00.0984  55.77 KB (57,104 bytes)          2/10/2003 5:29:56 PM
Microsoft Corporation              c:\winnt\system32\iismap.dll
nsepm.dll  5.00.0984  43.27 KB (44,304 bytes)          2/10/2003 5:31:05 PM
Microsoft Corporation              c:\winnt\system32\inetsrv\nsepm.dll
coadmin.dll             5.00.0984  39.27 KB (40,208 bytes)          2/10/2003
5:31:04 PM              Microsoft Corporation
c:\winnt\system32\inetsrv\coadmin.dll
iisadmin.dll            5.00.0984  15.27 KB (15,632 bytes)          2/10/2003
5:31:05 PM              Microsoft Corporation
c:\winnt\system32\inetsrv\iisadmin.dll
rpcref.dll   5.00.0984  4.27 KB (4,368 bytes)2/10/2003 5:31:06 PM
Microsoft Corporation              c:\winnt\system32\inetsrv\rpcref.dll
iisrtl.dll    5.00.0984  119.77 KB (122,640 bytes)          2/10/2003 5:29:56 PM
Microsoft Corporation              c:\winnt\system32\iisrtl.dll
inetinfo.exe            5.00.0984  14.27 KB (14,608 bytes)          2/10/2003
5:31:05 PM              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)          2/10/2003
5:30:08 PM              Microsoft Corporation
c:\winnt\system32\ntmarta.dll
provthrd.dll            1.50.1085.0000          68.07 KB (69,708 bytes)
2/10/2003 5:01:22 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)
2/10/2003 5:30:21 PM              Microsoft Corporation
c:\winnt\system32\wbem\cimwin32.dll
wbemsvc.dll             1.50.1085.0007          40.07 KB (41,036 bytes)
2/10/2003 5:30:22 PM              Microsoft Corporation
c:\winnt\system32\wbem\wbemsvc.dll
wbemess.dll             1.50.1085.0039          364.07 KB (372,804 bytes)
2/10/2003 5:30:22 PM              Microsoft Corporation
c:\winnt\system32\wbem\wbemess.dll
fastprox.dll            1.50.1085.0037          144.08 KB (147,536 bytes)
2/10/2003 5:30:21 PM              Microsoft Corporation
c:\winnt\system32\wbem\fastprox.dll
wbemcore.dll            1.50.1085.0036          628.07 KB (643,140 bytes)
2/10/2003 5:30:22 PM              Microsoft Corporation
c:\winnt\system32\wbem\wbemcore.dll
wbemcomn.dll            1.50.1085.0021          692.07 KB (708,675 bytes)
2/10/2003 5:30:21 PM              Microsoft Corporation
c:\winnt\system32\wbem\wbemcomn.dll
winmgmt.exe             1.50.1085.0029          192.08 KB (196,685 bytes)
2/10/2003 5:30:22 PM              Microsoft Corporation
c:\winnt\system32\wbem\winmgmt.exe
simptcp.dll5.00.2134.1              19.27 KB (19,728 bytes)          2/10/2003
11:57:19 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.exe4.71.2195.1              115.27 KB (118,032 bytes)          2/10/2003
5:30:05 PM              Microsoft Corporation
c:\winnt\system32\mstask.exe
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
regsvc.exe 5.00.2195.2104          65.27 KB (66,832 bytes)          2/10/2003
5:30:11 PM              Microsoft Corporation
c:\winnt\system32\regsvc.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
```

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llssrv.exe   5.00.2195.2649          114.27 KB (117,008 bytes)          5/4/2001
1:05:02 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)          2/10/2003
5:30:06 PM               Microsoft Corporation
c:\winnt\system32\netcfgx.dll
rasmans.dll              5.00.2195.2728          147.27 KB (150,800 bytes)
2/10/2003 5:30:11 PM                Microsoft Corporation
c:\winnt\system32\rasmans.dll
netshell.dll 5.00.2195.2779          457.27 KB (468,240 bytes)          2/10/2003
5:30:07 PM               Microsoft Corporation
c:\winnt\system32\netshell.dll
netman.dll 5.00.2195.2779            89.27 KB (91,408 bytes)            2/10/2003
5:30:06 PM               Microsoft Corporation
c:\winnt\system32\netman.dll
ntmsdba.dll              5.00.2195.2779          167.27 KB (171,280 bytes)
2/10/2003 5:30:08 PM                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)            2/10/2003
5:29:55 PM               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)          2/10/2003 5:29:54 PM
Microsoft Corporation               c:\winnt\system32\expsrv.dll
vbajet32.dll             6.1.8268    30.27 KB (30,992 bytes)            2/10/2003
5:30:16 PM               Microsoft Corporation
c:\winnt\system32\vbajet32.dll
msjtes40.dll             4.00.4229.0             236.27 KB (241,936 bytes)
2/10/2003 5:30:04 PM                Microsoft Corporation
c:\winnt\system32\msjtes40.dll
oledb32r.dll             2.70.9001.0 built by: Lab06_N(dagbuild)      64.00 KB
(65,536 bytes)           2/10/2003 5:55:10 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  2.71.9031.4 built by: Lab06_N(dagbuild)      124.00 KB (126,976
