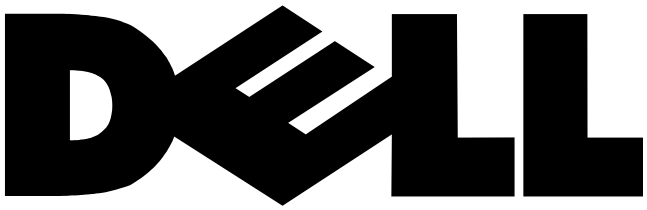


TPC Benchmark™ C
Full Disclosure Report
for
Dell PowerEdge 2800
Using
Microsoft SQL Server Workgroup Edition 2000 and
Microsoft Windows 2003 Server

First Edition
Submitted for Review
Updated to meet TPC-C Version 5.3 specification and updated pricing

February 24, 2004

First Printing, February 24, 2005

Dell believes that the information included in this document is accurate as of the publication date. The information in this document is subject to change without notice. Furthermore, Dell is not responsible for any errors contained within this document.

The pricing information given in this FDR is accurate as of the publication date, February 24, 2005 and is generally available.

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

All performance data contained in this report were obtained in a rigorously controlled environment. Actual performance experienced by a particular customer may vary due to differences in system layout and configuration, hardware and/or software revision levels, and background system activity. The content of this document is for informational purposes only.

Abstract

Overview

This report documents the methodology and results of the TPC Benchmark™ C test conducted on Dell PowerEdge 2800. The tests were run in a client/server configuration using one PowerEdge SC1420 as a client. The operating system used for the benchmark was Microsoft Windows 2003 Server on the database server and Microsoft Windows 2000 Server on the client. The database was Microsoft SQL Server Workgroup Edition. Microsoft COM+ provided the database connection queues. All tests were done in compliance with Revision 5.3 of the Transaction Processing Council's TPC Benchmark™ C Standard Specification. Two standard TPC Benchmark™ C metrics, transactions per second (tpmC) and price per tpmC ($/tpmC) are reported and referred to in this document. The results from the tests are summarized below.

Hardware	Software	Total System Cost	tpmC	$/tpmC	Availability Date
Dell PowerEdge 2800	Microsoft Windows 2003 Server with SQL Server Workgroup Edition	$39,340	28,122	$1.40	February 24, 2005

Auditor

The results of the benchmark and test methodology used to produce the results were audited by Lorna Livingtree of Performance Metrics and have fully met the TPC-C rev 5.3 specifications.

Additional copies of this Full Disclosure Report can be obtained from either the Transaction Processing Performance Council or Dell at the following address:

Transaction Processing Performance Council (TPC)
c/o Adminstrator, TPC
Presidio of San Francisco
Bldg 572B Ruger St.
San Francisco, CA 94129-0920
Phone: (415) 561-6272, fax 415-561 6120
www.tpc.org

or

Dell
1 Dell Way
Round Rock, TX 78682
Attention: Mike Molloy, Ph.D.

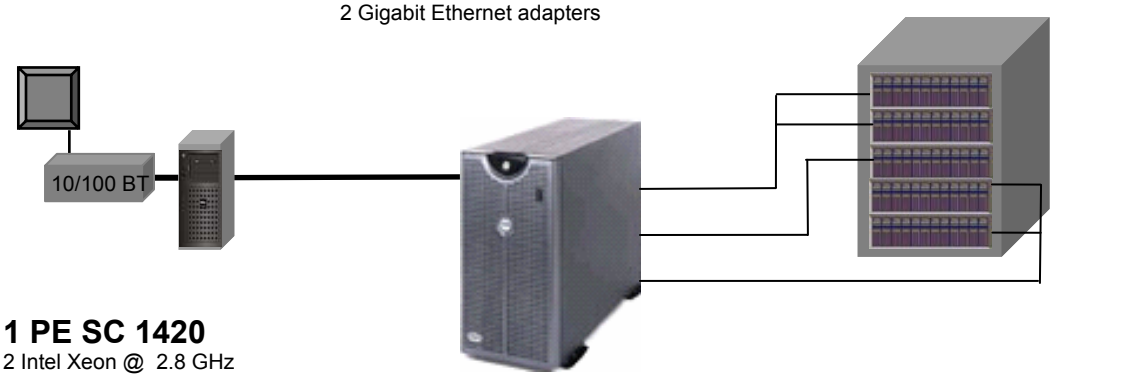
	PowerEdge 2800 Client/Server w/1 PE SC 1420 Front End		TPC-C Rev 5.3 Report Date **February 24, 2005** Revised Date **February 24, 2005**
Total System Cost	TPC-C Throughput	Price/Performance	Availability Date
$39,340	**28,122 tpmC**	**$1.40 / tpmC**	APRIL 30, 2005

Processors	Database Manager	OS	Other Software	Number of Users
1 x Intel Xeon™ Processors 3.4 GHz 2MB L2 Cache	Microsoft SQL Server 2000 Workgroup Edition	Microsoft Windows 2003 Server	Windows 2000 Server w/ COM+ Internet Information Server 5.0 Microsoft Visual C++	22,500

PE2800

w/ 1 3.4 GHz Intel Xeon CPUs
w/ 2MB L2 cache,
2.5GB RAM,
3 LSI MegaRAID Elite 1650 DC Controllers
6 36GB 15K RPM U320 SCSI disks
2 Gigabit Ethernet adapters

5 PV220S Disk Pods
70 36GB 15K RPM U320 SCSI Disks



1 PE SC 1420

2 Intel Xeon @ 2.8 GHz
w/ 1 MB L2
1024 MB RAM
1 36 GB Disk
2 Intel Pro100+ Ethernet NICs

System Component	Server		Each Client	
Processors Cache	1	Intel Xeon @ 3.4GHz 2MB cache	2	Intel Xeon w/ 1MB L2 Client @ 2.8 GHz
Memory		2560 MB		1024 MB
Disk Controllers	3	LSI MegaRAID Elite 1650 DC Controller	1	Adaptec 39160 SCSI
Disk Drives	76	36 GB 15k SCSI	1	36 GB SCSI
Total Storage		2585 GB		36 GB
Other	2 1	2GB NIC CD-ROM	2 1	10/100MB BT NIC CD-ROM

Dell	PowerEdge 2800				TPC-C REV 5.3 EXECUTIVE SUMMARY PAGE 2 OF 2		
		Client/Server			Report Date: 24-February-05		
Description	**Part Number**	**Third Party**		**Unit Price**	**Qty**	**Extended Price**	**3 yr. Maint. Price**
Server Hardware		**Brand**	**Pricing**				
Dell PowerEdge 2800 3.4GHz XEON w/2MB L2 cache,	221-7967			$2,199.00	1	$2,199.00	$300.00
800MHZ FSB, 2 onboard Gigabit NICs							
2GB DDR2 400MHz(4X512MB),1R	311-3591			$849.00	1	$849.00	
512MB DDR2 400MHz(2X256MB),1R	311-3585			$299.00	1	$299.00	
Dell E773,17 in Gray (16.0 VIS)	320-2907			$135.00	1	$135.00	
					Subtotal	$3,482.00	$300.00
3rd Party Raid Controllers							
LSI MegaRAID Elite 1650 2-ch SCSI ***	4942510264A	LSI	3	$999.00	5	$4,995.00	
PowerVault Disk Subsystem							
PV220S, U3, PS, Tower *	220-4477, etc.			$955.00	5	$4,775.00	$2,005.00
ZEMM,U320,PV22XS,SINGLE	340-9324			$399.00	5	$1,995.00	
600W,PWR SPLY,PV22XS	310-0677			$0.00	5	$0.00	
600W,PWR SPLY,PV22XS	310-0683			$89.00	5	$445.00	
36GB U320M SCSI 15K RPM Hard Drive	340-9472			$249.00	70	$17,430.00	
36GB U320M SCSI 15K RPM Hard Drive (OS+LOG)	340-9370			$249.00	6	$1,494.00	
					Subtotal	$26,139.00	$2,005.00
Server Software							
SQL Workgroup, Per processor licensing **	A5K-00206	Microsoft	1	$3,700.00	1	$3,700.00	
Windows 2003 Standard Server **	P73-00295	Microsoft	1	$738.00	1	$738.00	
Professional Support (1 Incident)		Microsoft	1	$245.00	1		$245.00
					Subtotal	$4,438.00	$245.00
Client Hardware							
Dell PowerEdge SC 1420, 2.8 GHz / 1MB L2 / 800 FSB	221-5680			$530.00	1	$530.00	$300.00
Additional processor , 2.8 GHz / 1MB	311-3803			$399.00	1	$399.00	
1.0GB DDR2, 400, 2X512 Dimms	311-3811			$499.00	1	$499.00	
36GB U160M SCSI 10K RPM Hard Drive	340-7087			$249.00	1	$249.00	
39320 ULTRA3 SCSI LVD CTRL	341-1032			$199.00	1	$199.00	
IntelPro 100S	430-0369			$59.00	1	$59.00	
Dell E773,17 in Gray (16.0 VIS)	320-2907			$135.00	1	$135.00	
					Subtotal	$2,070.00	$300.00
Client Software							
Windows 2003 Standard Server **	P73-00295	Microsoft	1	$738.00	1	$738.00	
Visual C++ ** .NET	254-00170	Microsoft	1	$109.00	1	$109.00	
					Subtotal	$847.00	
User Connectivity							
7ft Crossover cable	CBLC5C7	LanAdapter	2	$2.00	3	$6.00	
					Subtotal	$6.00	
					Other Discounts	$5,487.36	
					Total	**$36,490**	**$2,850**

Notes: * Maint. included in PowerVault 220S disk pod or PV650F/630F fibre channel disk pod	**Three-Year Cost of Ownership:**	**$39,340**
** All Microsoft maintenance is covered by the maintenance costs of Microsoft SQL Server		
*** 10% or minimum 2 spares are added in place of onsite service (products have a five year	**tpmC Rating:**	**28122**
return-to-vendor warranty) Pricing: 1 - Microsoft 2 - LanAdapter 3 - LSI		
Pricing may be verified by calling 1-800-BUY-DELL and referencing quote # 206051209 as a complex quote.		
Audited by Lorna Livingtree, Performance Metrics Inc.	**$ / tpmC:**	**1.40**

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

MQTh, computed Maximum Qualified Throughput 28,122 tpmC

Response Times (in seconds)	Average	90th	Max
- Neworder	0.44	0.60	5.34
- Payment	0.21	0.33	4.84
- Delivery (interactive portion)	0.10	0.11	1.06
- Stock-Level	2.41	3.99	10.83
- Order Status	0.31	0.44	5.57
- Delivery (deferred portion)	0.94	1.25	2.94
- Menu	0.44	0.11	1.14

Response time delay added for emulated components Menu 0.1
Resp 0.1

Transaction Mix, in percent of total transactions

- New-Order	44.90%
- Payment	43.02%
- Delivery	4.04%
- Stock-Level	4.02%
- Order-Status	4.02%

Keying/Think Times (in seconds),	Min		Average		Max	
- New-Order	18.02	0.0	18.03	12.05	19.07	120.40
- Payment	3.02	0.0	3.03	12.04	4.07	120.40
- Delivery	2.02	0.0	2.03	5.05	3.07	50.40
- Stock-Level	2.02	0.0	2.03	5.04	3.07	50.40
- Order-Status	2.02	0.0	2.03	10.07	3.07	100.40

Test Duration

- Ramp-up time	10 minutes
- Measurement interval	120 minutes
- Number of checkpoints	4
- Checkpoint interval	30 minutes
- Number of transactions (all types)	10,321,852
completed in measurement interval	7,819,498

Table of Contents

Document Structure

The TPC Benchmark C Standard Specification Revision 5.3, written and approved by the Transaction Processing Performance Council (TPC), determines the contents of this report. The format of this report is based on this specification. Most sections of this report begin with the specification requirements printed in italic type, immediately followed by the detail in plain type of how Dell complied with the specification. Where extensive listings are required (such as listing of code), a note is included which references an appendix containing the listing.

Benchmark Overview

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

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

The performance metric reported by TPC-C is a "business throughput" measuring the number of orders processed per minute. Multiple transactions are used to simulate the business activity of processing an order, and each transaction is subject to a response time constraint.

The performance metric for this benchmark is expressed in transactions-per-minute-C (tpmC). To be compliant with the TPC-C standard, all references to tpmC results must include the tpmC rate, the associated price-per-tpmC, and the availability date of the priced configuration.

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

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

Despite the fact that this benchmark offers a rich environment that emulates many OLTP applications, this benchmark does not reflect the entire range of OLTP requirements. In addition, the extent to which a customer can achieve the results reported by a vendor is highly dependent on how closely TPC-C approximates the customer application. The relative performance of

systems derived from this benchmark does not necessarily hold for other workloads or environments. Extrapolations to any other environment are not recommended.

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

System Overview

The hardware configuration used in this TPC-C test is a Dell PowerEdge 2800 server driven by one Dell PowerEdge SC1420 client. The PE2800 has two internal Gigabit Ethernet adapters, of which only one is in use. The client and server are networked together via a cross-over cable. One remote terminal emulator (RTE) system (PowerEdge 2200's) emulate 22,500 users executing the standard TPC-C workload. The RTE's are connected to the client through a 10/100 BaseT switch. The switch connects to the client machine at 100 BaseT and to the RTE machines at 100Mbit/sec, full duplex. Microsoft Windows 2003 Server was the operating system used on the server. Microsoft Windows 2000 Server was used on the client. Microsoft SQL Server Workgroup Edition was the database on the server machine.

The PowerEdge 2800 motherboard uses the Intel E7520 (Lindenhurst) chipset and can hold up to two Pentium® 4 Xeon processors (3.6 GHz with 2 MB L2 cache each) and 64-bit Extensions. The system has 4 PCI-X 64-bit/100MHz I/O slots, 1 PCI 2.2 32-bit/33MHz I/O slots, and 2 PCI-E slots. The measured configuration used 2.50 Gbytes of DDR2 RAM, which was achieved by using four 512 Mbyte DIMMs and two 256Mbyte DIMMs.

The PowerEdge 2800 has an integrated 7 slot riser board to which was attached 6 36GB hard disks in RAID 10 configuration containing the database log and OS via an internal channel on a LSI PERC3 DC RAID controller. In addition, three LSI PERC3 DC RAID controllers were installed in PCI-X slots for the data volumes. The three PERC3 controllers were connected to five PV220 disk pods enclosing a total of 70 36GB 15K RPM SCSI disks.

The client has dual 2.8GHz Intel Xeon processors with 1MB of L2 cache. The client has 1024 Mbytes of RAM, one 36 GB hard disk, one intergrated Intel Ether Express Pro100+ PCI Ethernet adapter and one Intel Pro 100 Network Interface Card. The client's Intel Ethernet adapter was connected to the RTE machine through a 10/100 BaseT switch and the Intel Pro NIC was connected to the Database Server through a cross-over cable. The client was driven through three network segments to run a total of 22,500 emulated users.

Test Sponsor

A statement identifying the sponsor of the Benchmark and any other companies who have participated.

Dell was the test sponsor of this TPC Benchmark™ C.

Application Code and Definition Statements

The application program must be disclosed. This includes, but is not limited to, the code implementing the five transactions and the terminal input/output functions.

The application consists of the Microsoft Benchcraft Remote Terminal Emulator (RTE) program emulating a set of users entering TPC-C transactions through web browsers, and communicating with Client machines running the Microsoft Internet Information Server (IIS) web server. The Client machines use the COM+ transaction monitor to communicate with the database server machine.

On each Client machine IIS loads a custom Microsoft Internet Information Server Application Programming Interface dynamic link library (ISAPI DLL) application program that communicates with the emulated web browsers through the HTTP protocol and with the database server through the COM+ transaction monitor and the Microsoft DBLIB interface. The application supplies fill-in screens to the user for each transaction, then parses the data in each request, and makes a call on SQL Server through the COM+ layer, which manages a set of DBLIB connections to the database server. The resulting data is passed back to the application where it is formatted into HTML and sent back to the user's browser. The Delivery transaction is handled directly from the application to the database without the use of COM+.

The web Client code is listed in Appendix A.

Parameter Settings

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

- *Database options*
- *Recover/commit options*
- *Consistency/locking options*
- *System parameter, application parameters, and configuration parameters.*

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

Appendix C contains all the database, Windows 2003 Server, and Internet Information Service parameters used in this benchmark.

Appendix D contains the 60 day space calculations.

Configuration Diagrams

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

Figures 1 and 2 respectively show the measured and priced full client/server configurations. The system under test (SUT) in the measured system was identical to what was priced.

Figure 1: Measured Configuration

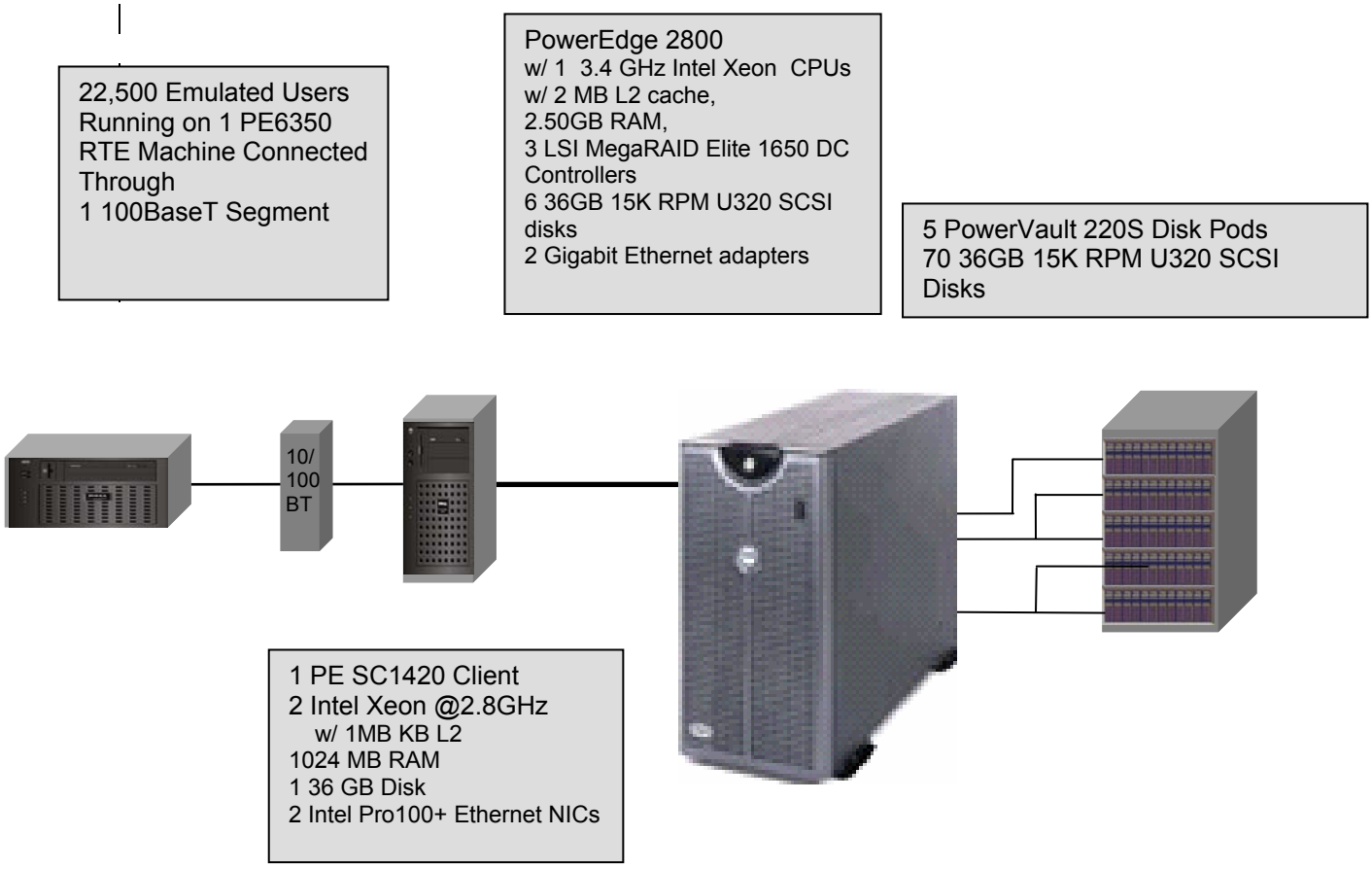


Figure 2: Priced Configuration

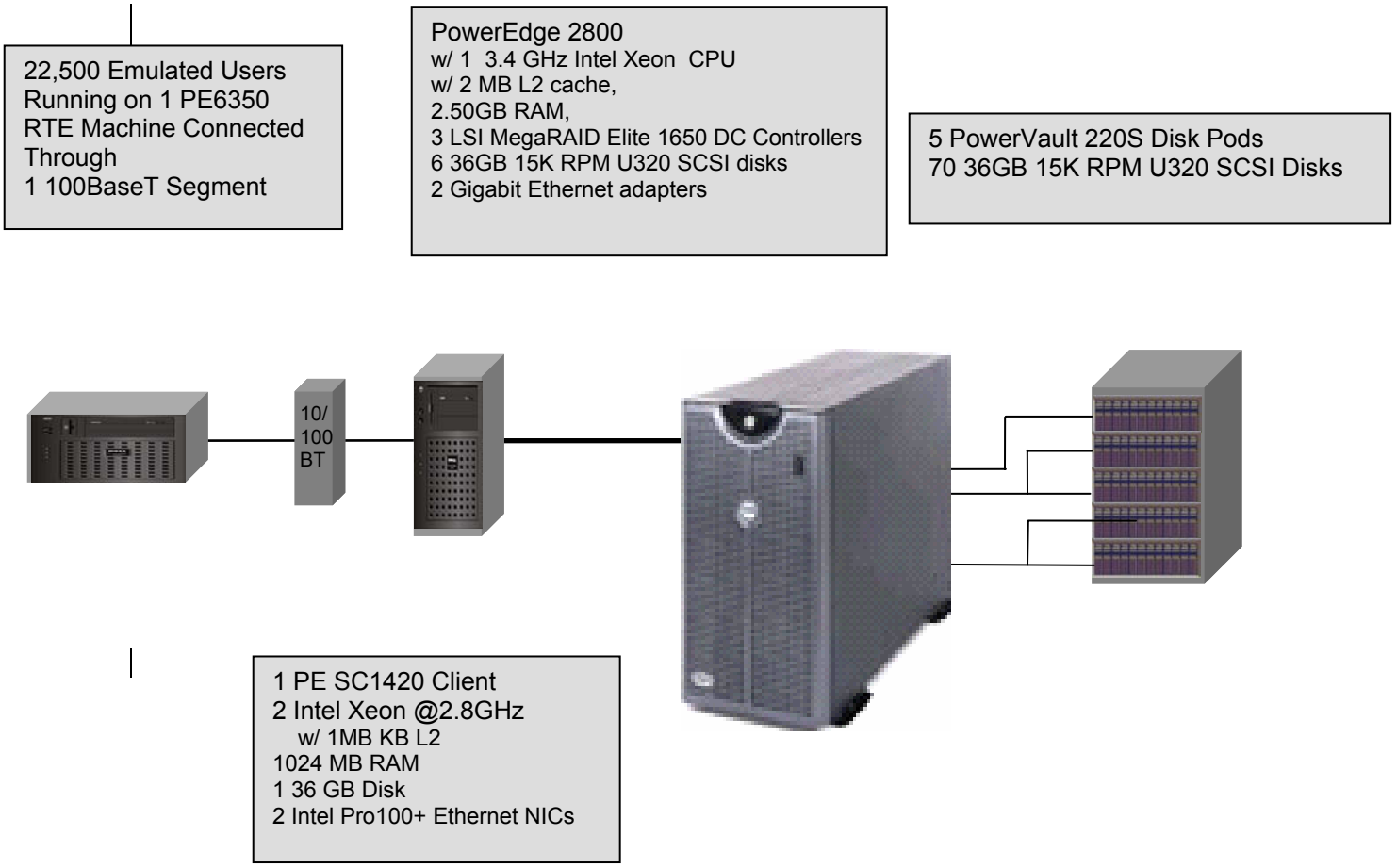


Table Definitions

Listings must be provided for all table definition statements and all other statements used to set-up the database. (8.1.2.1)

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

Physical Organization of the Database

The physical organization of tables and indices, within the database, must be disclosed. (8.1.2.2)

The measured configuration used 76 disk drives. The organization is shown in Table 5: Data Distribution.

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. (8.1.2.3)

Insert and delete functionality was fully operational during the benchmark.

Horizontal and Vertical Partitioning

While there are a 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. (8.1.2.4)

Partitioning was not used in this benchmark.

Replication

Replication of tables, if used, must be disclosed (see Clause 1.4.6). (8.1.2.5)

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). (8.1.2.6)

No additional attributes were used in this benchmark.

Random Number Generation

The method of verification for the random number generation must be described. (8.1.3.1)

The random number generation was done internal to the Microsoft BenchCraft RTE program, which was audited independently.

Screen Layout

The actual layouts of the terminal input/output screens must be disclosed. (8.1.3.2)

The screen layouts are based on those in Clauses 2.4.3, 2.5.3, 2.6.3, 2.7.3, and 2.8.3 of the TPC-C Standard Specification. There are some very minor differences based on the fact that this is a web client implementation.

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

The terminal features were verified by allowing the auditor to manually execute each of the five transaction types, using Microsoft Internet Explorer version 3.0.

Intelligent Terminals

Any usage of presentation managers or intelligent terminals must be explained. (8.1.3.4)
Comment 1*: The intent of this clause is to describe any special manipulations performed by a local terminal or workstation to off-load work from the SUT. This includes, but is not limited to: screen presentations, message bundling, and local storage of TPC-C rows.*
Comment 2*: This disclosure also requires that all data manipulation functions performed by the local terminal to provide navigational aids for transaction(s) must also be described. Within this disclosure, the purpose of such additional function(s) must be explained.*

Application code involved in the manipulation of data was run on the client. Screen manipulation commands in the form of HTML were downloaded to the web browser, which handled input and output presentation graphics. A listing of this code is included in Appendix A. Microsoft Internet Information Service assisted in the processing and presentation of this data.

Transaction Profiles

The percentage of home and remote order-lines in the New-Order transactions must be disclosed. (8.1.3.5)
The percentage of New-Order transactions that were rolled back as a result of an unused item number must be disclosed. (8.1.3.6)
The number of items per orders entered by New-Order transactions must be disclosed. (8.1.3.7)
The percentage of home and remote Payment transactions must be disclosed. (8.1.3.8)
The percentage of Payment and Order-Status transactions that used non-primary key (C_LAST) access to the database must be disclosed. (8.1.3.9)
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. (8.1.3.10)

Table 1: Transaction Statistics

Transaction	Function	Value
New Order	Home Warehouse Items	99.00%
	Remote Warehouse Items	1.00%
	Rolled Back Transactions	1.00%
	Average Lines Per Order	10.00
Payment	Home Warehouse	84.98%
	Remote Warehouse	0.150137%
	Non-Primary Key Access	60.00%
Order Status	Non-Primary Key Access	60.09%
Delivery	Skipped Transactions	0

Transaction Mix

The mix (i.e., percentages) of transaction types seen by the SUT must be disclosed. (8.1.3.11)

Table 2: Transaction mix

Transaction	Percentage
New Order	44.85%
Payment	43.06%
Order Status	4.04%
Delivery	4.03%
Stock Level	4.02%

Deferred Delivery Mechanism

The queuing mechanism used to defer the execution of the Delivery transaction must be disclosed. (8.1.3.12)

The application creates a semaphore-base thread pool consisting of a user-specified number of threads, which open DBLIB connections on the database. When a Delivery transaction is posted one of these threads makes the database call while the transaction's original thread returns control to the user. Upon completion the Delivery thread writes an entry in the Delivery log and returns to the thread pool.

The source code is listed in Appendix A.

ACID Tests

The results of the ACID tests must be disclosed along with a description of how the ACID requirements were met. This includes disclosing which case was followed for the execution of Isolation Test 7. (8.1.4.1)

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

Atomicity

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

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

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

Consistency

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

Consistency conditions one through four were tested using a shell script to issue queries to the database. The results of the queries verified that the database was consistent for all four tests. A run was executed under full load lasting over ten (10) minutes and included a checkpoint. The shell script was executed again. The result of the same queries verified that the database remained consistent after the run.

Isolation

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

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

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

For Isolation test seven, case A was followed.

Durability

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

Durable Media Failure

Durability from media failure was demonstrated on the 225 warehouse database. The standard driving mechanism was used to generate the transaction load of 2250 users for the Loss of Data.

Loss of Data

Loss of data was demonstrated on the 225 warehouse database. The standard driving mechanism was used to generate the transaction load of 2250 users for the test. To demonstrate recovery from a permanent failure of durable media containing TPC-C tables, the following steps were executed:

1. The 225 warehouse database was used for this test.
2. The database was backed up using SQL Server backup facilities.
3. A sum of D_NEXT_O_ID was taken.
4. 2250 users were logged in to the database and ran transactions.
5. The system was run at steady state for 5 minutes.
6. One disk drive in the data array was removed causing SQL Server errors.
7. The RTE was allowed to continue running. Completed transactions enroute from the clients were recorded. Error messages began appearing on the RTE screen.
8. The RTE was stopped.
9. SQL Server was stopped and restarted and a dump of the transaction log was taken.
10. SQL Server was stopped, Windows 2003 was shutdown and the machine powered off.
11. The failed disk was replaced.
12. The machine was powered up, Windows 2003 and SQL Server were started.
13. The TPC-C database was dropped and restored from backup.
14. The transaction log was restored and transactions rolled forward.
15. A new count of D_NEXT_O_ID was taken.
15. This number was compared with the number of new orders reported by the RTE. The difference was valid per the spec.

Instantaneous Interruption and Loss of Memory/ Loss of Log

Instantaneous Interruption, Loss of Memory, and Loss of Log were demonstrated on the full database with 2250 warehouses in a single test. The standard driving mechanism was used to generate the transaction load of 22500 users for the test. To demonstrate recovery an instantaneous system interruption caused by powering off the Server, the following steps were executed:

1. The full database was used.
2. A sum of D_NEXT_O_ID was taken.
3. 22500 users were logged in to the database and ran transactions.
4. The system was run is steady state for 5 minutes
5. One disk drive in the transaction log array was removed with no effect on Windows 2003 or SQL Server.
6. The system was run is steady state for another 5 minutes.
7. A checkpoint was executed and allowed to finish.
8. The system ran for an additional 30 seconds.
9. The Server was powered off by normal means, causing instantaneous interruption.

10. The RTE was allowed to continue running. Completed transactions enroute from the clients were recorded. Error messages began appearing on the RTE screen.
11. The RTE was stopped.
12. The server was powered on again and rebooted.
13. The failed disk was replaced.
14. SQL Server was restarted and automatically recovered.
15. A new count of D_NEXT_O_ID was taken.
16. This number was compared with the number of new orders reported by the RTE. The difference was valid per the spec.

Clause 4 -- Scaling and Database Population Related Items

Table Cardinality

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. (8.1.5.1)

The database was originally built with 2250 warehouses.

Table 3: Table Cardinality

Table	Cardinality as Benchmarked
Warehouse	2,250
District	22,500
Customer	67,500,000
History	67,500,000
NewOrder	20,250,000
Orders	67,500,000
OrderLine	675,003,921
Item	100,000
Stock	225,000,000
Deleted Warehouses	0

Constant Values

The following values were used as constant value inputs to the NURand function for this benchmark.

Table 4: Constant Values

Function	Constant C Value
C_LAST (Build)	123
C_LAST (Run)	208

Data Distribution

The distribution of tables and logs across all media must be explicitly depicted for the tested and priced systems. (8.1.5.2)

The Database was built using a total of 76 disks: 70 36GB for data, 6 36GB for log and OS, and application software. The data drives were configured as hardware RAID 0. Logs and OS were configured as hardware RAID 10. LSI MEGARAID ELITE 1650 DC RAID Controllers 2 and were 3 configured with 2 logicals drive each. Each logical drive spanned 14 disk drives. LSI MEGARAID ELITE 1650 DC RAID Controller 1 was configured with 1 logical drive spanning 6 36GB SCSI drives. Each Windows 2003 data drive contained 3 partitions: partition 1 for customer/stock, partition 2 for miscellaneous, and partition 3 for backup. Partitions 1 and 2 were RAW file systems and partition 3 was formatted NTFS. The details are shown in Table 5.

Table 5: Data Distribution

W2K Disk Administration			LSI MEGARAID ELITE 1650 DCConfiguration					
Disk **0 104028MB**				Controller # **1**				
Partition			Slot# **1**		Channels			
1	2	3		SCSI ID	A	B	C	D
C:	**E:**			0	**A1-1**			
OS	**MS1**			1	**A1-2**			
NTFS	**RAW**			2	**A1-3**			
10GB	**40.5GB**			3	**A1-4**			
				4	**A1-5**			
				5	**A1-6**			
				8				
				9				
				10				
				11				
				12				
				13				
				14				
				15				

W2K Disk Administration			LSI MEGARAID ELITE 1650 DCConfiguration					
Disk 1 435.36GB				Controller # **1**				
Partition			Slot# **1**		Channels			
1	2	3		SCSI ID	A	B	C	D
F:	**M:**	**T:**		0		**A2-1**		
MS1	**CS1**	**Backup1**		1		**A2-2**		
RAW	**RAW**	**NTFS**		2		**A2-3**		
13.6GB	**26.0GB**	**393.02 GB**		3		**A2-4**		
				4		**A2-5**		
				5		**A2-6**		
				8		**A2-7**		
				9		**A2-8**		
				10		**A2-9**		
				11		**A2-10**		
				12		**A2-11**		
				13		**A2-12**		
				14		**A2-13**		
				15		**A2-14**		

W2K Disk Administration			LSI MEGARAID ELITE 1650 DC Configuration					
Disk 2 & 3 870.5GB				Controller # **2**				
Partition			Slot# **2**		Channels			
1	2	3		SCSI ID	A	B	C	D
Channel A:				0	**A1-1**	**A2-1**		
G:	**N:**	**U:**		1	**A1-2**	**A2-2**		
MS2	**CS2**	**Backup2**		2	**A1-3**	**A2-3**		
RAW	**RAW**	**NTFS**		3	**A1-4**	**A2-4**		
13.6GB	**26.0GB**	**393.02 GB**		4	**A1-5**	**A2-5**		
				5	**A1-6**	**A2-6**		
Channel B:				8	**A1-7**	**A2-7**		
H:	**O:**	**V:**		9	**A1-8**	**A2-8**		
MS3	**CS3**	**Backup3**		10	**A1-9**	**A2-9**		
RAW	**RAW**	**NTFS**		11	**A1-10**	**A2-10**		
13.6GB	**26.0GB**	**393.02 GB**		12	**A1-11**	**A2-11**		
				13	**A1-12**	**A2-12**		
				14	**A1-13**	**A2-13**		
				15	**A1-14**	**A2-14**		

W2K Disk Administration			LSI MEGARAID ELITE 1650 DC Configuration					
Disk 4 & 5 870.5GB				Controller # **3**				
Partition			Slot# **3**		Channels			
1	2	3		SCSI ID	A	B	C	D
Channel A:				0	**A1-1**	**A2-1**		
I:	**P:**	**W:**		1	**A1-2**	**A2-2**		
MS4	**CS4**	**Backup4**		2	**A1-3**	**A2-3**		
RAW	**RAW**	**NTFS**		3	**A1-4**	**A2-4**		
13.6GB	**26.0GB**	**393.02 GB**		4	**A1-5**	**A2-5**		
				5	**A1-6**	**A2-6**		
Channel B:				8	**A1-7**	**A2-7**		
J:	**Q:**			9	**A1-8**	**A2-8**		
MS5	**CS5**			10	**A1-9**	**A2-9**		
RAW	**RAW**			11	**A1-10**	**A2-10**		
13.6GB	**26.0GB**			12	**A1-11**	**A2-11**		
				13	**A1-12**	**A2-12**		
				14	**A1-13**	**A2-13**		
				15	**A1-14**	**A2-14**		

***Comment**: Detailed diagrams for layout of database files on disks can widely vary, and it is difficult to provide exact guideline suitable for all implementations. The intent is to provide sufficient detail to allow independent reconstruction of the test database. The two figures below are examples of database layout descriptions and are not intended to depict or imply any optimal layout for the TPC-C database.*
8.1.5.3 A statement must be provided that describes:

1. *The data 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 Workgroup Edition is a relational DBMS.

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

Partition Mapping

The mapping of database partitions/replications must be explicitly described.
***Comment**: The intent is to provide sufficient detail about partitioning and replication to allow independent reconstruction of the test database. (8.1.5.4)*
An description of a database partitioning scheme is presented below as an example. The nomenclature of this example was outlined using the CUSTOMER table (in Clause 8.1.2.1), and has been extended to use the ORDER and ORDER_LINE tables as well.

The database was not replicated.

60 day Space Calculation

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). (8.1.5.5)

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

1. The current log space usage was determined by running *dbcc sqlperf(logspace)*
2. Transactions were run against the database with a full load of users.
3. The final log space usage was determined by running *dbcc sqlperf(logspace)*
4. The space used was calculated as the difference between the first and second query.
5. The number of NEW-ORDERS was verified from an RTE report covering the entire run.
6. The space used was divided by the number of NEW-ORDERS giving a spaceused per NEW-ORDER transaction.
7. The space used per transaction was multiplied by the measured tpmC rate times 480 minutes.

The results of the above steps yielded a requirement 134.1604 GB (including mirror) to sustain the log for 8 hours. Space available on the transaction log volume was 849.29 GB (including mirror), indicating that enough storage was configured to sustain 8 hours of growth.

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

The details of the 60-day space requirement is shown in Appendix D.

