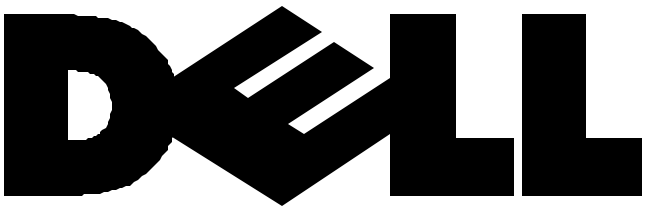

TPC Benchmark™ C
Full Disclosure Report
for
Dell PowerEdge 6400
Using
Microsoft SQL Server 2000 8.0 Enterprise Edition
and
Microsoft Windows 2000 Advanced Server

First Edition
Submitted for Review
OCT 23, 2000

First Printing, OCT 23, 2000

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, OCT 23, 2000 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.

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Abstract

Overview

This report documents the methodology and results of the TPC Benchmark™ C test conducted on Dell PowerEdge 6400. The tests were run in a client/server configuration using four PowerEdge 1300's as clients. The operating system used for the benchmark was Microsoft Windows 2000 Advanced Server on the database server and Microsoft Windows 2000 Server on the clients. The database was Microsoft SQL Server 2000 Enterprise Edition. Microsoft COM+ provided the database connection queues. All tests were done in compliance with Revision 3.5 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 6400	Microsoft Windows 2000 Advanced Server Windows 2000 Server SQL Server 2000 Enterprise Edition	$211,426	30,231.37	$7.00	Oct. 23, 2000

Auditor

The results of the benchmark and test methodology used to produce the results were audited by Tom Sawyer of Performance Metrics and have fully met the TPC-C rev 3.5 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 Shanley Public Relations
777 North First Street, Suite 600
San Jose, CA 95112, USA
Phone: (408) 295-8894, fax 295-9768
www.tpc.org

or

Dell
1 Dell Drive
Round Rock, TX 78682
Attention: Mike Molloy

PowerEdge 6400

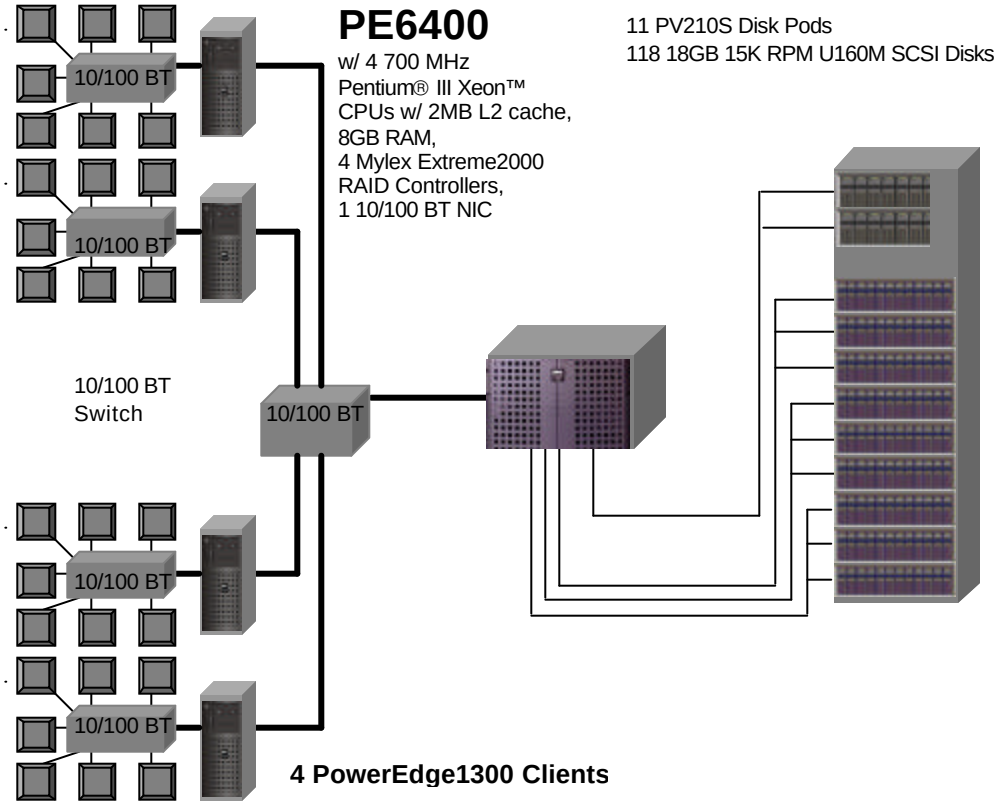
Client/Server w/4 PE1300 Front Ends

Repricing date
Sept 26, 2001

TPC-C Rev 5.0
Repricing
Report Date
Oct 23, 2000

Total System Cost	TPC-C Throughput	Price/Performance	Availability Date
$211,426	**30,231.37 tpmC**	**$7.00/ tpmC**	Oct 23, 2000

Processors	Database Manager	OS	Other Software	Number of Users
4 x Pentium® III Xeon™ Processors 700 MHz 2MB L2 Cache	Microsoft SQL Server 2000 Enterprise Edition	Microsoft Windows 2000 Advanced Server	Windows 2000 Server w/ COM+ Internet Information Server 5.0 Microsoft Visual C++	24,320



System Component	Server		Each Client	
Processors Cache	4	Pentium® III Xeon™ @ 700MHz 2MB	1	Pentium® III w/ 512 KB L2 3 clients @ 600MHz, 1 @ 550
Memory		8192 MB		512 MB
Disk Controllers	4 2	Mylex ExtremeRAID 2000 Adaptec On-Board	1	Adaptec On-Board
Disk Drives	118 1	18 GB SCSI 9 GB SCSI	1	9 GB
Total Storage		1,985 GB		9 GB
Other	1 1 1	10/100 BT NIC CD-ROM Internal DAT	2 1	