bytes)      9/27/2002 12:22:40 PM               Microsoft Corporation
c:\winnt\system32\msdart.dll
oledb32.dll              2.71.9031.4 built by: Lab06_N(dagbuild)      408.00 KB
(417,792 bytes)          9/27/2002 12:22:42 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)
2/10/2003 5:30:03 PM                Microsoft Corporation
c:\winnt\system32\msjint40.dll
msjter40.dll             4.00.2927.2             52.27 KB (53,520 bytes)
2/10/2003 5:30:04 PM                Microsoft Corporation
c:\winnt\system32\msjter40.dll
mswstr10.dll             4.00.3829.2             600.27 KB (614,672 bytes)
2/10/2003 5:30:05 PM                Microsoft Corporation
c:\winnt\system32\mswstr10.dll
msjet40.dll4.00.4431.3               1.43 MB (1,503,504 bytes)          2/10/2003
5:30:03 PM               Microsoft Corporation
c:\winnt\system32\msjet40.dll
msjetoledb40.dll         4.00.4331.4             340.27 KB (348,432 bytes)
2/10/2003 5:30:03 PM                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)
2/10/2003 5:30:08 PM                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)            2/10/2003
5:29:55 PM               Microsoft Corporation
c:\winnt\system32\iassvcs.dll
iassdo.dll   5.00.2195.2104          261.77 KB (268,048 bytes)          2/10/2003
5:29:55 PM               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)          2/10/2003
5:29:54 PM               Microsoft Corporation
c:\winnt\system32\es.dll
mtxoci.dll  2000.2.3471.1            101.77 KB (104,208 bytes)          2/10/2003
5:30:06 PM               Microsoft Corporation
c:\winnt\system32\mtxoci.dll
resutils.dll 5.00.2195.2787          39.77 KB (40,720 bytes)            2/10/2003
5:30:11 PM               Microsoft Corporation
c:\winnt\system32\resutils.dll
clusapi.dll  5.00.2195.2104          54.27 KB (55,568 bytes)            2/10/2003
5:29:50 PM               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)            2/10/2003
11:57:24 AM              Microsoft Corporation
c:\winnt\system32\xolehlp.dll
msdtclog.dll             1999.9.3421.3           89.77 KB (91,920 bytes)
2/10/2003 11:57:24 AM               Microsoft Corporation
c:\winnt\system32\msdtclog.dll
mtxclu.dll  2000.2.3471.1            51.27 KB (52,496 bytes)            2/10/2003
5:30:06 PM               Microsoft Corporation
c:\winnt\system32\mtxclu.dll
msdtcprx.dll             2000.2.3471.1           665.77 KB (681,744 bytes)
2/10/2003 5:30:00 PM                Microsoft Corporation
c:\winnt\system32\msdtcprx.dll
txfaux.dll  2000.2.3471.1            374.27 KB (383,248 bytes)          2/10/2003
5:30:15 PM               Microsoft Corporation
c:\winnt\system32\txfaux.dll
msdtctm.dll              2000.2.3471.1           1.07 MB (1,120,528 bytes)
2/10/2003 5:30:00 PM                Microsoft Corporation
c:\winnt\system32\msdtctm.dll
msdtc.exe  1999.9.3421.3             6.77 KB (6,928 bytes) 2/10/2003 11:57:24
AM          Microsoft Corporation               c:\winnt\system32\msdtc.exe
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
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admwprox.dll        5.00.0984  31.77 KB (32,528 bytes)          2/10/2003
11:57:52 AM         Microsoft Corporation
c:\winnt\system32\admwprox.dll
inetpp.dll  5.00.2195.2842        65.27 KB (66,832 bytes)          2/10/2003
5:29:56 PM          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.dll5.00.2195.2780        11.27 KB (11,536 bytes)          2/10/2003
5:30:15 PM          Microsoft Corporation
c:\winnt\system32\usbmon.dll
tcpmon.dll 5.00.2195.2780        40.77 KB (41,744 bytes)          2/10/2003
5:30:15 PM          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.dll5.00.2195.2793        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)          2/10/2003
11:47:14 AM         Microsoft Corporation
c:\winnt\system32\spoolss.dll
spoolsv.exe         5.00.2161.1           43.77 KB (44,816 bytes)
2/10/2003 11:47:14 AM         Microsoft Corporation
c:\winnt\system32\spoolsv.exe
rpcss.dll   5.00.2195.2815        231.27 KB (236,816 bytes)        2/10/2003
5:30:12 PM          Microsoft Corporation
c:\winnt\system32\rpcss.dll
svchost.exe         5.00.2134.1           7.77 KB (7,952 bytes)12/7/1999
7:00:00 AM          Microsoft Corporation
c:\winnt\system32\svchost.exe
dssenh.dll  5.00.2195.2228        142.77 KB (146,192 bytes)        2/10/2003
5:31:00 PM          Microsoft Corporation
c:\winnt\system32\dssenh.dll