Clause 5 -- Performance Metrics and Response Time Related Items

Measured TpmC

Measured tpmC must be reported. (8.1.6.1)

Measured TpmC	28,122
Price per TpmC	$1.40

Response Times

Ninetieth percentile, maximum and average response times must be reported for all transaction types as well as for the Menu response time. (8.1.6.2)

Table 6: Transaction Response Times

Transaction	Average	90%	Maximum
New Order	0.44	0.60	5.34
Payment	0.21	0.33	4.84
Interactive Delivery	0.10	0.11	1.06
Stock Level	2.41	3.99	10.83
Order Status	0.31	0.44	5.57
Deferred Delivery	0.94	1.25	2.94
Menu	0.10	0.11	1.14

Think Times & Key Times

The minimum, the average, and the maximum keying and think times must be reported for each

transaction type. (8.1.6.3)

Table 7: Transaction Key Times

Transaction	Minimum	Average	Maximum
New Order	18.02	18.03	19.07
Payment	3.02	3.03	4.07
Delivery	2.02	2.03	3.07
Stock Level	2.02	2.03	3.07
Order Status	2.02	2.03	3.07

Table 8: Transaction Think Times

Transaction	Minimum	Average	Maximum
New Order	0.00	12.05	120.40
Payment	0.00	12.04	120.40
Delivery	0.00	5.05	50.40
Stock Level	0.00	5.04	50.40
Order Status	0.00	10.07	100.40

Response Time Distribution Curves

Response Time frequency distribution curves (see Clause 5.6.1) must be reported for each transaction type. (8.1.6.4)

Figure 3: New Order Response Time Distribution

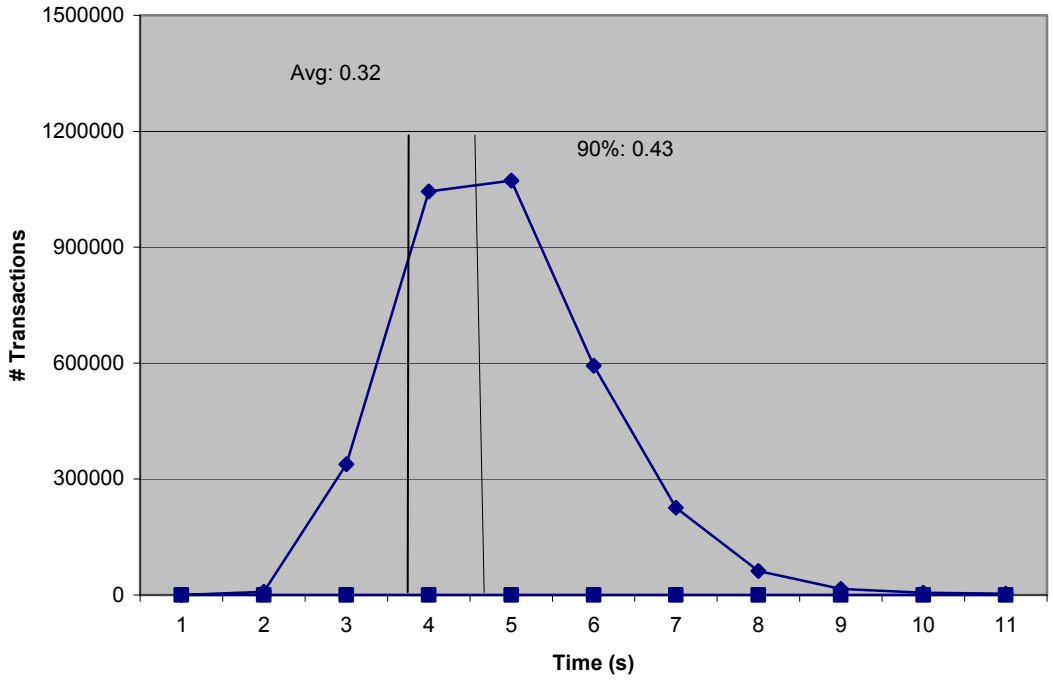


Figure 4: Payment Response Time Distribution

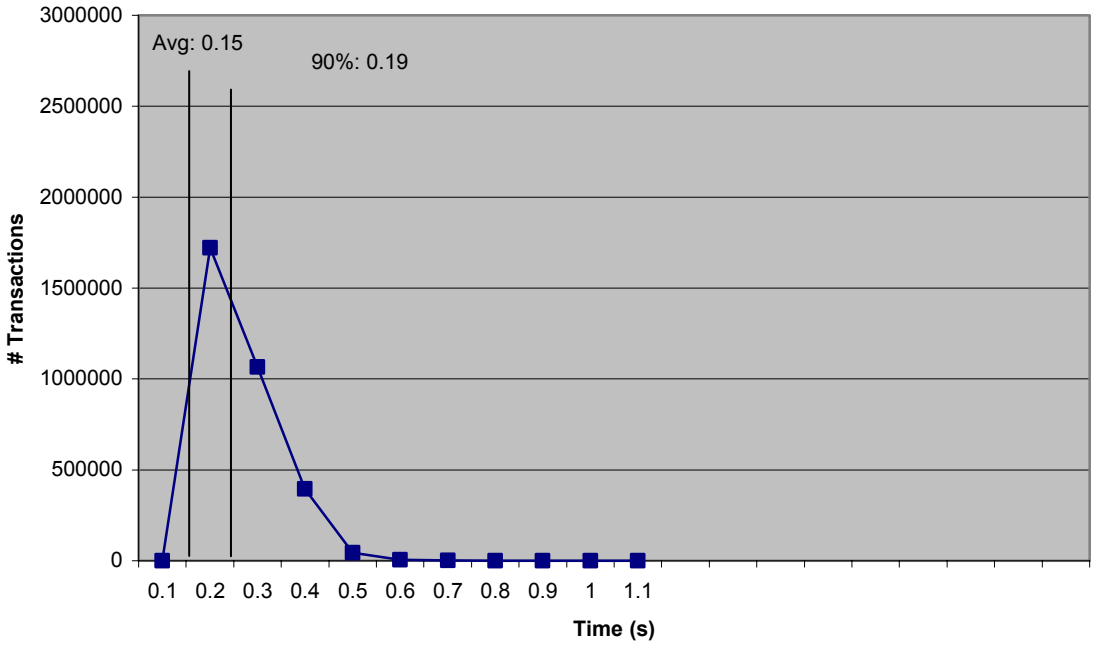


Figure 5: Order Status Response Time Distribution

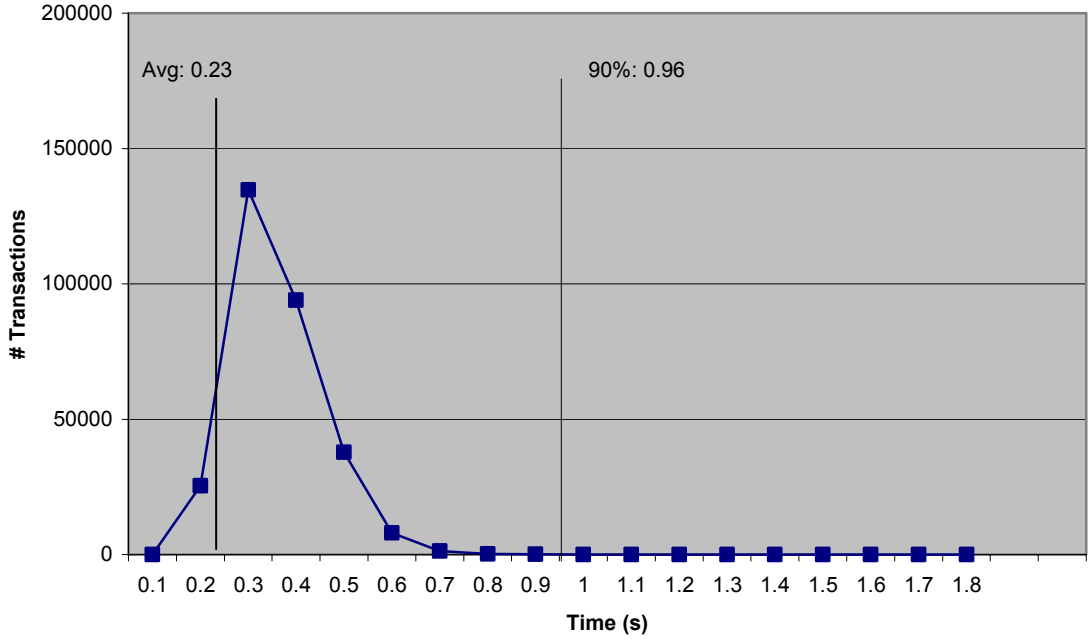


Figure 6: Delivery Response Time Distribution

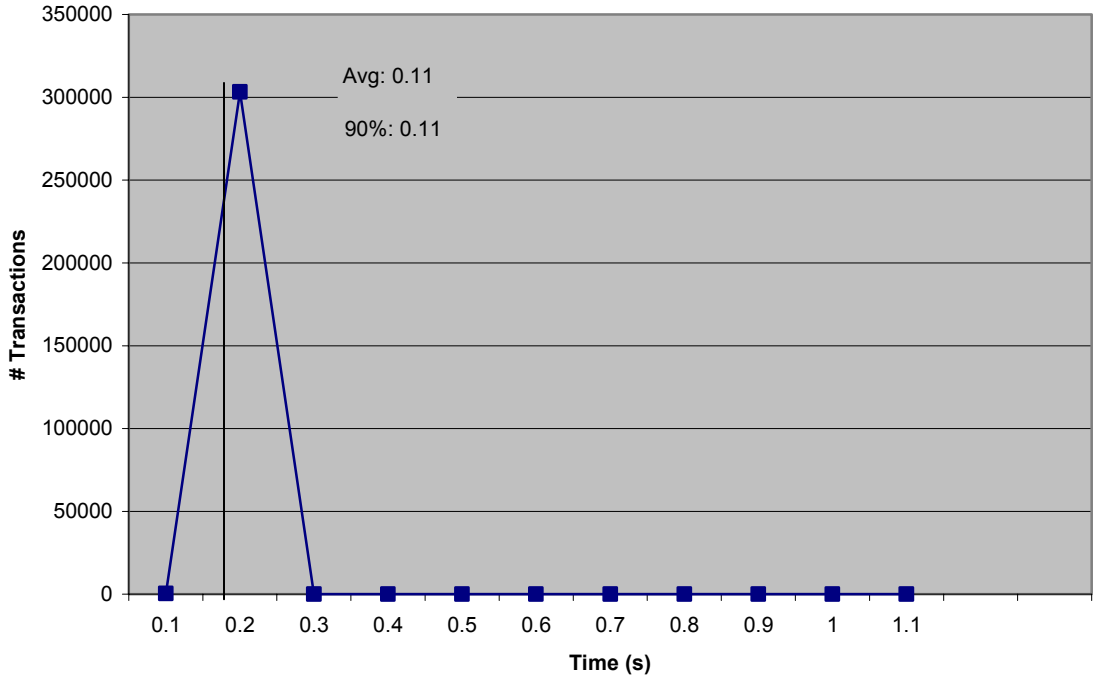
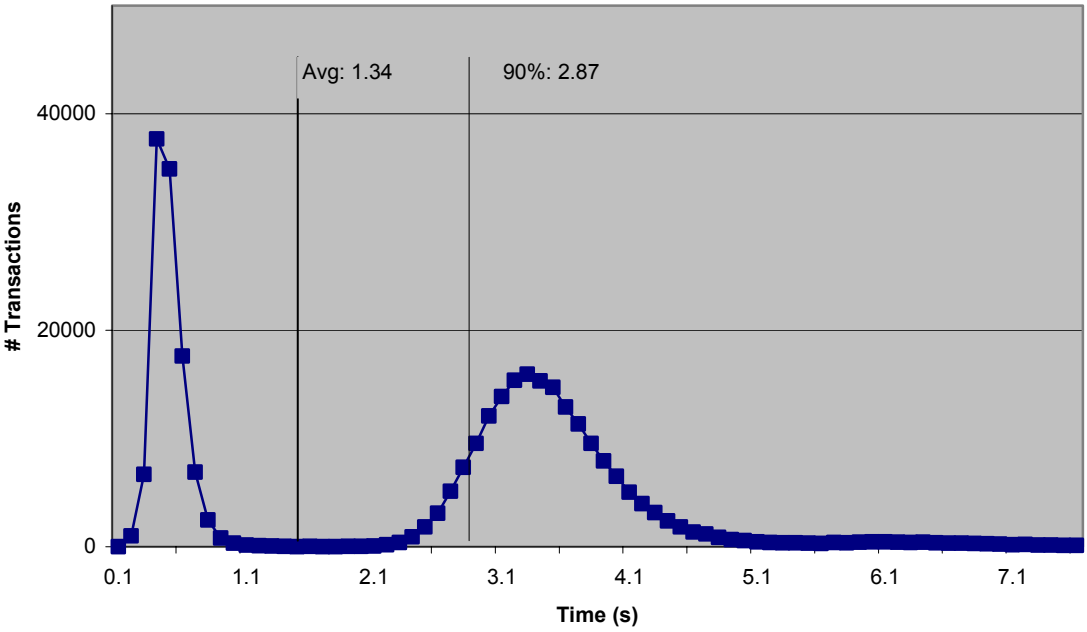


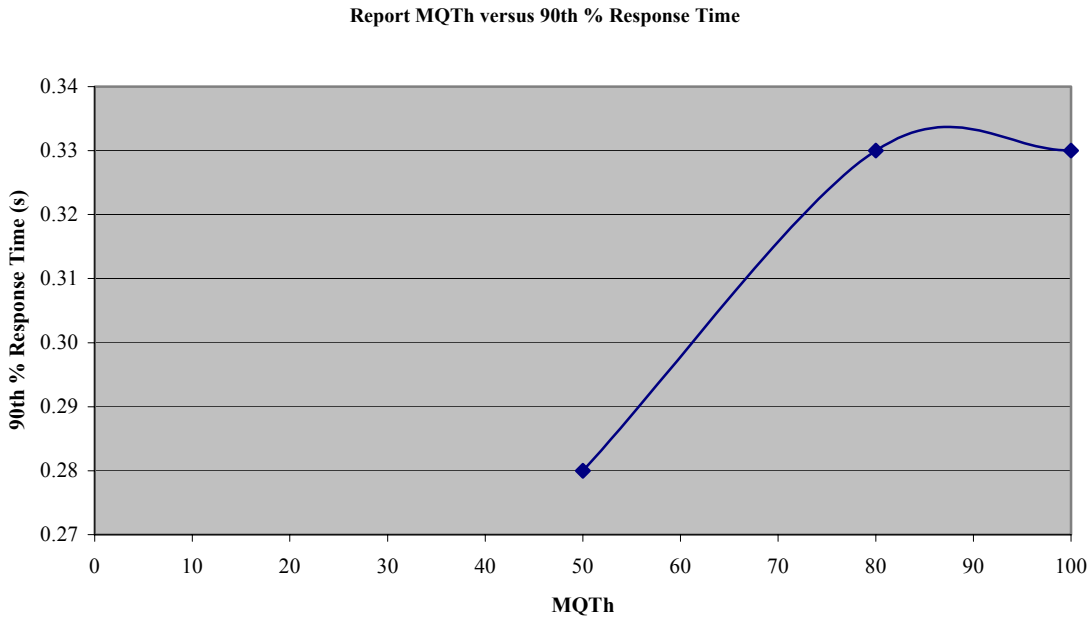
Figure 7: Stock Level Response Time Distribution



New-Order Response Time vs. Throughput Graph

The performance curve for response times versus throughput (see Clause 5.6.2) must be reported for the New-Order transaction. (8.1.6.5)

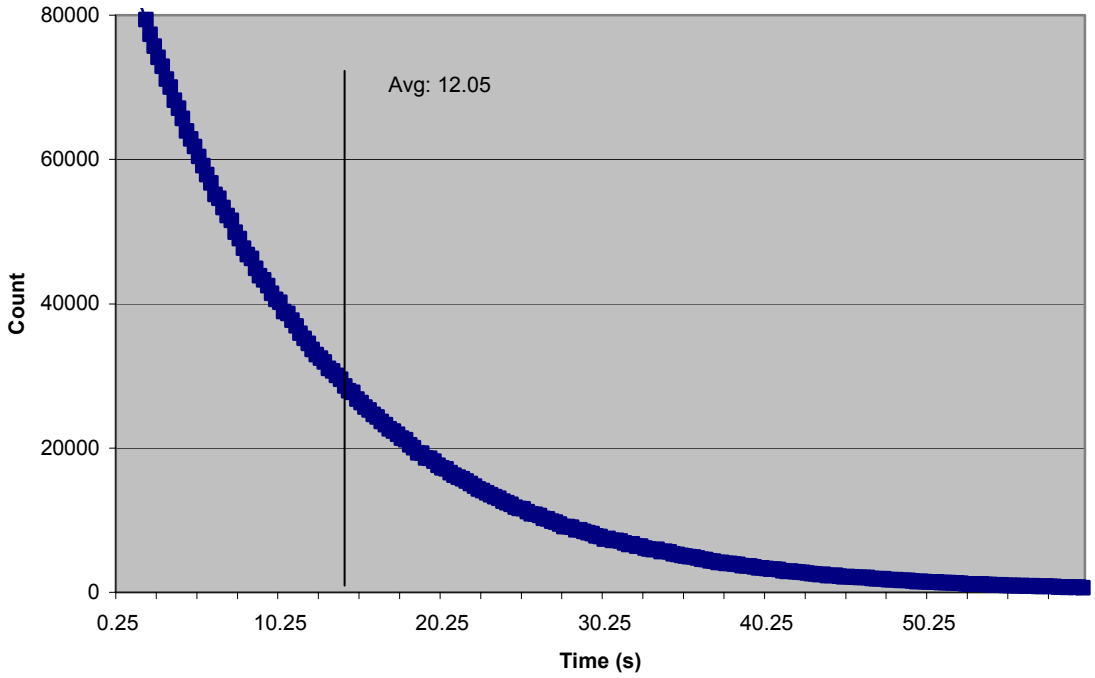
Figure 8: New Order Response Time vs. Throughput



New-Order Think Time Distribution Graph

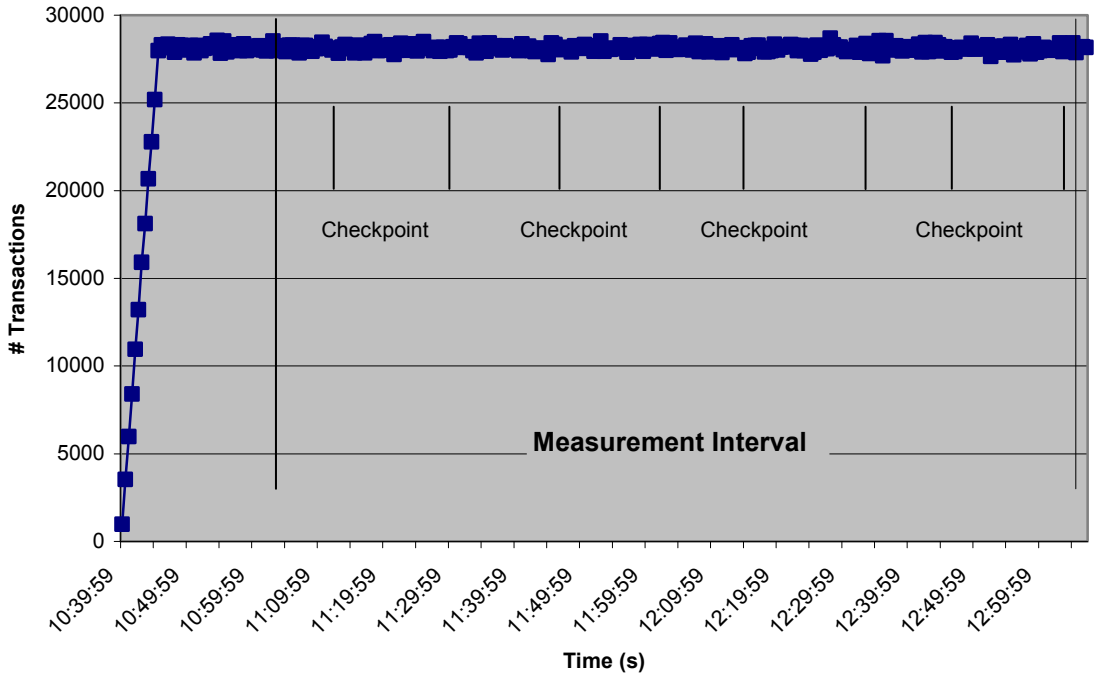
Think Time frequency distribution curves (see Clause 5.6.3) must be reported for the New-Order transaction (8.1.6.6)

Figure 9: New Order Think Time Distribution



Steady-State Graph
A graph of throughput versus elapsed time (see Clause 5.6.5) must be reported for the New-Order transaction. (8.1.6.8)

Figure 10: New Order Throughput vs. 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. (8.1.6.9)

Steady state was determined using real time monitor utilities from both the operating system and the RTE. Steady state was further confirmed by the throughput data collected during the run and graphed in Figure 10.

Work Performed During Steady State
A description of how the work normally performed during a sustained test (for example checkpointing, writing redo/undo log records, etc.), actually occurred during the measurement interval must be reported. (8.1.6.10)

The RTE generated the required input data to choose a transaction from the menu. This data was timestamped. The menu response for the requested transaction was verified and timestamped 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 HTTP request to the client. The transmission was timestamped. The return of the screen with the required response data was timestamped. The difference between these two timestamps was the response time for that transaction 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 the web-based application program running on the client machines through Ethernet LANs. These web clients managed the emulated web browser interface as well as all requests to the database on the server. The applications communicated with the database server over another Ethernet LAN using the COM+ transaction monitor and Microsoft SQL Server DBLIB library and RPC calls.

To perform checkpoints at specific intervals, we set SQL Server *recovery interval* to the maximum allowable value and wrote a script to schedule multiple checkpoints at specific intervals. By setting the TRACE FLAG #3502, SQL Server logged the checkpoint beginning and ending time in the ERRORLOG file. The script included a wait time between each checkpoint equal to the measurement interval, which was 30 minutes. The checkpoint script was started manually after the RTE had all users logged in and sending transactions.

At each checkpoint, Microsoft SQL Server wrote to disk all memory pages that had been updated but not yet physically written to disk. Upon completion of the checkpoint, Microsoft SQL Server wrote a special record to the recovery log to indicate that all disk operations had been satisfied to this point.

Measurement Interval

A statement of the duration of the measurement interval for the reported Maximum Qualified Throughput (tpmC) must be included. (8.1.6.12)

The measurement interval was 7200 minutes.

Measurement Period Duration and Checkpoint Duration

The start time and duration in seconds of at least the four (4) longest checkpoints during the measurement interval must be disclosed (see clause 5.5.2.2(2)) (8.1.6.11)
A statement of the duration of the measurement interval for the reported Maximum Qualified Throughput (tpmC) must be included. (8.1.6.12)

	Start	**End**	**Duration**
Measurement Interval	11:10:10	1:10:10	7,200
1st Checkpoint	11:17:27	11:33:10	943
2nd Checkpoint	11:47:22	12:05:54	1,112
3rd Checkpoint	12:17:17	12:36:27	1,150
4th Checkpoint	12:47:12	13:09:05	1,313

Transaction Mix

8.1.6.13 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)

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

The percentage of the total mix for each transaction type must be disclosed. (8.1.6.14)

Table 9: Transaction Mix

Transaction	Percentage
New Order	44.91%
Payment	43.02%
Delivery	4.04%
Stock Level	4.02%
Order Status	4.01%

Other Metrics

The percentage of New-Order transactions rolled back as a result of invalid item number must be disclosed. (8.1.6.15)
The average number of order-lines entered per New-Order transaction must be disclosed. (8.1.6.16)
The percentage of remote order-lines entered per New-Order transaction must be disclosed. (8.1.6.17)
The percentage of remote Payment transactions must be disclosed. (8.1.6.18)
The percentage of customer selections by customer last name in the Payment and Order-Status transactions must be disclosed. (8.1.6.19)
The percentage of Delivery transactions skipped due to there being fewer than necessary orders in the New-Order table must be disclosed. (8.1.6.20)

Table 10: Transaction Statistics

Transaction	Function	Value
New Order	Home Warehouse Items	99.00%
	Remote Warehouse Items	1.00%
	Rolled Back Transactions	1.00%
	Average Lines Per Order	10.00
Payment	Home Warehouse	84.98%
	Remote Warehouse	15.02%
	Non-Primary Key Access	60.00%
Order Status	Non-Primary Key Access	60.15%
Delivery	Skipped Transactions	0

RTE Parameters

The RTE input parameters, code fragments, functions, etc. used to generate each transaction input field must be disclosed. (8.1.7.1)
Comment: *The intent is to demonstrate the RTE was configured to generate transaction input data as specified in Clause 2.*

The RTE input parameters are listed in Appendix C - Tunable Parameters.

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. (8.1.7.2)

No components were emulated.

Benchmarked and Targeted System Configuration Diagrams

A complete functional diagram of both the benchmark configuration and the configuration of the proposed (target) system must be disclosed. A detailed list of all 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). (8.1.7.3)

The driver system performed transaction data generation and communication to the client through the standard web browser (HTTP) protocol. It also captured and timestamped the SUT output data for post-processing of the reported metrics. No other functionality was included on the driver system.

Figures 1 & 2 of this report contain detailed diagrams of both the benchmark configuration and the priced configuration.

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). (8.1.7.4)

The network configurations of the benchmarked and priced configurations were identical.

Network Bandwidth

The bandwidth of the network(s) used in the tested/priced configuration must be disclosed. (8.1.7.5)

The bandwidth of the tested and priced networks were as follows:

- 100 BaseT (100 Mbit/sec) network segments between the RTE/Emulated Users and the switch.
- 100 BaseT (100 Mbit/sec) between the Clients and Server.

Operator Intervention

If the configuration requires operator intervention (see Clause 6.6.6), the mechanism and the frequency of this intervention must be disclosed. (8.1.7.6)

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

Clause 7 -- Pricing Related Items

Hardware and Software List

A detailed list of hardware and software used in the priced system must be reported. Each separately orderable item must have vendor part number, description, and release/revision level, and either general availability status or committed delivery 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) of price(s) must also be reported. (8.1.8.1)

The total 5-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. (8.1.8.2)

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

Availability 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 date for the priced system must be the date at which all components are committed to be available. (8.1.8.3)

Hardware Availability Date: February 24, 2005
Software Availability Date: April 30, 2005

Measured TpmC

A statement of the measured tpmC, as well as the respective calculations for 5-year pricing, price/performance (price/tpmC), and the availability date must be included. (8.1.8.4)

Maximum Qualified Throughput: 28,122 tpmC
Price Performance Metric: $1.40

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. (8.1.8.5)

This system is priced for the United States of America.

Usage Pricing

For any usage pricing, the sponsor must disclose (8.1.8.6):

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

Comment*: Usage pricing may include, but is not limited to, the operating system and database management software.*

The component pricing based on usage is shown below:

- 1 Microsoft Windows 2003 Server Standard License.
- 1 Microsoft Windows 2000 Server Standard License.
- 1 Microsoft SQL Server Workgroup Edition License.
- 1 Microsoft Visual C++ 32 bit Edition.
- 3 Year Support for Hardware Components.

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). Clause 6.1 describes the Server and Client components. An example of the standard pricing sheet is shown in Appendix B. (8.1.8.7)
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. See example in Appendix B. (8.1.8.8)

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

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. (8.1.9.1)
A review of the pricing model is required to ensure that all components required are priced (see Clause 9.2.8). The auditor is not required to review the final Full Disclosure Report or the final pricing prior to issuing the attestations letter. (8.1.9.2)

This TPC-C benchmark has been audited by Lorna Livingtree of Performance Metrics.

Availability of the Full Disclosure Report

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

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

Transaction Processing Performance Council
c/o Adminstrator, TPC
Presidio of San Francisco
Bldg 572B Ruger St.
San Francisco, CA 94129-0920

Phone: (415) 561-6272, fax 415-561 6120
www.tpc.org

or:

Dell
One Dell Way
Round Rock, TX 78682
Attention: Mike Molloy, Ph.D.

February 24, 2005

Mr. Eugene Purdy
Dell Computer Corporation
One Dell Way
Round Rock, TX 78682

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

Platform: Dell PowerEdge 2800
Database Manager: Microsoft SQL Workgroup
Operating System: Microsoft Windows 2003 Standard Server
Transaction Monitor: COM+

System Under Test: Dell PowerEdge 2800 with:				
CPU's	Memory	Disks (total)	90% Response	TpmC
1 Intel Xeon @ 3.4 Ghz	Main: 2.5 GB	76 @ 36GB	0.60	28,122

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

- The transactions were correctly implemented.
- The database files were properly sized.
- The database was properly scaled with 2,250 warehouses, all of which were active during the measured interval.
- The ACID properties were successfully demonstrated.
- Data loss durability was demonstrated on a subset of the SUT configured with a database properly populated for 225 warehouses.
- Input data was generated according to the specified percentages.
- Eight hours of mirrored log space was present on the tested system.
- Eight hours of growth space for the dynamic tables was present on the tested system.
- The data for the 60 days space calculation was verified.
- The controller cache for the log disks was disabled.
- The steady state portion of the test was 120 minutes.
- More than one checkpoint was taken before the measured interval opened.
- Four checkpoints were completed inside the measured interval.
- The system pricing was checked for major components and maintenance.
- Third party quotes were verified for compliance.

Auditor Notes: None

Sincerely,

Lorna Livingtree
Auditor

Appendix A - Application Source Code

tpcc.dll ISAPI DLL Source Code

isapi_dll/src/tpcc.def

```
LIBRARY TPCC.DLL

EXPORTS

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

lsapi_dll/src/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(long w_id, short o_carrier_id);
BOOL IsNumeric(char *ptr);
BOOL IsDecimal(char *ptr);
void DeliveryWorkerThread(void *ptr);
```

isapi_dll/src/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
```

isapi_dll/src/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, Reg.szSPPrefix );
                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(long 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=6><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, Reg.szSPPrefix );
                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: %6.6d   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: %6.6d   ",
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: %6.6d   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, "%6.6d   %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: %6.6d"
                        "                               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: %6.6d                         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: %6.6d  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>";

          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: %6.6d   ",
                    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, "  %6.6d     %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: %6.6d<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 = 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;
}
```

isapi_dll/src/resource.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
```

common/src/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;

        size = sizeof( pReg->szSPPrefix );
        if ( RegQueryValueExW(hKey, L"SPPrefix", 0, &type, (BYTE *)&pReg->szSPPrefix,
&size) != ERROR_SUCCESS )
                pReg->szSPPrefix[0] = L'\0';

        RegCloseKey(hKey);

        return FALSE;
}
```

common/src/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];
        wchar_t szSPPrefix[32];       //tpcc_odbc.dll stored procedures prefix
} TPCCREGISTRYDATA, *PTPCCREGISTRYDATA;

BOOL ReadTPCCRegistrySettings( TPCCREGISTRYDATA *pReg );
```

common/src/error.h

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

#pragma once

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

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

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

typedef enum _ErrorLevel
{
        ERR_FATAL_LEVEL                 = 1,
        ERR_WARNING_LEVEL       = 2,
        ERR_INFORMATION_LEVEL   = 3
} ErrorLevel;


#define ERR_TYPE_LOGIC
        -1              //logic error in program; internal error

#define ERR_SUCCESS
        0               //success (a non-error error)
#define ERR_BAD_ITEM_ID
        1               //expected abort record in txnRecord
#define ERR_TYPE_DELIVERY_POST                                          2
        //expected delivery post failed
#define   ERR_TYPE_WEBDLL
        3               //tpcc web generated error
#define   ERR_TYPE_SQL
        4               //sql server generated error
#define   ERR_TYPE_DBLIB
        5               //dblib generated error
#define   ERR_TYPE_ODBC
        6               //odbc generated error
#define ERR_TYPE_SOCKET
        7               //error on communication socket client rte only
#define ERR_TYPE_DEADLOCK                                               8
        //dblib and odbc only deadlock condition
#define ERR_TYPE_COM
        9               //error from COM call
#define ERR_TYPE_TUXEDO
        10              //tuxedo error
#define ERR_TYPE_OS
        11              //operating system error
#define ERR_TYPE_MEMORY
        12              //memory allocation error
#define ERR_TYPE_TPCC_ODBC                                              13
        //error from tpcc odbc txn module
#define ERR_TYPE_TPCC_DBLIB                                             14
        //error from tpcc dblib txn module
#define ERR_TYPE_DELISRV                                                15
        //delivery server error
#define ERR_TYPE_TXNLOG
        16              //txn log error
#define ERR_TYPE_BCCONN
        17              //Benchcraft connection class
#define ERR_TYPE_TPCC_CONN                                              18
        //Benchcraft connection class
#define ERR_TYPE_ENCINA
        19              //Encina error
#define ERR_TYPE_COMPONENT                                              20
        //error from COM component
#define ERR_TYPE_RTE
        21              //Benchcraft rte
#define ERR_TYPE_AUTOMATION                                             22
        //Benchcraft automation errors
#define ERR_TYPE_DRIVER
        23              //Driver engine errors
#define ERR_TYPE_RTE_BASE                                               24
        //Framework errors
#define   ERR_BUF_OVERFLOW                                              25
        //Buffer overflow during receive
#define ERR_TYPE_SOAP_HTTP                                              26
        //HTTP/SOAP dll generated error
// TPC-W error types
#define ERR_TYPE_TPCW_CONN                                              50
        //Benchcraft connection class
#define ERR_TYPE_TPCW_HTML                                              51
        //error from TpcwHtml dll
#define ERR_TYPE_TPCW_USER                                              52
        //error from TPC-W user class
#define ERR_TYPE_TPCW_ENG_BASE                                          53
#define ERR_TYPE_TPCW_ENG_OS                                    54
```

```
#define ERR_TYPE_HTML_RESP                                              55
#define ERR_TYPE_TPCW_ODBC                                              56
#define ERR_TYPE_SCHANNEL                                               57
#define ERR_TYPE_THINK_LIST                                             58

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



class CBaseErr
{
public:

          CBaseErr(LPCTSTR szLoc = NULL)
          {
                    m_idMsg             = GetLastError();   //take the error code
immediatelly before it is reset by other functions


                    if (szLoc)
                    {
                              m_szLoc = new char[strlen(szLoc)+1/*m_szLoc_size*/];
                              strcpy(m_szLoc, szLoc);
                    }
                    else
                              m_szLoc   = NULL;

                    m_szApp             = new char[m_szApp_size];
                    GetModuleFileName(GetModuleHandle(NULL), m_szApp, m_szApp_size);
          }



          CBaseErr(int idMsg, LPCTSTR szLoc = NULL)
          {
                    m_idMsg             = idMsg;


                    if (szLoc)
                    {
                              m_szLoc = new char[strlen(szLoc)+1/*m_szLoc_size*/];
                              strcpy(m_szLoc, szLoc);
                    }
                    else
                              m_szLoc   = NULL;

                    m_szApp             = new char[m_szApp_size];
                    GetModuleFileName(GetModuleHandle(NULL), m_szApp, m_szApp_size);
          }

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

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

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

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

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

          char *GetApp(void) { return m_szApp; }
          char *GetLocation(void) { return m_szLoc; }
          virtual int ErrorNum() { return m_idMsg; }



          virtual int ErrorType() = 0;  // a value which distinguishes the kind of error
that occurred
          virtual char *ErrorText() = 0; // a string (i.e., human readable)
representation of the error


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

          //short   m_errType;
};

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

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

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

        Action    m_eAction;
        char      *m_szErrorText;

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

};

class CSystemErr : public CBaseErr
{
public:
        enum Action
        {
                eNone = 0,
                eTransactNamedPipe,
                eWaitNamedPipe,
                eSetNamedPipeHandleState,
                eCreateFile,
                eCreateProcess,
                eCallNamedPipe,
                eCreateEvent,
                eCreateThread,
                eVirtualAlloc,
                eReadFile = 10,
                eWriteFile,
                eMapViewOfFile,
                eCreateFileMapping,
                eInitializeSecurityDescriptor,
                eSetSecurityDescriptorDacl,
                eCreateNamedPipe,
                eConnectNamedPipe,
                eWaitForSingleObject,
                eRegOpenKeyEx,
                eRegQueryValueEx = 20,
                ebeginthread,
                eRegEnumValue,
                eRegSetValueEx,
                eRegCreateKeyEx,
                eWaitForMultipleObjects,
                eRegisterClassEx,
                eCreateWindow,
                eCreateSemaphore,
                eReleaseSemaphore,
                eFSeek,
                eFRead,
                eFWrite,
                eTmpFile,
                eSetFilePointer,
                eNew,
                eCloseHandle,
        };

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

private:
        char m_szMsg[ERR_MSG_BUF_SIZE];
};

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

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


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

        int ErrorType() {return ERR_BUF_OVERFLOW;}

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

common/src/trans.h

```
/*        FILE:               TRANS.H
 *                                      Microsoft TPC-C Kit Ver. 4.42.000
 *                                      Copyright Microsoft, 2002
 *              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:
 *                  4.42.000 - changed w_id fields from short to long to support >32K
warehouses
 *                  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
          long                                      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
          long                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
          long                                      w_id;
          short                                     d_id;
          long                                      c_id;
          short                                     c_d_id;
          long                                      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;
          long                              ol_supply_w_id;
          short                                     ol_quantity;
          double                                    ol_amount;
```

```
        TIMESTAMP_STRUCT    ol_delivery_d;
} OL_ORDER_STATUS_DATA;

typedef struct
{       // input params
        long                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
        long                        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
        long                w_id;                       //delivery warehouse
        short               o_carrier_id;       //carrier id
} DELIVERY_TRANSACTION;

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

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

common/src/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;
};
```

install\src\install.c

```
/*      FILE:               INSTALL.C
 *                                      Microsoft TPC-C Kit Ver. 4.51.000
 *                                      Copyright Microsoft, 2003
 *              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
 *      4.50.000 - added IIS6 configuration options
```

```
 *                  4.51.000 - added routines to copy Visual Studio runtime module
(MSVCR70.DLL)
 *                                      to SystemRoot\System32
 */

#include <windows.h>
#include <direct.h>
#include <io.h>
#include <stdlib.h>
#include <stdio.h>
#include <commctrl.h>
#include "..\..\common\src\ReadRegistry.h"
#include <process.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                   iMaxPoolThreads;
static    int                   iThreadTimeout;
static    int                   iListenBackLog;
static    int                   iAcceptExOutstanding;
static    int                   iUriEnableCache;
static    int                   iUriScavengerPeriod;
static    int                   iMaxConnections;

static    int                   iIISMajorVersion;
static    int                   iNumberOfProcessors;

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, char *szWindowsPath);
static    void                  ReadRegistrySettings(void);
static    void                  WriteRegistrySettings(char *szDllPath);
static    BOOL                  RegisterDLL(char *szFileName);
static    int                             CopyFiles(HWND hDlg, char *szDllPath, char
*szWindowsPath);
static    BOOL                  GetInstallPath(char *szDllPath);
static    BOOL                  GetWindowsInstallPath(char *szWindowsPath);
static    void                  GetVersionInfo(char *szDLLPath, char *szExePath);
static    BOOL                  CheckWWWebService(void);
static    BOOL                  StartWWWebService(void);
static    BOOL                  StopWWWebService(void);
static    void                  UpdateDialog(HWND hDlg);
static    void                  ConfigureIIS6(HWND hwnd, HWND hDlg);

SYSTEM_INFO siSysInfo;

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                     szWindowsPath[256];
                static char                     szExePath[256];

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

                                if ( GetWindowsInstallPath(szWindowsPath) )
                                {
                                        MessageBox(hwnd, "Error: Cannot determine Windows
System Root.", NULL, MB_ICONSTOP | MB_OK);
                                        EndDialog(hwnd, FALSE);
                                        return TRUE;
                                }

                                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();

                                // copy the hardware information to the SYSTEM_INFO
structure
                                GetSystemInfo(&siSysInfo);
                                // store the number of processors on this system
                                iNumberOfProcessors = siSysInfo.dwNumberOfProcessors;

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

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

        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);

        // check to see if the web services are running
        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);
        }

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

        // while we have the web services shutdown, check to see if this
        // is IIS6.  If it is, then call ConfigureIIS6
        if ( iIISMajorVersion == 6)
        {
                ConfigureIIS6(hwnd, 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();
        }

        // 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, "SOFTWARE\\Microsoft\\InetStp", 0,
KEY_READ, &hKey) == ERROR_SUCCESS )
        {
                size = sizeof(iIISMajorVersion);
                if ( RegQueryValueEx(hKey, "MajorVersion", 0, &type, (char
*)&iIISMajorVersion, &size) == ERROR_SUCCESS )
                        if ( !iIISMajorVersion )
                                iIISMajorVersion = 5;
        }

        if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\Inetinfo\\Parameters", 0, KEY_READ, &hKey) ==
ERROR_SUCCESS )
        {
                if ( iIISMajorVersion == 6)
                {
```

```
                        // since IIS6 handles the pool thread parameters
differently, we need to fill in the dialog
                        // with the MaxPoolThreads rather thatn PoolThreadLimit
                        // for ease of coding, we are just going to stuff the value
into iPoolThreadLimit
            size = sizeof(iPoolThreadLimit);
                        if ( RegQueryValueEx(hKey, "MaxPoolThreads", 0, &type,
(char *)&iPoolThreadLimit, &size) == ERROR_SUCCESS )
                        if ( !iPoolThreadLimit )
                                iPoolThreadLimit =  iMaxPhysicalMemory * 2;
                }
                else
                {
                        size = sizeof(iPoolThreadLimit);
                        if ( RegQueryValueEx(hKey, "MaxPoolThreads", 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);
        }
        if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE,
"SYSTEM\\CurrentControlSet\\Services\\HTTP\\Parameters", 0, KEY_READ, &hKey) ==
ERROR_SUCCESS )
        {
                size = sizeof(iUriEnableCache);
                if ( RegQueryValueEx(hKey, "UriEnableCache", 0, &type, (char
*)&iUriEnableCache, &size) == ERROR_SUCCESS )
                        if ( !iUriEnableCache )
                                iUriEnableCache = 0;

                size = sizeof(iUriScavengerPeriod);
                if ( RegQueryValueEx(hKey, "UriScavengerPeriod", 0, &type, (char
*)&iUriScavengerPeriod, &size) == ERROR_SUCCESS )
                        if ( !iUriScavengerPeriod )
                                iUriScavengerPeriod = 10800;
                size = sizeof(iMaxConnections);
                if ( RegQueryValueEx(hKey, "MaxConnections", 0, &type, (char
*)&iMaxConnections, &size) == ERROR_SUCCESS )
                        if ( !iMaxConnections )
                                iMaxConnections = 100000;

                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 )
        {
```

```
                    // if this is IIS6, then we need to treat the PoolThreadLimit
differently
                    // if IIS6, then PoolThreadLimit is the maximum number of threads for
the entire system.
                    // IIS6 added MaxPoolThreads which controls the number of threads per
processor.  For IIS6
                    // we will set MaxPoolThreads to the value the user proivided in the
dialog and then set
                    // PoolThreadLimit to MaxPoolThreads * number of processors on this
system
                    if ( iIISMajorVersion == 6 )
                    {
                              iMaxPoolThreads = iPoolThreadLimit;
                              iPoolThreadLimit = iMaxPoolThreads * iNumberOfProcessors;
                              RegSetValueEx(hKey, "PoolThreadLimit", 0, REG_DWORD, (char
*)&iPoolThreadLimit, sizeof(iPoolThreadLimit));
                              RegSetValueEx(hKey, "MaxPoolThreads", 0, REG_DWORD, (char
*)&iMaxPoolThreads, sizeof(iMaxPoolThreads));
                    }
                    else
                    {
                              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, char *szWindowsPath)
{
          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 MSVCR70.DLL
        strcpy( szLastFileName, "msvcr70.dll" );
        if (!FileFromResource( "MSVCRT70", IDR_MSVCRT701, szWindowsPath, 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);

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

        return 1;
}

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


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

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

                RegCloseKey(hKey);
        }

        return bRc;
}

static BOOL GetWindowsInstallPath(char *szWindowsPath)
{
    HKEY  hKey;
        BYTE      szData[256];
        DWORD     sv;
        BOOL      bRc;
        int                 len;
        int                 iRc;
```

```
        // Registry key HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows
NT\CurrentVersion\SystemRoot is used to find the
        // system root to install the VC70 DLL.

        szWindowsPath[0] =  0;
        bRc = TRUE;
        if ( RegOpenKeyEx(HKEY_LOCAL_MACHINE, "SOFTWARE\\Microsoft\\Windows
NT\\CurrentVersion", 0, KEY_ALL_ACCESS, &hKey) == ERROR_SUCCESS )
        {
                sv = sizeof(szData);
                iRc = RegQueryValueEx( hKey, "SystemRoot", NULL, NULL, szData, &sv );
                if (iRc == ERROR_SUCCESS)
                {
                        bRc = FALSE;
                        strcpy(szWindowsPath, szData);
                        len = strlen(szWindowsPath);
                        if ( szWindowsPath[len-1] != '\\' )
                        {
                                szWindowsPath[len] = '\\';
                                szWindowsPath[len+1] = 0;
                        }
                        // now append the path to SYSTEM32
                        strcat(szWindowsPath, "SYSTEM32\\");
                }

                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);
        schService = OpenService(schSCManager, TEXT("IISADMIN"), 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;
}

static void ConfigureIIS6(HWND hwnd, HWND hDlg)
{
        int                 irc;
        char      szErrTxt[128];
        FILE      *fErrorFile;

        SetDlgItemText(hDlg, IDC_STATUS, "Configuring IIS6...");
        //SendDlgItemMessage(hDlg, IDC_PROGRESS1, PBM_STEPIT, 0, 0);
        UpdateDialog(hDlg);

        irc = system("IIS6_CONFIG.CMD");

        // since the return code from the command file is always 1,
        // check to see if the file iis6_config.err exists
        // if it does, then something hosed
        fErrorFile = fopen("IIS6_CONFIG.err","r");
        if ( fErrorFile != NULL )
        {
                ShowWindow(hwnd, SW_SHOWNA);
                DestroyWindow(hDlg);
                strcpy( szErrTxt, "IIS6 configuration error." );
                strcat( szErrTxt, "Check iis6_config.err" );
                MessageBox(hwnd, szErrTxt, NULL, MB_ICONSTOP | MB_OK);
                EndDialog(hwnd, 0);
                return;
        }
}
```

install\src\install_com.cpp

```
/*        FILE:               INSTALL_COM.CPP
 *                                    Microsoft TPC-C Kit Ver. 4.51.000
 *                                    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;
}
```

db_dblib_dll/src/tpcc_dblib.cpp