oakley.dll  5.00.2195.2785        378.77 KB (387,856 bytes)        2/10/2003
5:30:08 PM          Microsoft Corporation
c:\winnt\system32\oakley.dll
mfc42u.dll 6.00.8665.0            972.05 KB (995,384 bytes)        12/7/1999
7:00:00 AM          Microsoft Corporation
c:\winnt\system32\mfc42u.dll
polagent.dll        5.00.2183.1           108.27 KB (110,864 bytes)
12/7/1999 7:00:00 AM          Microsoft Corporation
c:\winnt\system32\polagent.dll
scecli.dll  5.00.2195.2780        105.27 KB (107,792 bytes)        2/10/2003
5:30:12 PM          Microsoft Corporation
c:\winnt\system32\scecli.dll
atl.dll     3.00.8449  57.56 KB (58,938 bytes)          12/7/1999 7:00:00 AM
Microsoft Corporation         c:\winnt\system32\atl.dll
certcli.dll  5.00.2195.2778       130.77 KB (133,904 bytes)        2/10/2003
5:29:50 PM          Microsoft Corporation
c:\winnt\system32\certcli.dll
esent.dll   6.0.3940.13           1.08 MB (1,135,376 bytes)        2/10/2003
5:29:54 PM          Microsoft Corporation
c:\winnt\system32\esent.dll
ntdsatq.dll 5.00.2195.2878        31.27 KB (32,016 bytes)          2/10/2003
5:30:07 PM          Microsoft Corporation
c:\winnt\system32\ntdsatq.dll
ntdsa.dll   5.00.2195.2899        990.77 KB (1,014,544 bytes)      2/10/2003
5:30:07 PM          Microsoft Corporation
c:\winnt\system32\ntdsa.dll
kdcsvc.dll  5.00.2195.2878        137.77 KB (141,072 bytes)        2/10/2003
5:29:58 PM          Microsoft Corporation
c:\winnt\system32\kdcsvc.dll
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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)          2/10/2003
5:30:11 PM          Microsoft Corporation
c:\winnt\system32\rassfm.dll
mpr.dll     5.00.2195.2779        53.27 KB (54,544 bytes)          2/10/2003
5:29:59 PM          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)
2/10/2003 5:30:06 PM          Microsoft Corporation
c:\winnt\system32\netlogon.dll
kerberos.dll        5.00.2195.2913        198.77 KB (203,536 bytes)
2/10/2003 5:29:58 PM          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)
2/10/2003 5:30:17 PM          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)          2/10/2003
5:30:11 PM          Microsoft Corporation
c:\winnt\system32\rnr20.dll
wshtcpip.dll        5.00.2195.2104        17.27 KB (17,680 bytes)
2/10/2003 5:30:17 PM          Microsoft Corporation
c:\winnt\system32\wshtcpip.dll
msafd.dll   5.00.2195.2779        106.77 KB (109,328 bytes)        2/10/2003
5:29:59 PM          Microsoft Corporation
c:\winnt\system32\msafd.dll
mswsock.dll         5.00.2195.2871        62.77 KB (64,272 bytes)
2/10/2003 5:30:05 PM          Microsoft Corporation
c:\winnt\system32\mswsock.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
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)
2/10/2003 5:29:48 PM          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)       2/10/2003
5:30:10 PM              Microsoft Corporation
c:\winnt\system32\psbase.dll
cryptsvc.dll            5.00.2181.1             61.77 KB (63,248 bytes)
12/7/1999 7:00:00 AM            Microsoft Corporation
c:\winnt\system32\cryptsvc.dll
cryptdll.dll5.00.2135.1         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)
2/10/2003 5:29:52 PM            VERITAS Software Corp.
c:\winnt\system32\dmserver.dll
winsta.dll  5.00.2195.2386      36.77 KB (37,648 bytes)         2/10/2003
5:30:17 PM              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)
2/10/2003 5:29:53 PM            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)       2/10/2003
5:29:47 PM              Microsoft Corporation
c:\winnt\system32\adsldpc.dll
activeds.dll            5.00.2195.2778          174.77 KB (178,960 bytes)
2/10/2003 5:29:41 PM            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)         2/10/2003
5:30:07 PM              Microsoft Corporation
c:\winnt\system32\ntdsapi.dll
```

```
scesrv.dll  5.00.2195.2780      226.27 KB (231,696 bytes)       2/10/2003
5:30:12 PM              Microsoft Corporation
c:\winnt\system32\scesrv.dll
umpnpmgr.dll            5.00.2182.1             86.27 KB (88,336 bytes)
12/7/1999 7:00:00 AM            Microsoft Corporation
c:\winnt\system32\umpnpmgr.dll
services.exe            5.00.2195.2780          86.77 KB (88,848 bytes)
12/7/1999 7:00:00 AM            Microsoft Corporation
c:\winnt\system32\services.exe
msv1_0.dll5.00.2195.2900        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)       2/10/2003
5:29:50 PM              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)       2/10/2003
5:29:51 PM              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)
2/10/2003 5:30:17 PM            Microsoft Corporation
c:\winnt\system32\wlnotify.dll
cscdll.dll   5.00.2195.2401     98.27 KB (100,624 bytes)        2/10/2003
5:29:51 PM              Microsoft Corporation
c:\winnt\system32\cscdll.dll
lz32.dll     5.00.2134.1        9.77 KB (10,000 bytes)          12/7/1999
7:00:00 AM              Microsoft Corporation
c:\winnt\system32\lz32.dll
version.dll 5.00.2134.1         15.77 KB (16,144 bytes)         12/7/1999
7:00:00 AM              Microsoft Corporation
c:\winnt\system32\version.dll
rsaenh.dll  5.00.2195.2228      130.77 KB (133,904 bytes)       2/10/2003
5:31:00 PM              Microsoft Corporation
c:\winnt\system32\rsaenh.dll
mscat32.dll             5.131.2134.1            7.77 KB (7,952 bytes) 12/7/1999
7:00:00 AM              Microsoft Corporation
c:\winnt\system32\mscat32.dll
ole32.dll   5.00.2195.2887      969.77 KB (993,040 bytes)       2/10/2003
5:30:09 PM              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)       2/10/2003
5:29:51 PM              Microsoft Corporation
c:\winnt\system32\crypt32.dll
wintrust.dll            5.131.2195.2779         162.27 KB (166,160 bytes)
2/10/2003 5:30:17 PM            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.dll5.00.3315.1000       282.77 KB (289,552 bytes)       2/10/2003
5:30:13 PM          Microsoft Corporation
c:\winnt\system32\shlwapi.dll
shell32.dll 5.00.3315.2902      2.25 MB (2,359,056 bytes)       2/10/2003
5:30:13 PM          Microsoft Corporation
c:\winnt\system32\shell32.dll
msgina.dll 5.00.2195.2779       324.27 KB (332,048 bytes)       12/7/1999
7:00:00 AM          Microsoft Corporation
c:\winnt\system32\msgina.dll
wsock32.dll         5.00.2195.2871          21.27 KB (21,776 bytes)
2/10/2003 5:30:17 PM            Microsoft Corporation
c:\winnt\system32\wsock32.dll
dnsapi.dll  5.00.2195.2785      130.77 KB (133,904 bytes)       2/10/2003
5:29:53 PM          Microsoft Corporation
c:\winnt\system32\dnsapi.dll
wldap32.dll         5.00.2195.2797          125.27 KB (128,272 bytes)
2/10/2003 5:30:17 PM            Microsoft Corporation
c:\winnt\system32\wldap32.dll
ws2help.dll         5.00.2134.1             17.77 KB (18,192 bytes)
12/7/1999 7:00:00 AM            Microsoft Corporation
c:\winnt\system32\ws2help.dll
ws2_32.dll5.00.2195.2780        67.77 KB (69,392 bytes)         2/10/2003
5:30:17 PM          Microsoft Corporation
c:\winnt\system32\ws2_32.dll
samlib.dll  5.00.2195.2780      49.77 KB (50,960 bytes)         12/7/1999
7:00:00 AM          Microsoft Corporation
c:\winnt\system32\samlib.dll
netrap.dll  5.00.2134.1         11.27 KB (11,536 bytes)         12/7/1999
7:00:00 AM          Microsoft Corporation
c:\winnt\system32\netrap.dll
netapi32.dll        5.00.2195.2808          303.77 KB (311,056 bytes)
2/10/2003 5:30:06 PM            Microsoft Corporation
c:\winnt\system32\netapi32.dll
profmap.dll         5.00.2181.1             29.27 KB (29,968 bytes)
12/7/1999 7:00:00 AM            Microsoft Corporation
c:\winnt\system32\profmap.dll
secur32.dll5.00.2195.2862       46.77 KB (47,888 bytes)         2/10/2003
5:30:12 PM          Microsoft Corporation
c:\winnt\system32\secur32.dll
sfc.dll     5.00.2195.2896      92.11 KB (94,320 bytes)         2/10/2003
5:30:12 PM          Microsoft Corporation
c:\winnt\system32\sfc.dll
nddeapi.dll5.00.2137.1          15.27 KB (15,632 bytes)         12/7/1999
7:00:00 AM          Microsoft Corporation
c:\winnt\system32\nddeapi.dll
userenv.dll5.00.2195.2780       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)       2/10/2003
5:30:11 PM          Microsoft Corporation
c:\winnt\system32\rpcrt4.dll
advapi32.dll        5.00.2195.2867          351.77 KB (360,208 bytes)
12/7/1999 7:00:00 AM            Microsoft Corporation
c:\winnt\system32\advapi32.dll
kernel32.dll        5.00.2195.2778          714.77 KB (731,920 bytes)
12/7/1999 7:00:00 AM            Microsoft Corporation
c:\winnt\system32\kernel32.dll
```

```
msvcrt.dll  6.10.8924.0         284.05 KB (290,869 bytes)       5/4/2001
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)       2/10/2003
5:30:12 PM          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 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
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 Command Service          RMSYS      Running    Auto         Own
Process     c:\program files\benchcraft\rsys.exe             Normal
.\Administrator        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
Benchcraft CLIENT10\Administrator:Benchcraft