```
/*        FILE:               TPCC_DBLIB.CPP
 *                                      Microsoft TPC-C Kit Ver. 4.42.000
 *                                      Copyright Microsoft, 2002
 *              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:
 *                  4.42.000 - changed w_id fields from short to long to support >32K
warehouses
 *                  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, SQLINT4, -1, -1, (BYTE *)
&m_txn.StockLevel.w_id);                // @w_id int
                              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, SQLINT4, -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, SQLINT4, -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, SQLINT4, -1, -1, (BYTE *)
&m_txn.Payment.w_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT4, -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, SQLINT4, -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, SQLINT4, -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;
}
```

db_dblib_dll/src/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."
                    };

                    CTPCC_DBLIB_ERR( int iErr ) { m_errno = iErr; };

                    int                 m_errno;

                    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);
```

tm_com_dll/src/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 );
}
```

tm_com_dll/src/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/src/methods.h

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


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

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

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

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

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

                int ErrorType() {return ERR_TYPE_COMPONENT;};
                int ErrorNum() {return m_Error;};
                char *ErrorText();
};


static void WriteMessageToEventLog(LPTSTR lpszMsg);


////////////////////////////////////////////////////////////////////////
// CTPCC_Common
class CTPCC_Common :
        public ITPCC,
        public IObjectControl,
        public IObjectConstruct,
        public CComObjectRootEx<CComSingleThreadModel>
{
public:
BEGIN_COM_MAP(CTPCC_Common)
        COM_INTERFACE_ENTRY(ITPCC)
        COM_INTERFACE_ENTRY(IObjectControl)
        COM_INTERFACE_ENTRY(IObjectConstruct)
END_COM_MAP()

        CTPCC_Common();
        ~CTPCC_Common();

// ITPCC
public:
        HRESULT __stdcall NewOrder(             VARIANT txn_in, VARIANT* txn_out);
        HRESULT __stdcall Payment(              VARIANT txn_in, VARIANT* txn_out);
```

```
          HRESULT __stdcall Delivery(             VARIANT txn_in, VARIANT* txn_out)
{return E_NOTIMPL;}
          HRESULT __stdcall StockLevel( VARIANT txn_in, VARIANT* txn_out);
          HRESULT __stdcall OrderStatus(          VARIANT txn_in, VARIANT* txn_out);

          HRESULT __stdcall CallSetComplete();

// IObjectControl
          STDMETHODIMP_(BOOL) CanBePooled() { return m_bCanBePooled; }
          STDMETHODIMP Activate() { return S_OK; }          // we don't support COM
Services transactions (no enlistment)
          STDMETHODIMP_(void) Deactivate() { /* nothing to do */ }

// IObjectConstruct
          STDMETHODIMP Construct(IDispatch * pUnk);

          // helper methods
private:
          BOOL                m_bCanBePooled;
          CTPCC_BASE          *m_pTxn;

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

};

/////////////////////////////////////////////////////////////////////////////
// CTPCC
class CTPCC :
          public CTPCC_Common,
          public CComCoClass<CTPCC, &CLSID_TPCC>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_TPCC)

BEGIN_COM_MAP(CTPCC)
          COM_INTERFACE_ENTRY2(IUnknown, CComObjectRootEx)
          COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

};


/////////////////////////////////////////////////////////////////////////////
// CNewOrder
class CNewOrder :
          public CTPCC_Common,
          public CComCoClass<CNewOrder, &CLSID_NewOrder>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_NEWORDER)

BEGIN_COM_MAP(CNewOrder)
          COM_INTERFACE_ENTRY2(IUnknown, CComObjectRootEx)
          COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

// ITPCC
public:
//        HRESULT __stdcall NewOrder(             VARIANT txn_in, VARIANT* txn_out)
{return E_NOTIMPL;}
          HRESULT __stdcall Payment(              VARIANT txn_in, VARIANT* txn_out)
{return E_NOTIMPL;}
          HRESULT __stdcall StockLevel( VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
          HRESULT __stdcall OrderStatus(          VARIANT txn_in, VARIANT* txn_out)
{return E_NOTIMPL;}
};


          /////////////////////////////////////////////////////////////////////////////
// COrderStatus
class COrderStatus :
          public CTPCC_Common,
          public CComCoClass<COrderStatus, &CLSID_OrderStatus>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_ORDERSTATUS)

BEGIN_COM_MAP(COrderStatus)
          COM_INTERFACE_ENTRY2(IUnknown, CComObjectRootEx)
          COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

// ITPCC
public:
          HRESULT __stdcall NewOrder(             VARIANT txn_in, VARIANT* txn_out)
{return E_NOTIMPL;}
          HRESULT __stdcall Payment(              VARIANT txn_in, VARIANT* txn_out)
{return E_NOTIMPL;}
          HRESULT __stdcall StockLevel( VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
//        HRESULT __stdcall OrderStatus(          VARIANT txn_in, VARIANT* txn_out)
{return E_NOTIMPL;}
};


/////////////////////////////////////////////////////////////////////////////
// CPayment
class CPayment :
          public CTPCC_Common,
          public CComCoClass<CPayment, &CLSID_Payment>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_PAYMENT)

BEGIN_COM_MAP(CPayment)
          COM_INTERFACE_ENTRY2(IUnknown, CComObjectRootEx)
          COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

// ITPCC
public:
          HRESULT __stdcall NewOrder(             VARIANT txn_in, VARIANT* txn_out)
{return E_NOTIMPL;}
```

```
//        HRESULT __stdcall Payment(              VARIANT txn_in, VARIANT* txn_out)
{return E_NOTIMPL;}
          HRESULT __stdcall StockLevel( VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
          HRESULT __stdcall OrderStatus(          VARIANT txn_in, VARIANT* txn_out)
{return E_NOTIMPL;}
};


/////////////////////////////////////////////////////////////////////////////
// CStockLevel
class CStockLevel :
          public CTPCC_Common,
          public CComCoClass<CStockLevel, &CLSID_StockLevel>
{
public:
DECLARE_REGISTRY_RESOURCEID(IDR_STOCKLEVEL)

BEGIN_COM_MAP(CStockLevel)
          COM_INTERFACE_ENTRY2(IUnknown, CComObjectRootEx)
          COM_INTERFACE_ENTRY_CHAIN(CTPCC_Common)
END_COM_MAP()

// ITPCC
public:
          HRESULT __stdcall NewOrder(             VARIANT txn_in, VARIANT* txn_out)
{return E_NOTIMPL;}
          HRESULT __stdcall Payment(              VARIANT txn_in, VARIANT* txn_out)
{return E_NOTIMPL;}
//        HRESULT __stdcall StockLevel( VARIANT txn_in, VARIANT* txn_out) {return
E_NOTIMPL;}
          HRESULT __stdcall OrderStatus(          VARIANT txn_in, VARIANT* txn_out)
{return E_NOTIMPL;}
};
```

tpcc_com_all/src/resource.h

```
//{{NO_DEPENDENCIES}}
// Microsoft Developer Studio generated include file.
// Used by tpcc_com_all.rc
//
#define IDS_PROJNAME                    100
#define IDR_TPCC                        101
#define IDR_NEWORDER                    102
#define IDR_ORDERSTATUS                 103
#define IDR_PAYMENT                     104
#define IDR_STOCKLEVEL                  105

// Next default values for new objects
//
#ifdef APSTUDIO_INVOKED
#ifndef APSTUDIO_READONLY_SYMBOLS
#define _APS_NEXT_RESOURCE_VALUE        202
#define _APS_NEXT_COMMAND_VALUE         32768
#define _APS_NEXT_CONTROL_VALUE         201
#define _APS_NEXT_SYMED_VALUE           106
#endif
#endif
```

tpcc_com_all/src/tpcc_com_all.cpp

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

#define STRICT
#define _WIN32_WINNT 0x0400
#define _ATL_APARTMENT_THREADED

#include <stdio.h>
#include <atlbase.h>
//You may derive a class from CComModule and use it if you want to override
//something, but do not change the name of _Module
extern CComModule _Module;

#include <atlcom.h>
#include <initguid.h>
#include <transact.h>
#include <atlimpl.cpp>
#include <comsvcs.h>

#include <sqltypes.h>
#include <sql.h>
#include <sqlext.h>

#include "tpcc_com_ps.h"
#include "..\..\common\src\trans.h"                                          //tpckit
transaction header contains defination of structures specific to TPC-C
#include "..\..\common\src\txn_base.h"
#include "..\..\common\src\error.h"
#include "..\..\common\src\ReadRegistry.h"
#include "..\..\db_dblib_dll\src\tpcc_dblib.h"              // DBLIB implementation of
TPC-C txns
#include "..\..\db_odbc_dll\src\tpcc_odbc.h"                // ODBC implementation of
TPC-C txns

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


CComModule _Module;
```

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


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

static  HINSTANCE hLibInstanceDb = NULL;

TYPE_CTPCC_DBLIB    *pCTPCC_DBLIB_new;
TYPE_CTPCC_ODBC             *pCTPCC_ODBC_new;


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

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

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

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

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

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

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

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

          }
          catch (CBaseErr *e)
          {
                    WriteMessageToEventLog(e->ErrorText());
                    delete e;
                    return FALSE;
          }
          catch (...)
          {
                    WriteMessageToEventLog(TEXT("Unhandled exception in object
DllMain"));
                    return FALSE;
          }

          return TRUE;        // OK
}

////////////////////////////////////////////////////////////////////////////
// Used to determine whether the DLL can be unloaded by OLE

STDAPI DllCanUnloadNow(void)
{
          return (_Module.GetLockCount()==0) ? S_OK : S_FALSE;
}

////////////////////////////////////////////////////////////////////////////
// Returns a class factory to create an object of the requested type

STDAPI DllGetClassObject(REFCLSID rclsid, REFIID riid, LPVOID* ppv)
{
          return _Module.GetClassObject(rclsid, riid, ppv);
}

////////////////////////////////////////////////////////////////////////////
// DllRegisterServer - Adds entries to the system registry

STDAPI DllRegisterServer(void)
{
          // registers object, typelib and all interfaces in typelib
          return _Module.RegisterServer(TRUE);
}

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

```
// DllUnregisterServer - Removes entries from the system registry

STDAPI DllUnregisterServer(void)
{
          _Module.UnregisterServer();
          return S_OK;
}


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

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

    _stprintf(szMsg, TEXT("Error in COM+ TPC-C Component: "));
    lpszStrings[0] = szMsg;
    lpszStrings[1] = lpszMsg;

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

        (VOID) DeregisterEventSource(hEventSource);
    }
}

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

/* FUNCTION: CCOMPONENT_ERR::ErrorText
 *
 */

char* CCOMPONENT_ERR::ErrorText(void)
{
          static SERRORMSG errorMsgs[] =
          {
                    { ERR_MISSING_REGISTRY_ENTRIES,         "Required entries missing
from registry."                                 },
                    { ERR_LOADDLL_FAILED,                             "Load of DLL
failed.  DLL="
          },
                    { ERR_GETPROCADDR_FAILED,               "Could not map proc in DLL.
GetProcAddr error.  DLL="     },
                    { ERR_UNKNOWN_DB_PROTOCOL,              "Unknown database protocol
specified in registry."                 },
                    { 0,
          ""                                                                  }
          };

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

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

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


CTPCC_Common::CTPCC_Common()
{
          m_pTxn = NULL;
          m_bCanBePooled = TRUE;
}

CTPCC_Common::~CTPCC_Common()
{
          if (m_pTxn)
                    delete m_pTxn;
}

HRESULT CTPCC_Common::CallSetComplete()
{
          IObjectContext* pObjectContext = NULL;

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

//
//        called by the ctor activator
//
STDMETHODIMP CTPCC_Common::Construct(IDispatch * pUnk)
```

```
{
          // Code to access construction string, if needed later...
          //        if (!pUnk)
          //                  return E_UNEXPECTED;
          //        IObjectConstructString * pString = NULL;
          //        HRESULT hr = pUnk->QueryInterface(IID_IObjectConstructString, (void
**)&pString);
          //        pString->Release();

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

          return S_OK;
}

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

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

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

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

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

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

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

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

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

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

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

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

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

                    pData->retval = e->ErrorType();
                    pData->error = e->ErrorNum();
                    delete e;
```

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

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

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

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

                m_pTxn->StockLevel();

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

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

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

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

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

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

                m_pTxn->OrderStatus();

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

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

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

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

tpcc_com_all/src/tpcc_com_all.def

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

LIBRARY      "tpcc_com_all.dll"

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

tpcc_com_all/src/tpcc_com_all.h

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

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


 /* File created by MIDL compiler version 5.03.0280 */
/* at Sat Apr 08 16:40:18 2000
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), ms_ext, c_ext
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )


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

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

#ifndef __tpcc_com_all_h__
#define __tpcc_com_all_h__

/* Forward Declarations */

#ifndef __TPCC_FWD_DEFINED__
#define __TPCC_FWD_DEFINED__

#ifdef __cplusplus
typedef class TPCC TPCC;
#else
typedef struct TPCC TPCC;
#endif /* __cplusplus */

#endif    /* __TPCC_FWD_DEFINED__ */


#ifndef __NewOrder_FWD_DEFINED__
#define __NewOrder_FWD_DEFINED__

#ifdef __cplusplus
typedef class NewOrder NewOrder;
#else
typedef struct NewOrder NewOrder;
#endif /* __cplusplus */

#endif    /* __NewOrder_FWD_DEFINED__ */


#ifndef __OrderStatus_FWD_DEFINED__
#define __OrderStatus_FWD_DEFINED__

#ifdef __cplusplus
typedef class OrderStatus OrderStatus;
#else
typedef struct OrderStatus OrderStatus;
#endif /* __cplusplus */

#endif    /* __OrderStatus_FWD_DEFINED__ */


#ifndef __Payment_FWD_DEFINED__
#define __Payment_FWD_DEFINED__

#ifdef __cplusplus
typedef class Payment Payment;
#else
typedef struct Payment Payment;
#endif /* __cplusplus */

#endif    /* __Payment_FWD_DEFINED__ */


#ifndef __StockLevel_FWD_DEFINED__
#define __StockLevel_FWD_DEFINED__

#ifdef __cplusplus
typedef class StockLevel StockLevel;
#else
typedef struct StockLevel StockLevel;
#endif /* __cplusplus */

#endif    /* __StockLevel_FWD_DEFINED__ */


/* header files for imported files */
#include "oaidl.h"
#include "ocidl.h"
#include "tpcc_com_ps.h"

#ifdef __cplusplus
extern "C"{
#endif

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

/* interface __MIDL_itf_tpcc_com_all_0000 */
/* [local] */
```

```
extern RPC_IF_HANDLE __MIDL_itf_tpcc_com_all_0000_v0_0_c_ifspec;
extern RPC_IF_HANDLE __MIDL_itf_tpcc_com_all_0000_v0_0_s_ifspec;


#ifndef __TPCCLib_LIBRARY_DEFINED__
#define __TPCCLib_LIBRARY_DEFINED__

/* library TPCCLib */
/* [helpstring][version][uuid] */


EXTERN_C const IID LIBID_TPCCLib;

EXTERN_C const CLSID CLSID_TPCC;

#ifdef __cplusplus

class DECLSPEC_UUID("122A3128-2520-11D3-BA71-00C04FBFE08B")
TPCC;
#endif

EXTERN_C const CLSID CLSID_NewOrder;

#ifdef __cplusplus

class DECLSPEC_UUID("975BAABF-84A7-11D2-BA47-00C04FBFE08B")
NewOrder;
#endif

EXTERN_C const CLSID CLSID_OrderStatus;

#ifdef __cplusplus

class DECLSPEC_UUID("266836AD-A50D-11D2-BA4E-00C04FBFE08B")
OrderStatus;
#endif

EXTERN_C const CLSID CLSID_Payment;

#ifdef __cplusplus

class DECLSPEC_UUID("CD02F7EF-A4FA-11D2-BA4E-00C04FBFE08B")
Payment;
#endif

EXTERN_C const CLSID CLSID_StockLevel;

#ifdef __cplusplus

class DECLSPEC_UUID("2668369E-A50D-11D2-BA4E-00C04FBFE08B")
StockLevel;
#endif
#endif /* __TPCCLib_LIBRARY_DEFINED__ */

/* Additional Prototypes for ALL interfaces */

/* end of Additional Prototypes */

#ifdef __cplusplus
}
#endif

#endif
```

tpcc_com_all/src/tpcc_com_all.idl

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

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


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

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

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


          [
                    uuid(975BAABF-84A7-11D2-BA47-00C04FBFE08B),
```

```
                helpstring("NewOrder Class")
        ]
        coclass NewOrder
        {
                [default] interface ITPCC;
        };


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


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


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

};
```

tpcc_com_all/src/tpcc_com_all.rc

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

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

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

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

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

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

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

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

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

#endif    // APSTUDIO_INVOKED


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

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

```
        END
    END
    BLOCK "VarFileInfo"
    BEGIN
        VALUE "Translation", 0x409, 1200
    END
END

#endif    // !_MAC


/////////////////////////////////////////////////////////////////////////////
//
// REGISTRY
//

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

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

STRINGTABLE DISCARDABLE
BEGIN
    IDS_PROJNAME            "tpcc_com_all"
END

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



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

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

tpcc_com_all/src/tpcc_com_all.rgs

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

tpcc_com_all/src/tpcc_com_all_i.c

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

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

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


 /* File created by MIDL compiler version 5.03.0280 */
/* at Sat Apr 08 16:40:18 2000
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win32 (32b run), ms_ext, c_ext
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if !defined(_M_IA64) && !defined(_M_AXP64)

#ifdef __cplusplus
extern "C"{
#endif


#include <rpc.h>
#include <rpcndr.h>

#ifdef _MIDL_USE_GUIDDEF_

#ifndef INITGUID
#define INITGUID
#include <guiddef.h>
#undef INITGUID
#else
#include <guiddef.h>
#endif
```

```
#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8) \
        DEFINE_GUID(name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)

#else // !_MIDL_USE_GUIDDEF_

#ifndef __IID_DEFINED__
#define __IID_DEFINED__

typedef struct _IID
{
    unsigned long x;
    unsigned short s1;
    unsigned short s2;
    unsigned char  c[8];
} IID;

#endif // __IID_DEFINED__

#ifndef CLSID_DEFINED
#define CLSID_DEFINED
typedef IID CLSID;
#endif // CLSID_DEFINED

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8) \
        const type name = {l,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}

#endif !_MIDL_USE_GUIDDEF_

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


MIDL_DEFINE_GUID(CLSID,
CLSID_TPCC,0x122A3128,0x2520,0x11D3,0xBA,0x71,0x00,0xC0,0x4F,0xBF,0xE0,0x8B);


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


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


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


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

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



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

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

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

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


 /* File created by MIDL compiler version 5.03.0280 */
/* at Sat Apr 08 16:40:18 2000
 */
/* Compiler settings for .\src\tpcc_com_all.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win64 (32b run,appending), ms_ext, c_ext, robust
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )

#if defined(_M_IA64) || defined(_M_AXP64)

#ifdef __cplusplus
extern "C"{
#endif


#include <rpc.h>
#include <rpcndr.h>

#ifdef _MIDL_USE_GUIDDEF_

#ifndef INITGUID
#define INITGUID
#include <guiddef.h>
#undef INITGUID
#else
#include <guiddef.h>
#endif

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8) \
        DEFINE_GUID(name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8)

#else // !_MIDL_USE_GUIDDEF_

#ifndef __IID_DEFINED__
#define __IID_DEFINED__

typedef struct _IID
{
    unsigned long x;
    unsigned short s1;
    unsigned short s2;
    unsigned char  c[8];
} IID;

#endif // __IID_DEFINED__

#ifndef CLSID_DEFINED
#define CLSID_DEFINED
typedef IID CLSID;
#endif // CLSID_DEFINED

#define MIDL_DEFINE_GUID(type,name,l,w1,w2,b1,b2,b3,b4,b5,b6,b7,b8) \
```

```
        const type name = {l,w1,w2,{b1,b2,b3,b4,b5,b6,b7,b8}}

#endif !_MIDL_USE_GUIDDEF_

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


MIDL_DEFINE_GUID(CLSID,
CLSID_TPCC,0x122A3128,0x2520,0x11D3,0xBA,0x71,0x00,0xC0,0x4F,0xBF,0xE0,0x8B);


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


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


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


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

#undef MIDL_DEFINE_GUID

#ifdef __cplusplus
}
#endif



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

tpcc_com_all/src/tpcc_com_no.rgs

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

tpcc_com_all/src/tpcc_com_os.rgs

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

tpcc_com_all/src/tpcc_com_pay.rgs

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

```
                            InprocServer32 = s '%MODULE%'
                            {
                                    val ThreadingModel = s 'Both'
                            }
                    }
            }
}
```

tpcc_com_all/src/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_all/src/tpcc_com_sl.rgs

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

tpcc_com_ps/src/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 */
```

tpcc_com_ps/src/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/src/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/src/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/src/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/src/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( 0xfffffd4 ),      /* 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( 0xfffffffd4 ),     /* 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( 0xfffffe4 ),     /* Offset= -28 (602) */
/* 632 */
                              0x1b,               /* FC_CARRAY */
                              0x3,                /* 3 */
/* 634 */ NdrFcShort( 0x4 ),  /* 4 */
/* 636 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                              0x0,                /*  */
/* 638 */ NdrFcShort( 0x0 ),  /* 0 */
/* 640 */
                              0x4b,               /* FC_PP */
                              0x5c,               /* FC_PAD */
/* 642 */
                              0x48,               /* FC_VARIABLE_REPEAT */
                              0x49,               /* FC_FIXED_OFFSET */
/* 644 */ NdrFcShort( 0x4 ),  /* 4 */
/* 646 */ NdrFcShort( 0x0 ),  /* 0 */
/* 648 */ NdrFcShort( 0x1 ),  /* 1 */
/* 650 */ NdrFcShort( 0x0 ),  /* 0 */
/* 652 */ NdrFcShort( 0x0 ),  /* 0 */
/* 654 */ 0x12, 0x0,          /* FC_UP */
/* 656 */ NdrFcShort( 0xfffffffd4 ),     /* 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( 0xfffffffd4 ),     /* 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( 0xfffffff0c ),     /* 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( 0xfffffff8 ),     /* Offset= -24 (806) */
/* 832 */
                            0x5b,               /* FC_END */

                            0x8,                /* FC_LONG */
/* 834 */ 0x8,              /* FC_LONG */
                            0x5b,               /* FC_END */
/* 836 */
                            0x15,               /* FC_STRUCT */
                            0x3,                /* 3 */
/* 838 */ NdrFcShort( 0x8 ),  /* 8 */
/* 840 */ 0x8,              /* FC_LONG */
                            0x8,                /* FC_LONG */
/* 842 */ 0x5c,             /* FC_PAD */
                            0x5b,               /* FC_END */
/* 844 */
                            0x1b,               /* FC_CARRAY */
                            0x3,                /* 3 */
/* 846 */ NdrFcShort( 0x8 ),  /* 8 */
/* 848 */ 0x7,              /* Corr desc: FC_USHORT */
                            0x0,                /*  */
/* 850 */ NdrFcShort( 0xffd8 ),        /* -40 */
/* 852 */ 0x4c,             /* FC_EMBEDDED_COMPLEX */
                            0x0,                /* 0 */
/* 854 */ NdrFcShort( 0xffffffee ),     /* Offset= -18 (836) */
/* 856 */ 0x5c,             /* FC_PAD */
                            0x5b,               /* FC_END */
/* 858 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x3,                /* 3 */
/* 860 */ NdrFcShort( 0x28 ), /* 40 */
/* 862 */ NdrFcShort( 0xffffffee ),     /* Offset= -18 (844) */
/* 864 */ NdrFcShort( 0x0 ),  /* Offset= 0 (864) */
/* 866 */ 0x6,              /* FC_SHORT */
                            0x6,                /* FC_SHORT */
/* 868 */ 0x38,             /* FC_ALIGNM4 */
                            0x8,                /* FC_LONG */
/* 870 */ 0x8,              /* FC_LONG */
                            0x4c,               /* FC_EMBEDDED_COMPLEX */
/* 872 */ 0x0,              /* 0 */
                            NdrFcShort( 0xfffffdf7 ),     /* Offset= -521 (352) */
                            0x5b,               /* FC_END */
/* 876 */
                            0x12, 0x0,          /* FC_UP */
/* 878 */ NdrFcShort( 0xfffffef6 ),     /* Offset= -266 (612) */
/* 880 */
                            0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 882 */ 0x1,              /* FC_BYTE */
                            0x5c,               /* FC_PAD */
/* 884 */
                            0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 886 */ 0x6,              /* FC_SHORT */
                            0x5c,               /* FC_PAD */
/* 888 */
                            0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 890 */ 0x8,              /* FC_LONG */
                            0x5c,               /* FC_PAD */
/* 892 */
                            0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 894 */ 0xa,              /* FC_FLOAT */
                            0x5c,               /* FC_PAD */
/* 896 */
                            0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 898 */ 0xc,              /* FC_DOUBLE */
                            0x5c,               /* FC_PAD */
/* 900 */
                            0x12, 0x0,          /* FC_UP */
/* 902 */ NdrFcShort( 0xfffffd90 ),     /* Offset= -624 (278) */
/* 904 */
                            0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 906 */ NdrFcShort( 0xfffffd92 ),     /* Offset= -622 (284) */
/* 908 */
                            0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 910 */ NdrFcShort( 0xfffffda6 ),     /* Offset= -602 (308) */
/* 912 */
                            0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 914 */ NdrFcShort( 0xfffffdb4 ),     /* Offset= -588 (326) */
/* 916 */
                            0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 918 */ NdrFcShort( 0xfffffdc2 ),     /* Offset= -574 (344) */
/* 920 */
                            0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 922 */ NdrFcShort( 0x2 ),  /* Offset= 2 (924) */
/* 924 */
                            0x12, 0x0,          /* FC_UP */
/* 926 */ NdrFcShort( 0x16 ), /* Offset= 22 (948) */
/* 928 */
                            0x15,               /* FC_STRUCT */
                            0x7,                /* 7 */
/* 930 */ NdrFcShort( 0x10 ), /* 16 */
/* 932 */ 0x6,              /* FC_SHORT */
                            0x1,                /* FC_BYTE */
/* 934 */ 0x1,              /* FC_BYTE */
                            0x38,               /* FC_ALIGNM4 */
/* 936 */ 0x8,              /* FC_LONG */
                            0x39,               /* FC_ALIGNM8 */
/* 938 */ 0xb,              /* FC_HYPER */
                            0x5b,               /* FC_END */
/* 940 */
                            0x12, 0x0,          /* FC_UP */
/* 942 */ NdrFcShort( 0xfffffff2 ),     /* Offset= -14 (928) */
/* 944 */
                            0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 946 */ 0x2,              /* FC_CHAR */
                            0x5c,               /* FC_PAD */
/* 948 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x7,                /* 7 */
/* 950 */ NdrFcShort( 0x20 ), /* 32 */
/* 952 */ NdrFcShort( 0x0 ),  /* 0 */
/* 954 */ NdrFcShort( 0x0 ),  /* Offset= 0 (954) */
/* 956 */ 0x8,              /* FC_LONG */
                            0x8,                /* FC_LONG */
/* 958 */ 0x6,              /* FC_SHORT */
                            0x6,                /* FC_SHORT */
/* 960 */ 0x6,              /* FC_SHORT */
                            0x6,                /* FC_SHORT */
/* 962 */ 0x4c,             /* FC_EMBEDDED_COMPLEX */
                            0x0,                /* 0 */
/* 964 */ NdrFcShort( 0xffffffc42 ),     /* 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,{0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00}} */


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


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


extern const MIDL_STUB_DESC Object_StubDesc;


extern const MIDL_SERVER_INFO ITPCC_ServerInfo;

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

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

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

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

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

extern const USER_MARSHAL_ROUTINE_QUADRUPLE UserMarshalRoutines[ WIRE_MARSHAL_TABLE_SIZE
];

static const MIDL_STUB_DESC Object_StubDesc =
    {
    0,
    NdrOleAllocate,
    NdrOleFree,
    0,
    0,
    0,
    0,
    0,
    __MIDL_TypeFormatString.Format,
    1, /* -error bounds_check flag */
    0x50002, /* Ndr library version */
    0,
    0x5030118, /* MIDL Version 5.3.280 */
    0,
    UserMarshalRoutines,
    0,  /* notify & notify_flag routine table */
    0x1, /* MIDL flag */
    0,  /* Reserved3 */
    0,  /* Reserved4 */
    0   /* Reserved5 */
    };

#pragma data_seg(".rdata")

static const USER_MARSHAL_ROUTINE_QUADRUPLE UserMarshalRoutines[ WIRE_MARSHAL_TABLE_SIZE
] =
        {

            {
            VARIANT_UserSize
            ,VARIANT_UserMarshal
            ,VARIANT_UserUnmarshal
            ,VARIANT_UserFree
            }

        };


#if !defined(__RPC_WIN64__)
#error  Invalid build platform for this stub.
#endif
```

```
static const MIDL_PROC_FORMAT_STRING __MIDL_ProcFormatString =
    {
        0,
        {

          /* Procedure NewOrder */

                                0x33,               /* FC_AUTO_HANDLE */
                                0x6c,               /* Old Flags:  object, Oi2 */
/*  2 */  NdrFcLong( 0x0 ),   /* 0 */
/*  6 */  NdrFcShort( 0x3 ),  /* 3 */
#ifndef _ALPHA_
/*  8 */  NdrFcShort( 0x38 ), /* ia64 Stack size/offset = 56 */
#else
                                NdrFcShort( 0x30 ), /* axp64 Stack size/offset = 48 */
#endif
/* 10 */  NdrFcShort( 0x0 ),  /* 0 */
/* 12 */  NdrFcShort( 0x8 ),  /* 8 */
/* 14 */  0x47,               /* Oi2 Flags:  srv must size, clt must size, has return,
has ext, */
                                0x3,                /* 3 */
/* 16 */  0xa,                /* 10 */
                                0x7,                /* Ext Flags:  new corr desc, clt corr
check, srv corr check, */
/* 18 */  NdrFcShort( 0x20 ), /* 32 */
/* 20 */  NdrFcShort( 0x20 ), /* 32 */
/* 22 */  NdrFcShort( 0x0 ),  /* 0 */
/* 24 */  NdrFcShort( 0x0 ),  /* 0 */

          /* Parameter txn_in */

/* 26 */  NdrFcShort( 0x8b ), /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
/* 28 */  NdrFcShort( 0x10 ), /* ia64 Stack size/offset = 16 */
#else
                                NdrFcShort( 0x8 ),  /* axp64 Stack size/offset = 8 */
#endif
/* 30 */  NdrFcShort( 0x3b6 ),          /* Type Offset=950 */

          /* Parameter txn_out */

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

          /* Return value */

/* 38 */  NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 40 */  NdrFcShort( 0x30 ), /* ia64 Stack size/offset = 48 */
#else
                                NdrFcShort( 0x28 ), /* axp64 Stack size/offset = 40 */
#endif
/* 42 */  0x8,                /* FC_LONG */
                                0x0,                /* 0 */

          /* Procedure Payment */

/* 44 */  0x33,               /* FC_AUTO_HANDLE */
                                0x6c,               /* Old Flags:  object, Oi2 */
/* 46 */  NdrFcLong( 0x0 ),   /* 0 */
/* 50 */  NdrFcShort( 0x4 ),  /* 4 */
#ifndef _ALPHA_
/* 52 */  NdrFcShort( 0x38 ), /* ia64 Stack size/offset = 56 */
#else
                                NdrFcShort( 0x30 ), /* axp64 Stack size/offset = 48 */
#endif
/* 54 */  NdrFcShort( 0x0 ),  /* 0 */
/* 56 */  NdrFcShort( 0x8 ),  /* 8 */
/* 58 */  0x47,               /* Oi2 Flags:  srv must size, clt must size, has return,
has ext, */
                                0x3,                /* 3 */
/* 60 */  0xa,                /* 10 */
                                0x7,                /* Ext Flags:  new corr desc, clt corr
check, srv corr check, */
/* 62 */  NdrFcShort( 0x20 ), /* 32 */
/* 64 */  NdrFcShort( 0x20 ), /* 32 */
/* 66 */  NdrFcShort( 0x0 ),  /* 0 */
/* 68 */  NdrFcShort( 0x0 ),  /* 0 */

          /* Parameter txn_in */

/* 70 */  NdrFcShort( 0x8b ), /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
/* 72 */  NdrFcShort( 0x10 ), /* ia64 Stack size/offset = 16 */
#else
                                NdrFcShort( 0x8 ),  /* axp64 Stack size/offset = 8 */
#endif
/* 74 */  NdrFcShort( 0x3b6 ),          /* Type Offset=950 */

          /* Parameter txn_out */

/* 76 */  NdrFcShort( 0x6113 ),         /* Flags:  must size, must free, out, simple ref,
srv alloc size=24 */
#ifndef _ALPHA_
/* 78 */  NdrFcShort( 0x28 ), /* ia64 Stack size/offset = 40 */
#else
                                NdrFcShort( 0x20 ), /* axp64 Stack size/offset = 32 */
#endif
/* 80 */  NdrFcShort( 0x3c8 ),          /* Type Offset=968 */

          /* Return value */

/* 82 */  NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 84 */  NdrFcShort( 0x30 ), /* ia64 Stack size/offset = 48 */
#else
                                NdrFcShort( 0x28 ), /* axp64 Stack size/offset = 40 */
#endif
/* 86 */  0x8,                /* FC_LONG */
                                0x0,                /* 0 */

          /* Procedure Delivery */

/* 88 */  0x33,               /* FC_AUTO_HANDLE */
                                0x6c,               /* Old Flags:  object, Oi2 */
/* 90 */  NdrFcLong( 0x0 ),   /* 0 */
/* 94 */  NdrFcShort( 0x5 ),  /* 5 */
#ifndef _ALPHA_
/* 96 */  NdrFcShort( 0x38 ), /* ia64 Stack size/offset = 56 */
```

```
#else
                            NdrFcShort( 0x30 ), /* axp64 Stack size/offset = 48 */
#endif
/* 98 */  NdrFcShort( 0x0 ),  /* 0 */
/* 100 */ NdrFcShort( 0x8 ),  /* 8 */
/* 102 */ 0x47,               /* Oi2 Flags:  srv must size, clt must size, has return,
has ext, */
                            0x3,                /* 3 */
/* 104 */ 0xa,                /* 10 */
                            0x7,                /* Ext Flags:  new corr desc, clt corr
check, srv corr check, */
/* 106 */ NdrFcShort( 0x20 ), /* 32 */
/* 108 */ NdrFcShort( 0x20 ), /* 32 */
/* 110 */ NdrFcShort( 0x0 ),  /* 0 */
/* 112 */ NdrFcShort( 0x0 ),  /* 0 */

          /* Parameter txn_in */

/* 114 */ NdrFcShort( 0x8b ), /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
/* 116 */ NdrFcShort( 0x10 ), /* ia64 Stack size/offset = 16 */
#else
                            NdrFcShort( 0x8 ),  /* axp64 Stack size/offset = 8 */
#endif
/* 118 */ NdrFcShort( 0x3b6 ),          /* Type Offset=950 */

          /* Parameter txn_out */

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

          /* Return value */

/* 126 */ NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 128 */ NdrFcShort( 0x30 ), /* ia64 Stack size/offset = 48 */
#else
                            NdrFcShort( 0x28 ), /* axp64 Stack size/offset = 40 */
#endif
/* 130 */ 0x8,                /* FC_LONG */
                            0x0,                /* 0 */

          /* Procedure StockLevel */

/* 132 */ 0x33,               /* FC_AUTO_HANDLE */
                            0x6c,               /* Old Flags:  object, Oi2 */
/* 134 */ NdrFcLong( 0x0 ),   /* 0 */
/* 138 */ NdrFcShort( 0x6 ),  /* 6 */
#ifndef _ALPHA_
/* 140 */ NdrFcShort( 0x38 ), /* ia64 Stack size/offset = 56 */
#else
                            NdrFcShort( 0x30 ), /* axp64 Stack size/offset = 48 */
#endif
/* 142 */ NdrFcShort( 0x0 ),  /* 0 */
/* 144 */ NdrFcShort( 0x8 ),  /* 8 */
/* 146 */ 0x47,               /* Oi2 Flags:  srv must size, clt must size, has return,
has ext, */
                            0x3,                /* 3 */
/* 148 */ 0xa,                /* 10 */
                            0x7,                /* Ext Flags:  new corr desc, clt corr
check, srv corr check, */
/* 150 */ NdrFcShort( 0x20 ), /* 32 */
/* 152 */ NdrFcShort( 0x20 ), /* 32 */
/* 154 */ NdrFcShort( 0x0 ),  /* 0 */
/* 156 */ NdrFcShort( 0x0 ),  /* 0 */

          /* Parameter txn_in */

/* 158 */ NdrFcShort( 0x8b ), /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
/* 160 */ NdrFcShort( 0x10 ), /* ia64 Stack size/offset = 16 */
#else
                            NdrFcShort( 0x8 ),  /* axp64 Stack size/offset = 8 */
#endif
/* 162 */ NdrFcShort( 0x3b6 ),          /* Type Offset=950 */

          /* Parameter txn_out */

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

          /* Return value */

/* 170 */ NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 172 */ NdrFcShort( 0x30 ), /* ia64 Stack size/offset = 48 */
#else
                            NdrFcShort( 0x28 ), /* axp64 Stack size/offset = 40 */
#endif
/* 174 */ 0x8,                /* FC_LONG */
                            0x0,                /* 0 */

          /* Procedure OrderStatus */

/* 176 */ 0x33,               /* FC_AUTO_HANDLE */
                            0x6c,               /* Old Flags:  object, Oi2 */
/* 178 */ NdrFcLong( 0x0 ),   /* 0 */
/* 182 */ NdrFcShort( 0x7 ),  /* 7 */
#ifndef _ALPHA_
/* 184 */ NdrFcShort( 0x38 ), /* ia64 Stack size/offset = 56 */
#else
                            NdrFcShort( 0x30 ), /* axp64 Stack size/offset = 48 */
#endif
/* 186 */ NdrFcShort( 0x0 ),  /* 0 */
/* 188 */ NdrFcShort( 0x8 ),  /* 8 */
/* 190 */ 0x47,               /* Oi2 Flags:  srv must size, clt must size, has return,
has ext, */
                            0x3,                /* 3 */
/* 192 */ 0xa,                /* 10 */
                            0x7,                /* Ext Flags:  new corr desc, clt corr
check, srv corr check, */
/* 194 */ NdrFcShort( 0x20 ), /* 32 */
/* 196 */ NdrFcShort( 0x20 ), /* 32 */
/* 198 */ NdrFcShort( 0x0 ),  /* 0 */
```

```
/* 200 */ NdrFcShort( 0x0 ),  /* 0 */

         /* Parameter txn_in */

/* 202 */ NdrFcShort( 0x8b ), /* Flags:  must size, must free, in, by val, */
#ifndef _ALPHA_
/* 204 */ NdrFcShort( 0x10 ), /* ia64 Stack size/offset = 16 */
#else
                               NdrFcShort( 0x8 ),  /* axp64 Stack size/offset = 8 */
#endif
/* 206 */ NdrFcShort( 0x3b6 ),          /* Type Offset=950 */

         /* Parameter txn_out */

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

         /* Return value */

/* 214 */ NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
#ifndef _ALPHA_
/* 216 */ NdrFcShort( 0x30 ), /* ia64 Stack size/offset = 48 */
#else
                               NdrFcShort( 0x28 ), /* axp64 Stack size/offset = 40 */
#endif
/* 218 */ 0x8,                /* FC_LONG */
                               0x0,                /* 0 */

         /* Procedure CallSetComplete */

/* 220 */ 0x33,               /* FC_AUTO_HANDLE */
                               0x6c,               /* Old Flags:  object, Oi2 */
/* 222 */ NdrFcLong( 0x0 ),   /* 0 */
/* 226 */ NdrFcShort( 0x8 ),  /* 8 */
/* 228 */ NdrFcShort( 0x10 ), /* ia64, axp64 Stack size/offset = 16 */
/* 230 */ NdrFcShort( 0x0 ),  /* 0 */
/* 232 */ NdrFcShort( 0x8 ),  /* 8 */
/* 234 */ 0x44,               /* Oi2 Flags:  has return, has ext, */
                               0x1,                /* 1 */
/* 236 */ 0xa,                /* 10 */
                               0x1,                /* Ext Flags:  new corr desc, */
/* 238 */ NdrFcShort( 0x0 ),  /* 0 */
/* 240 */ NdrFcShort( 0x0 ),  /* 0 */
/* 242 */ NdrFcShort( 0x0 ),  /* 0 */
/* 244 */ NdrFcShort( 0x0 ),  /* 0 */

         /* Return value */

/* 246 */ NdrFcShort( 0x70 ), /* Flags:  out, return, base type, */
/* 248 */ NdrFcShort( 0x8 ),  /* ia64, axp64 Stack size/offset = 8 */
/* 250 */ 0x8,                /* FC_LONG */
                               0x0,                /* 0 */

                               0x0

       }
   };
```

```
static const MIDL_TYPE_FORMAT_STRING __MIDL_TypeFormatString =
    {
        0,
        {
                               NdrFcShort( 0x0 ),  /* 0 */
/*  2 */
                               0x12, 0x0,          /* FC_UP */
/*  4 */  NdrFcShort( 0x39e ),          /* Offset= 926 (930) */
/*  6 */
                               0x2b,               /* FC_NON_ENCAPSULATED_UNION */
                               0x9,                /* FC_ULONG */
/*  8 */  0x7,                /* Corr desc: FC_USHORT */
                               0x0,                /*  */
/* 10 */  NdrFcShort( 0xfff8 ),         /* -8 */
/* 12 */  NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 14 */  NdrFcShort( 0x2 ),  /* Offset= 2 (16) */
/* 16 */  NdrFcShort( 0x10 ), /* 16 */
/* 18 */  NdrFcShort( 0x2b ), /* 43 */
/* 20 */  NdrFcLong( 0x3 ),   /* 3 */
/* 24 */  NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 26 */  NdrFcLong( 0x11 ),  /* 17 */
/* 30 */  NdrFcShort( 0x8001 ),         /* Simple arm type: FC_BYTE */
/* 32 */  NdrFcLong( 0x2 ),   /* 2 */
/* 36 */  NdrFcShort( 0x8006 ),         /* Simple arm type: FC_SHORT */
/* 38 */  NdrFcLong( 0x4 ),   /* 4 */
/* 42 */  NdrFcShort( 0x800a ),         /* Simple arm type: FC_FLOAT */
/* 44 */  NdrFcLong( 0x5 ),   /* 5 */
/* 48 */  NdrFcShort( 0x800c ),         /* Simple arm type: FC_DOUBLE */
/* 50 */  NdrFcLong( 0xb ),   /* 11 */
/* 54 */  NdrFcShort( 0x8006 ),         /* Simple arm type: FC_SHORT */
/* 56 */  NdrFcLong( 0xa ),   /* 10 */
/* 60 */  NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 62 */  NdrFcLong( 0x6 ),   /* 6 */
/* 66 */  NdrFcShort( 0xd6 ), /* Offset= 214 (280) */
/* 68 */  NdrFcLong( 0x7 ),   /* 7 */
/* 72 */  NdrFcShort( 0x800c ),         /* Simple arm type: FC_DOUBLE */
/* 74 */  NdrFcLong( 0x8 ),   /* 8 */
/* 78 */  NdrFcShort( 0xd0 ), /* Offset= 208 (286) */
/* 80 */  NdrFcLong( 0xd ),   /* 13 */
/* 84 */  NdrFcShort( 0xe4 ), /* Offset= 228 (312) */
/* 86 */  NdrFcLong( 0x9 ),   /* 9 */
/* 90 */  NdrFcShort( 0xf0 ), /* Offset= 240 (330) */
/* 92 */  NdrFcLong( 0x2000 ),          /* 8192 */
/* 96 */  NdrFcShort( 0xfc ), /* Offset= 252 (348) */
/* 98 */  NdrFcLong( 0x24 ),  /* 36 */
/* 102 */ NdrFcShort( 0x2f4 ),          /* Offset= 756 (858) */
/* 104 */ NdrFcLong( 0x4024 ),          /* 16420 */
/* 108 */ NdrFcShort( 0x2ee ),          /* Offset= 750 (858) */
/* 110 */ NdrFcLong( 0x4011 ),          /* 16401 */
/* 114 */ NdrFcShort( 0x2ec ),          /* Offset= 748 (862) */
/* 116 */ NdrFcLong( 0x4002 ),          /* 16386 */
/* 120 */ NdrFcShort( 0x2ea ),          /* Offset= 746 (866) */
/* 122 */ NdrFcLong( 0x4003 ),          /* 16387 */
/* 126 */ NdrFcShort( 0x2e8 ),          /* Offset= 744 (870) */
/* 128 */ NdrFcLong( 0x4004 ),          /* 16388 */
/* 132 */ NdrFcShort( 0x2e6 ),          /* Offset= 742 (874) */
/* 134 */ NdrFcLong( 0x4005 ),          /* 16389 */
/* 138 */ NdrFcShort( 0x2e4 ),          /* Offset= 740 (878) */
/* 140 */ NdrFcLong( 0x400b ),          /* 16395 */
/* 144 */ NdrFcShort( 0x2d2 ),          /* Offset= 722 (866) */
/* 146 */ NdrFcLong( 0x400a ),          /* 16394 */
/* 150 */ NdrFcShort( 0x2d0 ),          /* Offset= 720 (870) */
/* 152 */ NdrFcLong( 0x4006 ),          /* 16390 */
```

```
/* 156 */ NdrFcShort( 0x2d6 ),          /* Offset= 726 (882) */
/* 158 */ NdrFcLong( 0x4007 ),          /* 16391 */
/* 162 */ NdrFcShort( 0x2cc ),          /* Offset= 716 (878) */
/* 164 */ NdrFcLong( 0x4008 ),          /* 16392 */
/* 168 */ NdrFcShort( 0x2ce ),          /* Offset= 718 (886) */
/* 170 */ NdrFcLong( 0x400d ),          /* 16397 */
/* 174 */ NdrFcShort( 0x2cc ),          /* Offset= 716 (890) */
/* 176 */ NdrFcLong( 0x4009 ),          /* 16393 */
/* 180 */ NdrFcShort( 0x2ca ),          /* Offset= 714 (894) */
/* 182 */ NdrFcLong( 0x6000 ),          /* 24576 */
/* 186 */ NdrFcShort( 0x2c8 ),          /* Offset= 712 (898) */
/* 188 */ NdrFcLong( 0x400c ),          /* 16396 */
/* 192 */ NdrFcShort( 0x2c6 ),          /* Offset= 710 (902) */
/* 194 */ NdrFcLong( 0x10 ),  /* 16 */
/* 198 */ NdrFcShort( 0x8002 ),         /* Simple arm type: FC_CHAR */
/* 200 */ NdrFcLong( 0x12 ),  /* 18 */
/* 204 */ NdrFcShort( 0x8006 ),         /* Simple arm type: FC_SHORT */
/* 206 */ NdrFcLong( 0x13 ),  /* 19 */
/* 210 */ NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 212 */ NdrFcLong( 0x16 ),  /* 22 */
/* 216 */ NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 218 */ NdrFcLong( 0x17 ),  /* 23 */
/* 222 */ NdrFcShort( 0x8008 ),         /* Simple arm type: FC_LONG */
/* 224 */ NdrFcLong( 0xe ),   /* 14 */
/* 228 */ NdrFcShort( 0x2aa ),          /* Offset= 682 (910) */
/* 230 */ NdrFcLong( 0x400e ),          /* 16398 */
/* 234 */ NdrFcShort( 0x2b0 ),          /* Offset= 688 (922) */
/* 236 */ NdrFcLong( 0x4010 ),          /* 16400 */
/* 240 */ NdrFcShort( 0x2ae ),          /* Offset= 686 (926) */
/* 242 */ NdrFcLong( 0x4012 ),          /* 16402 */
/* 246 */ NdrFcShort( 0x26c ),          /* Offset= 620 (866) */
/* 248 */ NdrFcLong( 0x4013 ),          /* 16403 */
/* 252 */ NdrFcShort( 0x26a ),          /* Offset= 618 (870) */
/* 254 */ NdrFcLong( 0x4016 ),          /* 16406 */
/* 258 */ NdrFcShort( 0x264 ),          /* Offset= 612 (870) */
/* 260 */ NdrFcLong( 0x4017 ),          /* 16407 */
/* 264 */ NdrFcShort( 0x25e ),          /* Offset= 606 (870) */
/* 266 */ NdrFcLong( 0x0 ),   /* 0 */
/* 270 */ NdrFcShort( 0x0 ),  /* Offset= 0 (270) */
/* 272 */ NdrFcLong( 0x1 ),   /* 1 */
/* 276 */ NdrFcShort( 0x0 ),  /* Offset= 0 (276) */
/* 278 */ NdrFcShort( 0xffffffff ),     /* Offset= -1 (277) */
/* 280 */
                           0x15,               /* FC_STRUCT */
                           0x7,                /* 7 */
/* 282 */ NdrFcShort( 0x8 ),  /* 8 */
/* 284 */ 0xb,                /* FC_HYPER */
                           0x5b,               /* FC_END */
/* 286 */
                           0x12, 0x0,          /* FC_UP */
/* 288 */ NdrFcShort( 0xe ),  /* Offset= 14 (302) */
/* 290 */
                           0x1b,               /* FC_CARRAY */
                           0x1,                /* 1 */
/* 292 */ NdrFcShort( 0x2 ),  /* 2 */
/* 294 */ 0x9,                /* Corr desc: FC_ULONG */
                           0x0,                /*  */
/* 296 */ NdrFcShort( 0xfffc ),         /* -4 */
/* 298 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 300 */ 0x6,                /* FC_SHORT */
                           0x5b,               /* FC_END */
/* 302 */
                           0x17,               /* FC_CSTRUCT */
                           0x3,                /* 3 */
/* 304 */ NdrFcShort( 0x8 ),  /* 8 */
/* 306 */ NdrFcShort( 0xfffffff0 ),     /* Offset= -16 (290) */
/* 308 */ 0x8,                /* FC_LONG */
                           0x8,                /* FC_LONG */
/* 310 */ 0x5c,               /* FC_PAD */
                           0x5b,               /* FC_END */
/* 312 */
                           0x2f,               /* FC_IP */
                           0x5a,               /* FC_CONSTANT_IID */
/* 314 */ NdrFcLong( 0x0 ),   /* 0 */
/* 318 */ NdrFcShort( 0x0 ),  /* 0 */
/* 320 */ NdrFcShort( 0x0 ),  /* 0 */
/* 322 */ 0xc0,               /* 192 */
                           0x0,                /* 0 */
/* 324 */ 0x0,                /* 0 */
                           0x0,                /* 0 */
/* 326 */ 0x0,                /* 0 */
                           0x0,                /* 0 */
/* 328 */ 0x0,                /* 0 */
                           0x46,               /* 70 */
/* 330 */
                           0x2f,               /* FC_IP */
                           0x5a,               /* FC_CONSTANT_IID */
/* 332 */ NdrFcLong( 0x20400 ),         /* 132096 */
/* 336 */ NdrFcShort( 0x0 ),  /* 0 */
/* 338 */ NdrFcShort( 0x0 ),  /* 0 */
/* 340 */ 0xc0,               /* 192 */
                           0x0,                /* 0 */
/* 342 */ 0x0,                /* 0 */
                           0x0,                /* 0 */
/* 344 */ 0x0,                /* 0 */
                           0x0,                /* 0 */
/* 346 */ 0x0,                /* 0 */
                           0x46,               /* 70 */
/* 348 */
                           0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 350 */ NdrFcShort( 0x2 ),  /* Offset= 2 (352) */
/* 352 */
                           0x12, 0x0,          /* FC_UP */
/* 354 */ NdrFcShort( 0x1e6 ),          /* Offset= 486 (840) */
/* 356 */
                           0x2a,               /* FC_ENCAPSULATED_UNION */
                           0x89,               /* 137 */
/* 358 */ NdrFcShort( 0x20 ), /* 32 */
/* 360 */ NdrFcShort( 0xa ),  /* 10 */
/* 362 */ NdrFcLong( 0x8 ),   /* 8 */
/* 366 */ NdrFcShort( 0x50 ), /* Offset= 80 (446) */
/* 368 */ NdrFcLong( 0xd ),   /* 13 */
/* 372 */ NdrFcShort( 0x70 ), /* Offset= 112 (484) */
/* 374 */ NdrFcLong( 0x9 ),   /* 9 */
/* 378 */ NdrFcShort( 0x90 ), /* Offset= 144 (522) */
/* 380 */ NdrFcLong( 0xc ),   /* 12 */
/* 384 */ NdrFcShort( 0xb0 ), /* Offset= 176 (560) */
/* 386 */ NdrFcLong( 0x24 ),  /* 36 */
/* 390 */ NdrFcShort( 0x104 ),          /* Offset= 260 (650) */
/* 392 */ NdrFcLong( 0x800d ),          /* 32781 */
/* 396 */ NdrFcShort( 0x120 ),          /* Offset= 288 (684) */
/* 398 */ NdrFcLong( 0x10 ),  /* 16 */
/* 402 */ NdrFcShort( 0x13a ),          /* Offset= 314 (716) */
/* 404 */ NdrFcLong( 0x2 ),   /* 2 */
/* 408 */ NdrFcShort( 0x150 ),          /* Offset= 336 (744) */
/* 410 */ NdrFcLong( 0x3 ),   /* 3 */
```

```
/* 414 */ NdrFcShort( 0x166 ),          /* Offset= 358 (772) */
/* 416 */ NdrFcLong( 0x14 ),  /* 20 */
/* 420 */ NdrFcShort( 0x17c ),          /* Offset= 380 (800) */
/* 422 */ NdrFcShort( 0xffffffff ),     /* Offset= -1 (421) */
/* 424 */
                                0x21,               /* FC_BOGUS_ARRAY */
                                0x3,                /* 3 */
/* 426 */ NdrFcShort( 0x0 ),  /* 0 */
/* 428 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 430 */ NdrFcShort( 0x0 ),  /* 0 */
/* 432 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 434 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 438 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 440 */
                                0x12, 0x0,          /* FC_UP */
/* 442 */ NdrFcShort( 0xffffff74 ),     /* Offset= -140 (302) */
/* 444 */ 0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 446 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 448 */ NdrFcShort( 0x10 ), /* 16 */
/* 450 */ NdrFcShort( 0x0 ),  /* 0 */
/* 452 */ NdrFcShort( 0x6 ),  /* Offset= 6 (458) */
/* 454 */ 0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 456 */ 0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 458 */
                                0x11, 0x0,          /* FC_RP */
/* 460 */ NdrFcShort( 0xffffffdc ),     /* Offset= -36 (424) */
/* 462 */
                                0x21,               /* FC_BOGUS_ARRAY */
                                0x3,                /* 3 */
/* 464 */ NdrFcShort( 0x0 ),  /* 0 */
/* 466 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 468 */ NdrFcShort( 0x0 ),  /* 0 */
/* 470 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 472 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 476 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 478 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                /* 0 */
/* 480 */ NdrFcShort( 0xffffff58 ),     /* Offset= -168 (312) */
/* 482 */ 0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 484 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 486 */ NdrFcShort( 0x10 ), /* 16 */
/* 488 */ NdrFcShort( 0x0 ),  /* 0 */
/* 490 */ NdrFcShort( 0x6 ),  /* Offset= 6 (496) */
/* 492 */ 0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 494 */ 0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 496 */
                                0x11, 0x0,          /* FC_RP */
/* 498 */ NdrFcShort( 0xffffffdc ),     /* Offset= -36 (462) */
/* 500 */
                                0x21,               /* FC_BOGUS_ARRAY */
                                0x3,                /* 3 */
/* 502 */ NdrFcShort( 0x0 ),  /* 0 */
/* 504 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 506 */ NdrFcShort( 0x0 ),  /* 0 */
/* 508 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 510 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 514 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 516 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
                                0x0,                /* 0 */
/* 518 */ NdrFcShort( 0xffffff44 ),     /* Offset= -188 (330) */
/* 520 */ 0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 522 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 524 */ NdrFcShort( 0x10 ), /* 16 */
/* 526 */ NdrFcShort( 0x0 ),  /* 0 */
/* 528 */ NdrFcShort( 0x6 ),  /* Offset= 6 (534) */
/* 530 */ 0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 532 */ 0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 534 */
                                0x11, 0x0,          /* FC_RP */
/* 536 */ NdrFcShort( 0xffffffdc ),     /* Offset= -36 (500) */
/* 538 */
                                0x21,               /* FC_BOGUS_ARRAY */
                                0x3,                /* 3 */
/* 540 */ NdrFcShort( 0x0 ),  /* 0 */
/* 542 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 544 */ NdrFcShort( 0x0 ),  /* 0 */
/* 546 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 548 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 552 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 554 */
                                0x12, 0x0,          /* FC_UP */
/* 556 */ NdrFcShort( 0x176 ),          /* Offset= 374 (930) */
/* 558 */ 0x5c,               /* FC_PAD */
                                0x5b,               /* FC_END */
/* 560 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 562 */ NdrFcShort( 0x10 ), /* 16 */
/* 564 */ NdrFcShort( 0x0 ),  /* 0 */
/* 566 */ NdrFcShort( 0x6 ),  /* Offset= 6 (572) */
/* 568 */ 0x8,                /* FC_LONG */
                                0x39,               /* FC_ALIGNM8 */
/* 570 */ 0x36,               /* FC_POINTER */
                                0x5b,               /* FC_END */
/* 572 */
                                0x11, 0x0,          /* FC_RP */
/* 574 */ NdrFcShort( 0xffffffdc ),     /* Offset= -36 (538) */
/* 576 */
                                0x2f,               /* FC_IP */
                                0x5a,               /* FC_CONSTANT_IID */
/* 578 */ NdrFcLong( 0x2f ),  /* 47 */
/* 582 */ NdrFcShort( 0x0 ),  /* 0 */
/* 584 */ NdrFcShort( 0x0 ),  /* 0 */
/* 586 */ 0xc0,               /* 192 */
                                0x0,                /* 0 */
/* 588 */ 0x0,                /* 0 */
                                0x0,                /* 0 */
```

```
/* 590 */ 0x0,               /* 0 */
                             0x0,                /* 0 */
/* 592 */ 0x0,               /* 0 */
                             0x46,               /* 70 */
/* 594 */
                             0x1b,               /* FC_CARRAY */
                             0x0,                /* 0 */
/* 596 */ NdrFcShort( 0x1 ), /* 1 */
/* 598 */ 0x19,              /* Corr desc:  field pointer, FC_ULONG */
                             0x0,                /*  */
/* 600 */ NdrFcShort( 0x4 ), /* 4 */
/* 602 */ NdrFcShort( 0x1 ), /* Corr flags:  early, */
/* 604 */ 0x1,               /* FC_BYTE */
                             0x5b,               /* FC_END */
/* 606 */
                             0x1a,               /* FC_BOGUS_STRUCT */
                             0x3,                /* 3 */
/* 608 */ NdrFcShort( 0x18 ), /* 24 */
/* 610 */ NdrFcShort( 0x0 ), /* 0 */
/* 612 */ NdrFcShort( 0xc ), /* Offset= 12 (624) */
/* 614 */ 0x8,               /* FC_LONG */
                             0x8,                /* FC_LONG */
/* 616 */ 0x4c,              /* FC_EMBEDDED_COMPLEX */
                             0x0,                /* 0 */
/* 618 */ NdrFcShort( 0xffffffd6 ),     /* Offset= -42 (576) */
/* 620 */ 0x39,              /* FC_ALIGNM8 */
                             0x36,               /* FC_POINTER */
/* 622 */ 0x5c,              /* FC_PAD */
                             0x5b,               /* FC_END */
/* 624 */
                             0x12, 0x0,          /* FC_UP */
/* 626 */ NdrFcShort( 0xffffffe0 ),     /* Offset= -32 (594) */
/* 628 */
                             0x21,               /* FC_BOGUS_ARRAY */
                             0x3,                /* 3 */
/* 630 */ NdrFcShort( 0x0 ), /* 0 */
/* 632 */ 0x19,              /* Corr desc:  field pointer, FC_ULONG */
                             0x0,                /*  */
/* 634 */ NdrFcShort( 0x0 ), /* 0 */
/* 636 */ NdrFcShort( 0x1 ), /* Corr flags:  early, */
/* 638 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 642 */ NdrFcShort( 0x0 ), /* Corr flags:  */
/* 644 */
                             0x12, 0x0,          /* FC_UP */
/* 646 */ NdrFcShort( 0xffffffd8 ),     /* Offset= -40 (606) */
/* 648 */ 0x5c,              /* FC_PAD */
                             0x5b,               /* FC_END */
/* 650 */
                             0x1a,               /* FC_BOGUS_STRUCT */
                             0x3,                /* 3 */
/* 652 */ NdrFcShort( 0x10 ), /* 16 */
/* 654 */ NdrFcShort( 0x0 ), /* 0 */
/* 656 */ NdrFcShort( 0x6 ), /* Offset= 6 (662) */
/* 658 */ 0x8,               /* FC_LONG */
                             0x39,               /* FC_ALIGNM8 */
/* 660 */ 0x36,              /* FC_POINTER */
                             0x5b,               /* FC_END */
/* 662 */
                             0x11, 0x0,          /* FC_RP */
/* 664 */ NdrFcShort( 0xffffffdc ),     /* Offset= -36 (628) */
/* 666 */
                             0x1d,               /* FC_SMFARRAY */
                             0x0,                /* 0 */
```

```
/* 668 */ NdrFcShort( 0x8 ),  /* 8 */
/* 670 */ 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( 0xfffffe7 ),     /* Offset= -25 (672) */
                             0x5b,               /* FC_END */
/* 700 */
                             0x11, 0x0,          /* FC_RP */
/* 702 */ NdrFcShort( 0xffffff10 ),     /* Offset= -240 (462) */
/* 704 */
                             0x1b,               /* FC_CARRAY */
                             0x0,                /* 0 */
/* 706 */ NdrFcShort( 0x1 ),  /* 1 */
/* 708 */ 0x19,              /* Corr desc:  field pointer, FC_ULONG */
                             0x0,                /*  */
/* 710 */ NdrFcShort( 0x0 ),  /* 0 */
/* 712 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 714 */ 0x1,               /* FC_BYTE */
                             0x5b,               /* FC_END */
/* 716 */
                             0x1a,               /* FC_BOGUS_STRUCT */
                             0x3,                /* 3 */
/* 718 */ NdrFcShort( 0x10 ), /* 16 */
/* 720 */ NdrFcShort( 0x0 ),  /* 0 */
/* 722 */ NdrFcShort( 0x6 ),  /* Offset= 6 (728) */
/* 724 */ 0x8,               /* FC_LONG */
                             0x39,               /* FC_ALIGNM8 */
/* 726 */ 0x36,              /* FC_POINTER */
                             0x5b,               /* FC_END */
/* 728 */
                             0x12, 0x0,          /* FC_UP */
/* 730 */ NdrFcShort( 0xfffffffe6 ),     /* Offset= -26 (704) */
/* 732 */
                             0x1b,               /* FC_CARRAY */
                             0x1,                /* 1 */
/* 734 */ NdrFcShort( 0x2 ),  /* 2 */
/* 736 */ 0x19,              /* Corr desc:  field pointer, FC_ULONG */
                             0x0,                /*  */
/* 738 */ NdrFcShort( 0x0 ),  /* 0 */
/* 740 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 742 */ 0x6,               /* FC_SHORT */
                             0x5b,               /* FC_END */
```

```
/* 744 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x3,                /* 3 */
/* 746 */ NdrFcShort( 0x10 ), /* 16 */
/* 748 */ NdrFcShort( 0x0 ),  /* 0 */
/* 750 */ NdrFcShort( 0x6 ),  /* Offset= 6 (756) */
/* 752 */ 0x8,                /* FC_LONG */
                            0x39,               /* FC_ALIGNM8 */
/* 754 */ 0x36,               /* FC_POINTER */
                            0x5b,               /* FC_END */
/* 756 */
                            0x12, 0x0,          /* FC_UP */
/* 758 */ NdrFcShort( 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( 0xfffffffdc ),     /* Offset= -36 (930) */
/* 968 */ 0xb4,               /* FC_USER_MARSHAL */
                         0x83,               /* 131 */
/* 970 */ NdrFcShort( 0x0 ),  /* 0 */
/* 972 */ NdrFcShort( 0x18 ), /* 24 */
/* 974 */ NdrFcShort( 0x0 ),  /* 0 */
/* 976 */ NdrFcShort( 0xffffffff4 ),     /* 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)*/
```