CLIENT10\Administrator
Startup      CLIENT10\Administrator:Startup
CLIENT10\Administrator

[Startup Programs]

Program    Command User NameLocation
No startup program information

[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 51876-270-8956491-05798
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 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
advpack.dll            5.0.3103.1000           87 KB       5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
browselc.dll           5.0.3315.2846           35 KB       5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
browseui.dll           5.0.3315.2846           789 KB      5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
ckcnv.exe  5.0.2189.1 9 KB         12/7/1999 8:00:00 AM
C:\WINNT\system32  Microsoft Corporation
comctl32.dll           5.81.3103.1000          538 KB      5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
crypt32.dll 5.131.2195.2833        451 KB      5/4/2001 1:05:02 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 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
iexplore.exe           5.0.2920.0 59 KB        12/7/1999 8:00:00 AM
C:\Program Files\Internet Explorer             Microsoft Corporation
imagehlp.dll           5.0.2195.2778           126 KB      5/4/2001 1:05:02 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 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
jobexec.dll 5.0.0.1    47 KB       12/7/1999 8:00:00 AM
C:\WINNT\system32  Microsoft Corporation
jscript.dll   5.1.0.5907 476 KB      5/4/2001 1:05:02 PM  C:\WINNT\system32
Microsoft Corporation
jsproxy.dll 5.0.2920.0 13 KB       12/7/1999 8:00:00 AM
C:\WINNT\system32  Microsoft Corporation
msaahtml.dll           <File Missing>          Not Available            Not
Available  Not Available           Not Available
mshtml.dll 5.0.3315.2870           2290 KB   5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
msjava.dll  5.0.3802.0 923 KB      5/4/2001 1:05:02 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 1:05:02 PM  C:\WINNT\system32
Microsoft Corporation
occache.dll            5.0.3103.1000           86 KB       5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
ole32.dll    5.0.2195.2887         970 KB      5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
oleaut32.dll           2.40.4517.0             612 KB      5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
olepro32.dll           5.0.4517.0 160 KB       5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
rsabase.dll 5.0.2195.2228          128 KB      5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
rsaenh.dll  5.0.2195.2228          131 KB      5/4/2001 1:05:02 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 1:05:02 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 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
shell32.dll 5.0.3315.2902          2304 KB   5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
shlwapi.dll 5.0.3315.1000          283 KB      5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
url.dll        5.0.2920.0 82 KB       12/7/1999 8:00:00 AM
C:\WINNT\system32  Microsoft Corporation
urlmon.dll 5.0.3315.1000           441 KB      5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
vbscript.dll           5.1.0.5907 428 KB       5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
webcheck.dll           5.0.3315.1000           252 KB      5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
win.com    5.0.2134.1 24 KB        12/7/1999 8:00:00 AM
C:\WINNT\system32  Microsoft Corporation
wininet.dll 5.0.3315.1000          457 KB      5/4/2001 1:05:02 PM
C:\WINNT\system32  Microsoft Corporation
```

```
winsock.dll         3.10.0.103 3 KB     12/7/1999 8:00:00 AM
C:\WINNT\system32   Microsoft Corporation
wintrust.dll        5.131.2195.2779     162 KB    5/4/2001 1:05:02 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 1:05:02 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        17351 MB
Available Disk Space    13323 MB
Maximum Cache Size 542 MB
Available Cache Size    542 MB

[List of Objects]

Program File            Status      CodeBase
No cached object information available

[Content]

[ Following are sub-categories of this main category ]

[Summary]

Item        Value
Content Advisor         Disabled

[Personal Certificates]

Issued To   Issued By   Validity    Signature Algorithm
Administrator           Administrator           2/10/2003 to 1/17/2103
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
```

RTE Input Parameters

```
Profile:    1530wh_15rte
File Path:  C:\Program Files\BenchCraft\1530wh_15rte.pro
Version:    3

            Number of Engines: 15

                        Name: rte111
                        Description: rte111
                        Directory: c:\rtelogs\rte111.log
                        Machine: rtes2
                        Parameter Set: PARAM2
                        Index: 0
                        Seed: 25744
                        Configured Users: 1020
                        Pipe Name: DRIVER11571562
                        Connect Rate: 400
                        Start Rate: 0
                        Max. Concurrency: -1
                        Concurrency Rate: 10
                        CLIENT_NURAND: 233
                        CPU: 0

                        Name: rte112
                        Description: rte112
                        Directory: c:\rtelogs\rte112.log
                        Machine: rtes2
                        Parameter Set: PARAM2
                        Index: 3000000
                        Seed: 25744
                        Configured Users: 1020
                        Pipe Name: DRIVER25384421
                        Connect Rate: 400
                        Start Rate: 0
                        Max. Concurrency: -1
                        Concurrency Rate: 10
                        CLIENT_NURAND: 233
                        CPU: 1

                        Name: rte113
                        Description: rte113
                        Directory: c:\rtelogs\rte113.log
                        Machine: rtes2
                        Parameter Set: PARAM2
                        Index: 6000000
                        Seed: 25744
                        Configured Users: 1020
                        Pipe Name: DRIVER35434750
                        Connect Rate: 400
                        Start Rate: 0
                        Max. Concurrency: -1
                        Concurrency Rate: 10
                        CLIENT_NURAND: 233
                        CPU: 2
```

```
Name: rte114
Description: rte114
Directory: c:\rtelogs\rte114.log
Machine: rtes2
Parameter Set: PARAM2
Index: 9000000
Seed: 25744
Configured Users: 1020
Pipe Name: DRIVER45470859
Connect Rate: 400
Start Rate: 0
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 3

Name: rte121
Description: rte121
Directory: c:\rtelogs\rte121.log
Machine: rtes2
Parameter Set: PARAM2
Index: 15000000
Seed: 25744
Configured Users: 1020
Pipe Name: DRIVER55546265
Connect Rate: 400
Start Rate: 0
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 0

Name: rte122
Description: rte122
Directory: c:\rtelogs\rte122.log
Machine: rtes2
Parameter Set: PARAM2
Index: 18000000
Seed: 25744
Configured Users: 1020
Pipe Name: DRIVER65583640
Connect Rate: 400
Start Rate: 0
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 1

Name: rte123
Description: rte123
Directory: c:\rtelogs\rte123.log
Machine: rtes2
Parameter Set: PARAM2
Index: 21000000
Seed: 25744
Configured Users: 1020
Pipe Name: DRIVER75623609
Connect Rate: 400
Start Rate: 0
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 2

Name: rte124
Description: rte124
Directory: c:\rtelogs\rte124.log
Machine: rtes2
Parameter Set: PARAM2
Index: 24000000
Seed: 25744
Configured Users: 1020
Pipe Name: DRIVER85670968
Connect Rate: 400
Start Rate: 0
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 3

Name: rte132
Description: rte132
Directory: c:\rtelogs\rte132.log
Machine: frte90
Parameter Set: PARAM2
Index: 27000000
Seed: 25744
Configured Users: 1020
Pipe Name: DRIVER95713843
Connect Rate: 400
Start Rate: 0
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 0

Name: rte133
Description: rte133
Directory: c:\rtelogs\rte133.log
Machine: frte90
Parameter Set: PARAM2
Index: 30000000
Seed: 25744
Configured Users: 1020
Pipe Name: DRIVER105754984
Connect Rate: 400
Start Rate: 0
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 1

Name: rte134
Description: rte134
Directory: c:\rtelogs\rte134.log
Machine: frte90
Parameter Set: PARAM2
Index: 33000000
Seed: 25744
Configured Users: 1020
Pipe Name: DRIVER115821125
Connect Rate: 400
Start Rate: 0
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 0

Name: rte135
Description: rte135
Directory: c:\rtelogs\rte135.log
Machine: frte90
Parameter Set: PARAM2
Index: 72000000
Seed: 25744
```

```
        Configured Users: 1020
        Pipe Name: DRIVER2568868468
        Connect Rate: 400
        Start Rate: 0
        Max. Concurrency: -1
        Concurrency Rate: 10
        CLIENT_NURAND: 233
        CPU: 1

        Name: rte141
        Description: rte141
        Directory: c:\rtelogs\rte141.log
        Machine: frte90
        Parameter Set: PARAM2
        Index: 75000000
        Seed: 25744
        Configured Users: 1020
        Pipe Name: DRIVER2668925937
        Connect Rate: 400
        Start Rate: 0
        Max. Concurrency: -1
        Concurrency Rate: 10
        CLIENT_NURAND: 233
        CPU: 1

        Name: rte142
        Description: rte142
        Directory: c:\rtelogs\rte142.log
        Machine: frte90
        Parameter Set: PARAM2
        Index: 78000000
        Seed: 25744
        Configured Users: 1020
        Pipe Name: DRIVER2768987671
        Connect Rate: 400
        Start Rate: 0
        Max. Concurrency: -1
        Concurrency Rate: 10
        CLIENT_NURAND: 233
        CPU: 0

        Name: rte143
        Description: rte143
        Directory: c:\rtelogs\rte143.log
        Machine: frte90
        Parameter Set: PARAM2
        Index: 81000000
        Seed: 25744
        Configured Users: 1020
        Pipe Name: DRIVER2869074843
        Connect Rate: 400
        Start Rate: 0
        Max. Concurrency: -1
        Concurrency Rate: 10
        CLIENT_NURAND: 233
        CPU: 1

Number of User groups: 15

        Driver Engine: rte111
        IIS Server: client11
        SQL Server: ibmserver3
        Database: tpcc
        User: sa
        Protocol: HTML
        w_id Range: 1 - 102
        w_id Min Warehouse: 1
        w_id Max Warehouse: 1530
        Scale: Normal
        User Count: 1020
        District id: 1
        Scale Down: No

        Driver Engine: rte112
        IIS Server: client11
        SQL Server: ibmserver3
        Database: tpcc
        User: sa
        Protocol: HTML
        w_id Range: 103 - 204
        w_id Min Warehouse: 1
        w_id Max Warehouse: 1530
        Scale: Normal
        User Count: 1020
        District id: 1
        Scale Down: No

        Driver Engine: rte113
        IIS Server: client11
        SQL Server: ibmserver3
        Database: tpcc
        User: sa
        Protocol: HTML
        w_id Range: 205 - 306
        w_id Min Warehouse: 1
        w_id Max Warehouse: 1530
        Scale: Normal
        User Count: 1020
        District id: 1
        Scale Down: No

        Driver Engine: rte114
        IIS Server: client11
        SQL Server: ibmserver3
        Database: tpcc
        User: sa
        Protocol: HTML
        w_id Range: 307 - 408
        w_id Min Warehouse: 1
        w_id Max Warehouse: 1530
        Scale: Normal
        User Count: 1020
        District id: 1
        Scale Down: No

        Driver Engine: rte121
        IIS Server: client12
        SQL Server: ibmserver3
        Database: tpcc
        User: sa
        Protocol: HTML
        w_id Range: 409 - 510
        w_id Min Warehouse: 1
        w_id Max Warehouse: 1530
        Scale: Normal
        User Count: 1020
        District id: 1
        Scale Down: No

        Driver Engine: rte122
        IIS Server: client12
        SQL Server: ibmserver3
        Database: tpcc
        User: sa
        Protocol: HTML
        w_id Range: 511 - 612
```