common/txnlog/include/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 );
}
```

common/txnlog/include/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
```

common/txnlog/include/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 "";};
};
```

Appendix A - Application Source Code

Appendix B - Database Design

Build Scripts

setup.cmd

```
ECHO OFF

@ECHO ******************************************************************************
@ECHO *                                                                            *
@ECHO *  Microsoft TPC-C Benchmark Kit Ver. 4.01                                    *
@ECHO *                                                                            *
@ECHO ******************************************************************************

if '%1'=='' goto usage
if '%2'=='' goto usage
if '%3'=='' goto usage
if '%4'=='' goto usage
if not '%5'=='' if not '%5' == 'scaled' goto usage

::Cleanup any old .err files
@if exist logs\*.err del logs\*.err
        >nul

if  '%3'=='full' goto start
if  '%3'=='builddb' goto builddb
if  '%3'=='objects' goto objects
if  '%3'=='bulkload' goto bulkload
if  '%3'=='objectsfull' goto objects
if  '%3'=='bulkloadfull' goto bulkload
if  '%3'=='backup' goto backup
goto usage

:start
:: Cleanup the logs directory...
@if exist logs\version.log del logs\version.log                                 >nul
@if exist logs\db.log del logs\db.log                                           >nul
@if exist logs\objects.log del logs\objects.log                                 >nul
@if exist logs\objects.log del logs\objects.log                                 >nul
@if exist logs\bulkload.log del logs\bulkload.log                       >nul
@if exist logs\backup.log del logs\backup.log                                   >nul

isql -Usa -P -S%1 -Q"select @@version"                                          >
logs\version.log
isql -Usa -P -S%1 -Q"select getdate()"                                          >>
logs\version.log

:builddb
@if exist logs\db.log del logs\db.log                                           >nul
@ECHO Building database files and database...
isql -Usa -P -S%1 -e < scripts\%2.war\%4\createdb.sql                           >
logs\db.log
@ECHO Database build complete.
if  '%3'=='full' goto objects
goto end

:objects
@if exist logs\objects.log del logs\objects.log                                 >nul
@ECHO Creating database objects...
isql -Usa -P -S%1 -e < scripts\ddl\%4\tables.sql                        >  logs\objects.log
isql -Usa -P -S%1 -e < scripts\dml\%4\neword.sql                        >> logs\objects.log
isql -Usa -P -S%1 -e < scripts\dml\%4\payment.sql                       >> logs\objects.log
isql -Usa -P -S%1 -e < scripts\dml\%4\ordstat.sql                       >> logs\objects.log
isql -Usa -P -S%1 -e < scripts\dml\%4\delivery.sql                              >>
logs\objects.log
isql -Usa -P -S%1 -e < scripts\dml\%4\stocklev.sql                              >>
logs\objects.log
@ECHO Database object creation complete.
if  '%3'=='full' goto bulkload
if  '%3'=='objectsfull' goto bulkload
goto end

:bulkload
@if exist logs\bulkload.log del logs\bulkload.log                       >nul
@ECHO Beginning data load and index creation...
isql -Usa -P -S%1 -e < scripts\utility\%4\dbopt1.sql                            >>
logs\objects.log
if '%4'=='mssql70' goto odbc
if '%4'=='mssql65' goto dblib
goto usage
:dblib
if '%5'==''      loader\%4\bin\tpccldr -S%1 -W%2 -flogs\bulkload.log -dscripts\ddl\%4 -c0
if '%5'=='normal' loader\%4\bin\tpccldr -S%1 -W%2 -flogs\bulkload.log -dscripts\ddl\%4 -
c0
if '%5'=='scaled' loader\%4\bin\tpccldr -S%1 -W%2 -flogs\bulkload.log -dscripts\ddl\%4 -
c1
goto bulkloaddone
:odbc
if '%5'==''      loader\%4\bin\tpccldr -S%1 -W%2 -flogs\bulkload.log -dscripts\ddl\%4 -c0
if '%5'=='normal' loader\%4\bin\tpccldr -S%1 -W%2 -flogs\bulkload.log -dscripts\ddl\%4 -
c0
if '%5'=='scaled' loader\%4\bin\tpccldr -S%1 -W%2 -flogs\bulkload.log -dscripts\ddl\%4 -
c1
goto bulkloaddone
:bulkloaddone
isql -Usa -P -S%1 -e < scripts\utility\%4\dbopt2.sql                            >>
logs\bulkload.log
@ECHO Data load and index creation complete.
if  '%3'=='full' goto backup
if  '%3'=='objectsfull' goto backup
if  '%3'=='bulkloadfull' goto backup
goto end

:backup
@if exist logs\backup.log del logs\backup.log                                   >nul
@ECHO Backing up database...
isql -Usa -P -S%1 -e < scripts\%2.war\%4\backup.sql                             >
logs\backup.log
@ECHO Database backup complete.
if  '%3'=='full' goto verifyload
if  '%3'=='objectsfull' goto verifyload
if  '%3'=='bulkloadfull' goto verifyload
goto complete

:verifyload
@if exist logs\verifyload.log del logs\verifyload.log                           >nul
@Echo Verifying TPC-C database load...
```

```
isql -Usa -P -S%1 < scripts\utility\%4\verifytpccload.sql                    >
logs\verifyload.log
@ECHO Check logs\verifyload.log to verify database load.

:complete
@ECHO ********************************************************************
@ECHO *                                                                  *
@ECHO *  Full TPC-C build complete.  Check logs directory for setup errors.   *
@ECHO *                                                                  *
@ECHO ********************************************************************

goto end

:usage
@ECHO ********************************************************************
@ECHO *                                                                  *
@ECHO *  The TPC-C setup command file requires the following parameters:      *
@ECHO *                                                                  *
@ECHO *  setup SERVER NUMWAR BLDOPT VERSION DBTYPE                        *
@ECHO *                                                                  *
@ECHO *      SERVER  = machine name of server (use "" for local server)       *
@ECHO *      NUMWAR  = number of warehouses                              *
@ECHO *      BLDOPT  = full, builddb, objects, objectsfull, bulkload,         *
@ECHO *                bulkloadfull, or backup                           *
@ECHO *      VERSION = mssql65 or mssql70                                *
@ECHO *      DBTYPE  = normal or scaled                                  *
@ECHO *                                                                  *
@ECHO *  Note #1: the BLDOPT and VERSION parameters are case sensitive.       *
@ECHO *                                                                  *
@ECHO *  Note #2: the DBTYPE is optional.  If no DBTYPE is specified, SETUP   *
@ECHO *           will default to NORMAL.                                *
@ECHO *                                                                  *
@ECHO *  Example:                                                        *
@ECHO *                                                                  *
@ECHO *  The following command would be used to build a complete 200          *
@ECHO *  warehouse database on SQL Server 7.0 runnning on server \\myserver.  *
@ECHO *                                                                  *
@ECHO *      SETUP myserver 200 full mssql70                             *
@ECHO *                                                                  *
@ECHO *  Note, this command file does a backup of the database by default     *
@ECHO *  after the database build process is complete.  If you do not wish    *
@ECHO *  to make a backup (strongly discouraged), you must edit this file     *
@ECHO *  and comment that section out.  Also, if you need to run the dbcheck  *
@ECHO *  and the dbtables scripts on the fresh database load for an audit,    *
@ECHO *  you must either run them manually or edit this file to include them. *
@ECHO *                                                                  *
@ECHO ********************************************************************

:end

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


use master
go

--        Create temporary table for timing

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

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

insert    into tpcc_timer values (0,0)
go

--        Store starting time

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

--  create main database files

CREATE DATABASE tpcc
ON PRIMARY
(         NAME                = MSSQL_tpcc_root,
          FILENAME  = "C:\MSSQL_tpcc_root.mdf",
          SIZE                = 8MB,
          FILEGROWTH          =0),
FILEGROUP MSSQL_misc_fg
(         NAME                = MSSQL_misc1,
          FILENAME  = "K:",
          SIZE                = 30000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_misc2,
          FILENAME  = "S:",
          SIZE                = 30000MB,
          FILEGROWTH          = 0),
FILEGROUP MSSQL_cs_fg
(         NAME                = MSSQL_cs1,
          FILENAME  = "Y:",
          SIZE                = 50000MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL_cs2,
          FILENAME  = "W:",
          SIZE                = 50000MB,
          FILEGROWTH          = 0)

LOG ON
(         NAME                =MSSQL_tpcc_log,
          FILENAME  ="L:",
          SIZE                =54000MB,
          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
```

tables.sql

```
--  File:     TABLES.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.00
--            Copyright Microsoft, 1996
--  Purpose:  Creates TPC-C tables


use tpcc
go

if exists ( select name from sysobjects where name = 'warehouse' )
          drop table warehouse
go
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 MSSQL70_misc_fg
go

if exists ( select name from sysobjects where name = 'district' )
          drop table district
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 MSSQL70_misc_fg
go

if exists ( select name from sysobjects where name = 'customer' )
          drop table customer
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 MSSQL70_cs_fg
go

if exists ( select name from sysobjects where name = 'history' )
          drop table history
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 MSSQL70_misc_fg
go

if exists ( select name from sysobjects where name = 'new_order' )
          drop table new_order
go
create table new_order
(
          no_o_id                                       int,
          no_d_id                                       tinyint,
          no_w_id                                       smallint
) on MSSQL70_misc_fg
go

if exists ( select name from sysobjects where name = 'orders' )
          drop table orders
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 MSSQL70_misc_fg
go
```

```
if exists ( select name from sysobjects where name = 'order_line' )
          drop table order_line
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 MSSQL70_misc_fg
go

if exists ( select name from sysobjects where name = 'item' )
          drop table item
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 MSSQL70_misc_fg
go

if exists ( select name from sysobjects where name = 'stock' )
          drop table stock
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 MSSQL70_cs_fg
go
```

idxcuscl.sql

```
--  File:     IDXCUSCL.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.00
--            Copyright Microsoft, 1996
--  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 MSSQL70_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. 4.00
--            Copyright Microsoft, 1996
--  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 MSSQL70_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. 4.00
--            Copyright Microsoft, 1996
--  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 MSSQL70_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. 4.00
--            Copyright Microsoft, 1996
--  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 MSSQL70_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. 4.00
--            Copyright Microsoft, 1996
--  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 MSSQL70_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:     IDXNODCL.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.00
--            Copyright Microsoft, 1996
--  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 MSSQL70_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. 4.00
--            Copyright Microsoft, 1996
--  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 MSSQL70_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. 4.00
--            Copyright Microsoft, 1996
--  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 MSSQL70_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. 4.00
--            Copyright Microsoft, 1996
--  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 MSSQL70_misc_fg

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

go
```

dbopt1.sql

```
--  File:     DBOPT1.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.00
--            Copyright Microsoft, 1996
--  Purpose:  Sets database options for data load


use master
go

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

use tpcc
go

checkpoint
go
```

dbopt2.sql

```
--  File:     DBOPT2.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.00
--            Copyright Microsoft, 1996
--  Purpose:  Resets database options after data load


use master
go

sp_dboption tpcc,'select ',false
go

sp_dboption tpcc,'trunc. ',false
go

use tpcc
go

checkpoint
go

sp_configure allow,1
go

reconfigure with override
go

/*                                          */
/* Set option values for user-defined indexes */
/*                                          */

sp_indexoption 'customer','AllowPageLocks',FALSE
go
sp_indexoption 'district','AllowPageLocks',FALSE
go
sp_indexoption 'warehouse','AllowPageLocks',FALSE
go
sp_indexoption 'stock','AllowPageLocks',FALSE
go
sp_indexoption 'order_line','AllowPageLocks',FALSE
go
sp_indexoption 'orders','AllowPageLocks',FALSE
go
sp_indexoption 'new_order','AllowRowLocks',FALSE
go
sp_indexoption 'item','AllowRowLocks',FALSE
go
sp_indexoption 'item','AllowPageLocks',FALSE
go

Print ' '
Print '******************'
Print 'Pre-specified Locking Hierarchy:'
Print '   Lockflag = 0 ==> No pre-pecified 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,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
```

dbopt3.sql

```
use tpcc
go
sp_indexoption 'orders','AllowPagelocks',TRUE
go
sp_indexoption 'orders','AllowRowlocks',FALSE
go
sp_indexoption 'order_line','AllowPagelocks',TRUE
go
sp_indexoption 'order_line','AllowRowlocks',FALSE
go
```

backup.sql

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


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

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

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

go
```

restore.sql

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


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

load database tpcc from tpccback1, tpccback2 with stats = 1

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

go
```

Stored Procedures

neword.sql

```
--  File:     NEWORD.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.01
--            Copyright Microsoft, 1996
--  Purpose:  Creates new order transaction stored procedure
--
--  Modified 9/21/98 - Jamie Reding - Microsoft Corporation
--                  Reordered @rowcount check so that invalid supply warehouse id,
--      as well as invalid item id, is detected and causes explicit
--                  transaction rollback.
--

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. 4.00
--            Copyright Microsoft, 1996
--  Purpose:  Creates payment transaction stored procedure


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. 4.00
--            Copyright Microsoft, 1996
--  Purpose:  Creates order status transaction stored procedure


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,
          tinyint,

          int,
= ""

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
                                                                                @d_id

                                                                                @c_id

                                                                                @c_last  char(16)
```

```
--  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. 4.00
--            Copyright Microsoft, 1996
--  Purpose:  Creates delivery transaction stored procedure

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. 4.00
--            Copyright Microsoft, 1996
--  Purpose:  Creates stock level transaction stored procedure


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
```

Loader Source Code

tpcc.h

```
//        File:               TPCC.H
//                                      Microsoft TPC-C Kit Ver. 4.00
//                                      Copyright Microsoft, 1996, 1997, 1998

//        Purpose:  Header file for TPC-C database loader


// Build number of TPC Benchmark Kit
#define TPCKIT_VER  "4.00"

// 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 ORDERS_PER_DIST                  3000
#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. 4.00
//                                    Copyright Microsoft, 1996, 1997, 1998
//        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);

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      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     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);

      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(500, 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_DIST+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_DIST);

          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 12:00:00.000");

                              }
                    }
          }
}


//================================================================
//
// 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 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;

}
```

getargs.c

```
//        File:               GETARGS.C
//                                    Microsoft TPC-C Kit Ver. 4.00
//                                    Copyright Microsoft, 1996, 1997, 1998
//        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. 4.00
//                                  Copyright Microsoft, 1996, 1997, 1998
```

```
//        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. 4.00
//                                    Copyright Microsoft, 1996, 1997, 1998
//        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;
          static    char chArray[] =
"0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz";
          static    int       chArrayMax = 61;

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

          len= RandomNumber(x, y);

          for (i=0; i<len; i++)
                    str[i] = chArray[RandomNumber(0, chArrayMax)];
          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. 4.00
//                                      Copyright Microsoft, 1996, 1997, 1998
//        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;
}
```

Appendix C - Tunable Parameters

Server Configuration Parameters

Microsoft Windows 2003 Server Parameters

The following registry key was added to disable the kernel counters for Global and Per-Process I/Os:
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\I/O System]
"CountOperations"=dword:00000000

Microsoft Windows 2003 Server Configuration

The following services were disabled on the server:

- Alerter
- Automatic Updates
- Computer Browser
- Cryptographic Services
- DHCP Client
- Distributed File System
- Distributed Link Tracking Client
- DNS Client
- Global Array Manager Server
- Help and Support
- IPSEC Policy Agent
- License Logging Service
- Messenger
- MSSQLserver
- Microsoft Search
- Print Spooler
- Process Control Service
- Remote Registry Service
- Removable Storage
- Run as Service
- System Event Notification
- SSDP Discovery service
- Task Scheduler
- Wireless configuration

Microsoft SQL Server 2000 Startup Parameters

Microsoft SQL Server was started with the following command line options

sqlservr -c -x -T3502 –g100

where

-c	Start SQL Server independently of the Microsoft Windows NT Service Control Manager.

-x	Disable the keeping of CPU time and cache-hit ratio statistics.
-T3502	Prints a message to the log at the beginning and end of each checkpoint.
-g150	Reserve 150 MB for non-buffer pool allocations

Microsoft SQL Server Stack Size

The default stack size of Microsoft SQL Server was changed using the EDITBIN utility. The EDITBIN utility ships with Microsoft Visual C++. The command used was editbin /stack:131072 sqlservr.exe.

Microsoft SQL Server 2000 Configuration Parameters

name	minimum	maximum	config_value	run_value
affinity mask	0	2147483647	3	3
allow updates	0	1	1	1
c2 audit mode	0	1	0	0
cost threshold for parallelism	0	32767	5	5
cursor threshold	-1	2147483647	-1	-1
default full-text language	0	2147483647	1033	1033
default language	0	9999	0	0
fill factor (%)	0	100	0	0
index create memory (KB)	704	1600000	0	0
language in cache	3	100	3	3
lightweight pooling	0	1	1	1
locks	5000	2147483647	0	0
max degree of parallelism	0	32	1	1
max server memory (MB)	4	2147483647	2000	2000
max text repl size (B)	0	2147483647	65536	65536
max worker threads	10	1024	820	820
media retention	0	365	0	0
min memory per query (KB)	512	2147483647	1024	1024
min server memory (MB)	0	2147483647	0	0
nested triggers	0	1	1	1
network packet size (B)	512	65535	4096	4096
open objects	0	2147483647	0	0
priority boost	0	1	1	1
query governor cost limit	0	2147483647	0	0
query wait (s)	-1	2147483647	-1	-1
recovery interval (min)	0	32767	32767	32767
remote access	0	1	0	0
remote login timeout (s)	0	2147483647	5	5
remote proc trans	0	1	0	0
remote query timeout (s)	0	2147483647	0	0
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	16383	0	0

Appendix C – Tunable Parameters

System Information report written at: 02/01/05 17:43:59
System Name: PE2800
[System Summary]

Item Value
OS Name Microsoft(R) Windows(R) Server 2003, Standard Edition
Version 5.2.3790 Build 3790
OS Manufacturer Microsoft Corporation
System Name PE2800
System Manufacturer Dell Computer Corporation
System Model PowerEdge 2800
System Type X86-based PC
Processor x86 Family 15 Model 4 Stepping 3 GenuineIntel ~3391 Mhz
Processor x86 Family 15 Model 4 Stepping 3 GenuineIntel ~3391 Mhz
BIOS Version/Date Dell Computer Corporation A01, 9/2/2004
SMBIOS Version 2.3
Windows Directory C:\WINDOWS
System Directory C:\WINDOWS\system32
Boot Device \Device\HarddiskVolume1
Locale United States
Hardware Abstraction Layer Version = "5.2.3790.0 (srv03_rtm.030324-2048)"
User Name PE2800\Administrator
Time Zone Central America Standard Time
Total Physical Memory 2,560.00 MB
Available Physical Memory 711.00 MB
Total Virtual Memory 6.85 GB
Available Virtual Memory 3.39 GB
Page File Space 4.35 GB
Page File C:\pagefile.sys

[Hardware Resources]

[Conflicts/Sharing]

Resource Device
I/O Port 0x00000000-0x00000CF7 PCI bus
I/O Port 0x00000000-0x00000CF7 Direct memory access controller

I/O Port 0x0000E000-0x0000EFFF PCI standard PCI-to-PCI bridge
I/O Port 0x0000E000-0x0000EFFF PCI standard PCI-to-PCI bridge

I/O Port 0x0000B000-0x0000CFFF PCI standard PCI-to-PCI bridge
I/O Port 0x0000B000-0x0000CFFF PCI standard PCI-to-PCI bridge

Memory Address 0xC4000000-0xC7FFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xC4000000-0xC7FFFFFF DELL PERC 3/DC Plus RAID Controller

Memory Address 0xC8000000-0xD7FFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xC8000000-0xD7FFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xC8000000-0xD7FFFFFF DELL PERC 3/DC Plus RAID Controller

IRQ 16 PCI standard PCI-to-PCI bridge

IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 Standard Universal PCI to USB Host Controller

IRQ 18 Standard Universal PCI to USB Host Controller
IRQ 18 RADEON 7000 RADEON VE Family (Microsoft Corporation)

Memory Address 0xB8000000-0xC7FFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xB8000000-0xC7FFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xB8000000-0xC7FFFFFF DELL PERC 3/DC Plus RAID Controller

Memory Address 0xA0000-0xBFFFF PCI bus
Memory Address 0xA0000-0xBFFFF RADEON 7000 RADEON VE Family (Microsoft Corporation)

[DMA]

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

[Forced Hardware]

Device PNP Device ID

[I/O]

Resource	Device	Status
0x00000000-0x00000CF7	PCI bus	OK
0x00000000-0x00000CF7	Direct memory access controller	OK
0x00000D00-0x0000FFFF	PCI bus	OK
0x0000E000-0x0000EFFF	PCI standard PCI-to-PCI bridge	OK
0x0000E000-0x0000EFFF	PCI standard PCI-to-PCI bridge	OK
0x0000EC00-0x0000ECFF	LSI Logic PCI-X Ultra320 SCSI Host Adapter	OK
0x0000E800-0x0000E8FF	LSI Logic PCI-X Ultra320 SCSI Host Adapter	OK
0x0000D000-0x0000DFFF	PCI standard PCI-to-PCI bridge	OK
0x0000B000-0x0000CFFF	PCI standard PCI-to-PCI bridge	OK
0x0000B000-0x0000CFFF	PCI standard PCI-to-PCI bridge	OK
0x0000C000-0x0000CFFF	PCI standard PCI-to-PCI bridge	OK
0x0000CCC0-0x0000CCFF	Intel(R) PRO/1000 MT Network Connection	OK
0x0000A000-0x0000AFFF	PCI standard PCI-to-PCI bridge	OK
0x00008CE0-0x00008CFF	Standard Universal PCI to USB Host Controller	OK
0x00008CC0-0x00008CDF	Standard Universal PCI to USB Host Controller	OK
0x00008CA0-0x00008CBF	Standard Universal PCI to USB Host Controller	OK
0x00009C00-0x00009CFF	RADEON 7000 RADEON VE Family (Microsoft Corporation)	OK
0x000003B0-0x000003BB	RADEON 7000 RADEON VE Family (Microsoft Corporation)	OK
0x000003C0-0x000003DF	RADEON 7000 RADEON VE Family (Microsoft Corporation)	OK
0x00000A79-0x00000A79	ISAPNP Read Data Port	OK
0x00000279-0x00000279	ISAPNP Read Data Port	OK

```
0x00000274-0x00000277    ISAPNP Read Data Port          OK
0x00000080-0x0000009F    Direct memory access controller OK
0x000000C0-0x000000DF    Direct memory access controller OK
0x000000F0-0x000000FF    Numeric data processor OK
0x00000020-0x0000003F    Programmable interrupt controller      OK
0x000000A0-0x000000BF    Programmable interrupt controller      OK
0x000004D0-0x000004D1    Programmable interrupt controller      OK
0x00000061-0x00000061    System speakerOK
0x00000070-0x0000007F    System CMOS/real time clock    OK
0x00000040-0x0000005F    System timer    OK
0x000003F0-0x000003F5    Standard floppy disk controller    OK
0x000003F7-0x000003F7    Standard floppy disk controller    OK
0x00000060-0x00000060    Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
        OK
0x00000064-0x00000064    Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
        OK
0x000003F8-0x000003FF    Communications Port (COM1)    OK
0x00000378-0x0000037F    ECP Printer Port (LPT1)OK
0x00000778-0x0000077F    ECP Printer Port (LPT1)OK
0x00000800-0x0000087F    System board    OK
0x00000880-0x000008BF    System board    OK
0x000008C0-0x000008DF    System board    OK
0x00000C00-0x00000C0F    System board    OK
0x00000C10-0x00000C1F    System board    OK
0x00000CA0-0x00000CAF    System board    OK
0x00000C20-0x00000C3F    System board    OK
0x000000E0-0x000000E7    System board    OK
0x0000FC00-0x0000FC0F    Intel(r) 82801EB Parallel Ultra ATA Storage Controller-24DB
        OK
0x000001F0-0x000001F7    Primary IDE Channel    OK
0x000003F6-0x000003F6    Primary IDE Channel    OK
0x00000170-0x00000177    Secondary IDE ChannelOK
0x00000376-0x00000376    Secondary IDE ChannelOK

[IRQs]