w_id Min Warehouse: 1
w_id Max Warehouse: 1530
Scale: Normal
User Count: 1020
District id: 1
Scale Down: No

Driver Engine: rte123
IIS Server: client12
SQL Server: ibmserver3
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 613 - 714
w_id Min Warehouse: 1
w_id Max Warehouse: 1530
Scale: Normal
User Count: 1020
District id: 1
Scale Down: No

Driver Engine: rte124
IIS Server: client12
SQL Server: ibmserver3
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 715 - 816
w_id Min Warehouse: 1
w_id Max Warehouse: 1530
Scale: Normal
User Count: 1020
District id: 1
Scale Down: No

Driver Engine: rte132
IIS Server: client13
SQL Server: ibmserver3
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 817 - 918
w_id Min Warehouse: 1
w_id Max Warehouse: 1530
Scale: Normal
User Count: 1020
District id: 1
Scale Down: No

Driver Engine: rte133
IIS Server: client13
SQL Server: ibmserver3
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 919 - 1020
w_id Min Warehouse: 1
w_id Max Warehouse: 1530
Scale: Normal
User Count: 1020
District id: 1
Scale Down: No

Driver Engine: rte134
IIS Server: client13
SQL Server: ibmserver3
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1021 - 1122
w_id Min Warehouse: 1
w_id Max Warehouse: 1530
Scale: Normal
User Count: 1020
District id: 1
Scale Down: No

Driver Engine: rte135
IIS Server: client13
SQL Server: ibmserver3
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1123 - 1224
w_id Min Warehouse: 1
w_id Max Warehouse: 1530
Scale: Normal
User Count: 1020
District id: 1
Scale Down: No

Driver Engine: rte141
IIS Server: client14
SQL Server: ibmserver3
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1225 - 1326
w_id Min Warehouse: 1
w_id Max Warehouse: 1530
Scale: Normal
User Count: 1020
District id: 1
Scale Down: No

Driver Engine: rte142
IIS Server: client14
SQL Server: ibmserver3
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1327 - 1428
w_id Min Warehouse: 1
w_id Max Warehouse: 1530
Scale: Normal
User Count: 1020
District id: 1
Scale Down: No

Driver Engine: rte143
IIS Server: client14
SQL Server: ibmserver3
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1429 - 1530
w_id Min Warehouse: 1
w_id Max Warehouse: 1530
Scale: Normal
User Count: 1020
District id: 1
Scale Down: No

Number of Parameter Sets: 2

```
                ~Default
                Default Parameter Set
                        Txn    Think  Key    RT     RT     Menu
                        Weight  Time   Time   Delay  Fence  Delay
                New Order       10.00  12.05        18.01        0.10
5.00       0.10
                Payment         10.00  12.05         3.01        0.10
5.00       0.10
                Delivery         1.00   5.05         2.01        0.10
5.00       0.10
                Stock Level      1.00   5.05         2.01        0.10
20.00      0.10
                Order Status     1.00  10.05         2.01        0.10
5.00       0.10

                PARAM2
                Performance parameters
                        Txn    Think  Key    RT     RT     Menu
                        Weight  Time   Time   Delay  Fence  Delay
                New Order       10.00  12.05        18.01        0.10
5.00       0.10
                Payment          9.61  12.05         3.01        0.10
5.00       0.10
                Delivery         0.90   5.05         2.01        0.10
5.00       0.10
                Stock Level      0.90   5.05         2.01        0.10
20.00      0.10
                Order Status     0.90  10.05         2.01        0.10
5.00       0.10
```