Resource        Device  Status
IRQ 9   Microsoft ACPI-Compliant System        OK
IRQ 16  PCI standard PCI-to-PCI bridge  OK
IRQ 16  PCI standard PCI-to-PCI bridge  OK
IRQ 16  PCI standard PCI-to-PCI bridge  OK
IRQ 16  PCI standard PCI-to-PCI bridge  OK
IRQ 16  PCI standard PCI-to-PCI bridge  OK
IRQ 16  Standard Universal PCI to USB Host Controller  OK
IRQ 34  LSI Logic PCI-X Ultra320 SCSI Host Adapter     OK
IRQ 33  LSI Logic PCI-X Ultra320 SCSI Host Adapter     OK
IRQ 37  DELL PERC 3/DC Plus RAID Controller OK
IRQ 106         DELL PERC 3/DC Plus RAID Controller OK
IRQ 101         DELL PERC 3/DC Plus RAID Controller OK
IRQ 64  Intel(R) PRO/1000 MT Network Connection        OK
IRQ 19  Standard Universal PCI to USB Host Controller  OK
IRQ 18  Standard Universal PCI to USB Host Controller  OK
IRQ 18  RADEON 7000 RADEON VE Family (Microsoft Corporation)      OK
IRQ 23  Standard Enhanced PCI to USB Host Controller OK
IRQ 13  Numeric data processor OK
```

IRQ 8 System CMOS/real time clock OK
IRQ 0 System timer OK
IRQ 6 Standard floppy disk controller OK
IRQ 1 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard OK
IRQ 12 PS/2 Compatible MouseOK
IRQ 4 Communications Port (COM1) OK
IRQ 14 Primary IDE Channel OK
IRQ 15 Secondary IDE ChannelOK

[Memory]

Resource Device Status
0xA0000-0xBFFFF PCI busOK
0xA0000-0xBFFFF RADEON 7000 RADEON VE Family (Microsoft Corporation) OK
0xA0000000-0xFEBFFFFF PCI busOK
0xDFB00000-0xDFEFFFFF PCI standard PCI-to-PCI bridge OK
0xC8000000-0xD7FFFFFF PCI standard PCI-to-PCI bridge OK
0xC8000000-0xD7FFFFFF PCI standard PCI-to-PCI bridge OK
0xC8000000-0xD7FFFFFF DELL PERC 3/DC Plus RAID Controller OK
0xDFD00000-0xDFEFFFFF PCI standard PCI-to-PCI bridge OK
0xD7000000-0xD7FFFFFF PCI standard PCI-to-PCI bridge OK
0xDFDF0000-0xDFDFFFFF LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
0xDFDE0000-0xDFDEFFFF LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
0xDFDD0000-0xDFDDFFFF LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
0xDFDC0000-0xDFDCFFFF LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
0xDFC00000-0xDFCFFFFF PCI standard PCI-to-PCI bridge OK
0xDF800000-0xDFAFFFFF PCI standard PCI-to-PCI bridge OK
0xB8000000-0xC7FFFFFF PCI standard PCI-to-PCI bridge OK
0xB8000000-0xC7FFFFFF PCI standard PCI-to-PCI bridge OK
0xB8000000-0xC7FFFFFF DELL PERC 3/DC Plus RAID Controller OK
0xDFA00000-0xDFAFFFFF PCI standard PCI-to-PCI bridge OK
0xC4000000-0xC7FFFFFF PCI standard PCI-to-PCI bridge OK
0xC4000000-0xC7FFFFFF DELL PERC 3/DC Plus RAID Controller OK
0xDF900000-0xDF9FFFFF PCI standard PCI-to-PCI bridge OK
0xDF700000-0xDF7FFFFF PCI standard PCI-to-PCI bridge OK
0xD9000000-0xD9FFFFFF PCI standard PCI-to-PCI bridge OK
0xDF200000-0xDF6FFFFF PCI standard PCI-to-PCI bridge OK
0xDF500000-0xDF6FFFFF PCI standard PCI-to-PCI bridge OK
0xDF5E0000-0xDF5FFFFF Intel(R) PRO/1000 MT Network Connection OK
0xDF300000-0xDF4FFFFF PCI standard PCI-to-PCI bridge OK
0xDF100000-0xDF1FFFFF PCI standard PCI-to-PCI bridge OK
0xD8000000-0xD8FFFFFF PCI standard PCI-to-PCI bridge OK
0xDFF00000-0xDFF003FF Standard Enhanced PCI to USB Host Controller OK
0xB0000000-0xB7FFFFFF RADEON 7000 RADEON VE Family (Microsoft Corporation) OK
0xDEFF0000-0xDEFFFFFF RADEON 7000 RADEON VE Family (Microsoft Corporation) OK
0xFEBFFC00-0xFEBFFFFF Intel(r) 82801EB Parallel Ultra ATA Storage Controller-24DB OK
0xE0000000-0xEFFFFFFF Motherboard resources OK
0xFED00000-0xFED003FF OK

[Components]

Appendix C – Tunable Parameters

[Multimedia]

[Audio Codecs]

CODEC Manufacturer Description Status File Version Size Creation Date
c:\windows\system32\sl_anet.acm Sipro Lab Telecom Inc. Sipro Lab Telecom Audio Codec
OK C:\WINDOWS\system32\SL_ANET.ACM 3.02 84.00 KB (86,016 bytes)
3/29/2003 6:00 AM
c:\windows\system32\msaud32.acm Microsoft Corporation Windows Media Audio Codec
OK C:\WINDOWS\system32\MSAUD32.ACM 8.00.00.4487 288.00 KB
(294,912 bytes) 3/29/2003 6:00 AM
c:\windows\system32\tssoft32.acm DSP GROUP, INC. OK
C:\WINDOWS\system32\TSSOFT32.ACM 1.01 9.50 KB (9,728 bytes)
3/29/2003 6:00 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)3/29/2003 6:00 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) 3/29/2003 6:00 AM
c:\windows\system32\imaadp32.acm Microsoft Corporation OK
C:\WINDOWS\system32\IMAADP32.ACM 5.2.3790.0 (srv03_rtm.030324-2048)
15.50 KB (15,872 bytes)3/29/2003 6:00 AM
c:\windows\system32\msg723.acm Microsoft Corporation OK
C:\WINDOWS\system32\MSG723.ACM 4.4.4000 116.00 KB (118,784 bytes)
1/28/2005 1:56 PM
c:\windows\system32\l3codeca.acm Fraunhofer Institut Integrierte Schaltungen IIS
Fraunhofer IIS MPEG Layer-3 Codec OK
C:\WINDOWS\system32\L3CODECA.ACM 1, 9, 0, 0305 284.00 KB (290,816
bytes) 3/29/2003 6:00 AM
c:\windows\system32\msgsm32.acm Microsoft Corporation OK
C:\WINDOWS\system32\MSGSM32.ACM 5.2.3790.0 (srv03_rtm.030324-2048)
20.50 KB (20,992 bytes)3/29/2003 6:00 AM

[Video Codecs]

CODEC Manufacturer Description Status File Version Size Creation Date
c:\windows\system32\msrle32.dll Microsoft Corporation OK
C:\WINDOWS\system32\MSRLE32.DLL 5.2.3790.0 (srv03_rtm.030324-2048) 10.50
KB (10,752 bytes) 3/29/2003 6:00 AM
c:\windows\system32\msh261.drv Microsoft Corporation OK
C:\WINDOWS\system32\MSH261.DRV 4.4.4000 180.00 KB (184,320 bytes)
1/28/2005 1:56 PM
c:\windows\system32\msyuv.dll Microsoft Corporation OK
C:\WINDOWS\system32\MSYUV.DLL 5.2.3790.0 (srv03_rtm.030324-2048) 16.50
KB (16,896 bytes) 3/24/2003 7:49 PM
c:\windows\system32\msvidc32.dll Microsoft Corporation OK
C:\WINDOWS\system32\MSVIDC32.DLL 5.2.3790.0 (srv03_rtm.030324-2048)
26.50 KB (27,136 bytes)3/29/2003 6:00 AM
c:\windows\system32\iyuv_32.dll Microsoft Corporation OK
C:\WINDOWS\system32\IYUV_32.DLL 5.2.3790.0 (srv03_rtm.030324-2048) 45.00
KB (46,080 bytes) 3/24/2003 7:49 PM

c:\windows\system32\msh263.drv Microsoft Corporation OK
C:\WINDOWS\system32\MSH263.DRV 4.4.4000 284.00 KB (290,816 bytes) 3/24/2003 7:46 PM
c:\windows\system32\tsbyuv.dll Microsoft Corporation OK
C:\WINDOWS\system32\TSBYUV.DLL 5.2.3790.0 (srv03_rtm.030324-2048) 8.00 KB (8,192 bytes) 3/24/2003 7:50 PM

[CD-ROM]

Item Value
Drive D:
Description CD-ROM Drive
Media Loaded No
Media Type CD-ROM
Name TEAC CD-224E
Manufacturer (Standard CD-ROM drives)
Status OK
Transfer Rate Not Available
SCSI Target ID 0
PNP Device ID IDE\CDROMTEAC_CD-224E_____K.9A____\5&2A02168E&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), 3/29/2003 6:00 AM)

[Sound Device]

Item Value

[Display]

Item Value
Name RADEON 7000 RADEON VE Family (Microsoft Corporation)
PNP Device ID
PCI\VEN_1002&DEV_5159&SUBSYS_016E1028&REV_00\4&1F7DBC9F&0&68F0
Adapter Type Radeon 7000 (QY), ATI Technologies Inc. compatible
Adapter Description RADEON 7000 RADEON VE Family (Microsoft Corporation)
Adapter RAM 16.00 MB (16,777,216 bytes)
Installed Driversati2dvag.dll
Driver Version 5.1.2600.0
INF File atiixpag.inf (ati2mtag_RV100 section)
Color Planes 1
Color Table Entries 4294967296
Resolution 1024 x 768 x 85 hertz
Bits/Pixel 32
Memory Address 0xB0000000-0xB7FFFFFF
I/O Port 0x00009C00-0x00009CFF
Memory Address 0xDEFF0000-0xDEFFFFFF
IRQ Channel IRQ 18
I/O Port 0x000003B0-0x000003BB
I/O Port 0x000003C0-0x000003DF
Memory Address 0xA0000-0xBFFFF
Driver c:\windows\system32\drivers\ati2mtag.sys (6.13.10.6153, 439.63 KB (450,176 bytes), 1/28/2005 7:51 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&26DD0F47&0
Number of Function Keys 12
I/O Port 0x00000060-0x00000060
I/O Port 0x00000064-0x00000064
IRQ Channel IRQ 1
Driver c:\windows\system32\drivers\i8042prt.sys (5.2.3790.0 (srv03_rtm.030324-2048), 68.50 KB (70,144 bytes), 3/29/2003 6:00 AM)

[Pointing Device]

Item Value
Hardware Type PS/2 Compatible Mouse
Number of Buttons 3
Status OK
PNP Device ID ACPI\PNP0F13\4&26DD0F47&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), 3/29/2003 6:00 AM)

[Modem]

Item Value

[Network]

[Adapter]

Item Value
Name [00000001] RAS Async Adapter
Adapter Type Not Available
Product Type RAS Async Adapter
Installed Yes
PNP Device ID Not Available
Last Reset 2/1/2005 11:14 AM
Index 1
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 [00000002] WAN Miniport (L2TP)
Adapter Type Not Available
Product Type WAN Miniport (L2TP)
Installed Yes
PNP Device ID ROOT\MS_L2TPMINIPORT\0000
Last Reset 2/1/2005 11:14 AM
Index 2
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), 3/29/2003 6:00 AM)

Name [00000003] 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 2/1/2005 11:14 AM
Index 3
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), 3/29/2003 6:00 AM)

Name [00000004] 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 2/1/2005 11:14 AM
Index 4
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), 3/29/2003 6:00 AM)

Name [00000005] Direct Parallel
Adapter Type Not Available
Product Type Direct Parallel
Installed Yes
PNP Device ID ROOT\MS_PTIMINIPORT\0000
Last Reset 2/1/2005 11:14 AM
Index 5
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), 3/29/2003 6:00 AM)

Name [00000006] WAN Miniport (IP)
Adapter Type Not Available
Product Type WAN Miniport (IP)
Installed Yes
PNP Device ID ROOT\MS_NDISWANIP\0000
Last Reset 2/1/2005 11:14 AM
Index 6
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), 3/29/2003 6:00 AM)

Name [00000007] Intel(R) PRO/1000 MT Network Connection
Adapter Type Ethernet 802.3
Product Type Intel(R) PRO/1000 MT Network Connection
Installed Yes
PNP Device ID
PCI\VEN_8086&DEV_1076&SUBSYS_016D1028&REV_05\5&803901B&0&380028
Last Reset 2/1/2005 11:14 AM

Index 7
Service Name E1000
IP Address 192.1.2.28
IP Subnet 255.255.0.0
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:11:43:D5:C4:8B
Memory Address 0xDF5E0000-0xDF5FFFFF
I/O Port 0x0000CCC0-0x0000CCFF
IRQ Channel IRQ 64
Driver c:\windows\system32\drivers\e1000325.sys (7.2.19.1 built by: WinDDK, 123.00 KB (125,952 bytes), 1/28/2005 2:03 PM)

Name [00000008] Intel(R) PRO/1000 MT Network Connection
Adapter Type Not Available
Product Type Intel(R) PRO/1000 MT Network Connection
Installed Yes
PNP Device ID
PCI\VEN_8086&DEV_1076&SUBSYS_016D1028&REV_05\5&C8E9BA0&0&400228
Last Reset 2/1/2005 11:14 AM
Index 8
Service Name E1000
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled Yes
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Driver c:\windows\system32\drivers\e1000325.sys (7.2.19.1 built by: WinDDK, 123.00 KB (125,952 bytes), 1/28/2005 2:03 PM)

[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_{23882C2E-10D8-41A8-9DFF-8AED3F92D3CB}] 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_{23882C2E-10D8-41A8-9DFF-8AED3F92D3CB}] 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_{9E09F088-C123-4BFF-A8AE-325950D97C52}] 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_{9E09F088-C123-4BFF-A8AE-325950D97C52}]
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_{EAD6A103-2103-4392-8E0E-E33B800BF457}]
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_{EAD6A103-2103-4392-8E0E-E33B800BF457}]
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_{55511F2F-8DD1-4C46-BE9F-7BA99B1361CB}] SEQPACKET 2
Connectionless Service No
Guarantees Delivery Yes
Guarantees SequencingYes
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_{55511F2F-8DD1-4C46-BE9F-7BA99B1361CB}] DATAGRAM 2
Connectionless Service Yes
Guarantees Delivery No
Guarantees SequencingNo
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
I/O Port 0x000003F8-0x000003FF
IRQ Channel IRQ 4
Driver c:\windows\system32\drivers\serial.sys (5.2.3790.0 (srv03_rtm.030324-2048), 76.00 KB (77,824 bytes), 3/29/2003 6:00 AM)

[Parallel]

Item Value
Name LPT1

PNP Device ID ACPI\PNP0401\4&26DD0F47&0
I/O Port 0x00000378-0x0000037F
I/O Port 0x00000778-0x0000077F
Driver c:\windows\system32\drivers\parport.sys (5.2.3790.0 (srv03_rtm.030324-2048), 76.50 KB (78,336 bytes), 3/24/2003 5:04 PM)

[Storage]

[Drives]

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

Drive C:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 10.00 GB (10,733,957,120 bytes)
Free Space 6.61 GB (7,093,399,552 bytes)
Volume Name
Volume Serial Number A879781A

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

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

Drive O:
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 P:

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 Q:
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 T:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 435.36 GB (467,459,047,424 bytes)
Free Space 393.02 GB (421,999,476,736 bytes)
Volume Name
Volume Serial Number 7C76DD6C

Drive U:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 435.36 GB (467,459,047,424 bytes)
Free Space 393.02 GB (421,999,476,736 bytes)
Volume Name
Volume Serial Number 606D0540

Drive V:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 435.36 GB (467,459,047,424 bytes)
Free Space 393.02 GB (421,999,476,736 bytes)
Volume Name
Volume Serial Number 1C62F8A9

Drive W:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 435.36 GB (467,459,047,424 bytes)
Free Space 393.02 GB (421,999,542,272 bytes)
Volume Name
Volume Serial Number 205A64DF

[Disks]

Appendix C – Tunable Parameters

Item Value
Description Disk drive
Manufacturer (Standard disk drives)
Model PERC LD 0 PERCRAID SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 3
SCSI Bus 3
SCSI Logical Unit 0
SCSI Port 3
SCSI Target ID 0
Sectors/Track 63
Size 474.11 GB (509,070,804,480 bytes)
Total Cylinders 61,891
Total Sectors 994,278,915
Total Tracks 15,782,205
Tracks/Cylinder 255
Partition Disk #2, Partition #0
Partition Size 12.79 GB (13,727,960,064 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #2, Partition #1
Partition Size 25.97 GB (27,883,699,200 bytes)
Partition Starting Offset 13,727,992,320 bytes
Partition Disk #2, Partition #2
Partition Size 435.36 GB (467,459,112,960 bytes)
Partition Starting Offset 41,611,691,520 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model PERC LD 0 PERCRAID SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 3
SCSI Bus 3
SCSI Logical Unit 0
SCSI Port 4
SCSI Target ID 0
Sectors/Track 63
Size 474.11 GB (509,070,804,480 bytes)
Total Cylinders 61,891
Total Sectors 994,278,915
Total Tracks 15,782,205
Tracks/Cylinder 255
Partition Disk #4, Partition #0
Partition Size 12.79 GB (13,727,960,064 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #4, Partition #1
Partition Size 25.97 GB (27,883,699,200 bytes)
Partition Starting Offset 13,727,992,320 bytes
Partition Disk #4, Partition #2
Partition Size 435.36 GB (467,459,112,960 bytes)
Partition Starting Offset 41,611,691,520 bytes

Appendix C – Tunable Parameters

Description Disk drive
Manufacturer (Standard disk drives)
Model PERC LD 0 PERCRAID SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 2
SCSI Bus 3
SCSI Logical Unit 0
SCSI Port 2
SCSI Target ID 0
Sectors/Track 63
Size 101.59 GB (109,083,663,360 bytes)
Total Cylinders 13,262
Total Sectors 213,054,030
Total Tracks 3,381,810
Tracks/Cylinder 255
Partition Disk #0, Partition #0
Partition Size 10.00 GB (10,733,958,144 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #0, Partition #1
Partition Size 39.01 GB (41,883,125,760 bytes)
Partition Starting Offset 10,733,990,400 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model PERC LD 1 PERCRAID SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 3
SCSI Bus 3
SCSI Logical Unit 1
SCSI Port 3
SCSI Target ID 0
Sectors/Track 63
Size 474.11 GB (509,070,804,480 bytes)
Total Cylinders 61,891
Total Sectors 994,278,915
Total Tracks 15,782,205
Tracks/Cylinder 255
Partition Disk #3, Partition #0
Partition Size 12.79 GB (13,727,960,064 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #3, Partition #1
Partition Size 25.97 GB (27,883,699,200 bytes)
Partition Starting Offset 13,727,992,320 bytes
Partition Disk #3, Partition #2
Partition Size 435.36 GB (467,459,112,960 bytes)
Partition Starting Offset 41,611,691,520 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model PERC LD 1 PERCRAID SCSI Disk Device
Bytes/Sector 512

Media Loaded Yes
Media Type Fixed hard disk
Partitions 3
SCSI Bus 3
SCSI Logical Unit 1
SCSI Port 4
SCSI Target ID 0
Sectors/Track 63
Size 474.11 GB (509,070,804,480 bytes)
Total Cylinders 61,891
Total Sectors 994,278,915
Total Tracks 15,782,205
Tracks/Cylinder 255
Partition Disk #5, Partition #0
Partition Size 12.79 GB (13,727,960,064 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #5, Partition #1
Partition Size 25.97 GB (27,883,699,200 bytes)
Partition Starting Offset 13,727,992,320 bytes
Partition Disk #5, Partition #2
Partition Size 435.36 GB (467,459,112,960 bytes)
Partition Starting Offset 41,611,691,520 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model PERC LD 1 PERCRAID SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 2
SCSI Bus 3
SCSI Logical Unit 1
SCSI Port 2
SCSI Target ID 0
Sectors/Track 63
Size 474.11 GB (509,070,804,480 bytes)
Total Cylinders 61,891
Total Sectors 994,278,915
Total Tracks 15,782,205
Tracks/Cylinder 255
Partition Disk #1, Partition #0
Partition Size 12.79 GB (13,727,960,064 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #1, Partition #1
Partition Size 25.97 GB (27,883,699,200 bytes)
Partition Starting Offset 13,727,992,320 bytes

[SCSI]

Item Value
Name LSI Logic PCI-X Ultra320 SCSI Host Adapter
Manufacturer LSI Logic Inc.
Status OK
PNP Device ID
PCI\VEN_1000&DEV_0030&SUBSYS_014A1028&REV_08\5&39562480&0&280010

I/O Port 0x0000EC00-0x0000ECFF
Memory Address 0xDFDF0000-0xDFDFFFFF
Memory Address 0xDFDE0000-0xDFDEFFFF
IRQ Channel IRQ 34
Driver c:\windows\system32\drivers\symmpi.sys (1.08.18.00 (NT.021001-2000), 25.88 KB (26,496 bytes), 3/29/2003 6:00 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_014A1028&REV_08\5&39562480&0&290010
I/O Port 0x0000E800-0x0000E8FF
Memory Address 0xDFDD0000-0xDFDDFFFF
Memory Address 0xDFDC0000-0xDFDCFFFF
IRQ Channel IRQ 33
Driver c:\windows\system32\drivers\symmpi.sys (1.08.18.00 (NT.021001-2000), 25.88 KB (26,496 bytes), 3/29/2003 6:00 AM)

Name DELL PERC 3/DC Plus RAID Controller
Manufacturer DELL
Status OK
PNP Device ID
PCI\VEN_101E&DEV_1960&SUBSYS_04941028&REV_01\5&D2DE446&0&580210
Memory Address 0xC8000000-0xD7FFFFFF
IRQ Channel IRQ 37
Driver c:\windows\system32\drivers\mraid35x.sys (5.2.22.4 built by: WinDDK, 17.88 KB (18,304 bytes), 1/9/2003 5:54 AM)

Name DELL PERC 3/DC Plus RAID Controller
Manufacturer DELL
Status OK
PNP Device ID
PCI\VEN_101E&DEV_1960&SUBSYS_04941028&REV_01\5&6E82759&0&200018
Memory Address 0xC4000000-0xC7FFFFFF
IRQ Channel IRQ 106
Driver c:\windows\system32\drivers\mraid35x.sys (5.2.22.4 built by: WinDDK, 17.88 KB (18,304 bytes), 1/9/2003 5:54 AM)

Name DELL PERC 3/DC Plus RAID Controller
Manufacturer DELL
Status OK
PNP Device ID
PCI\VEN_101E&DEV_1960&SUBSYS_04941028&REV_01\5&25D1BD4&0&180218
Memory Address 0xB8000000-0xC7FFFFFF
IRQ Channel IRQ 101
Driver c:\windows\system32\drivers\mraid35x.sys (5.2.22.4 built by: WinDDK, 17.88 KB (18,304 bytes), 1/9/2003 5:54 AM)

[IDE]

Item Value
Name Intel(r) 82801EB Parallel Ultra ATA Storage Controller-24DB
Manufacturer Intel
Status OK

PNP Device ID
PCI\VEN_8086&DEV_24DB&SUBSYS_016E1028&REV_02\3&13C0B0C5&0&F9
I/O Port 0x0000FC00-0x0000FC0F
Memory Address 0xFEBFFC00-0xFEBFFFFF
Driver c:\windows\system32\drivers\intelide.sys (5.2.3790.0 (srv03_rtm.030324-2048), 7.00 KB (7,168 bytes), 1/28/2005 7:51 AM)

Name Primary IDE Channel
Manufacturer (Standard IDE ATA/ATAPI controllers)
Status OK
PNP Device ID PCIIDE\IDECHANNEL\4&C3EA019&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), 3/29/2003 6:00 AM)

Name Secondary IDE Channel
Manufacturer (Standard IDE ATA/ATAPI controllers)
Status OK
PNP Device ID PCIIDE\IDECHANNEL\4&C3EA019&0&1
I/O Port 0x00000170-0x00000177
I/O Port 0x00000376-0x00000376
IRQ Channel IRQ 15
Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.0 (srv03_rtm.030324-2048), 89.00 KB (91,136 bytes), 3/29/2003 6:00 AM)

[Printing]

Name Driver Port Name Server Name

[Problem Devices]

Device PNP Device ID Error Code
Intel(R) PRO/1000 MT Network Connection #2
PCI\VEN_8086&DEV_1076&SUBSYS_016D1028&REV_05\5&C8E9BA0&0&400228
This device is disabled.
Not Available ACPI\PNP0103\0 The drivers for this device are not installed.

[USB]

Device PNP Device ID
Standard Universal PCI to USB Host Controller
PCI\VEN_8086&DEV_24D2&SUBSYS_016E1028&REV_02\3&13C0B0C5&0&E8
USB Root Hub USB\ROOT_HUB\4&2CD28F52&0
Standard Universal PCI to USB Host Controller
PCI\VEN_8086&DEV_24D4&SUBSYS_016E1028&REV_02\3&13C0B0C5&0&E9
USB Root Hub USB\ROOT_HUB\4&CF25AB&0
Standard Universal PCI to USB Host Controller
PCI\VEN_8086&DEV_24D7&SUBSYS_016E1028&REV_02\3&13C0B0C5&0&EA
USB Root Hub USB\ROOT_HUB\4&1D790A7C&0
Standard Enhanced PCI to USB Host Controller
PCI\VEN_8086&DEV_24DD&SUBSYS_016E1028&REV_02\3&13C0B0C5&0&EF
USB Root Hub USB\ROOT_HUB20\4&2F36802A&0
Generic USB Hub USB\VID_413C&PID_A001\5&263AC2B2&0&3

Appendix C – Tunable Parameters

[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
ati2mtag ati2mtag c:\windows\system32\drivers\ati2mtag.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
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
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
e1000 Intel(R) PRO/1000 Adapter Driver c:\windows\system32\drivers\e1000325.sys
Kernel Driver Yes Manual Running OK Normal No Yes
fastfat Fastfat c:\windows\system32\drivers\fastfat.sys File System Driver Yes
Disabled Running OK Normal No Yes
fdc Floppy Disk Controller Driver c:\windows\system32\drivers\fdc.sys Kernel Driver
Yes Manual Running OK Normal No Yes
fips Fips c:\windows\system32\drivers\fips.sys Kernel Driver Yes System
Running OK Normal No Yes
flpydisk Floppy Disk Driver c:\windows\system32\drivers\flpydisk.sys Kernel Driver
Yes Manual Running OK Normal No Yes
ftdisk Volume Manager Driver c:\windows\system32\drivers\ftdisk.sys Kernel Driver Yes
Boot Running OK Normal No Yes
gpc Generic Packet Classifier c:\windows\system32\drivers\msgpc.sys Kernel Driver
Yes Manual Running OK Normal No Yes
hpn hpn Not Available Kernel Driver No Disabled Stopped OK
Normal No No
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

Appendix C – Tunable Parameters

i2omp i2omp Not Available Kernel Driver No Disabled Stopped OK
Normal No No
i8042prt i8042 Keyboard and PS/2 Mouse Port Driver
c:\windows\system32\drivers\i8042prt.sys Kernel Driver Yes System
Running OK Normal No Yes
iirsp iirsp Not Available Kernel Driver No Disabled Stopped OK
Normal No No
imapi CD-Burning Filter Driver c:\windows\system32\drivers\imapi.sys Kernel Driver No
System Stopped OK Normal No No
intelide IntelIde c:\windows\system32\drivers\intelide.sys Kernel Driver Yes Boot
Running OK Normal No Yes
ipfilterdriver IP Traffic Filter Driver c:\windows\system32\drivers\ipfltdrv.sys Kernel Driver
No Manual Stopped OK Normal No No
ipinip IP in IP Tunnel Driver c:\windows\system32\drivers\ipinip.sys Kernel Driver No
Manual Stopped OK Normal No No
ipnat IP Network Address Translator c:\windows\system32\drivers\ipnat.sys Kernel Driver
No Manual Stopped OK Normal No No
ipsec IPSEC driver c:\windows\system32\drivers\ipsec.sys Kernel Driver Yes System
Running OK Normal No Yes
ipsraidn ipsraidn Not Available Kernel Driver No Disabled Stopped OK
Normal No No
irenum IR Enumerator Service c:\windows\system32\drivers\irenum.sys Kernel Driver No
Manual Stopped OK Normal No No
isapnp PnP ISA/EISA Bus Driver c:\windows\system32\drivers\isapnp.sys Kernel Driver
Yes Boot Running OK Critical No Yes
kbdclass Keyboard Class Driver c:\windows\system32\drivers\kbdclass.sys Kernel
Driver Yes System Running OK Normal No Yes
ksecdd KSecDD c:\windows\system32\drivers\ksecdd.sys Kernel Driver Yes Boot
Running OK Normal No Yes
lp6nds35 lp6nds35 Not Available Kernel Driver No Disabled
Stopped OK Normal No No
mnmdd mnmdd c:\windows\system32\drivers\mnmdd.sys Kernel Driver Yes System
Running OK Ignore No Yes
modem Modem c:\windows\system32\drivers\modem.sys Kernel Driver No Manual
Stopped OK Ignore No No
mouclass Mouse Class Driver c:\windows\system32\drivers\mouclass.sys Kernel
Driver Yes System Running OK Normal No Yes
mountmgr Mount Point Manager c:\windows\system32\drivers\mountmgr.sys Kernel
Driver Yes Boot Running OK Normal No Yes
mraid35x mraid35x c:\windows\system32\drivers\mraid35x.sys Kernel Driver
Yes Boot Running OK Normal No Yes
mrxdav WebDav Client Redirector c:\windows\system32\drivers\mrxdav.sys File
System Driver No Manual Stopped OK Normal No No
mrxsmb MRXSMB c:\windows\system32\drivers\mrxsmb.sys File System Driver
Yes System Running OK Normal No Yes
msfs Msfs c:\windows\system32\drivers\msfs.sys File System Driver Yes System
Running OK Normal No Yes
mup Mup c:\windows\system32\drivers\mup.sys File System Driver Yes Boot
Running OK Normal No Yes
ndis NDIS System Driver c:\windows\system32\drivers\ndis.sys Kernel Driver Yes
Boot Running OK Normal No Yes
ndistapi Remote Access NDIS TAPI Driver c:\windows\system32\drivers\ndistapi.sys
Kernel Driver Yes Manual Running OK Normal No Yes
ndisuio NDIS Usermode I/O Protocol c:\windows\system32\drivers\ndisuio.sys Kernel Driver
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
nfrd960 nfrd960 Not Available Kernel Driver No Disabled Stopped OK
Normal No No
npfs Npfs c:\windows\system32\drivers\npfs.sys File System Driver Yes System
Running OK Normal No Yes
ntfs Ntfs c:\windows\system32\drivers\ntfs.sys File System Driver Yes
Disabled Running OK Normal No Yes
null Null c:\windows\system32\drivers\null.sys Kernel Driver Yes System
Running OK Normal No Yes
parport 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
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 No Manual
       Stopped OK Normal No No
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
update Microcode Update Driver c:\windows\system32\drivers\update.sys Kernel Driver
Yes Manual Running OK Normal No Yes
usbehci Microsoft USB 2.0 Enhanced Host Controller Miniport Driver
c:\windows\system32\drivers\usbehci.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
usbstor USB Mass Storage Driver c:\windows\system32\drivers\usbstor.sys Kernel
Driver No Manual Stopped OK Normal No No
usbuhci Microsoft USB Universal Host Controller Miniport Driver
c:\windows\system32\drivers\usbuhci.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_4_0
Processor No PROCESSOR 5.2.3790.0 10/1/2002 (Standard processor
types) cpu.inf Not Available ACPI\GENUINEINTEL_-_X86_FAMILY_15_MODEL_4_1
PCI bus No SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices)
machine.inf Not Available ACPI\PNP0A03\1

PCI standard host CPU bridge No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
PCI\VEN_8086&DEV_3590&SUBSYS_00000000&REV_09\3&13C0B0C5&0&00
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
PCI\VEN_8086&DEV_3595&SUBSYS_00000000&REV_09\3&13C0B0C5&0&10
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
PCI\VEN_8086&DEV_0330&SUBSYS_00000000&REV_06\4&3007CA40&0&0010
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_014A1028&REV_08\5&39562480&0&280010
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_014A1028&REV_08\5&39562480&0&290010
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
PCI\VEN_8086&DEV_0332&SUBSYS_00000000&REV_06\4&3007CA40&0&0210
DELL PERC 3/DC Plus RAID Controller No SCSIADAPTER 5.2.22.4 12/3/2002
DELL oem1.inf Not Available
PCI\VEN_101E&DEV_1960&SUBSYS_04941028&REV_01\5&D2DE446&0&580210
DELL PV22XS Backplane No SYSTEM 5.2.3790.0 10/1/2002 Dell
scsidev.inf Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.14\6&82CE00&0&060
PE 1x8 Backplane No SYSTEM 5.2.3790.0 10/1/2002 Dell
scsidev.inf Not Available
SCSI\PROCESSOR&VEN_PE/PV&PROD_1X8_SCSI_BP&REV_1.0\6&82CE00&0&160
DELL PERCRAID Virtual DeviceNo SYSTEM 5.2.22.4 12/3/2002 DELL
oem0.inf Not Available
SCSI\OTHER&VEN___RAID&PROD__DUMMYDEVICE&REV_0000\6&82CE00&0&2F0
Disk drive No DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives)
disk.inf Not Available
SCSI\DISK&VEN_PERC&PROD__LD__0_PERCRAID&REV_\6&82CE00&0&300
Disk drive No DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives)
disk.inf Not Available
SCSI\DISK&VEN_PERC&PROD__LD__1_PERCRAID&REV_\6&82CE00&0&301
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
PCI\VEN_8086&DEV_3596&SUBSYS_00000000&REV_09\3&13C0B0C5&0&18
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
PCI\VEN_8086&DEV_0329&SUBSYS_00000000&REV_09\4&2676C242&0&0018
DELL PERC 3/DC Plus RAID Controller No SCSIADAPTER 5.2.22.4 12/3/2002
DELL oem1.inf Not Available
PCI\VEN_101E&DEV_1960&SUBSYS_04941028&REV_01\5&6E82759&0&200018
DELL PV22XS Backplane No SYSTEM 5.2.3790.0 10/1/2002 Dell
scsidev.inf Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.14\6&1C51DF74&0&060
DELL PV22XS Backplane No SYSTEM 5.2.3790.0 10/1/2002 Dell
scsidev.inf Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.14\6&1C51DF74&0&160
DELL PERCRAID Virtual DeviceNo SYSTEM 5.2.22.4 12/3/2002 DELL
oem0.inf Not Available
SCSI\OTHER&VEN___RAID&PROD__DUMMYDEVICE&REV_0000\6&1C51DF74&0&2
F0

Disk drive No DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives)
disk.inf Not Available
SCSI\DISK&VEN_PERC&PROD__LD__0_PERCRAID&REV_\6&1C51DF74&0&300
Disk drive No DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives)
disk.inf Not Available
SCSI\DISK&VEN_PERC&PROD__LD__1_PERCRAID&REV_\6&1C51DF74&0&301
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
PCI\VEN_8086&DEV_032A&SUBSYS_00000000&REV_09\4&2676C242&0&0218
DELL PERC 3/DC Plus RAID Controller No SCSIADAPTER 5.2.22.4 12/3/2002
DELL oem1.inf Not Available
PCI\VEN_101E&DEV_1960&SUBSYS_04941028&REV_01\5&25D1BD4&0&180218
DELL PV22XS Backplane No SYSTEM 5.2.3790.0 10/1/2002 Dell
scsidev.inf Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.14\6&1BB608E1&0&060
DELL PV22XS Backplane No SYSTEM 5.2.3790.0 10/1/2002 Dell
scsidev.inf Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.14\6&1BB608E1&0&160
DELL PERCRAID Virtual DeviceNo SYSTEM 5.2.22.4 12/3/2002 DELL
oem0.inf Not Available
SCSI\OTHER&VEN___RAID&PROD__DUMMYDEVICE&REV_0000\6&1BB608E1&0&2
F0
Disk drive No DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives)
disk.inf Not Available
SCSI\DISK&VEN_PERC&PROD__LD__0_PERCRAID&REV_\6&1BB608E1&0&300
Disk drive No DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives)
disk.inf Not Available
SCSI\DISK&VEN_PERC&PROD__LD__1_PERCRAID&REV_\6&1BB608E1&0&301
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
PCI\VEN_8086&DEV_3597&SUBSYS_00000000&REV_09\3&13C0B0C5&0&20
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
PCI\VEN_8086&DEV_3598&SUBSYS_00000000&REV_09\3&13C0B0C5&0&28
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
PCI\VEN_8086&DEV_0329&SUBSYS_00000000&REV_09\4&13C5C3DD&0&0028
Intel(R) PRO/1000 MT Network Connection No NET 7.2.19.1 3/15/2004
Intel oem2.inf Not Available
PCI\VEN_8086&DEV_1076&SUBSYS_016D1028&REV_05\5&803901B&0&380028
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
PCI\VEN_8086&DEV_032A&SUBSYS_00000000&REV_09\4&13C5C3DD&0&0228
Intel(R) PRO/1000 MT Network Connection No NET 7.2.19.1 3/15/2004
Intel oem2.inf Not Available
PCI\VEN_8086&DEV_1076&SUBSYS_016D1028&REV_05\5&C8E9BA0&0&400228
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
PCI\VEN_8086&DEV_3599&SUBSYS_00000000&REV_09\3&13C0B0C5&0&30
Standard Universal PCI to USB Host Controller No USB 5.2.3790.0 10/1/2002
(Standard USB Host Controller) usbport.inf Not Available
PCI\VEN_8086&DEV_24D2&SUBSYS_016E1028&REV_02\3&13C0B0C5&0&E8
USB Root Hub No USB 5.2.3790.0 10/1/2002 (Standard USB Host Controller)
usbport.inf Not Available USB\ROOT_HUB\4&2CD28F52&0

Standard Universal PCI to USB Host Controller No USB 5.2.3790.0 10/1/2002
(Standard USB Host Controller) usbport.inf Not Available
PCI\VEN_8086&DEV_24D4&SUBSYS_016E1028&REV_02\3&13C0B0C5&0&E9
USB Root Hub No USB 5.2.3790.0 10/1/2002 (Standard USB Host Controller)
usbport.inf Not Available USB\ROOT_HUB\4&CF25AB&0
Standard Universal PCI to USB Host Controller No USB 5.2.3790.0 10/1/2002
(Standard USB Host Controller) usbport.inf Not Available
PCI\VEN_8086&DEV_24D7&SUBSYS_016E1028&REV_02\3&13C0B0C5&0&EA
USB Root Hub No USB 5.2.3790.0 10/1/2002 (Standard USB Host Controller)
usbport.inf Not Available USB\ROOT_HUB\4&1D790A7C&0
Standard Enhanced PCI to USB Host Controller No USB 5.2.3790.0 10/1/2002
(Standard USB Host Controller) usbport.inf Not Available
PCI\VEN_8086&DEV_24DD&SUBSYS_016E1028&REV_02\3&13C0B0C5&0&EF
USB Root Hub No USB 5.2.3790.0 10/1/2002 (Standard USB Host Controller)
usbport.inf Not Available USB\ROOT_HUB20\4&2F36802A&0
Generic USB Hub No USB 5.2.3790.0 10/1/2002 (Generic USB Hub)
usb.inf Not Available USB\VID_413C&PID_A001\5&263AC2B2&0&3
Intel(R) 82801DB PCI Bridge - 244E No SYSTEM 5.2.3790.0 10/1/2002
Intel machine.inf Not Available
PCI\VEN_8086&DEV_244E&SUBSYS_00000000&REV_C2\3&13C0B0C5&0&F0
RADEON 7000 RADEON VE Family (Microsoft Corporation) No DISPLAY
6.13.10.6153 8/8/2002 ATI Technologies Inc. atiixpag.inf Not Available
PCI\VEN_1002&DEV_5159&SUBSYS_016E1028&REV_00\4&1F7DBC9F&0&68F0
Default Monitor No MONITOR 5.1.2001.0 6/6/2001 (Standard monitor
types) monitor.inf Not Available
DISPLAY\DEFAULT_MONITOR\5&D64285B&0&10000000&10&0D
PCI standard ISA bridgeNo SYSTEM 5.2.3790.0 10/1/2002 (Standard
system devices)machine.inf Not Available
PCI\VEN_8086&DEV_24D0&SUBSYS_00000000&REV_02\3&13C0B0C5&0&F8
ISAPNP Read Data Port No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
ISAPNP\READDATAPORT\0
Direct memory access controller No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
ACPI\PNP0200\4&26DD0F47&0
Numeric data processor No SYSTEM 5.2.3790.0 10/1/2002 (Standard
system devices)machine.inf Not Available ACPI\PNP0C04\4&26DD0F47&0
Programmable interrupt controller No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
ACPI\PNP0000\4&26DD0F47&0
System speakerNo SYSTEM 5.2.3790.0 10/1/2002 (Standard system
devices) machine.inf Not Available ACPI\PNP0800\4&26DD0F47&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&26DD0F47&0
System timer No SYSTEM 5.2.3790.0 10/1/2002 (Standard system
devices) machine.inf Not Available ACPI\PNP0100\4&26DD0F47&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&26DD0F47&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&14BBD7CB&0&0
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&26DD0F47&0

PS/2 Compatible MouseNo MOUSE 5.2.3790.0 10/1/2002 Microsoft
msmouse.inf Not Available ACPI\PNP0F13\4&26DD0F47&0
Communications Port No PORTS 5.2.3790.0 10/1/2002 (Standard port types)
msports.inf Not Available ACPI\PNP0501\1
ECP Printer Port No PORTS 5.2.3790.0 10/1/2002 (Standard port types)
msports.inf Not Available ACPI\PNP0401\4&26DD0F47&0
Printer Port Logical Interface No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
LPTENUM\MICROSOFTRAWPORT\5&7CE1BCF&0&LPT1
System board No SYSTEM 5.2.3790.0 10/1/2002 (Standard system
devices) machine.inf Not Available ACPI\PNP0C01\4&26DD0F47&0
Intel(r) 82801EB Parallel Ultra ATA Storage Controller-24DB No HDC 5.2.3790.0
10/1/2002 Intel mshdc.inf Not Available
PCI\VEN_8086&DEV_24DB&SUBSYS_016E1028&REV_02\3&13C0B0C5&0&F9
Primary IDE Channel No HDC 5.2.3790.0 10/1/2002 (Standard IDE
ATA/ATAPI controllers) mshdc.inf Not Available
PCIIDE\IDECHANNEL\4&C3EA019&0&0
CD-ROM Drive No CDROM 5.2.3790.0 10/1/2002 (Standard CD-ROM
drives) cdrom.inf Not Available IDE\CDROMTEAC_CD-
224E_____K.9A____\5&2A02168E&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&C3EA019&0&1
Motherboard resources No SYSTEM 5.2.3790.0 10/1/2002 (Standard
system devices)machine.inf Not Available ACPI\PNP0C02\0
Not Available Not Available Not Available Not Available Not Available Not Available
Not Available Not Available ACPI\PNP0103\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 Manager No 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&SIGNATUREB64FB64FOFFSET7E00LENGTH27
FCB3400
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB64FB64FOFFSET27FCBB200LEN
GTH9C06DC800
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB750B751OFFSET7E00LENGTH33
2400C00
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB750B751OFFSET332408A00LEN
GTH67DFF7C00
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB750B750OFFSET7E00LENGTH33
2400C00

Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB750B750OFFSET332408A00LEN
GTH67DFF7C00
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB750B750OFFSET9B0400600LEN
GTH6CD6BC0000
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB750B752OFFSET7E00LENGTH33
2400C00
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB750B752OFFSET332408A00LEN
GTH67DFF7C00
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB750B752OFFSET9B0400600LEN
GTH6CD6BC0000
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREF48B69E6OFFSET7E00LENGTH33
2400C00
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREF48B69E6OFFSET332408A00LEN
GTH67DFF7C00
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREF48B69E6OFFSET9B0400600LEN
GTH6CD6BC0000
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREF48B69E1OFFSET7E00LENGTH33
2400C00
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREF48B69E1OFFSET332408A00LEN
GTH67DFF7C00
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREF48B69E1OFFSET9B0400600LEN
GTH6CD6BC0000
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 ROOT\LEGACY_GPC\0000
IPSEC driver Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available ROOT\LEGACY_IPSEC\0000
ksecdd Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_KSECDD\0000
mnmdd Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_MNMDD\0000
mountmgr Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_MOUNTMGR\0000
NDIS System Driver Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NDIS\0000
Remote Access NDIS TAPI Driver Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NDISTAPI\0000
NDIS Usermode I/O Protocol Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NDISUIO\0000
NDProxy Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NDPROXY\0000
NetBios over Tcpip Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NETBT\0000
Null Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NULL\0000
Partition Manager Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_PARTMGR\0000
Parvdm Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_PARVDM\0000
PCIIde Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_PCIIDE\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\80\Tools\BINN;C:\Program Files\Microsoft SQL Server\MSSQL\Binn;.; <SYSTEM>
PATHEXT .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH <SYSTEM>
PROCESSOR_ARCHITECTURE x86 <SYSTEM>
PROCESSOR_IDENTIFIER x86 Family 15 Model 4 Stepping 3, GenuineIntel <SYSTEM>
PROCESSOR_LEVEL 15 <SYSTEM>
PROCESSOR_REVISION 0403 <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\NETWORK SERVICE
TMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\NETWORK SERVICE
TEMP %USERPROFILE%\Local Settings\Temp PE2800\Administrator
TMP %USERPROFILE%\Local Settings\Temp PE2800\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

Appendix C – Tunable Parameters

[Network Connections]

Local Name Remote Name Type Status User Name

[Running Tasks]

Name Path Process ID Priority Min Working Set Max Working Set Start Time Version Size File Date
system idle process Not Available 0 0 Not Available Not Available Not Available Not Available Not Available
system Not Available 4 8 0 1413120 Not Available Not Available Not Available Not Available
smss.exe Not Available 424 11 204800 1413120 2/1/2005 11:15 AM Not Available Not Available Not Available
csrss.exe Not Available 472 13 Not Available Not Available 2/1/2005 11:15 AM Not Available Not Available Not Available
winlogon.exe c:\windows\system32\winlogon.exe 504 13 204800 1413120 2/1/2005 11:15 AM 5.2.3790.0 (srv03_rtm.030324-2048) 536.50 KB (549,376 bytes) 3/29/2003 6:00 AM
services.exe c:\windows\system32\services.exe 548 9 204800 1413120 2/1/2005 11:15 AM 5.2.3790.0 (srv03_rtm.030324-2048) 102.00 KB (104,448 bytes) 3/29/2003 6:00 AM
lsass.exe c:\windows\system32\lsass.exe 560 9 204800 1413120 2/1/2005 11:15 AM 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 6:00 AM
svchost.exe c:\windows\system32\svchost.exe 736 8 204800 1413120 2/1/2005 11:15 AM 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 6:00 AM
svchost.exe c:\windows\system32\svchost.exe 788 8 204800 1413120 2/1/2005 11:15 AM 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 6:00 AM
svchost.exe c:\windows\system32\svchost.exe 912 8 204800 1413120 2/1/2005 11:15 AM 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 6:00 AM
msdtc.exe Not Available 972 8 Not Available Not Available 2/1/2005 11:15 AM Not Available Not Available Not Available
explorer.exe c:\windows\explorer.exe 1268 8 204800 1413120 2/1/2005 11:17 AM 6.00.3790.0 (srv03_rtm.030324-2048) 1,008.50 KB (1,032,704 bytes) 3/29/2003 6:00 AM
sqlmangr.exe c:\program files\microsoft sql server\80\tools\binn\sqlmangr.exe 1332 8 204800 1413120 2/1/2005 11:17 AM 2000.080.0760.00 72.57 KB (74,308 bytes) 1/28/2005 2:29 PM
cmd.exe c:\windows\system32\cmd.exe 964 8 204800 1413120 2/1/2005 1:58 PM 5.2.3790.0 (srv03_rtm.030324-2048) 374.00 KB (382,976 bytes) 3/29/2003 6:00 AM
sqlservr.exe c:\program files\microsoft sql server\mssql\binn\sqlservr.exe 1004 13 204800 1413120 2/1/2005 1:58 PM 2000.080.0818.00 7.20 MB (7,544,916 bytes) 1/28/2005 2:28 PM
mmc.exe c:\windows\system32\mmc.exe 1724 8 204800 1413120 2/1/2005 5:42 PM 5.2.3790.0 (srv03_rtm.030324-2048) 762.50 KB (780,800 bytes) 3/29/2003 6:00 AM
helpctr.exe c:\windows\pchealth\helpctr\binaries\helpctr.exe 216 8 204800 1413120 2/1/2005 5:43 PM 5.2.3790.0 (srv03_rtm.030324-2048) 764.00 KB (782,336 bytes) 1/28/2005 1:56 PM

wmiprvse.exe Not Available 1528 8 Not Available Not Available 2/1/2005 5:43 PM Not Available Not Available Not Available
helpsvc.exe c:\windows\pchealth\helpctr\binaries\helpsvc.exe 1496 8 204800 1413120 2/1/2005 5:43 PM 5.2.3790.0 (srv03_rtm.030324-2048) 720.00 KB (737,280 bytes) 1/28/2005 1:56 PM
wmiprvse.exe Not Available 464 8 Not Available Not Available 2/1/2005 5:43 PM Not Available Not Available Not Available

[Loaded Modules]

Name Version Size File Date Manufacturer Path
winlogon 5.2.3790.0 (srv03_rtm.030324-2048) 536.50 KB (549,376 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\winlogon.exe
ntdll 5.2.3790.0 (srv03_rtm.030324-2048) 722.50 KB (739,840 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\ntdll.dll
kernel32 5.2.3790.0 (srv03_rtm.030324-2048) 965.00 KB (988,160 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\kernel32.dll
msvcrt 7.0.3790.0 (srv03_rtm.030324-2048) 319.50 KB (327,168 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\msvcrt.dll
advapi32 5.2.3790.0 (srv03_rtm.030324-2048) 559.50 KB (572,928 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\advapi32.dll
rpcrt4 5.2.3790.0 (srv03_rtm.030324-2048) 643.50 KB (658,944 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\rpcrt4.dll
user32 5.2.3790.0 (srv03_rtm.030324-2048) 562.00 KB (575,488 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\user32.dll
gdi32 5.2.3790.0 (srv03_rtm.030324-2048) 263.00 KB (269,312 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\gdi32.dll
userenv 5.2.3790.0 (srv03_rtm.030324-2048) 732.50 KB (750,080 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\userenv.dll
nddeapi 5.2.3790.0 (srv03_rtm.030324-2048) 16.00 KB (16,384 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\nddeapi.dll
crypt32 5.131.3790.0 (srv03_rtm.030324-2048) 598.00 KB (612,352 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\crypt32.dll
msasn1 5.2.3790.0 (srv03_rtm.030324-2048) 58.00 KB (59,392 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\msasn1.dll
secur32 5.2.3790.0 (srv03_rtm.030324-2048) 63.00 KB (64,512 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\secur32.dll
winsta 5.2.3790.0 (srv03_rtm.030324-2048) 51.00 KB (52,224 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\winsta.dll
netapi32 5.2.3790.0 (srv03_rtm.030324-2048) 317.00 KB (324,608 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\netapi32.dll
profmap 5.2.3790.0 (srv03_rtm.030324-2048) 22.00 KB (22,528 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\profmap.dll
regapi 5.2.3790.0 (srv03_rtm.030324-2048) 48.50 KB (49,664 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\regapi.dll
ws2_32 5.2.3790.0 (srv03_rtm.030324-2048) 87.50 KB (89,600 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\ws2_32.dll
ws2help 5.2.3790.0 (srv03_rtm.030324-2048) 19.50 KB (19,968 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\ws2help.dll
psapi 5.2.3790.0 (srv03_rtm.030324-2048) 21.50 KB (22,016 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\psapi.dll
version 5.2.3790.0 (srv03_rtm.030324-2048) 17.00 KB (17,408 bytes) 3/29/2003 6:00 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) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\setupapi.dll

msgina 5.2.3790.0 (srv03_rtm.030324-2048) 1.14 MB (1,191,936 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\msgina.dll
shsvcs 6.00.3790.0 (srv03_rtm.030324-2048) 121.50 KB (124,416 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\shsvcs.dll
shlwapi 6.00.3790.0 (srv03_rtm.030324-2048) 281.00 KB (287,744 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\shlwapi.dll
sfc 5.2.3790.0 (srv03_rtm.030324-2048) 4.50 KB (4,608 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\sfc.dll
sfc_os 5.2.3790.0 (srv03_rtm.030324-2048) 133.00 KB (136,192 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\sfc_os.dll
wintrust 5.131.3790.0 (srv03_rtm.030324-2048) 161.50 KB (165,376 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\wintrust.dll
ole32 5.2.3790.0 (srv03_rtm.030324-2048) 1.13 MB (1,187,328 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\ole32.dll
imagehlp 5.2.3790.0 (srv03_rtm.030324-2048) 142.50 KB (145,920 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\imagehlp.dll
comctl32 6.0 (srv03_rtm.030324-2048) 907.00 KB (928,768 bytes) 1/28/2005 7:48 AM Microsoft Corporation c:\windows\winsxs\x86_microsoft.windows.common-controls_6595b64144ccf1df_6.0.100.0_x-ww_8417450b\comctl32.dll
winscard 5.2.3790.0 (srv03_rtm.030324-2048) 98.50 KB (100,864 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\winscard.dll
wtsapi32 5.2.3790.0 (srv03_rtm.030324-2048) 17.50 KB (17,920 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\wtsapi32.dll
sxs 5.2.3790.0 (srv03_rtm.030324-2048) 733.00 KB (750,592 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\sxs.dll
winmm 5.2.3790.0 (srv03_rtm.030324-2048) 166.00 KB (169,984 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\winmm.dll
shell32 6.00.3790.0 (srv03_rtm.030324-2048) 7.79 MB (8,166,400 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\shell32.dll
wldap32 5.2.3790.0 (srv03_rtm.030324-2048) 158.00 KB (161,792 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\wldap32.dll
rsaenh 5.2.3790.0 (srv03_rtm.030324-2048) 176.83 KB (181,072 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\rsaenh.dll
cscdll 5.2.3790.0 (srv03_rtm.030324-2048) 99.00 KB (101,376 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\cscdll.dll
wlnotify 5.2.3790.0 (srv03_rtm.030324-2048) 87.50 KB (89,600 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\wlnotify.dll
winspool 5.2.3790.0 (srv03_rtm.030324-2048) 140.00 KB (143,360 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\winspool.drv
mpr 5.2.3790.0 (srv03_rtm.030324-2048) 56.00 KB (57,344 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\mpr.dll
comctl32 5.82 (srv03_rtm.030324-2048) 561.00 KB (574,464 bytes) 1/28/2005 7:48 AM Microsoft Corporation c:\windows\winsxs\x86_microsoft.windows.common-controls_6595b64144ccf1df_5.82.0.0_x-ww_8a69ba05\comctl32.dll
uxtheme 6.00.3790.0 (srv03_rtm.030324-2048) 196.00 KB (200,704 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\uxtheme.dll
samlib 5.2.3790.0 (srv03_rtm.030324-2048) 49.00 KB (50,176 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\samlib.dll
cscui 5.2.3790.0 (srv03_rtm.030324-2048) 305.00 KB (312,320 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\cscui.dll
oleaut32 5.2.3790.0 486.00 KB (497,664 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\oleaut32.dll
clbcatq 2001.12.4720.0 (srv03_rtm.030324-2048) 481.00 KB (492,544 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\clbcatq.dll

comres 2001.12.4720.0 (srv03_rtm.030324-2048) 778.00 KB (796,672 bytes)
3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\comres.dll
ntmarta 5.2.3790.0 (srv03_rtm.030324-2048) 114.00 KB (116,736 bytes) 3/29/2003 6:00
AM Microsoft Corporation c:\windows\system32\ntmarta.dll
wbemprox 5.2.3790.0 (srv03_rtm.030324-2048) 17.50 KB (17,920 bytes)1/28/2005 1:54
PM Microsoft Corporation c:\windows\system32\wbem\wbemprox.dll
wbemcomn 5.2.3790.0 (srv03_rtm.030324-2048) 211.50 KB (216,576 bytes)
3/29/2003 6:00 AM Microsoft Corporation
c:\windows\system32\wbem\wbemcomn.dll
services 5.2.3790.0 (srv03_rtm.030324-2048) 102.00 KB (104,448 bytes)
3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\services.exe
scesrv 5.2.3790.0 (srv03_rtm.030324-2048) 316.50 KB (324,096 bytes) 3/29/2003 6:00
AM Microsoft Corporation c:\windows\system32\scesrv.dll
authz 5.2.3790.0 (srv03_rtm.030324-2048) 67.00 KB (68,608 bytes)3/29/2003 6:00 AM
Microsoft Corporation c:\windows\system32\authz.dll
umpnpmgr 5.2.3790.0 (srv03_rtm.030324-2048) 121.50 KB (124,416 bytes)
3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\umpnpmgr.dll
ncobjapi 5.2.3790.0 (srv03_rtm.030324-2048) 34.50 KB (35,328 bytes)3/29/2003 6:00
AM Microsoft Corporation c:\windows\system32\ncobjapi.dll
msvcp60 6.05.2144.0 388.00 KB (397,312 bytes) 3/29/2003 6:00 AM
Microsoft Corporation c:\windows\system32\msvcp60.dll
eventlog 5.2.3790.0 (srv03_rtm.030324-2048) 60.50 KB (61,952 bytes)3/29/2003 6:00
AM Microsoft Corporation c:\windows\system32\eventlog.dll
lsass 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes)3/29/2003 6:00 AM
Microsoft Corporation c:\windows\system32\lsass.exe
lsasrv 5.2.3790.0 (srv03_rtm.030324-2048) 780.50 KB (799,232 bytes) 3/29/2003 6:00
AM Microsoft Corporation c:\windows\system32\lsasrv.dll
samsrv 5.2.3790.0 (srv03_rtm.030324-2048) 452.00 KB (462,848 bytes) 3/29/2003 6:00
AM Microsoft Corporation c:\windows\system32\samsrv.dll
cryptdll 5.2.3790.0 (srv03_rtm.030324-2048) 34.00 KB (34,816 bytes)3/29/2003 6:00 AM
Microsoft Corporation c:\windows\system32\cryptdll.dll
dnsapi 5.2.3790.0 (srv03_rtm.030324-2048) 147.50 KB (151,040 bytes) 3/29/2003 6:00
AM Microsoft Corporation c:\windows\system32\dnsapi.dll
ntdsapi 5.2.3790.0 (srv03_rtm.030324-2048) 76.00 KB (77,824 bytes)3/29/2003 6:00 AM
Microsoft Corporation c:\windows\system32\ntdsapi.dll
msapsspc 6.00.7755 78.25 KB (80,128 bytes)3/29/2003 6:00 AM Microsoft
Corporation c:\windows\system32\msapsspc.dll
msvcrt40 5.2.3790.0 (srv03_rtm.030324-2048) 60.00 KB (61,440 bytes)3/29/2003 6:00
AM Microsoft Corporation c:\windows\system32\msvcrt40.dll
msprivs 5.2.3790.0 (srv03_rtm.030324-2048) 46.50 KB (47,616 bytes)3/29/2003 6:00 AM
Microsoft Corporation c:\windows\system32\msprivs.dll
kerberos 5.2.3790.0 (srv03_rtm.030324-2048) 332.50 KB (340,480 bytes)
3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\kerberos.dll
msv1_0 5.2.3790.0 (srv03_rtm.030324-2048) 127.00 KB (130,048 bytes) 3/29/2003 6:00
AM Microsoft Corporation c:\windows\system32\msv1_0.dll
netlogon 5.2.3790.0 (srv03_rtm.030324-2048) 409.00 KB (418,816 bytes)
3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\netlogon.dll
w32time 5.2.3790.0 (srv03_rtm.030324-2048) 216.00 KB (221,184 bytes)
3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\w32time.dll
iphlpapi 5.2.3790.0 (srv03_rtm.030324-2048) 82.50 KB (84,480 bytes)3/29/2003 6:00 AM
Microsoft Corporation c:\windows\system32\iphlpapi.dll
schannel 5.2.3790.0 (srv03_rtm.030324-2048) 149.50 KB (153,088 bytes)
3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\schannel.dll
wdigest 5.2.3790.0 (srv03_rtm.030324-2048) 61.00 KB (62,464 bytes)3/29/2003 6:00 AM
Microsoft Corporation c:\windows\system32\wdigest.dll

rassfm 5.2.3790.0 (srv03_rtm.030324-2048) 20.50 KB (20,992 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\rassfm.dll
kdcsvc 5.2.3790.0 (srv03_rtm.030324-2048) 221.00 KB (226,304 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\kdcsvc.dll
ntdsa 5.2.3790.0 (srv03_rtm.030324-2048) 1.45 MB (1,520,640 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\ntdsa.dll
ntdsatq 5.2.3790.0 (srv03_rtm.030324-2048) 32.00 KB (32,768 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\ntdsatq.dll
mswsock 5.2.3790.0 (srv03_rtm.030324-2048) 254.00 KB (260,096 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\mswsock.dll
esent 5.2.3790.0 (srv03_rtm.030324-2048) 1.01 MB (1,056,256 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\esent.dll
scecli 5.2.3790.0 (srv03_rtm.030324-2048) 179.50 KB (183,808 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\scecli.dll
wshtcpip 5.2.3790.0 (srv03_rtm.030324-2048) 18.00 KB (18,432 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\wshtcpip.dll
dssenh 5.2.3790.0 (srv03_rtm.030324-2048) 131.33 KB (134,480 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\dssenh.dll
svchost 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\svchost.exe
rpcss 5.2.3790.0 (srv03_rtm.030324-2048) 276.50 KB (283,136 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\rpcss.dll
termsrv 5.2.3790.0 (srv03_rtm.030324-2048) 216.50 KB (221,696 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\termsrv.dll
icaapi 5.2.3790.0 (srv03_rtm.030324-2048) 10.50 KB (10,752 bytes)1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\icaapi.dll
mstlsapi 5.2.3790.0 (srv03_rtm.030324-2048) 104.50 KB (107,008 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\mstlsapi.dll
activeds 5.2.3790.0 (srv03_rtm.030324-2048) 189.00 KB (193,536 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\activeds.dll
adsldpc 5.2.3790.0 (srv03_rtm.030324-2048) 142.50 KB (145,920 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\adsldpc.dll
credui 5.2.3790.0 (srv03_rtm.030324-2048) 159.00 KB (162,816 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\credui.dll
atl 3.05.2283 83.00 KB (84,992 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\atl.dll
wkssvc 5.2.3790.0 (srv03_rtm.030324-2048) 125.00 KB (128,000 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\wkssvc.dll
es 2001.12.4720.0 (srv03_rtm.030324-2048) 221.50 KB (226,816 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\es.dll
sens 5.2.3790.0 (srv03_rtm.030324-2048) 35.50 KB (36,352 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\sens.dll
netman 5.2.3790.0 (srv03_rtm.030324-2048) 209.00 KB (214,016 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\netman.dll
mprapi 5.2.3790.0 (srv03_rtm.030324-2048) 81.00 KB (82,944 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\mprapi.dll
rtutils 5.2.3790.0 (srv03_rtm.030324-2048) 32.00 KB (32,768 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\rtutils.dll
rasapi32 5.2.3790.0 (srv03_rtm.030324-2048) 227.50 KB (232,960 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\rasapi32.dll
rasman 5.2.3790.0 (srv03_rtm.030324-2048) 56.50 KB (57,856 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\rasman.dll
tapi32 5.2.3790.0 (srv03_rtm.030324-2048) 175.00 KB (179,200 bytes) 3/29/2003 6:00 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 6:15 AM Microsoft Corporation c:\windows\system32\wzcsvc.dll
wmi 5.2.3790.0 (srv03_rtm.030324-2048) 6.50 KB (6,656 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\wmi.dll
dhcpcsvc 5.2.3790.0 (srv03_rtm.030324-2048) 101.50 KB (103,936 bytes) 3/29/2003 6:00 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 6:15 AM Microsoft Corporation c:\windows\system32\wzcsapi.dll
netshell 5.2.3790.0 (srv03_rtm.030324-2048) 1.67 MB (1,747,456 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\netshell.dll
clusapi 5.2.3790.0 (srv03_rtm.030324-2048) 56.00 KB (57,344 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\clusapi.dll
hnetcfg 5.2.3790.0 (srv03_rtm.030324-2048) 243.50 KB (249,344 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\hnetcfg.dll
wininet 6.00.3790.0 (srv03_rtm.030324-2048) 609.00 KB (623,616 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\wininet.dll
wmisvc 5.2.3790.0 (srv03_rtm.030324-2048) 131.00 KB (134,144 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\wbem\wmisvc.dll
vssapi 5.2.3790.0 (srv03_rtm.030324-2048) 528.00 KB (540,672 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\vssapi.dll
wbemcore 5.2.3790.0 (srv03_rtm.030324-2048) 457.00 KB (467,968 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\wbem\wbemcore.dll
esscli 5.2.3790.0 (srv03_rtm.030324-2048) 235.50 KB (241,152 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\wbem\esscli.dll
fastprox 5.2.3790.0 (srv03_rtm.030324-2048) 443.00 KB (453,632 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\wbem\fastprox.dll
wbemsvc 5.2.3790.0 (srv03_rtm.030324-2048) 42.50 KB (43,520 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\wbem\wbemsvc.dll
comsvcs 2001.12.4720.0 (srv03_rtm.030324-2048) 1.14 MB (1,199,616 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\comsvcs.dll
wmiutils 5.2.3790.0 (srv03_rtm.030324-2048) 90.50 KB (92,672 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\wbem\wmiutils.dll
repdrvfs 5.2.3790.0 (srv03_rtm.030324-2048) 165.00 KB (168,960 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\wbem\repdrvfs.dll
wmiprvsd 5.2.3790.0 (srv03_rtm.030324-2048) 405.50 KB (415,232 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\wbem\wmiprvsd.dll
wbemess 5.2.3790.0 (srv03_rtm.030324-2048) 256.50 KB (262,656 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\wbem\wbemess.dll
rasdlg 5.2.3790.0 (srv03_rtm.030324-2048) 642.00 KB (657,408 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\rasdlg.dll
pchsvc 5.2.3790.0 (srv03_rtm.030324-2048) 31.50 KB (32,256 bytes) 1/28/2005 1:56 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\pchsvc.dll
ncprov 5.2.3790.0 (srv03_rtm.030324-2048) 43.00 KB (44,032 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\wbem\ncprov.dll
wbemcons 5.2.3790.0 (srv03_rtm.030324-2048) 69.00 KB (70,656 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\wbem\wbemcons.dll
explorer 6.00.3790.0 (srv03_rtm.030324-2048) 1,008.50 KB (1,032,704 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\explorer.exe
browseui 6.00.3790.0 (srv03_rtm.030324-2048) 1.01 MB (1,057,280 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\browseui.dll
shdocvw 6.00.3790.0 (srv03_rtm.030324-2048) 1.33 MB (1,393,664 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\shdocvw.dll

apphelp 5.2.3790.0 (srv03_rtm.030324-2048) 122.00 KB (124,928 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\apphelp.dll
themeui 6.00.3790.0 (srv03_rtm.030324-2048) 360.50 KB (369,152 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\themeui.dll
msimg32 5.2.3790.0 (srv03_rtm.030324-2048) 4.50 KB (4,608 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\msimg32.dll
linkinfo 5.2.3790.0 (srv03_rtm.030324-2048) 16.50 KB (16,896 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\linkinfo.dll
ntshrui 6.00.3790.0 (srv03_rtm.030324-2048) 136.00 KB (139,264 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\ntshrui.dll
urlmon 6.00.3790.0 (srv03_rtm.030324-2048) 501.50 KB (513,536 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\urlmon.dll
webcheck 6.00.3790.0 (srv03_rtm.030324-2048) 261.50 KB (267,776 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\webcheck.dll
wsock32 5.2.3790.0 (srv03_rtm.030324-2048) 22.00 KB (22,528 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\wsock32.dll
stobject 5.2.3790.0 (srv03_rtm.030324-2048) 117.50 KB (120,320 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\stobject.dll
batmeter 6.00.3790.0 (srv03_rtm.030324-2048) 28.50 KB (29,184 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\batmeter.dll
powrprof 6.00.3790.0 (srv03_rtm.030324-2048) 14.50 KB (14,848 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\powrprof.dll
shdoclc 6.00.3790.0 (srv03_rtm.030324-2048) 588.50 KB (602,624 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\shdoclc.dll
printui 5.2.3790.0 (srv03_rtm.030324-2048) 536.50 KB (549,376 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\printui.dll
cfgmgr32 5.2.3790.0 (srv03_rtm.030324-2048) 17.50 KB (17,920 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\cfgmgr32.dll
drprov 5.2.3790.0 (srv03_rtm.030324-2048) 12.50 KB (12,800 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\drprov.dll
ntlanman 5.2.3790.0 (srv03_rtm.030324-2048) 41.00 KB (41,984 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\ntlanman.dll
netui0 5.2.3790.0 (srv03_rtm.030324-2048) 75.50 KB (77,312 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\netui0.dll
netui1 5.2.3790.0 (srv03_rtm.030324-2048) 184.00 KB (188,416 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\netui1.dll
davclnt 5.2.3790.0 (srv03_rtm.030324-2048) 23.50 KB (24,064 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\davclnt.dll
browselc 6.00.3790.0 (srv03_rtm.030324-2048) 62.00 KB (63,488 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\browselc.dll
mydocs 6.00.3790.0 (srv03_rtm.030324-2048) 88.00 KB (90,112 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\mydocs.dll
actxprxy 6.00.3790.0 (srv03_rtm.030324-2048) 95.00 KB (97,280 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\actxprxy.dll
sqlmangr 2000.080.0760.00 72.57 KB (74,308 bytes) 1/28/2005 2:29 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\sqlmangr.exe
sqlunirl 2000.080.0728.00 176.56 KB (180,800 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\sqlunirl.dll
comdlg32 6.00.3790.0 (srv03_rtm.030324-2048) 261.00 KB (267,264 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\comdlg32.dll
w95scm 2000.080.0760.00 48.56 KB (49,728 bytes) 1/28/2005 2:29 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) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\odbc32.dll

sqlsvc 2000.080.0760.00 92.56 KB (94,784 bytes)1/28/2005 2:29 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) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\odbcbcp.dll
sqlresld 2000.080.0382.00 28.56 KB (29,248 bytes)1/28/2005 2:29 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\sqlresld.dll
odbcint 3.525.1022.0 (srv03_rtm.030324-2048) 92.00 KB (94,208 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\odbcint.dll
resutils 5.2.3790.0 (srv03_rtm.030324-2048) 59.00 KB (60,416 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\resutils.dll
mfc42u 6.05.3014.0 960.00 KB (983,040 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\mfc42u.dll
sqlsvc 2000.080.0194.00 24.00 KB (24,576 bytes)1/28/2005 2:29 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\resources\1033\sqlsvc.rll
sqlmangr 2000.080.0194.00 96.00 KB (98,304 bytes)1/28/2005 2:29 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\resources\1033\sqlmangr.rll
cmd 5.2.3790.0 (srv03_rtm.030324-2048) 374.00 KB (382,976 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\cmd.exe
sqlservr 2000.080.0818.00 7.20 MB (7,544,916 bytes) 1/28/2005 2:28 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\sqlservr.exe
opends60 2000.080.0194.00 24.06 KB (24,639 bytes)1/28/2005 2:28 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\opends60.dll
ums 2000.080.0816.00 44.07 KB (45,132 bytes)1/28/2005 2:28 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\ums.dll
sqlsort 2000.080.0760.00 576.56 KB (590,396 bytes) 1/28/2005 2:28 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)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\msvcirt.dll
sqlevn70 2000.080.0789.00 28.00 KB (28,672 bytes)1/28/2005 2:28 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) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\xolehlp.dll
msdtcprx 2001.12.4720.0 (srv03_rtm.030324-2048) 427.50 KB (437,760 bytes) 1/28/2005 1:54 PM Microsoft Corporation c:\windows\system32\msdtcprx.dll
mtxclu 2001.12.4720.0 (srv03_rtm.030324-2048) 74.50 KB (76,288 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\mtxclu.dll
winrnr 5.2.3790.0 (srv03_rtm.030324-2048) 15.00 KB (15,360 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\winrnr.dll
rasadhlp 5.2.3790.0 (srv03_rtm.030324-2048) 6.50 KB (6,656 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\rasadhlp.dll
ssnetlib 2000.080.0818.00 80.56 KB (82,492 bytes)1/28/2005 2:28 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\ssnetlib.dll
security 5.2.3790.0 (srv03_rtm.030324-2048) 5.50 KB (5,632 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\security.dll
ssmslpcn 2000.080.0934.00 32.56 KB (33,340 bytes)1/28/2005 2:28 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\ssmslpcn.dll
ssnmpn70 2000.080.0818.00 24.56 KB (25,148 bytes)1/28/2005 2:28 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\ssnmpn70.dll
mmc 5.2.3790.0 (srv03_rtm.030324-2048) 762.50 KB (780,800 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\mmc.exe
oleacc 4.2.5406.0 (srv03_rtm.030324-2048) 171.00 KB (175,104 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\oleacc.dll

mmcbase 5.2.3790.0 (srv03_rtm.030324-2048) 70.50 KB (72,192 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\mmcbase.dll
mmcndmgr 5.2.3790.0 (srv03_rtm.030324-2048) 1.13 MB (1,182,720 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\mmcndmgr.dll
msxml3 8.40.9419.0 1.28 MB (1,337,344 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\msxml3.dll
filemgmt 5.2.3790.0 (srv03_rtm.030324-2048) 327.50 KB (335,360 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\filemgmt.dll
mshtml 6.00.3790.0 (srv03_rtm.030324-2048) 2.78 MB (2,916,352 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\mshtml.dll
mlang 6.00.3790.0 (srv03_rtm.030324-2048) 570.00 KB (583,680 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\mlang.dll
msimtf 5.2.3790.0 (srv03_rtm.030324-2048) 149.00 KB (152,576 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\msimtf.dll
msctf 5.2.3790.0 (srv03_rtm.030324-2048) 287.00 KB (293,888 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\msctf.dll
jscript 5.6.0.8515 436.00 KB (446,464 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\jscript.dll
msls31 3.10.349.0 147.00 KB (150,528 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\msls31.dll
imm32 5.2.3790.0 (srv03_rtm.030324-2048) 105.50 KB (108,032 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\imm32.dll
mshtmled 6.00.3790.0 (srv03_rtm.030324-2048) 443.50 KB (454,144 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\mshtmled.dll
imgutil 5.2.3790.0 (srv03_rtm.030324-2048) 35.00 KB (35,840 bytes)3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\imgutil.dll
snmpsnap 5.2.3790.0 (srv03_rtm.030324-2048) 173.50 KB (177,664 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\snmpsnap.dll
servdeps 5.2.3790.0 (srv03_rtm.030324-2048) 53.00 KB (54,272 bytes)1/28/2005 1:53 PM Microsoft Corporation c:\windows\system32\servdeps.dll
mmfutil 5.2.3790.0 (srv03_rtm.030324-2048) 17.00 KB (17,408 bytes)1/28/2005 1:53 PM Microsoft Corporation c:\windows\system32\mmfutil.dll
helpctr 5.2.3790.0 (srv03_rtm.030324-2048) 764.00 KB (782,336 bytes) 1/28/2005 1:56 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) 1/28/2005 1:56 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) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\itss.dll
pchshell 5.2.3790.0 (srv03_rtm.030324-2048) 100.50 KB (102,912 bytes) 1/28/2005 1:56 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\pchshell.dll
vbscript 5.6.0.8515 404.00 KB (413,696 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\vbscript.dll
mfc42 6.05.3014.0 960.00 KB (983,040 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\mfc42.dll
msinfo 5.2.3790.0 (srv03_rtm.030324-2048) 358.50 KB (367,104 bytes) 1/28/2005 1:56 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) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\riched32.dll
riched20 5.31.23.1218 406.00 KB (415,744 bytes) 3/29/2003 6:00 AM Microsoft Corporation c:\windows\system32\riched20.dll
helpsvc 5.2.3790.0 (srv03_rtm.030324-2048) 720.00 KB (737,280 bytes) 1/28/2005 1:56 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\helpsvc.exe

[Services]

Appendix C – Tunable Parameters

Display Name Name State Start Mode Service Type Path Error Control Start Name Tag 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 Stopped Manual 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 Manager dmserver Stopped Manual 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 Stopped Manual Share Process
c:\windows\system32\svchost.exe -k winerr Ignore LocalSystem 0
Event Log Eventlog Running Auto Share Process
c:\windows\system32\services.exe Normal LocalSystem 0
COM+ Event System EventSystem Running Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Help and Support helpsvc Running 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 SSL HTTPFilter Stopped Manual Share Process
c:\windows\system32\lsass.exe Normal LocalSystem 0
IMAPI CD-Burning COM Service ImapiService Stopped Disabled Own Process c:\windows\system32\imapi.exe Normal LocalSystem 0
Intersite Messaging IsmServ Stopped Disabled Own Process
c:\windows\system32\ismserv.exe Normal LocalSystem 0
Kerberos Key Distribution Center kdc Stopped Disabled Share Process
c:\windows\system32\lsass.exe Normal LocalSystem 0

Appendix C – Tunable Parameters

Server lanmanserver Stopped Manual 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 Stopped Manual 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
Network Location Awareness (NLA) Nla Stopped Disabled 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 Stopped Manual 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

Appendix C – Tunable Parameters

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 Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Ignore LocalSystem 0
System Event Notification SENS Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Internet Connection Firewall (ICF) / Internet Connection Sharing (ICS) SharedAccess
Stopped Disabled Share Process c:\windows\system32\svchost.exe -k
netsvcs Normal LocalSystem 0
Shell Hardware Detection ShellHWDetection Stopped Manual 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 Stopped Manual 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 Manual 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
Microsoft SQL Server All Users:Microsoft SQL Server All Users
Microsoft SQL Server - Switch All Users:Microsoft SQL Server - Switch All Users
Startup All Users:Startup All Users
Accessories 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 PE2800\Administrator:Accessories PE2800\Administrator
Accessories\Accessibility PE2800\Administrator:Accessories\Accessibility
PE2800\Administrator
Accessories\Entertainment PE2800\Administrator:Accessories\Entertainment
PE2800\Administrator
Administrative Tools PE2800\Administrator:Administrative Tools PE2800\Administrator
Startup PE2800\Administrator:Startup PE2800\Administrator

[Startup Programs]

Appendix C – Tunable Parameters

Program Command User Name Location
desktop desktop.ini NT AUTHORITY\SYSTEM Startup
desktop desktop.ini PE2800\Administrator Startup
desktop desktop.ini .DEFAULT Startup
desktop desktop.ini All Users Common Startup
Service Manager c:\progra~1\micros~1\80\tools\binn\sqlmangr.exe /n All Users Common Startup

[OLE Registration]

Object Local Server
Sound (OLE2) sndrec32.exe
Media Clip mplay32.exe
Video Clip mplay32.exe /avi
MIDI Sequence mplay32.exe /mid
Sound Not Available
Media Clip Not Available
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 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
actxprxy.dll 6.0.3790.0 95 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
advpack.dll 6.0.3790.0 94 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
advpack.dll 6.0.3790.0 94 KB 3/29/2003 6:00:00 AM . Microsoft Corporation

asctrls.ocx 6.0.3790.0 90 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
asctrls.ocx 6.0.3790.0 90 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
browselc.dll 6.0.3790.0 62 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
browselc.dll 6.0.3790.0 62 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
browseui.dll 6.0.3790.0 1,033 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
browseui.dll 6.0.3790.0 1,033 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
cdfview.dll 6.0.3790.0 144 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
cdfview.dll 6.0.3790.0 144 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
comctl32.dll 5.82.3790.0 561 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
comctl32.dll 5.82.3790.0 561 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
dxtrans.dll 6.3.3790.0 198 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
dxtrans.dll 6.3.3790.0 198 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
dxtmsft.dll 6.3.3790.0 344 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
dxtmsft.dll 6.3.3790.0 344 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
iecont.dll <File Missing> Not Available Not Available Not Available Not Available
iecontlc.dll <File Missing> Not Available Not Available Not Available Not Available
iedkcs32.dll 16.0.3790.0 300 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
iedkcs32.dll 16.0.3790.0 300 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
iepeers.dll 6.0.3790.0 230 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
iepeers.dll 6.0.3790.0 230 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
iesetup.dll 6.0.3790.0 59 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
iesetup.dll 6.0.3790.0 59 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
ieuinit.inf Not Available 20 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Not Available
ieuinit.inf Not Available 20 KB 3/29/2003 6:00:00 AM . Not Available
iexplore.exe 6.0.3790.0 90 KB 3/29/2003 6:00:00 AM C:\Program Files\Internet Explorer Microsoft Corporation
imgutil.dll 5.2.3790.0 35 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
imgutil.dll 5.2.3790.0 35 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
inetcpl.cpl 6.0.3790.0 303 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
inetcpl.cpl 6.0.3790.0 303 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
inetcplc.dll 6.0.3790.0 109 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
inetcplc.dll 6.0.3790.0 109 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
inseng.dll 6.0.3790.0 72 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
inseng.dll 6.0.3790.0 72 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
mlang.dll 6.0.3790.0 570 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Microsoft Corporation
mlang.dll 6.0.3790.0 570 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
msencode.dll 2002.10.4.0 112 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32 Not Available

msencode.dll 2002.10.4.0 112 KB 3/29/2003 6:00:00 AM . Not Available
mshta.exe 6.0.3790.0 26 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
mshta.exe 6.0.3790.0 26 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
mshtml.dll 6.0.3790.0 2,848 KB 3/29/2003 6:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
mshtml.dll 6.0.3790.0 2,848 KB 3/29/2003 6:00:00 AM . Microsoft
Corporation
mshtml.tlb 6.0.3790.0 1,319 KB 3/29/2003 6:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
mshtml.tlb 6.0.3790.0 1,319 KB 3/29/2003 6:00:00 AM . Microsoft
Corporation
mshtmled.dll 6.0.3790.0 444 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
mshtmled.dll 6.0.3790.0 444 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
mshtmler.dll 6.0.3790.0 55 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
mshtmler.dll 6.0.3790.0 55 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
msident.dll 6.0.3790.0 47 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
msident.dll 6.0.3790.0 47 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
msidntld.dll 6.0.3790.0 15 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
msidntld.dll 6.0.3790.0 15 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
msieftp.dll 6.0.3790.0 230 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
msieftp.dll 6.0.3790.0 230 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
msrating.dll 6.0.3790.0 132 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
msrating.dll 6.0.3790.0 132 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
mstime.dll 6.0.3790.0 491 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
mstime.dll 6.0.3790.0 491 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
occache.dll 6.0.3790.0 89 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
occache.dll 6.0.3790.0 89 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
proctexe.ocx 6.3.3790.0 78 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Intel Corporation
proctexe.ocx 6.3.3790.0 78 KB 3/29/2003 6:00:00 AM . Intel Corporation
sendmail.dll 6.0.3790.0 52 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
sendmail.dll 6.0.3790.0 52 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
shdoclc.dll 6.0.3790.0 589 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
shdoclc.dll 6.0.3790.0 589 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
shdocvw.dll 6.0.3790.0 1,361 KB 3/29/2003 6:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
shdocvw.dll 6.0.3790.0 1,361 KB 3/29/2003 6:00:00 AM . Microsoft
Corporation
shfolder.dll 6.0.3790.0 23 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
shfolder.dll 6.0.3790.0 23 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
shlwapi.dll 6.0.3790.0 281 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
shlwapi.dll 6.0.3790.0 281 KB 3/29/2003 6:00:00 AM . Microsoft Corporation

tdc.ocx 1.3.0.3130 58 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
tdc.ocx 1.3.0.3130 58 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
url.dll 6.0.3790.0 36 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
url.dll 6.0.3790.0 36 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
urlmon.dll 6.0.3790.0 502 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
urlmon.dll 6.0.3790.0 502 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
webcheck.dll 6.0.3790.0 262 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
webcheck.dll 6.0.3790.0 262 KB 3/29/2003 6:00:00 AM . Microsoft Corporation
wininet.dll 6.0.3790.0 609 KB 3/29/2003 6:00:00 AM C:\WINDOWS\system32
Microsoft Corporation
wininet.dll 6.0.3790.0 609 KB 3/29/2003 6:00:00 AM . Microsoft Corporation

[Connectivity]

Item Value
Connection Preference Never dial

LAN Settings

AutoConfigProxy Not Available
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\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

CLIENT70 PE SC1420
System Information report written at: 02/22/2005 02:50:15 AM
[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 4 Build 2195
OS Manufacturer Microsoft Corporation
System Name CLIENT70
System Manufacturer Dell Inc.
System Model PowerEdge SC1420
System Type X86-based PC
Processor x86 Family 15 Model 3 Stepping 4 GenuineIntel ~3391 Mhz
Processor x86 Family 15 Model 3 Stepping 4 GenuineIntel ~3391 Mhz
Processor x86 Family 15 Model 3 Stepping 4 GenuineIntel ~3391 Mhz
Processor x86 Family 15 Model 3 Stepping 4 GenuineIntel ~3391 Mhz
BIOS Version Phoenix ROM BIOS PLUS Version 1.10 A01
Windows Directory C:\WINNT
System Directory C:\WINNT\system32
Boot Device \Device\Harddisk0\Partition1
Locale United States
User Name CLIENT70\Administrator
Time Zone Central Standard Time
Total Physical Memory 1,046,624 KB

Available Physical Memory 864,304 KB
Total Virtual Memory 3,568,264 KB
Available Virtual Memory 3,295,004 KB
Page File Space 2,521,640 KB
Page File C:\pagefile.sys

[Hardware Resources]

[Following are sub-categories of this main category]

[Conflicts/Sharing]

Resource	Device
IRQ 9	Microsoft ACPI-Compliant System
IRQ 9	RAID Controller
IRQ 16	PCI standard PCI-to-PCI bridge
IRQ 16	PCI standard PCI-to-PCI bridge
IRQ 16	PCI standard PCI-to-PCI bridge
IRQ 16	Standard Universal PCI to USB Host Controller
IRQ 16	Standard Universal PCI to USB Host Controller

[DMA]

Channel	Device	Status
4	Direct memory access 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
0x0D00-0xFFFF	PCI bus	OK
0xD000-0xDFFF	PCI standard PCI-to-PCI bridge	OK
0xD000-0xDFFF	PCI standard PCI-to-PCI bridge	OK
0xD480-0xD4BF	Intel(R) PRO/100+ Server Adapter (PILA8470B)	OK
0xD800-0xD8FF	Adaptec 3960D Ultra160/m PCI SCSI Card	OK
0xDC00-0xDCFF	Adaptec 3960D Ultra160/m PCI SCSI Card	OK
0xD4C0-0xD4FF	Ethernet Controller	OK
0xFF80-0xFF9F	Standard Universal PCI to USB Host Controller	OK
0xFF60-0xFF7F	Standard Universal PCI to USB Host Controller	OK
0xFF40-0xFF5F	Standard Universal PCI to USB Host Controller	OK
0xFF20-0xFF3F	Standard Universal PCI to USB Host Controller	OK
0xCC00-0xCCFF	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
0x0062-0x0063	System board	OK
0x0065-0x006F	System board	OK

0x00E0-0x00EF System board OK
0x0800-0x085F System board OK
0x0C00-0x0C7F System board OK
0x0860-0x08FF System board OK
0x0080-0x009F Direct memory access controller OK
0x00C0-0x00DF Direct memory access controller OK
0x00F0-0x00FF Numeric data processor OK
0x0020-0x003F Programmable interrupt controller OK
0x00A0-0x00BF Programmable interrupt controller OK
0x04D0-0x04D1 Programmable interrupt controller OK
0x0061-0x0061 System speaker OK
0x0070-0x007F System CMOS/real time clock OK
0x0040-0x005F System timer 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
0xFFA0-0xFFAF Intel(r) 82801EB Parallel Ultra ATA Storage Controller - 24DB OK
0x01F0-0x01F7 Primary IDE Channel OK
0x03F6-0x03F6 Primary IDE Channel OK
0xFE00-0xFE07 RAID Controller OK
0xFE10-0xFE13 RAID Controller OK
0xFE20-0xFE27 RAID Controller OK
0xFE30-0xFE33 RAID Controller OK
0xFEA0-0xFEAF RAID Controller OK
0xECE0-0xECFF PCI Device OK

[IRQs]

IRQ Number Device
9 Microsoft ACPI-Compliant System
9 RAID Controller
16 PCI standard PCI-to-PCI bridge
16 PCI standard PCI-to-PCI bridge
16 PCI standard PCI-to-PCI bridge
16 Standard Universal PCI to USB Host Controller
16 Standard Universal PCI to USB Host Controller
53 Intel(R) PRO/100+ Server Adapter (PILA8470B)
49 Adaptec 3960D Ultra160/m PCI SCSI Card
50 Adaptec 3960D Ultra160/m PCI SCSI Card
11 Ethernet Controller
19 Standard Universal PCI to USB Host Controller
18 Standard Universal PCI to USB Host Controller
23 Standard Enhanced PCI to USB Host Controller
17 ATI Technologies Inc. RAGE XL PCI
13 Numeric data processor
8 System CMOS/real time clock
1 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
12 PS/2 Compatible Mouse
14 Primary IDE Channel
4 PCI Device

[Memory]

Range Device Status
0xA0000-0xBFFFF PCI bus OK
0xA0000-0xBFFFF ATI Technologies Inc. RAGE XL PCI OK

0x80000000-0xDFFFFFFF PCI busOK
0xF0000000-0xFEBFFFFF PCI busOK
0xDFC00000-0xDFEFFFFF PCI standard PCI-to-PCI bridge OK
0xDFC00000-0xDFEFFFFF PCI standard PCI-to-PCI bridge OK
0xDFCDD000-0xDFCDDFFF Intel(R) PRO/100+ Server Adapter (PILA8470B) OK
0xDFD00000-0xDFDFFFFF Intel(R) PRO/100+ Server Adapter (PILA8470B) OK
0xDFCDE000-0xDFCDEFFF Adaptec 3960D Ultra160/m PCI SCSI Card OK
0xDFCDF000-0xDFCDFFFF Adaptec 3960D Ultra160/m PCI SCSI Card OK
0xDFCE0000-0xDFCFFFFF Ethernet Controller OK
0xDFB00000-0xDFBFFFFF PCI standard PCI-to-PCI bridge OK
0xDFA00000-0xDFAFFFFF PCI standard PCI-to-PCI bridge OK
0xFEBFFC00-0xFEBFFFFF Standard Enhanced PCI to USB Host Controller OK
0xDE000000-0xDEFFFFFF ATI Technologies Inc. RAGE XL PCI OK
0xDF8FF000-0xDF8FFFFF ATI Technologies Inc. RAGE XL PCI OK
0xDFFFFC00-0xDFFFFFFF Intel(r) 82801EB Parallel Ultra ATA Storage Controller - 24DB
OK

[Components]

[Following are sub-categories of this main category]

[Multimedia]

[Following are sub-categories of this main category]

[Audio Codecs]

Codec Manufacturer Description Status File Version Size Creation Date
c:\winnt\system32\lhacm.acm Microsoft Corporation OK
C:\WINNT\system32\LHACM.ACM 4.4.3385 33.27 KB (34,064 bytes)
2/21/2005 10:46:08 PM
c:\winnt\system32\msg723.acm Microsoft Corporation OK
C:\WINNT\system32\MSG723.ACM 4.4.3385 106.77 KB (109,328 bytes)
2/21/2005 10:46:07 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)
6/20/2003 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)
6/20/2003 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)
6/20/2003 7:00:00 AM
c:\winnt\system32\imaadp32.acm Microsoft Corporation OK
C:\WINNT\system32\IMAADP32.ACM 5.00.2195.6612 16.27 KB (16,656 bytes)
6/20/2003 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)
6/20/2003 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) 6/20/2003
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)
6/20/2003 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)
2/21/2005 10:46:07 PM
c:\winnt\system32\msh263.drv Microsoft Corporation OK
C:\WINNT\system32\MSH263.DRV 4.4.3385 252.27 KB (258,320 bytes)
2/21/2005 10:45:52 PM
c:\winnt\system32\iccvid.dll Radius Inc. OK
C:\WINNT\system32\ICCVID.DLL 1.10.0.6 108.00 KB (110,592 bytes)
6/20/2003 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)
6/20/2003 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)
6/20/2003 7:00:00 AM
c:\winnt\system32\msrle32.dll Microsoft Corporation OK
C:\WINNT\system32\MSRLE32.DLL 5.00.2195.6612 10.77 KB (11,024 bytes)
6/20/2003 7:00:00 AM

[CD-ROM]

Item Value
Drive D:
Description CD-ROM Drive
Media Loaded True
Media Type CD-ROM
Name HL-DT-ST CD-ROM GCR-8483B
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-8483B_____1.05____\5&2B67685&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_80081002&REV_27\4&1C660DD6&0&68F0
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 Driversatidrab.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\4&1506BB2E&0
NumberOfFunctionKeys 12

[Pointing Device]

Item Value
Hardware Type PS/2 Compatible Mouse
Number of Buttons 3
Status OK
PNP Device ID ACPI\PNP0F13\4&1506BB2E&0
Power Management Supported False
Double Click Threshold 6
Handedness Right Handed Operation

[Modem]

Item Value
No modems

[Network]

[Following are sub-categories of this main category]

[Adapter]

Item Value
Name [00000000] Intel(R) PRO/100+ Server Adapter (PILA8470B)
Adapter Type Ethernet 802.3
Product Name Intel(R) PRO/100+ Server Adapter (PILA8470B)
Installed True

PNP Device ID
PCI\VEN_8086&DEV_1229&SUBSYS_100C8086&REV_08\5&3744353E&0&600210
Last Reset 2/21/2005 4:59:00 PM
Index 0
Service Name E100B
IP Address
IP Subnet
Default IP Gateway Not Available
DHCP Enabled True
DHCP Server
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:02:B3:5B:6B:B3
Service Name E100B
IRQ Number 53
I/O Port 0xD480-0xD4BF
Driver c:\winnt\system32\drivers\e100bnt5.sys (85776, 4.02.38.0000)

Name [00000001] RAS Async Adapter
Adapter Type Not Available
Product Name RAS Async Adapter
Installed True
PNP Device ID Not Available
Last Reset 2/21/2005 4:59:00 PM
Index 1
Service Name AsyncMac
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Service Name Not Available

Name [00000002] WAN Miniport (L2TP)
Adapter Type Not Available
Product Name WAN Miniport (L2TP)
Installed True
PNP Device ID ROOT\MS_L2TPMINIPORT\0000
Last Reset 2/21/2005 4:59:00 PM
Index 2
Service Name Rasl2tp
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Service Name Rasl2tp
Driver c:\winnt\system32\drivers\rasl2tp.sys (52112, 5.00.2195.6655)

Name [00000003] WAN Miniport (PPTP)
Adapter Type Wide Area Network (WAN)
Product Name WAN Miniport (PPTP)
Installed True
PNP Device ID ROOT\MS_PPTPMINIPORT\0000
Last Reset 2/21/2005 4:59:00 PM
Index 3
Service Name PptpMiniport
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 50:50:54:50:30:30
Service Name PptpMiniport
Driver c:\winnt\system32\drivers\raspptp.sys (48464, 5.00.2195.6711)

Name [00000004] Direct Parallel
Adapter Type Not Available
Product Name Direct Parallel
Installed True
PNP Device ID ROOT\MS_PTIMINIPORT\0000
Last Reset 2/21/2005 4:59:00 PM
Index 4
Service Name Raspti
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Service Name Raspti
Driver c:\winnt\system32\drivers\raspti.sys (16880, 5.00.2146.1)

Name [00000005] WAN Miniport (IP)
Adapter Type Not Available
Product Name WAN Miniport (IP)
Installed True
PNP Device ID ROOT\MS_NDISWANIP\0000
Last Reset 2/21/2005 4:59:00 PM
Index 5
Service Name NdisWan
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled False
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Service Name NdisWan

Driver c:\winnt\system32\drivers\ndiswan.sys (93360, 5.00.2195.6699)

[Protocol]

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

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

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

SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting True

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

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{77010362-4571-48C8-BD14-26CC5A9282CF}]
SEQPACKET 0
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize 20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{77010362-4571-48C8-BD14-26CC5A9282CF}]
DATAGRAM 0
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize 20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False

SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{CB6829BD-C936-4656-9BFE-0B0AAB4F37A6}] SEQPACKET 1
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize 20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{CB6829BD-C936-4656-9BFE-0B0AAB4F37A6}] DATAGRAM 1
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize 20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{455304D2-F552-47ED-953D-F9C869B0C345}] SEQPACKET 2
ConnectionlessService False
GuaranteesDelivery True
GuaranteesSequencing True
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize 20 bytes
PseudoStreamOriented False
SupportsBroadcasting False

SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{455304D2-F552-47ED-953D-F9C869B0C345}]
DATAGRAM 2
ConnectionlessService True
GuaranteesDelivery False
GuaranteesSequencing False
MaximumAddressSize 20 bytes
MaximumMessageSize 64000 bytes
MessageOriented True
MinimumAddressSize 20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData False
SupportsDisconnectData False
SupportsEncryption False
SupportsExpeditedData False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

[WinSock]

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

File c:\winnt\system32\wsock32.dll
Version 5.00.2195.6603
Size 21.27 KB (21,776 bytes)

[Ports]

[Following are sub-categories of this main category]

[Serial]

Item Value
No serial port information

[Parallel]

Item Value
No parallel port information

[Storage]

Appendix C – Tunable Parameters

[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 10.00 GB (10,733,957,120 bytes)
Free Space 7.69 GB (8,252,649,472 bytes)
Volume Name
Volume Serial Number EC5D9308
Partition Disk #0, Partition #0
Partition Size 10.00 GB (10,733,958,144 bytes)
Starting Offset 32256 bytes
Drive Description Disk drive
Drive Manufacturer (Standard disk drives)
Drive Model FUJITSU MAP3367NP 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 1
Drive SCSITargetId 0
Drive SectorsPerTrack 63
Drive Size 36413314560 bytes
Drive TotalCylinders 4427
Drive TotalSectors 71119755
Drive TotalTracks 1128885
Drive TracksPerCylinder 255

[SCSI]

Item Value
Name Adaptec 3960D Ultra160/m PCI SCSI Card
Caption Adaptec 3960D Ultra160/m PCI SCSI Card
Driver adpu160m
Status OK
PNP Device ID
PCI\VEN_9005&DEV_00C0&SUBSYS_F6209005&REV_01\5&3744353E&0&680210
Device ID
PCI\VEN_9005&DEV_00C0&SUBSYS_F6209005&REV_01\5&3744353E&0&680210
Device Map Not Available
Index Not Available
Max Number Controlled Not Available
IRQ Number 49
I/O Port 0xD800-0xD8FF

Driver c:\winnt\system32\drivers\adpu160m.sys (64432, v3.10a)

Name Adaptec 3960D Ultra160/m PCI SCSI Card
Caption Adaptec 3960D Ultra160/m PCI SCSI Card
Driver adpu160m
Status OK
PNP Device ID
PCI\VEN_9005&DEV_00C0&SUBSYS_F6209005&REV_01\5&3744353E&0&690210
Device ID
PCI\VEN_9005&DEV_00C0&SUBSYS_F6209005&REV_01\5&3744353E&0&690210
Device Map Not Available
Index Not Available
Max Number Controlled Not Available
IRQ Number 50
I/O Port 0xDC00-0xDCFF
Driver c:\winnt\system32\drivers\adpu160m.sys (64432, v3.10a)

[Printing]

Name Port Name Server Name
No printing information

[Problem Devices]

Device PNP Device ID Error Code
PCI Device PCI\VEN_8086&DEV_3591&SUBSYS_01731028&REV_00\3&172E68DD&0&01
28
Ethernet Controller
PCI\VEN_8086&DEV_1026&SUBSYS_01731028&REV_04\5&3744353E&0&700210
28
RAID Controller
PCI\VEN_8086&DEV_24DF&SUBSYS_01731028&REV_02\3&172E68DD&0&FA
28
PCI Device
PCI\VEN_8086&DEV_24D3&SUBSYS_01731028&REV_02\3&172E68DD&0&FB
28

[USB]

Device PNP Device ID
Standard Universal PCI to USB Host Controller
PCI\VEN_8086&DEV_24D2&SUBSYS_01731028&REV_02\3&172E68DD&0&E8
USB Root Hub USB\ROOT_HUB\4&B63F3E0&0
TEAC USB Floppy USB\VID_0644&PID_0000\5&1EC0AF8E&0&2
High-Capacity Floppy Disk DriveUSBSTOR\SFLOPPY&VEN_TEAC&PROD_FD-
05PUB&REV_1026\6&16D6FB9E&0
Standard Universal PCI to USB Host Controller
PCI\VEN_8086&DEV_24D4&SUBSYS_01731028&REV_02\3&172E68DD&0&E9
USB Root Hub USB\ROOT_HUB\4&4336C80&0
Standard Universal PCI to USB Host Controller
PCI\VEN_8086&DEV_24D7&SUBSYS_01731028&REV_02\3&172E68DD&0&EA
USB Root Hub USB\ROOT_HUB\4&331ADE44&0
Standard Universal PCI to USB Host Controller
PCI\VEN_8086&DEV_24DE&SUBSYS_01731028&REV_02\3&172E68DD&0&EB

USB Root Hub USB\ROOT_HUB\4&CBAAD3E&0
Standard Enhanced PCI to USB Host Controller
PCI\VEN_8086&DEV_24DD&SUBSYS_01731028&REV_02\3&172E68DD&0&EF
USB 2.0 Root Hub USB\ROOT_HUB20\4&9000308&0

[Software Environment]

[Following are sub-categories of this main category]

[Drivers]

Name Description File Type Started Start Mode State Status Error Control
Accept Pause Accept Stop
abiosdsk Abiosdsk Not Available Kernel Driver False Disabled
Stopped OK Ignore False False
abp480n5 abp480n5 Not Available Kernel Driver False Disabled
Stopped OK Normal False False
acpi Microsoft ACPI Driver c:\winnt\system32\drivers\acpi.sys Kernel Driver True
Boot Running OK Normal False True
acpiec ACPIEC c:\winnt\system32\drivers\acpiec.sys Kernel Driver False
Disabled Stopped OK Normal False False
adpu160m adpu160m c:\winnt\system32\drivers\adpu160m.sys Kernel Driver
True Boot Running OK Normal False True
afd AFD Networking Support Environment c:\winnt\system32\drivers\afd.sys Kernel
Driver True Auto Running OK Normal False True
aha154x Aha154x Not Available Kernel Driver False Disabled
Stopped OK Normal False False
aic116x aic116x Not Available Kernel Driver False Disabled Stopped OK
Normal False False
aic78u2 aic78u2 Not Available Kernel Driver False Disabled Stopped OK
Normal False False
aic78xx aic78xx Not Available Kernel Driver False Disabled Stopped OK
Normal False False
ami0nt ami0nt Not Available Kernel Driver False Disabled Stopped OK
Normal False False
amsint amsint Not Available Kernel Driver False Disabled Stopped OK
Normal False False
asc asc Not Available Kernel Driver False Disabled Stopped OK
Normal False False
asc3350p asc3350p Not Available Kernel Driver False Disabled
Stopped OK Normal False False
asc3550 asc3550 Not Available Kernel Driver False Disabled
Stopped OK Normal False False
asyncmac RAS Asynchronous Media Driver c:\winnt\system32\drivers\asyncmac.sys
Kernel Driver False Manual Stopped OK Normal False False
atapi Standard IDE/ESDI Hard Disk Controller c:\winnt\system32\drivers\atapi.sys Kernel
Driver True Boot Running OK Normal False True
atdisk Atdisk Not Available Kernel Driver False Disabled Stopped OK
Ignore False False
atirage3 atirage3 c:\winnt\system32\drivers\atimpab.sys Kernel Driver True
Manual Running OK Ignore False True
atmarpc ATM ARP Client Protocol c:\winnt\system32\drivers\atmarpc.sys Kernel
Driver False Manual Stopped OK Normal False False
audstub Audio Stub Driver c:\winnt\system32\drivers\audstub.sys Kernel Driver True
Manual Running OK Normal False True

beep Beep c:\winnt\system32\drivers\beep.sys Kernel Driver True System
Running OK Normal False True
buslogic BusLogic Not Available Kernel Driver False Disabled
Stopped OK Normal False False
cd20xrnt cd20xrnt Not Available Kernel Driver False Disabled
Stopped OK Normal False False
cdaudio Cdaudio c:\winnt\system32\drivers\cdaudio.sys Kernel Driver False System
Stopped OK Ignore False False
cdfs Cdfs c:\winnt\system32\drivers\cdfs.sys File System Driver True
Disabled Running OK Normal False True
cdrom CD-ROM Driver c:\winnt\system32\drivers\cdrom.sys Kernel Driver True System
Running OK Normal False True
changer Changer Not Available Kernel Driver False System Stopped
OK Ignore False False
cpqarray Cpqarray Not Available Kernel Driver False Disabled
Stopped OK Normal False False
cpqarry2 cpqarry2 Not Available Kernel Driver False Disabled
Stopped OK Normal False False
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 True Boot
Running OK Normal False True
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 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 Fdc c:\winnt\system32\drivers\fdc.sys Kernel Driver False System
Stopped OK Ignore False False
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

Appendix C – Tunable Parameters

flpydisk Flpydisk c:\winnt\system32\drivers\flpydisk.sys Kernel Driver False System
Stopped OK Ignore False False
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 c:\winnt\system32\drivers\intelide.sys Kernel Driver True Boot
Running OK Normal False True
ipfilterdriver IP Traffic Filter Driver c:\winnt\system32\drivers\ipfltdrv.sys Kernel Driver
False Manual Stopped OK Normal False False
ipinip IP in IP Tunnel Driver c:\winnt\system32\drivers\ipinip.sys Kernel Driver False
Manual Stopped OK Normal False False
ipnat IP Network Address Translator c:\winnt\system32\drivers\ipnat.sys Kernel Driver
False Manual Stopped OK Normal False False
ipsec IPSEC driver c:\winnt\system32\drivers\ipsec.sys Kernel Driver True Manual
Running OK Normal False True
ipsraidn ipsraidn Not Available Kernel Driver False Disabled Stopped OK
Normal False False
irenum IR Enumerator Service c:\winnt\system32\drivers\irenum.sys Kernel Driver False
Manual 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
ndisuio NDIS Usermode I/O Protocol c:\winnt\system32\drivers\ndisuio.sys Kernel Driver
False Manual Stopped OK Normal False False
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 c:\winnt\system32\drivers\parallel.sys Kernel Driver False Auto
Stopped OK Ignore False False
parport Parport c:\winnt\system32\drivers\parport.sys Kernel Driver False Auto
Stopped OK Ignore False False
partmgr PartMgr c:\winnt\system32\drivers\partmgr.sys Kernel Driver True Boot
Running OK Normal False True
parvdm ParVdm c:\winnt\system32\drivers\parvdm.sys Kernel Driver False Auto
Stopped OK Ignore False False
pci PCI Bus Driver c:\winnt\system32\drivers\pci.sys Kernel Driver True Boot
Running OK Critical False True
pcidump PCIDump Not Available Kernel Driver False System Stopped
OK Ignore False False
pciide PCIIde c:\winnt\system32\drivers\pciide.sys Kernel Driver True Boot
Running OK Normal False True
pcmcia Pcmcia c:\winnt\system32\drivers\pcmcia.sys Kernel Driver False Disabled
Stopped OK Normal False False
pdcomp PDCOMP Not Available Kernel Driver False Manual Stopped OK
Ignore False False
pdframe PDFRAME Not Available Kernel Driver False Manual Stopped
OK Ignore False False
pdreli PDRELI Not Available Kernel Driver False Manual Stopped OK
Ignore False False
pdrframe PDRFRAME Not Available Kernel Driver False Manual Stopped
OK Ignore False False

pptpminiport WAN Miniport (PPTP) c:\winnt\system32\drivers\raspptp.sys Kernel Driver
True Manual Running OK Normal False True
ptilink Direct Parallel Link Driver c:\winnt\system32\drivers\ptilink.sys Kernel Driver
True Manual Running OK Normal False True
ql1080 ql1080 Not Available Kernel Driver False Disabled Stopped OK
Normal False False
ql10wnt Ql10wnt Not Available Kernel Driver False Disabled Stopped
OK Normal False False
ql1240 ql1240 Not Available Kernel Driver False Disabled Stopped OK
Normal False False
ql2100 ql2100 Not Available Kernel Driver False Disabled Stopped OK
Normal False False
rasacd Remote Access Auto Connection Driver c:\winnt\system32\drivers\rasacd.sys Kernel
Driver True System Running OK Normal False True
rasl2tp WAN Miniport (L2TP) c:\winnt\system32\drivers\rasl2tp.sys Kernel Driver True
Manual Running OK Normal False True
raspti Direct Parallel c:\winnt\system32\drivers\raspti.sys Kernel Driver True Manual
Running OK Normal False True
rca Microsoft Streaming Network Raw Channel Access
c:\winnt\system32\drivers\rca.sys Kernel Driver False Manual Stopped
OK Normal False False
rdbss Rdbss c:\winnt\system32\drivers\rdbss.sys File System Driver True System
Running OK Normal False True
rdpwd RDPWD c:\winnt\system32\drivers\rdpwd.sys Kernel Driver False Manual
Stopped OK Ignore False False
redbook Digital CD Audio Playback Filter Driver c:\winnt\system32\drivers\redbook.sys
Kernel Driver False System Stopped OK Normal False False
serial Serial c:\winnt\system32\drivers\serial.sys Kernel Driver False Auto
Stopped OK Ignore False False
sfloppy High-Capacity Floppy Disk Drivec:\winnt\system32\drivers\sfloppy.sys Kernel Driver
True Manual Running OK Normal False True
sglfb sglfb Not Available Kernel Driver False System Stopped OK Normal
False False
simbad Simbad Not Available Kernel Driver False Disabled Stopped OK
Normal False False
sparrow Sparrow Not Available Kernel Driver False Disabled Stopped
OK Normal False False
spud Special Purpose Utility Driver c:\winnt\system32\drivers\spud.sys Kernel Driver
True Manual Running OK Normal False True
srv Srv c:\winnt\system32\drivers\srv.sys File System Driver True Manual
Running OK Normal False True
swenum Software Bus Driver c:\winnt\system32\drivers\swenum.sys Kernel Driver
True Manual Running OK Normal False True
symc810 symc810 Not Available Kernel Driver False Disabled
Stopped OK Normal False False
symc8xx symc8xx Not Available Kernel Driver False Disabled
Stopped OK Normal False False
sym_hi sym_hi Not Available Kernel Driver False Disabled Stopped OK
Normal False False
tcpip TCP/IP Protocol Driver c:\winnt\system32\drivers\tcpip.sys Kernel Driver True
System Running OK Normal False True
tdasync TDASYNC c:\winnt\system32\drivers\tdasync.sys Kernel Driver False Manual
Stopped OK Ignore False False
tdipx TDIPX c:\winnt\system32\drivers\tdipx.sys Kernel Driver False Manual
Stopped OK Ignore False False

tdnetb TDNETB c:\winnt\system32\drivers\tdnetb.sys Kernel Driver False Manual
Stopped OK Ignore False False
tdpipe TDPIPE c:\winnt\system32\drivers\tdpipe.sys Kernel Driver False Manual
Stopped OK Ignore False False