Appendix D: 60-Day Space

TPC-C 60-Day Space Requirements						
Warehouses	**1,530**				**tpmC**	**18,936.05**
Table	**Rows**	**Data KB**	**Index KB**	**Extra 5% KB**	**8HR Space**	**Total Space KB**
Warehouse	1,530	168	32	10.00		210.00
District	15,300	1,704	32	86.80		1,822.80
Item	100,000	9,528	48	478.80		10,054.80
New-Order	13,770,000	217,712	512		122,400.00	340,624.00
History	45,900,000	2,550,008	24		504,967.67	3,054,999.67
Orders	45,900,000	1,406,904	639,784		405,293.45	2,451,981.45
Customer	45,900,000	33,381,824	1,990,552	1,768,618.80		37,140,994.80
Order-Line	459,001,971	28,687,624	60,736		5,692,866.74	34,441,226.74
Stock	153,000,000	48,960,000	91,480	2,452,574.00		51,504,054.00
Totals		115,215,472	2,783,200	4,221,768.40	6,725,527.87	128,945,968.27
Segment	**LogDev Cnt.**	**Segment Size**	**Needed**	**Overhead**		**Not Needed**
misc	3	43,008,000	40,300,919	403,009		2,304,071.34
big	3	89,702,400	88,645,049	886,450		170,900.71
master, msdb,model	1	13,312	13,312			-
tpcc_root	1	8,192	8,192			-
tempdb	1	8,704	8,704			-
Totals		132,740,608.00	128,976,176.27	1,289,459.68		2,474,972.05
Dynamic Space	32,644,536.00	Sum of Data for Order, Order-Line and History				
Static Space	90,865,364.08	Data + Index + 5% Space + Overhead - Dynamic Space				
Free Space	6,755,735.87	Total Segment Size - Dynamic Space - Static Space - Not needed				
Daily Growth	6,464,403.30	(Dynamic Space/W * 62.5)* tpmC				
Daily Spread	(2,940,869.09)	Free Space - 1.5 * Daily Growth (Zero If Negative)				
60-Day Space (KB)	478,729,562.31	Static Space + 60 (Daily Growth + Daily Spread)				
60-Day Space (GB)	456.55	60-Day Space in GB (Excludes OS,Paging and RDBMS Logs)				
Available (GB)	711.06	Total storage configured and available for database, minus logs, in RAID-0 configuration.				
Log File Storage Requirement						
Log Size (MB)	45,000.00	Total Size of Log File				
% Log Used	28.2074	% of Log File Used During Entire Run				
Total N-O Txn	2,810,186.00	Total Count of New-Order Transactions during Entire Run				
Log / N-O Txn	4.63	KB of Log per New-Order Transaction				
8 Hour Log (GB)	40.09	8 Hours of Log in GB (Excluding Space for Redundancy)				
Log Configured (GB)	67.72					
Disk Capacity	MB	GB				
18.2GB 10K RPM	17,736	16.93				
73.4GB 10K RPM	70,944	67.72				
Space Usage	GB Needed		Disks Priced	Disk Size	GB Priced	GB Usable
60-Day (RAID-0)	456.55		42	18.2GB	711.06	711.06
					Total DB	711.06
8hr Log (RAID-1)	40.09		2	73.4GB	135.44	67.72
					Total Log	67.72
OS, SQL Server	4.00		1	18.2GB	16.93	16.93
Total Space	500.65		45		863.43	795.71

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

July 9, 2003

IBM Corporation
Chris King
3039 Cornwallis Road
Research Triangle Park,
NC 27709

Ms. King:

Here is the information you requested regarding pricing for several Microsoft products to be used in conjunction with your TPC-C benchmark testing.

All pricing shown is in US Dollars ($).

Part Number	Description	Unit Price	Quantity	Price
228-01079	**SQL Server 2000 Standard Edition** *Per processor licensing* *No discounts applied*	$4,999	1	$4,999
C11-00821	**Windows 2000 Server** *Server license only - No CALs* *Discount Schedule: Open Program - No Level* *Unit Price reflects a 8% discount from the retail unit price of $799.*	$738	1	$738
P73-00295	**Windows Server 2003, Standard Server** *Server license only - No CALs* *Discount Schedule: Open Program - No Level* *Unit Price reflects a 26% discount from the retail unit price of $999.*	$738	1	$738
254-00170	**Visual C++ Standard** *No discounts applied*	$109	1	$109
PRO-PRORS-16U-01	**Database Server Support Package** *1 Year Term*	$1,950	3	$5,850

Some products may not be currently orderable but will be available through Microsoft's normal distribution channels by April 2, 2003.

This quote is valid for the next 90 days.

If we can be of any further assistance, please contact Jamie Reding at (425) 703-0510 or jamiere@microsoft.com.

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- MAC
- MAGNETO OPTICAL
- MP3 PLAYER
- MULTIMEDIA
- NAS STORAGE
- NETWORKING
- OPTICAL
- PC PARTS
- POWER PROTECTION
- SERVERS
- SOFTWARE
- STORAGE COUNTRY
- SUN
- TAPE AUTOLOADERS
- TAPE_DRIVES
- TAPE_MEDIA
- KINGSTON_MEMORY

Free Ground Shipping with Online Orders Only.

Product Info			Price	QTY
08P3201	MYLEX ACCELERAID 170LP 1 CHANNEL PCI U160 SCSI RAID ADPTR 16MB NO BB. (A170LP-1-16NB)		$157.00	1
Get Details / Accessories	More Like This	Mfgr Page		
08P2465	MYLEX BBM BATTERY BACKUP MODULE W/0MB SDRAM FOR ACCELERAID 352		$270.00	1
Get Details / Accessories	More Like This	Mfgr Page		
08P4019	MYLEX ACCELERAID 170 1 CHANNEL PCI U160 SCSI RAID ADPTR 32MB NO BBU (SAME AS 08P		$365.00	1
Get Details / Accessories	More Like This	Mfgr Page		
08P2630	MYLEX ACCELERAID 170 1 CHANNEL PCI U160 SCSI RAID ADPTR 32MB NO BB .(A170-1-32N		$365.00	1
Get Details / Accessories	More Like This	Mfgr Page		
08P2632	MYLEX ACCELERAID 170 1 CHANNEL PCI U160 SCSI RAID ADPTR (A170-1-64NB)		$468.00	1
Get Details / Accessories	More Like This	Mfgr Page		
08P4021	ACCELERAID 170 1 CHANNEL PCI U160 SCSI RAID ADPTR 64MB NO BBU		$500.00	1
Get Details / Accessories	More Like This	Mfgr Page		
08P2420	LSI LOGIC MYLEX ACCELERAID 352 32MB (08P2420) ENTRY LEVEL ULTRA 160 SCSI RAID CO		$580.00	1
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