tdspx TDSPX c:\winnt\system32\drivers\tdspx.sys Kernel Driver False Manual
Stopped OK Ignore False False
tdtcp TDTCP c:\winnt\system32\drivers\tdtcp.sys Kernel Driver False Manual
Stopped OK Ignore False False
termdd Terminal Device Driver c:\winnt\system32\drivers\termdd.sys Kernel Driver False
Disabled Stopped OK Normal False False
tga tga Not Available Kernel Driver False System Stopped OK Ignore
False False
udfs Udfs c:\winnt\system32\drivers\udfs.sys File System Driver False
Disabled Stopped OK Normal False False
uhcd Microsoft USB Universal Host Controller Driver c:\winnt\system32\drivers\uhcd.sys
Kernel Driver True Manual Running OK Normal False True
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
usbehci Microsoft USB 2.0 Enhanced Host Controller Miniport Driver
c:\winnt\system32\drivers\usbehci.sys Kernel Driver True Manual Running
OK Normal False True
usbhub Microsoft USB Standard Hub Driver c:\winnt\system32\drivers\usbhub.sys Kernel
Driver True Manual Running OK Normal False True
usbhub20 USB 2.0 Root Hub Support c:\winnt\system32\drivers\usbhub20.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
usbstor USB Mass Storage Driver c:\winnt\system32\drivers\usbstor.sys Kernel Driver
True Manual Running OK Normal False True

[Environment Variables]

Variable Value User Name
ComSpec %SystemRoot%\system32\cmd.exe <SYSTEM>
Os2LibPath %SystemRoot%\system32\os2\dll; <SYSTEM>
Path
%SystemRoot%\system32;%SystemRoot%;%SystemRoot%\System32\Wbem;C:\Progra
m 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 3 Stepping 4, GenuineIntel <SYSTEM>
PROCESSOR_REVISION 0304 <SYSTEM>
NUMBER_OF_PROCESSORS 4 <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 CLIENT70\Administrator

Appendix C – Tunable Parameters

TMP %USERPROFILE%\Local Settings\Temp CLIENT70\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
No network connections information

[Running Tasks]

Name Path Process ID Priority Min Working Set Max Working Set Start Time Version Size File Date
system idle process Not Available 0 0 Not Available Not Available Not Available Unknown Unknown Unknown
system Not Available 8 8 0 1413120 Not Available Unknown Unknown Unknown
smss.exe c:\winnt\system32\smss.exe 196 11 204800 1413120 2/21/2005 10:59:15 PM 5.00.2195.6601 44.77 KB (45,840 bytes) 6/20/2003 7:00:00 AM
csrss.exe Not Available 220 13 Not Available Not Available 2/21/2005 10:59:18 PM Unknown Unknown Unknown
winlogon.exe c:\winnt\system32\winlogon.exe 216 13 204800 1413120 2/21/2005 10:59:19 PM 5.00.2195.6714 176.77 KB (181,008 bytes) 6/20/2003 7:00:00 AM
services.exe c:\winnt\system32\services.exe 268 9 204800 1413120 2/21/2005 10:59:21 PM 5.00.2195.6700 87.27 KB (89,360 bytes) 6/20/2003 7:00:00 AM
lsass.exe c:\winnt\system32\lsass.exe 280 9 204800 1413120 2/21/2005 10:59:21 PM 5.00.2195.6695 32.77 KB (33,552 bytes) 6/20/2003 7:00:00 AM
svchost.exe c:\winnt\system32\svchost.exe 464 8 204800 1413120 2/21/2005 10:59:23 PM 5.00.2134.1 7.77 KB (7,952 bytes) 6/20/2003 7:00:00 AM
spoolsv.exe c:\winnt\system32\spoolsv.exe 492 8 204800 1413120 2/21/2005 10:59:23 PM 5.00.2195.6659 44.27 KB (45,328 bytes) 2/21/2005 4:31:40 PM
msdtc.exe c:\winnt\system32\msdtc.exe 520 8 204800 1413120 2/21/2005 10:59:23 PM 1999.9.3421.3 6.77 KB (6,928 bytes) 2/21/2005 10:44:31 PM
svchost.exe c:\winnt\system32\svchost.exe 688 8 204800 1413120 2/21/2005 10:59:24 PM 5.00.2134.1 7.77 KB (7,952 bytes) 6/20/2003 7:00:00 AM
llssrv.exe c:\winnt\system32\llssrv.exe 716 9 204800 1413120 2/21/2005 10:59:24 PM 5.00.2195.6697 81.77 KB (83,728 bytes) 6/20/2003 7:00:00 AM
regsvc.exe c:\winnt\system32\regsvc.exe 780 8 204800 1413120 2/21/2005 10:59:25 PM 5.00.2195.6701 66.77 KB (68,368 bytes) 6/20/2003 7:00:00 AM
mstask.exe c:\winnt\system32\mstask.exe 792 8 204800 1413120 2/21/2005 10:59:25 PM 4.71.2195.6704 116.77 KB (119,568 bytes) 2/21/2005 10:45:56 PM
svchost.exe c:\winnt\system32\svchost.exe 852 8 204800 1413120 2/21/2005 10:59:25 PM 5.00.2134.1 7.77 KB (7,952 bytes) 6/20/2003 7:00:00 AM

dfssvc.exe c:\winnt\system32\dfssvc.exe 880 8 204800 1413120
2/21/2005 10:59:25 PM 5.00.2195.6664 88.77 KB (90,896 bytes)6/20/2003 7:00:00 AM
inetinfo.exe c:\winnt\system32\inetsrv\inetinfo.exe 900 8 204800 1413120
2/21/2005 10:59:25 PM 5.00.0984 14.27 KB (14,608 bytes)2/21/2005 10:44:18 PM
explorer.exe c:\winnt\explorer.exe 304 8 204800 1413120 2/21/2005
11:05:33 PM 5.00.3700.6690 237.77 KB (243,472 bytes) 6/20/2003 7:00:00 AM
dllhost.exe Not Available 316 8 Not Available Not Available 2/22/2005
2:45:36 AM Unknown Unknown Unknown
mmc.exe c:\winnt\system32\mmc.exe 332 8 204800 1413120
2/22/2005 2:48:41 AM 5.00.2195.6601 589.27 KB (603,408 bytes) 6/20/2003
7:00:00 AM
winmgmt.exe c:\winnt\system32\wbem\winmgmt.exe 388 8 204800 1413120
2/22/2005 2:48:41 AM 1.50.1085.0100 192.10 KB (196,706 bytes) 6/20/2003
7:00:00 AM
svchost.exe c:\winnt\system32\svchost.exe 1420 8 204800 1413120
2/22/2005 2:48:56 AM 5.00.2134.1 7.77 KB (7,952 bytes) 6/20/2003 7:00:00 AM
rsvp.exe c:\winnt\system32\rsvp.exe 1364 8 204800 1413120
2/22/2005 2:49:48 AM 5.00.2195.6663 172.77 KB (176,912 bytes) 6/20/2003
7:00:00 AM

[Loaded Modules]

Name Version Size File Date Manufacturer Path
traffic.dll 5.00.2195.6613 30.77 KB (31,504 bytes)6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\traffic.dll
rsvp.exe 5.00.2195.6663 172.77 KB (176,912 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\rsvp.exe
h323.tsp 5.00.2195.6699 248.77 KB (254,736 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\h323.tsp
ipconf.tsp 5.00.2143.1 10.77 KB (11,024 bytes)6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\ipconf.tsp
ndptsp.tsp 5.00.2143.1 38.27 KB (39,184 bytes)6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\ndptsp.tsp
kmddsp.tsp 5.00.2150.1 17.77 KB (18,192 bytes)6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\kmddsp.tsp
uniplat.dll 5.00.2195.6601 14.27 KB (14,608 bytes)6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\uniplat.dll
unimdm.tsp 5.00.2195.6601 199.27 KB (204,048 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\unimdm.tsp
tapisrv.dll 5.00.2195.6666 169.27 KB (173,328 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\tapisrv.dll
perfos.dll 5.00.2155.1 21.27 KB (21,776 bytes)6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\perfos.dll
ntevt.dll 1.50.1085.0072 192.06 KB (196,671 bytes) 6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\wbem\ntevt.dll
psapi.dll 5.00.2134.1 28.27 KB (28,944 bytes)6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\psapi.dll
framedyn.dll 1.50.1085.0076 164.07 KB (168,009 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\wbem\framedyn.dll
cimwin32.dll 1.50.1085.0103 1.04 MB (1,089,637 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\wbem\cimwin32.dll
adsldp.dll 5.00.2195.6613 122.77 KB (125,712 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\adsldp.dll
provthrd.dll 1.50.1085.0000 68.07 KB (69,708 bytes)2/21/2005 10:46:03 PM Microsoft
Corporation c:\winnt\system32\wbem\provthrd.dll

dsprov.dll 1.50.1085.0000 196.06 KB (200,761 bytes) 2/21/2005 10:46:03 PM
Microsoft Corporation c:\winnt\system32\wbem\dsprov.dll
mofd.dll 1.50.1085.0100 136.09 KB (139,353 bytes) 6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\wbem\mofd.dll
wmiprov.dll 1.50.1085.0099 108.09 KB (110,681 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\wbem\wmiprov.dll
wbemess.dll 1.50.1085.0100 364.09 KB (372,825 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\wbem\wbemess.dll
wbemcore.dll 1.50.1085.0100 632.09 KB (647,257 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\wbem\wbemcore.dll
winmgmt.exe 1.50.1085.0100 192.10 KB (196,706 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\wbem\winmgmt.exe
fastprox.dll 1.50.1085.0100 152.10 KB (155,749 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\wbem\fastprox.dll
wbemsvc.dll 1.50.1085.0007 40.07 KB (41,036 bytes)6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\wbem\wbemsvc.dll
wbemcomn.dll 1.50.1085.0100 692.09 KB (708,696 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\wbem\wbemcomn.dll
wbemprox.dll 1.50.1085.0100 40.10 KB (41,061 bytes)6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\wbem\wbemprox.dll
msinfo32.dll 5.00.2195.6601 312.27 KB (319,760 bytes) 2/21/2005 10:45:59 PM
Microsoft Corporation c:\program files\common files\microsoft
shared\msinfo\msinfo32.dll
comdlg32.dll 5.00.3700.6693 235.77 KB (241,424 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\comdlg32.dll
mmcndmgr.dll 5.00.2195.6601 816.27 KB (835,856 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\mmcndmgr.dll
mmc.exe 5.00.2195.6601 589.27 KB (603,408 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\mmc.exe
usp10.dll 1.0325.2195.6692 308.27 KB (315,664 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\usp10.dll
diskcopy.dll 5.00.2195.6601 15.77 KB (16,144 bytes)6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\diskcopy.dll
mshtmled.dll 5.00.3700.6699 229.77 KB (235,280 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\mshtmled.dll
imgutil.dll 5.00.3700.6682 30.77 KB (31,504 bytes)6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\imgutil.dll
faxshell.dll 5.00.2134.1 8.27 KB (8,464 bytes) 6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\faxshell.dll
msacm32.dll 5.00.2134.1 65.27 KB (66,832 bytes)6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\msacm32.dll
avifil32.dll 5.00.2195.6612 76.77 KB (78,608 bytes)6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\avifil32.dll
msvfw32.dll 5.00.2195.6612 113.77 KB (116,496 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\msvfw32.dll
docprop2.dll 5.00.2178.1 297.77 KB (304,912 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\docprop2.dll
webvw.dll 5.00.2920.0000 1.06 MB (1,115,408 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\webvw.dll
msls31.dll 3.10.337.0 145.27 KB (148,752 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\msls31.dll
shdoclc.dll 5.00.3700.6668 324.50 KB (332,288 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\shdoclc.dll
mshtml.dll 5.00.3700.6699 2.24 MB (2,353,936 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\mshtml.dll

imm32.dll 5.00.2195.6655 94.27 KB (96,528 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\imm32.dll
mlang.dll 5.00.3700.6655 510.77 KB (523,024 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\mlang.dll
urlmon.dll 5.00.3700.6705 442.77 KB (453,392 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\urlmon.dll
browselc.dll 5.00.3700.6661 34.50 KB (35,328 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\browselc.dll
linkinfo.dll 5.00.2134.1 15.77 KB (16,144 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\linkinfo.dll
powrprof.dll 5.00.3502.6601 13.27 KB (13,584 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\powrprof.dll
batmeter.dll 5.00.3502.6601 20.27 KB (20,752 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\batmeter.dll
stobject.dll 5.00.2195.6601 79.27 KB (81,168 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\stobject.dll
webcheck.dll 5.00.3502.6601 251.77 KB (257,808 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\webcheck.dll
netui1.dll 5.00.2134.1 210.27 KB (215,312 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\netui1.dll
netui0.dll 5.00.2195.6601 70.27 KB (71,952 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\netui0.dll
ntlanman.dll 5.00.2195.6601 35.27 KB (36,112 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\ntlanman.dll
ntshrui.dll 5.00.2134.1 46.77 KB (47,888 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\ntshrui.dll
mydocs.dll 5.00.3502.6601 55.77 KB (57,104 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\mydocs.dll
browseui.dll 5.00.3700.6661 789.27 KB (808,208 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\browseui.dll
shdocvw.dll 5.00.3700.6668 1.06 MB (1,107,728 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\shdocvw.dll
msi.dll 2.0.2600.1183 1.92 MB (2,017,792 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\msi.dll
explorer.exe 5.00.3700.6690 237.77 KB (243,472 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\explorer.exe
httpext.dll 5.00.0984 240.77 KB (246,544 bytes) 2/21/2005 10:44:17 PM Microsoft Corporation c:\winnt\system32\inetsrv\httpext.dll
md5filt.dll 5.00.0984 32.77 KB (33,552 bytes)2/21/2005 10:44:21 PM Microsoft Corporation c:\winnt\system32\inetsrv\md5filt.dll
gzip.dll 5.00.0984 30.27 KB (30,992 bytes)2/21/2005 10:44:21 PM Microsoft Corporation c:\winnt\system32\inetsrv\gzip.dll
compfilt.dll 5.00.0984 22.77 KB (23,312 bytes)2/21/2005 10:44:20 PM Microsoft Corporation c:\winnt\system32\inetsrv\compfilt.dll
sspifilt.dll 5.00.0984 42.77 KB (43,792 bytes)2/21/2005 10:44:21 PM Microsoft Corporation c:\winnt\system32\inetsrv\sspifilt.dll
iscomlog.dll 5.00.0984 24.27 KB (24,848 bytes)2/21/2005 10:44:18 PM Microsoft Corporation c:\winnt\system32\inetsrv\iscomlog.dll
lonsint.dll 5.00.0984 11.77 KB (12,048 bytes)2/21/2005 10:44:18 PM Microsoft Corporation c:\winnt\system32\inetsrv\lonsint.dll
iisfecnv.dll 5.00.0984 7.27 KB (7,440 bytes) 2/21/2005 10:44:27 PM Microsoft Corporation c:\winnt\system32\inetsrv\iisfecnv.dll
isatq.dll 5.00.0984 61.27 KB (62,736 bytes)2/21/2005 10:44:19 PM Microsoft Corporation c:\winnt\system32\inetsrv\isatq.dll

infocomm.dll 5.00.0984 242.27 KB (248,080 bytes) 2/21/2005 10:44:18 PM
Microsoft Corporation c:\winnt\system32\inetsrv\infocomm.dll
w3svc.dll 5.00.0984 338.27 KB (346,384 bytes) 2/21/2005 10:44:22 PM
Microsoft Corporation c:\winnt\system32\inetsrv\w3svc.dll
iislog.dll 5.00.0984 75.27 KB (77,072 bytes) 2/21/2005 10:44:18 PM Microsoft Corporation
c:\winnt\system32\inetsrv\iislog.dll
wshnetbs.dll 5.00.2134.1 7.77 KB (7,952 bytes) 6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\wshnetbs.dll
inetsloc.dll 5.00.0984 20.27 KB (20,752 bytes) 2/21/2005 10:44:19 PM Microsoft
Corporation c:\winnt\system32\inetsloc.dll
security.dll 5.00.2154.1 5.77 KB (5,904 bytes) 6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\security.dll
svcext.dll 5.00.0984 39.77 KB (40,720 bytes) 2/21/2005 10:44:18 PM Microsoft
Corporation c:\winnt\system32\inetsrv\svcext.dll
admexs.dll 5.00.0984 27.77 KB (28,432 bytes) 2/21/2005 10:44:17 PM Microsoft
Corporation c:\winnt\system32\inetsrv\admexs.dll
wamreg.dll 5.00.0984 45.77 KB (46,864 bytes) 2/21/2005 10:44:22 PM Microsoft
Corporation c:\winnt\system32\inetsrv\wamreg.dll
metadata.dll 5.00.0984 68.77 KB (70,416 bytes) 2/21/2005 10:44:18 PM Microsoft
Corporation c:\winnt\system32\inetsrv\metadata.dll
iismap.dll 5.00.0984 56.27 KB (57,616 bytes) 2/21/2005 10:44:19 PM Microsoft
Corporation c:\winnt\system32\iismap.dll
nsepm.dll 5.00.0984 43.27 KB (44,304 bytes) 2/21/2005 10:44:18 PM Microsoft
Corporation c:\winnt\system32\inetsrv\nsepm.dll
admwprox.dll 5.00.0984 31.77 KB (32,528 bytes) 2/21/2005 10:44:28 PM Microsoft
Corporation c:\winnt\system32\admwprox.dll
coadmin.dll 5.00.0984 39.77 KB (40,720 bytes) 2/21/2005 10:44:19 PM Microsoft
Corporation c:\winnt\system32\inetsrv\coadmin.dll
iisadmin.dll 5.00.0984 15.77 KB (16,144 bytes) 2/21/2005 10:44:17 PM Microsoft
Corporation c:\winnt\system32\inetsrv\iisadmin.dll
rpcref.dll 5.00.0984 4.27 KB (4,368 bytes) 2/21/2005 10:44:18 PM Microsoft
Corporation c:\winnt\system32\inetsrv\rpcref.dll
iisrtl.dll 5.00.0984 121.27 KB (124,176 bytes) 2/21/2005 10:44:18 PM Microsoft
Corporation c:\winnt\system32\iisrtl.dll
inetinfo.exe 5.00.0984 14.27 KB (14,608 bytes) 2/21/2005 10:44:18 PM Microsoft
Corporation c:\winnt\system32\inetsrv\inetinfo.exe
dfssvc.exe 5.00.2195.6664 88.77 KB (90,896 bytes) 6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\dfssvc.exe
sensapi.dll 5.00.2195.6627 7.27 KB (7,440 bytes) 6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\sensapi.dll
winhttp.dll 5.1.2600.1188 (xpsp2.030318-2132) 303.50 KB (310,784 bytes)
6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\winhttp.dll
ntmarta.dll 5.00.2195.6666 100.27 KB (102,672 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\ntmarta.dll
wininet.dll 5.00.3700.6713 455.77 KB (466,704 bytes) 6/20/2003 7:00:00 AM
Microsoft Corporation c:\winnt\system32\wininet.dll
regapi.dll 5.00.2195.6602 35.27 KB (36,112 bytes) 6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\regapi.dll
utildll.dll 5.00.2195.6701 25.77 KB (26,384 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation
c:\winnt\system32\utildll.dll
wtsapi32.dll 5.00.2134.1 14.27 KB (14,608 bytes) 6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\wtsapi32.dll
advpack.dll 5.00.3502.6601 86.77 KB (88,848 bytes) 6/20/2003 7:00:00 AM Microsoft
Corporation c:\winnt\system32\advpack.dll

Appendix C – Tunable Parameters

wuaueng.dll 5.4.3630.2554 built by: lab04_n 188.00 KB (192,512 bytes) 2/21/2005 10:44:27 PM Microsoft Corporation c:\winnt\system32\wuaueng.dll
wuauserv.dll 5.4.3630.2554 built by: lab04_n 9.00 KB (9,216 bytes) 2/21/2005 10:44:27 PM Microsoft Corporation c:\winnt\system32\wuauserv.dll
msidle.dll 5.00.2920.0000 6.27 KB (6,416 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\msidle.dll
mstask.exe 4.71.2195.6704 116.77 KB (119,568 bytes) 2/21/2005 10:45:56 PM Microsoft Corporation c:\winnt\system32\mstask.exe
regsvc.exe 5.00.2195.6701 66.77 KB (68,368 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\regsvc.exe
llsrpc.dll 5.00.2195.6601 47.77 KB (48,912 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\llsrpc.dll
llssrv.exe 5.00.2195.6697 81.77 KB (83,728 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\llssrv.exe
ipbootp.dll 5.00.2168.1 33.77 KB (34,576 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\ipbootp.dll
cryptui.dll 5.131.2195.6628 433.27 KB (443,664 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\cryptui.dll
rastls.dll 5.00.2195.6680 98.27 KB (100,624 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rastls.dll
raschap.dll 5.00.2195.6663 59.27 KB (60,688 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\raschap.dll
ntlsapi.dll 5.00.2195.6601 6.77 KB (6,928 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\ntlsapi.dll
rasppp.dll 5.00.2195.6626 194.27 KB (198,928 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rasppp.dll
rastapi.dll 5.00.2195.6604 52.77 KB (54,032 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rastapi.dll
rasdlg.dll 5.00.2195.6625 516.77 KB (529,168 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rasdlg.dll
netcfgx.dll 5.00.2195.6604 534.77 KB (547,600 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\netcfgx.dll
rasmans.dll 5.00.2195.6696 149.77 KB (153,360 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rasmans.dll
wmi.dll 5.00.2191.1 6.27 KB (6,416 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\wmi.dll
netshell.dll 5.00.2195.6604 466.27 KB (477,456 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\netshell.dll
netman.dll 5.00.2195.6660 93.27 KB (95,504 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\netman.dll
comsvcs.dll 2000.2.3504.0 1.38 MB (1,448,208 bytes) 2/21/2005 10:44:23 PM Microsoft Corporation c:\winnt\system32\comsvcs.dll
ntmsdba.dll 5.00.2195.6655 169.27 KB (173,328 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\ntmsdba.dll
sens.dll 5.00.2195.6627 37.27 KB (38,160 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\sens.dll
ntmssvc.dll 5.00.2195.6655 391.77 KB (401,168 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\ntmssvc.dll
es.dll 2000.2.3504.0 227.77 KB (233,232 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\es.dll
mtxoci.dll 2000.2.3504.0 103.27 KB (105,744 bytes) 2/21/2005 10:44:25 PM Microsoft Corporation c:\winnt\system32\mtxoci.dll
resutils.dll 5.00.2195.6702 39.77 KB (40,720 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\resutils.dll

clusapi.dll 5.00.2195.6683 54.27 KB (55,568 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\clusapi.dll
msvcp50.dll 5.00.7051 552.50 KB (565,760 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\msvcp50.dll
xolehlp.dll 1999.9.3421.3 17.27 KB (17,680 bytes)2/21/2005 10:44:31 PM Microsoft Corporation c:\winnt\system32\xolehlp.dll
msdtclog.dll 2000.2.3504.0 86.77 KB (88,848 bytes)2/21/2005 10:44:24 PM Microsoft Corporation c:\winnt\system32\msdtclog.dll
mtxclu.dll 2000.2.3504.0 51.27 KB (52,496 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\mtxclu.dll
msdtcprx.dll 2000.2.3504.0 690.77 KB (707,344 bytes) 2/21/2005 10:44:25 PM Microsoft Corporation c:\winnt\system32\msdtcprx.dll
txfaux.dll 2000.2.3504.0 388.27 KB (397,584 bytes) 2/21/2005 10:44:24 PM Microsoft Corporation c:\winnt\system32\txfaux.dll
msdtctm.dll 2000.2.3504.0 1.08 MB (1,131,280 bytes) 2/21/2005 10:44:24 PM Microsoft Corporation c:\winnt\system32\msdtctm.dll
msdtc.exe 1999.9.3421.3 6.77 KB (6,928 bytes) 2/21/2005 10:44:31 PM Microsoft Corporation c:\winnt\system32\msdtc.exe
inetpp.dll 5.00.2195.6707 65.27 KB (66,832 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\inetpp.dll
win32spl.dll 5.00.2195.6681 94.77 KB (97,040 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\win32spl.dll
usbmon.dll 5.00.2195.6684 11.27 KB (11,536 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\usbmon.dll
tcpmon.dll 5.00.2195.6659 40.77 KB (41,744 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\tcpmon.dll
pjlmon.dll 5.00.2165.1 12.77 KB (13,072 bytes)11/30/1999 5:39:36 PM Microsoft Corporation c:\winnt\system32\pjlmon.dll
cnbjmon.dll 5.00.2134.1 43.77 KB (44,816 bytes)11/30/1999 5:38:48 PM Microsoft Corporation c:\winnt\system32\cnbjmon.dll
localspl.dll 5.00.2195.6714 253.27 KB (259,344 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\localspl.dll
spoolss.dll 5.00.2195.6704 79.77 KB (81,680 bytes)2/21/2005 4:31:40 PM Microsoft Corporation c:\winnt\system32\spoolss.dll
spoolsv.exe 5.00.2195.6659 44.27 KB (45,328 bytes)2/21/2005 4:31:40 PM Microsoft Corporation c:\winnt\system32\spoolsv.exe
rpcss.dll 5.00.2195.6702 233.77 KB (239,376 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rpcss.dll
svchost.exe 5.00.2134.1 7.77 KB (7,952 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\svchost.exe
dssenh.dll 5.00.2195.6612 143.77 KB (147,216 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\dssenh.dll
oakley.dll 5.00.2195.6662 435.77 KB (446,224 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\oakley.dll
mfc42u.dll 6.00.9586.0 988.05 KB (1,011,764 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\mfc42u.dll
polagent.dll 5.00.2195.6655 109.27 KB (111,888 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\polagent.dll
scecli.dll 5.00.2195.6704 111.77 KB (114,448 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\scecli.dll
esent.dll 6.1.3940.31 1.08 MB (1,135,376 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\esent.dll
ntdsatq.dll 5.00.2195.6620 31.27 KB (32,016 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\ntdsatq.dll

ntdsa.dll 5.00.2195.6697 1016.27 KB (1,040,656 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\ntdsa.dll
kdcsvc.dll 5.00.2195.6627 144.77 KB (148,240 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\kdcsvc.dll
sfmapi.dll 5.00.2134.1 38.77 KB (39,696 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\sfmapi.dll
rassfm.dll 5.00.2195.6604 21.27 KB (21,776 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rassfm.dll
schannel.dll 5.00.2195.6705 144.27 KB (147,728 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\schannel.dll
netlogon.dll 5.00.2195.6695 363.27 KB (371,984 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\netlogon.dll
kerberos.dll 5.00.2195.6666 207.77 KB (212,752 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\kerberos.dll
msprivs.dll 5.00.2195.6695 46.00 KB (47,104 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\msprivs.dll
msnsspc.dll 6.00.7753 113.55 KB (116,272 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\msnsspc.dll
digest.dll 5.00.2134.1 45.27 KB (46,352 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\digest.dll
msvcirt.dll 6.10.8637.0 76.05 KB (77,878 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\msvcirt.dll
msvcrt40.dll 4.20 - OS use only. DO NOT DISTRIBUTE 63.50 KB (65,024 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\msvcrt40.dll
msapsspc.dll 6.00.7755 78.25 KB (80,128 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\msapsspc.dll
samsrv.dll 5.00.2195.6697 380.77 KB (389,904 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\samsrv.dll
lsasrv.dll 5.00.2195.6695 506.77 KB (518,928 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\lsasrv.dll
lsass.exe 5.00.2195.6695 32.77 KB (33,552 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\lsass.exe
wmicore.dll 5.00.2195.6611 72.77 KB (74,512 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\wmicore.dll
rasadhlp.dll 5.00.2168.1 7.27 KB (7,440 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rasadhlp.dll
winrnr.dll 5.00.2160.1 18.77 KB (19,216 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\winrnr.dll
rnr20.dll 5.00.2195.6603 35.77 KB (36,624 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rnr20.dll
wshtcpip.dll 5.00.2195.6601 17.27 KB (17,680 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\wshtcpip.dll
msafd.dll 5.00.2195.6602 106.27 KB (108,816 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\msafd.dll
mswsock.dll 5.00.2195.6603 62.77 KB (64,272 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\mswsock.dll
msgsvc.dll 5.00.2195.6656 34.77 KB (35,600 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\msgsvc.dll
browser.dll 5.00.2195.6693 67.27 KB (68,880 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\browser.dll
alrsvc.dll 5.00.2134.1 17.77 KB (18,192 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\alrsvc.dll
trkwks.dll 5.00.2195.6623 88.27 KB (90,384 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\trkwks.dll

seclogon.dll 5.00.2195.6707 16.77 KB (17,168 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\seclogon.dll
psbase.dll 5.00.2195.6661 112.77 KB (115,472 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\psbase.dll
cryptsvc.dll 5.00.2195.6661 74.27 KB (76,048 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\cryptsvc.dll
cryptdll.dll 5.00.2195.6607 43.27 KB (44,304 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\cryptdll.dll
wkssvc.dll 5.00.2195.6692 95.77 KB (98,064 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\wkssvc.dll
srvsvc.dll 5.00.2195.6697 81.77 KB (83,728 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\srvsvc.dll
cfgmgr32.dll 5.00.2134.1 16.77 KB (17,168 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\cfgmgr32.dll
dmserver.dll 2195.6605.297.3 11.77 KB (12,048 bytes)6/20/2003 7:00:00 AM VERITAS Software Corp. c:\winnt\system32\dmserver.dll
lmhsvc.dll 5.00.2195.6601 9.77 KB (10,000 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\lmhsvc.dll
dnsrslvr.dll 5.00.2195.6663 90.27 KB (92,432 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\dnsrslvr.dll
tapi32.dll 5.00.2195.6664 123.77 KB (126,736 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\tapi32.dll
rasman.dll 5.00.2195.6604 54.77 KB (56,080 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rasman.dll
rasapi32.dll 5.00.2195.6625 192.77 KB (197,392 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rasapi32.dll
rtutils.dll 5.00.2168.1 43.77 KB (44,816 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rtutils.dll
adsldpc.dll 5.00.2195.6701 130.77 KB (133,904 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\adsldpc.dll
activeds.dll 5.00.2195.6601 177.77 KB (182,032 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\activeds.dll
mprapi.dll 5.00.2181.1 79.27 KB (81,168 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\mprapi.dll
iphlpapi.dll 5.00.2195.6602 68.27 KB (69,904 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\iphlpapi.dll
icmp.dll 5.00.2134.1 7.27 KB (7,440 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\icmp.dll
dhcpcsvc.dll 5.00.2195.6685 90.77 KB (92,944 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\dhcpcsvc.dll
eventlog.dll 5.00.2195.6716 46.77 KB (47,888 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\eventlog.dll
ntdsapi.dll 5.00.2195.6666 56.27 KB (57,616 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\ntdsapi.dll
scesrv.dll 5.00.2195.6704 248.77 KB (254,736 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\scesrv.dll
umpnpmgr.dll 5.00.2182.1 86.27 KB (88,336 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\umpnpmgr.dll
services.exe 5.00.2195.6700 87.27 KB (89,360 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\services.exe
cabinet.dll 5.00.2147.1 54.77 KB (56,080 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\cabinet.dll
wzcsapi.dll 5.00.2195.6604 29.27 KB (29,968 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\wzcsapi.dll

wzcdlg.dll 5.00.2195.6604 51.27 KB (52,496 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\wzcdlg.dll
rsabase.dll 5.00.2195.6619 129.27 KB (132,368 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rsabase.dll
cscui.dll5.00.2195.6705 237.27 KB (242,960 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\cscui.dll
sclgntfy.dll 5.00.2195.6608 20.27 KB (20,752 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\sclgntfy.dll
msv1_0.dll 5.00.2195.6680 114.77 KB (117,520 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\msv1_0.dll
winspool.drv 5.00.2195.6659 111.27 KB (113,936 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\winspool.drv
winscard.dll 5.00.2195.6609 77.27 KB (79,120 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\winscard.dll
atl.dll 3.00.9435 73.06 KB (74,810 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\atl.dll
certcli.dll 5.00.2195.6619 132.27 KB (135,440 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\certcli.dll
wlnotify.dll 5.00.2195.6706 56.27 KB (57,616 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\wlnotify.dll
cscdll.dll 5.00.2195.6713 98.77 KB (101,136 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\cscdll.dll
rsaenh.dll 5.00.2195.6611 131.77 KB (134,928 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rsaenh.dll
mscat32.dll 5.131.2134.1 7.77 KB (7,952 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\mscat32.dll
imagehlp.dll 5.00.2195.6613 125.77 KB (128,784 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\imagehlp.dll
msasn1.dll 5.00.2195.6666 51.77 KB (53,008 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\msasn1.dll
crypt32.dll 5.131.2195.6661 468.27 KB (479,504 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\crypt32.dll
wintrust.dll 5.131.2195.6624 162.27 KB (166,160 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\wintrust.dll
clbcatq.dll 2000.2.3504.0 498.27 KB (510,224 bytes) 2/21/2005 10:44:22 PM Microsoft Corporation c:\winnt\system32\clbcatq.dll
mpr.dll 5.00.2195.6611 53.77 KB (55,056 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\mpr.dll
lz32.dll 5.00.2195.6611 9.77 KB (10,000 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\lz32.dll
version.dll 5.00.2195.6623 15.77 KB (16,144 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\version.dll
oleaut32.dll 2.40.4522 612.27 KB (626,960 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\oleaut32.dll
ole32.dll 5.00.2195.6692 972.77 KB (996,112 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\ole32.dll
comsetup.dll 2000.2.3421.3504 334.27 KB (342,288 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\setup\comsetup.dll
setupapi.dll 5.00.2195.6622 556.77 KB (570,128 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\setupapi.dll
winmm.dll 5.00.2161.1 184.77 KB (189,200 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\winmm.dll
winsta.dll 5.00.2195.6701 38.27 KB (39,184 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\winsta.dll

comctl32.dll 5.81 537.77 KB (550,672 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\comctl32.dll
shlwapi.dll 5.00.3502.6601 282.77 KB (289,552 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\shlwapi.dll
shell32.dll 5.00.3700.6705 2.27 MB (2,383,632 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\shell32.dll
msgina.dll 5.00.2195.6669 326.27 KB (334,096 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\msgina.dll
wsock32.dll 5.00.2195.6603 21.27 KB (21,776 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\wsock32.dll
dnsapi.dll 5.00.2195.6680 131.77 KB (134,928 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\dnsapi.dll
wldap32.dll 5.00.2195.6666 158.27 KB (162,064 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\wldap32.dll
ws2help.dll 5.00.2134.1 17.77 KB (18,192 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\ws2help.dll
ws2_32.dll 5.00.2195.6601 68.27 KB (69,904 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\ws2_32.dll
samlib.dll 5.00.2195.6666 48.77 KB (49,936 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\samlib.dll
netrap.dll 5.00.2134.1 11.27 KB (11,536 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\netrap.dll
netapi32.dll 5.00.2195.6601 304.27 KB (311,568 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\netapi32.dll
profmap.dll 5.00.2195.6610 29.27 KB (29,968 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\profmap.dll
secur32.dll 5.00.2195.6695 47.77 KB (48,912 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\secur32.dll
sfcfiles.dll 5.00.2195.6717 948.27 KB (971,024 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\sfcfiles.dll
sfc.dll 5.00.2195.6673 92.80 KB (95,024 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\sfc.dll
nddeapi.dll 5.00.2195.6661 15.77 KB (16,144 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\nddeapi.dll
userenv.dll 5.00.2195.6711 380.77 KB (389,904 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\userenv.dll
user32.dll 5.00.2195.6688 393.77 KB (403,216 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\user32.dll
gdi32.dll 5.00.2195.6660 228.27 KB (233,744 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\gdi32.dll
rpcrt4.dll 5.00.2195.6701 443.77 KB (454,416 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\rpcrt4.dll
advapi32.dll 5.00.2195.6710 378.27 KB (387,344 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\advapi32.dll
kernel32.dll 5.00.2195.6688 725.77 KB (743,184 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\kernel32.dll
msvcrt.dll 6.10.9844.0 280.05 KB (286,773 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\msvcrt.dll
winlogon.exe 5.00.2195.6714 176.77 KB (181,008 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\winlogon.exe
ntdll.dll 5.00.2195.6685 480.27 KB (491,792 bytes) 6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\ntdll.dll
smss.exe 5.00.2195.6601 44.77 KB (45,840 bytes)6/20/2003 7:00:00 AM Microsoft Corporation c:\winnt\system32\smss.exe

Appendix C – Tunable Parameters

[Services]

Display Name Name State Start Mode Service Type Path Error Control Start Name Tag ID
Alerter Alerter Running Auto Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
Application Management AppMgmt Stopped Manual Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
Background Intelligent Transfer Service BITS Stopped Manual Share Process c:\winnt\system32\svchost.exe -k bitsgroup Normal LocalSystem 0
Computer Browser Browser Running Auto Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
Indexing Service cisvc Stopped Disabled Share Process c:\winnt\system32\cisvc.exe Normal LocalSystem 0
ClipBook ClipSrv Stopped Manual Own Process c:\winnt\system32\clipsrv.exe Normal LocalSystem 0
Distributed File System Dfs Running Auto Own Process c:\winnt\system32\dfssvc.exe Normal LocalSystem 0
DHCP Client Dhcp Running Auto Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
Logical Disk Manager Administrative Service dmadmin Stopped Manual Share Process c:\winnt\system32\dmadmin.exe /com Normal LocalSystem 0
Logical Disk Manager dmserver Running Auto Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
DNS Client Dnscache Running Auto Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
Event Log Eventlog Running Auto Share Process c:\winnt\system32\services.exe Normal LocalSystem 0
COM+ Event System EventSystem Running Manual Share Process c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Fax Service Fax Stopped Manual Own Process c:\winnt\system32\faxsvc.exe Normal LocalSystem 0
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 Running Manual Share Process
c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Routing and Remote Access RemoteAccess Stopped Disabled Share Process
c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Remote Registry Service RemoteRegistry Running Auto Own Process
c:\winnt\system32\regsvc.exe Normal LocalSystem 0
Remote Procedure Call (RPC) Locator RpcLocator Stopped Manual Own Process
c:\winnt\system32\locator.exe Normal LocalSystem 0
Remote Procedure Call (RPC) RpcSs Running Auto Share Process
c:\winnt\system32\svchost -k rpcss Normal LocalSystem 0
QoS RSVP RSVP Running Manual Own Process c:\winnt\system32\rsvp.exe -s
Normal LocalSystem 0
Security Accounts Manager SamSs Running Auto Share Process
c:\winnt\system32\lsass.exe Normal LocalSystem 0
Smart Card Helper SCardDrv Stopped Manual Share Process
c:\winnt\system32\scardsvr.exe Ignore LocalSystem 0
Smart Card SCardSvr Stopped Manual Share Process
c:\winnt\system32\scardsvr.exe Ignore LocalSystem 0
Task Scheduler Schedule Running Auto Share Process
c:\winnt\system32\mstask.exe Normal LocalSystem 0
RunAs Service seclogon Running Auto Share Process
c:\winnt\system32\services.exe Ignore LocalSystem 0
System Event Notification SENS Running Auto Share Process
c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Internet Connection Sharing SharedAccess Stopped Manual Share Process
c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Print Spooler Spooler Running Auto Own Process c:\winnt\system32\spoolsv.exe
Normal LocalSystem 0
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
Automatic Updates wuauserv Running Auto Share Process
c:\winnt\system32\svchost.exe -k wugroup Normal LocalSystem 0
Wireless Configuration WZCSVC Stopped Manual Share Process
c:\winnt\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
Accessories\System Tools Default User:Accessories\System Tools Default User
Startup Default User:Startup Default User
Accessories All Users:Accessories All Users
Accessories\Communications All Users:Accessories\Communications All Users
Accessories\Entertainment All Users:Accessories\Entertainment All Users
Accessories\System Tools All Users:Accessories\System Tools All Users
Administrative Tools All Users:Administrative Tools All Users
Microsoft SQL Server All Users:Microsoft SQL Server All Users
Startup All Users:Startup All Users
Accessories CLIENT70\Administrator:Accessories CLIENT70\Administrator
Accessories\Accessibility CLIENT70\Administrator:Accessories\Accessibility
CLIENT70\Administrator
Accessories\Entertainment CLIENT70\Administrator:Accessories\Entertainment
CLIENT70\Administrator
Accessories\System Tools CLIENT70\Administrator:Accessories\System Tools
CLIENT70\Administrator
Startup CLIENT70\Administrator:Startup CLIENT70\Administrator

[Startup Programs]

Program Command User Name Location
No startup program information

[OLE Registration]

Object Local Server
Sound (OLE2) sndrec32.exe
Sound Not Available
Image Document "C:\Program Files\Windows NT\Accessories\ImageVue\KodakImg.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 5.00.3700.1000
Build 53700.1000
Product ID 51876-OEM-0045023-09136
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 5.0.2195.6710 378 KB 6/20/2003 6:00:00 AM C:\WINNT\system32
Microsoft Corporation
advpack.dll 5.0.3502.6601 87 KB 6/20/2003 6:00:00 AM C:\WINNT\system32
Microsoft Corporation
browselc.dll 5.0.3700.6661 35 KB 6/20/2003 6:00:00 AM C:\WINNT\system32
Microsoft Corporation
browseui.dll 5.0.3700.6661 789 KB 6/20/2003 6:00:00 AM C:\WINNT\system32
Microsoft Corporation
ckcnv.exe 5.0.2189.1 9 KB 6/20/2003 6:00:00 AM C:\WINNT\system32
Microsoft Corporation
comctl32.dll 5.81.3502.6601 538 KB 6/20/2003 6:00:00 AM C:\WINNT\system32
Microsoft Corporation
crypt32.dll 5.131.2195.6661 468 KB 6/20/2003 6:00:00 AM C:\WINNT\system32
Microsoft Corporation
enhsig.dll <File Missing> Not Available Not Available Not Available Not Available
iemigrat.dll <File Missing> Not Available Not Available Not Available Not Available
iesetup.dll 5.0.3502.6601 57 KB 6/20/2003 6:00:00 AM C:\WINNT\system32
Microsoft Corporation
iexplore.exe 5.0.2920.0 59 KB 6/20/2003 6:00:00 AM C:\Program Files\Internet
Explorer Microsoft Corporation
imagehlp.dll 5.0.2195.6613 126 KB 6/20/2003 6:00:00 AM C:\WINNT\system32
Microsoft Corporation
imghelp.dll <File Missing> Not Available Not Available Not Available Not Available
inseng.dll 5.0.3502.6601 72 KB 6/20/2003 6:00:00 AM C:\WINNT\system32
Microsoft Corporation

jobexec.dll 5.0.0.1 47 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
jscript.dll 5.1.0.8513 476 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
jsproxy.dll 5.0.2920.0 13 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
msaahtml.dll <File Missing> Not Available Not Available Not Available Not Available
mshtml.dll 5.0.3700.6699 2299 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
msoss.dll <File Missing> Not Available Not Available Not Available Not Available
msxml.dll 8.0.6730.0 502 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
occache.dll 5.0.3502.6601 86 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
ole32.dll 5.0.2195.6692 973 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
oleaut32.dll 2.40.4522.0 612 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
olepro32.dll 5.0.4522.0 160 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
rsabase.dll 5.0.2195.6619 129 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
rsaenh.dll 5.0.2195.6611 132 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
rsapi32.dll <File Missing> Not Available Not Available Not Available Not Available
rsasig.dll <File Missing> Not Available Not Available Not Available Not Available
schannel.dll 5.1.2195.6705 144 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
shdoc401.dll <File Missing> Not Available Not Available Not Available Not Available
shdocvw.dll 5.0.3700.6668 1082 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
shell32.dll 5.0.3700.6705 2328 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
shlwapi.dll 5.0.3502.6601 283 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
url.dll 5.0.3502.6601 82 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
urlmon.dll 5.0.3700.6705 443 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
vbscript.dll 5.1.0.7426 428 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
webcheck.dll 5.0.3502.6601 252 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
win.com 5.0.2134.1 24 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
wininet.dll 5.0.3700.6713 456 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
winsock.dll 3.10.0.103 3 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
wintrust.dll 5.131.2195.6624 162 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
wsock.vxd <File Missing> Not Available Not Available Not Available Not Available
wsock32.dll 5.0.2195.6603 21 KB 6/20/2003 6:00:00 AM C:\WINNT\system32 Microsoft Corporation
wsock32n.dll <File Missing> Not Available Not Available Not Available Not Available

[Connectivity]

Item Value
Connection Preference Never dial
EnableHttp1.1 1
ProxyHttp1.1 0

LAN Settings

AutoConfigProxy wininet.dll
AutoProxyDetectMode Enabled
AutoConfigURL
Proxy Disabled
ProxyServer
ProxyOverride

[Cache]

[Following are sub-categories of this main category]

[Summary]

Item Value
Page Refresh Type Automatic
Temporary Internet Files Folder C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files
Total Disk Space 10236 MB
Available Disk Space 7870 MB
Maximum Cache Size 319 MB
Available Cache Size 320 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 2/21/2005 to 1/28/2105 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: 2250_4_1_1
File Path: C:\Program Files\BenchCraft\2250_4_1_1.pro
Version: 4

Number of Engines: 4

Name: DRIVER1
Description: rte103_1
Directory: c:\tpcclog\rte103_1.log
Machine: rte103
Parameter Set: PARAM2
Index: 700000000
Seed: 59915
Configured Users: 5630
Pipe Name: DRIVER8-922426029
Connect Rate: 1000
Start Rate: 1000
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 0
Additional Options:

Name: DRIVER2
Description: rte103_2
Directory: c:\tpcclog\rte103_2.log
Machine: rte103
Parameter Set: PARAM2
Index: 100000000
Seed: 59915
Configured Users: 5620
Pipe Name: DRIVER2-1764008608
Connect Rate: 1000
Start Rate: 1000
Max. Concurrency: -1
Concurrency Rate: 10

CLIENT_NURAND: 233
CPU: 1
Additional Options:

Name: DRIVER3
Description: rte103_3
Directory: c:\tpcclog\rte103_3.log
Machine: rte103
Parameter Set: PARAM2
Index: 200000000
Seed: 59915
Configured Users: 5630
Pipe Name: DRIVER3-1689047983
Connect Rate: 1000
Start Rate: 1000
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 2
Additional Options:

Name: DRIVER4
Description: rte103_4
Directory: c:\tpcclog\rte103_4.log
Machine: rte103
Parameter Set: PARAM2
Index: 300000000
Seed: 59915
Configured Users: 5620
Pipe Name: DRIVER4568389500
Connect Rate: 1000
Start Rate: 1000
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 3
Additional Options:

Number of User groups: 4

Driver Engine: DRIVER1
IIS Server: client90
SQL Server: pe2850
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1 - 563
w_id Min Warehouse: 1
w_id Max Warehouse: 2250
Scale: Normal
User Count: 5630
District id: 1
Scale Down: No

Driver Engine: DRIVER2

IIS Server: client90
SQL Server: pe2850
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 564 - 1125
w_id Min Warehouse: 1
w_id Max Warehouse: 2250
Scale: Normal
User Count: 5620
District id: 1
Scale Down: No

Driver Engine: DRIVER3
IIS Server: client90
SQL Server: pe2850
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1126 - 1688
w_id Min Warehouse: 1
w_id Max Warehouse: 2250
Scale: Normal
User Count: 5630
District id: 1
Scale Down: No

Driver Engine: DRIVER4
IIS Server: client90
SQL Server: pe2850
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1689 - 2250
w_id Min Warehouse: 1
w_id Max Warehouse: 2250
Scale: Normal
User Count: 5620
District id: 1
Scale Down: No

Number of Parameter Sets: 5

~Default
Default Parameter Set

	Txn Weight	Think Time	Key Time	RT Delay	RT Fence	Menu 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

Appendix C – Tunable Parameters

	Txn Weight	Think Time	Key Time	RT Delay	RT Fence	Menu Delay	
New Order	44.89		12.04	18.02	0.10	5.00	0.10
Payment	43.03		12.04	3.02	0.10	5.00	0.10
Delivery	4.03		5.04	2.02	0.10	5.00	0.10
Stock Level	4.03		5.04	2.02	0.10	20.00	0.10
Order Status	4.03		10.04	2.02	0.10	5.00	0.10

50run

	Txn Weight	Think Time	Key Time	RT Delay	RT Fence	Menu Delay	
New Order	44.84		30.00	18.02	0.10	5.00	0.10
Payment	43.04		30.00	3.02	0.10	5.00	0.10
Delivery	4.05		15.00	2.02	0.10	5.00	0.10
Stock Level	4.05		15.00	2.02	0.10	20.00	0.10
Order Status	4.05		25.00	2.02	0.10	5.00	0.10

50run2

	Txn Weight	Think Time	Key Time	RT Delay	RT Fence	Menu Delay	
New Order	44.84		33.00	18.02	0.10	5.00	0.10
Payment	43.04		33.00	3.02	0.10	5.00	0.10
Delivery	4.05		18.00	2.02	0.10	5.00	0.10
Stock Level	4.05		18.00	2.02	0.10	20.00	0.10
Order Status	4.05		28.00	2.02	0.10	5.00	0.10

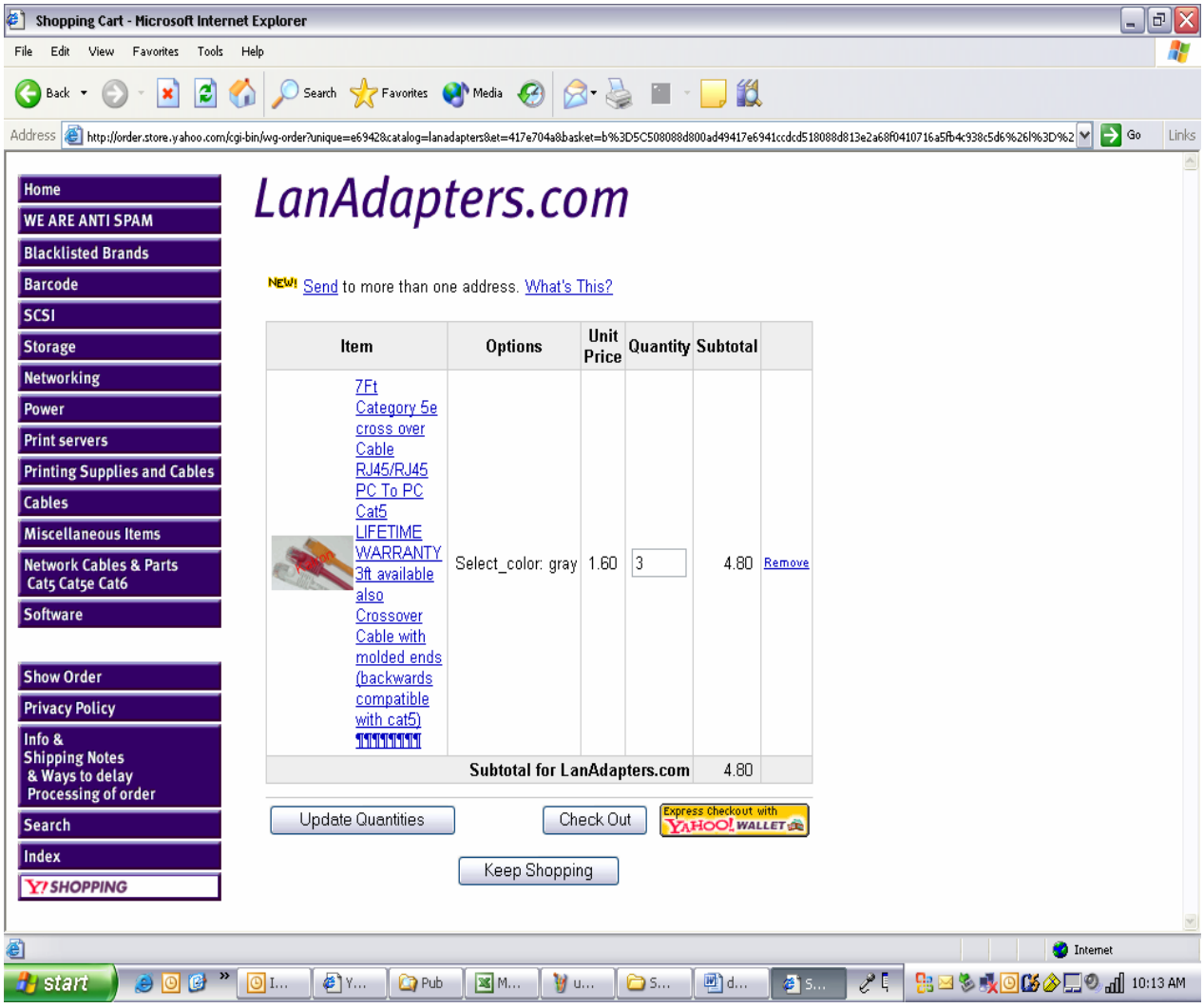
80run

	Txn Weight	Think Time	Key Time	RT Delay	RT Fence	Menu Delay	
New Order	44.84		18.00	18.02	0.10	5.00	0.10
Payment	43.04		18.00	3.02	0.10	5.00	0.10
Delivery	4.05		13.00	2.02	0.10	5.00	0.10
Stock Level	4.05		13.00	2.02	0.10	20.00	0.10
Order Status	4.05		8.00	2.02	0.10	5.00	0.10

Appendix D – Disk Storage

TPC-C 60 Day Space Requirements						
Warehouses	2250				TpmC	28,116.33
Table	Rows	Data KB	Index KB	Extra 5% KB	8hr Space	otal Space KB
Warehouse	2,250	248	40	14		302
District	22,500	2,536	48	129		2713
Customer	67,500,000	49,090,912	3,063,504	2,607,721		54762137
History	67,500,000	4,029,864	40		812,435	4029904
NewOrder	20,250,000	360,808	936	18,087		379831
Orders	67,500,000	2,204,088	1,075,248		3,919,362	3279336
OrderLine	675,003,921	45,000,264	106,520		10,017,884	45106784
Item	100,000	9,528	64	480		10072
Stock	225,000,000	72,000,000	152,440	3,607,622		75760062
Total		172,698,248	4,398,840	6,234,053	14,749,681	183,331,141
	MB					
Dynamic Space	50,033	Sum of Data for Order, Orderline and History				
Static Space	129,001	Sum of Data+Index+5%-Dynamic Space				
Free Space	na	Total Allocated Spac - (Dynamic + Static Space)				
Daily Growth	10,004	(Dynamic Space/(W*62.5))*tpmc				
Daily Spread	-	(Free Space -1.5*Daily Growth) Zero Assumed				
60 Day Space MB	729,217					
60 Day Space GB	712.13	GB				
Log Size	39,536.99	MB				
KB Per New Order	5.21	KB				
8 hr log MB	68,690	MB				
8 hr log GB	67.0802	GB				
		Disks	Disks	Formatted Size	Space	
Space Usage	GB Needed	Measured	Size	Size	Available	
180 Day Space DB	712.13	0	18GB	16.900	0.00	
		0	9GB	8.473	0.00	
		70	36GB	33.900	2373.00	
Total DB		70.00			**2373.00**	
8-hr log + mirror	134.1604	6	36GB	33.900	**203.40**	
		0	72GB	67.84		
OS, Swap	3	0	36GB	33.900	0.00	
Total Storage	849.29	GB			2,576.40	

Appendix E - Price Quotations



February 10, 2004

February 10, 2004

To: Mike Molloy

cc: Sean Campbell; LSI Logic, Norcross, GA
Elaine Morris, LSI Logic, Norcross, GA
Kelly Bryant; LSI Logic, Norcross, GA
Rich Lautzenheiser; LSI Logic, Houston, TX

Subject: Request for Quotation: MegaRAID SCSI Elite 1650 Controller

Dear Mike,

Thank you for the opportunity to quote pricing of LSI Logic's MegaRAID Elite 1650 controller.

Please note that this quotation contains LSI Logic confidential information and should not be disclosed to any other party.

Should you have any questions or need additional information, please feel free to contact me directly. This quotation is valid for 30 days.

Sincerely,

Sean Campbell

Product	Price
MegaRAID SCSI Elite 1650	**$999**

Appendix E – Price Quotations

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

Tel 425 882 8080
Fax 425 936 7329
http://www.microsoft.com/

Microsoft

February 14, 2005

Dell
Gene Purdy
1 Dell Way
Round Rock, TX 78664

Mr. Purdy:

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
A5K-00206	**SQL Server Workgroup Edition 2000** *Per Processor Licensing* *Discount Schedule: Open Program - No Level* *Unit Price reflects a 5% discount from the retail unit price of $3,899.*	$3,700	1	$3,700
C11-00821	**Windows 2000 Server** *Server License Only - No CALs* *Discount Schedule: No Level* *Unit Price reflects a 8% discount from the retail unit price of $799.*	$738	1	$738
P73-00295	**Windows Server 2003, Standard Edition** *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 Edition** *Discount Schedule: No Discounts Applied*	$109	1	$109
	Microsoft Problem Resolution Services *Professional Support* *(1 incident)*	$245	1	$245

Appendix E – Price Quotations

Some products may not be currently orderable but will be available through Microsoft's normal distribution channels by April 30, 2005.

This quote is valid for the next 90 days.

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

Reference ID: PCgepu0514027320.
Please include this Reference ID in any correspondence regarding this price.