Dell	PowerEdge 6400	TPC-C REV 5.0 EXECUTIVE SUMMARY PAGE 2 OF 2
Upgrade Date: 19-March-01	Client/Server	Report Date: 26-Sept-01

Description	Part Number	Third Party Brand	Third Party Pricing	Unit Price	Qty	Extended Price	3 yr. Maint. Price
Server Hardware							
Dell PowerEdge 6400	220-0660		1	5,132	1	5,132	1,100
Pentium III Xeon 700 MHz / 2MB L2 - 4 processors	311-0834		1	7,845	1	7,845	-
8 GB RAM, 16 x 512MB DIMMS	311-4118		1	10,855	1	10,855	-
6 Bay HD Back Plane	311-0485		1	249	1	249	-
9 GB U160M SCSI 10K RPM Hard Drive	340-8088		1	249	1	249	-
Intel Pro 100+ NIC	430-1970	Intel	1	59	1	59	-
Tape Backup Unit	340-7467		1	799	1	799	-
Dell 15" Monitor	320-0960		1	149	1	149	-
Extreme RAID 2000 PCI SCSI 4 channel RAID controller***	E2000-4-32NB	Mylex	3	1,849	6	11,094	-
Back-UPS Office 650	001332	APC	1	167	13	2,170	539
					Subtotal	38,601	1,639
PowerVault Disk Subsystem							
PV210S, U3 SCSI, PS, Rack mount	220-4099, etc.		1	2,499	11	27,489	8,404
SCSI Cables	310-0313		1	49	11	539	-
18 GB U160M SMRT SCSI 15K RPM Hard Drive *	340-3232		1	499	118	58,882	-
42U Rack	220-0605		1	1,294	1	1,294	-
					Subtotal	88,204	8,404
Server Software							
SQL Server 2000 Ent Edition, Per processor licensing **		Microsoft	2	16,541	4	66,164	6,285
Windows 2000 Advanced Server, 25 Client Licenses **		Microsoft	2	2,399	1	2,399	-
					Subtotal	68,563	6,285
Client Hardware							
Dell PowerEdge 1300, 600 MHz Pentium III w/ 512KB L2****	220-2332		1	549	3	1,647	1,494
Dell PowerEdge 1300, 550 MHz Pentium III w/ 512KB L2****	220-2332		1	549	1	549	498
512MB RAM, 2 DIMMs	311-1108		1	490	4	1,960	-
9GB LVD SCSI Hard Drive,	340-1963		1	249	4	996	-
Ether Express PRO 100+ Ethernet Adapter	430-1970	Intel	1	59	8	472	-
Dell 15" Monitor	320-0960		1	149	4	596	-
					Subtotal	6,220	1,992
Client Software							
Windows 2000 Server, 5 Client Licenses **		Microsoft	2	738	4	2,952	-
Visual C++ Professional 6.0 Win32 **		Microsoft	2	549	1	549	-
					Subtotal	3,501	-
User Connectivity							
8 Port Ethernet Switch ***	CT2208D3	ArkPC	4	61	3	183	-
					Subtotal	183	-
					Other Discounts	(12,166)	-
					Total	**193,106**	**18,320**

Notes: * Maint. included in PowerVault 210S disk pod or PV650F/630F fibre channel disk pod
** 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 return-to-vendor warranty) Pricing: 1 - Dell 2 - Microsoft 3 - Mylex 4 - ArkPC 5 - MicroBarn
**** Substituted with PE1400SC/933Mhz/P3 /256KB L2
Audited by Tom Sawyer, Performance Metrics Inc.

Three-Year Cost of Ownership: **$211,426**

tpmC Rating: **30231.00**

$ / tpmC: **7.00**

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: 30,231.37 tpmC

% throughput difference, reported & reproducibility runs: 0.47%

Response Times (in seconds)	Average	90th	Max
- Neworder	0.48	0.86	5.54
- Payment	0.38	0.76	2.73
- Order Status	0.41	0.79	5.45
- Delivery (interactive portion)	0.16	0.34	1.30
- Delivery (deferred portion)	0.32	0.55	1.86
- Stock-Level	1.37	2.18	5.12
- Menu	0.17	0.35	1.32

Response time delay added for emulated components: Menu 0.1, Resp 0.1

Transaction Mix, in percent of total transactions

- New-Order: 44.84%
- Payment: 43.02 %
- Order-Status: 4.04 %
- Delivery: 4.05 %
- Stock-Level: 4.05 %

Keying/Think Times (in seconds),	Min		Average		Max	
- New-Order	18.01	0.0	18.02	12.04	18.05	120.41
- Payment	3.01	0.0	3.02	12.04	3.02	120.41
- Order-Status	2.01	0.0	2.02	10.02	2.04	100.41
- Delivery	2.01	0.0	2.02	5.06	2.05	50.40
- Stock-Level	2.01	0.0	2.02	5.06	2.04	50.40

Test Duration

- Ramp-up time: 5 minutes
- Measurement interval: 30 minutes
- Number of checkpoints: 1
- Checkpoint interval: 30 minutes
- Number of transactions (all types) completed in measurement interval: 2,104,156

Table of Contents

Introduction

Document Structure

The TPC Benchmark C Standard Specification Revision 3.5, 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 6400 server driven by four Dell PowerEdge 1300 clients. The clients and server are networked together via a 10/100 Base T switch. Nine remote terminal emulator (RTE) systems (PowerEdge 2200's) emulate 24,320 users executing the standard TPC-C workload. The RTE's are connected to the four clients through 10/100 BaseT switches. Each switch connects to one client machine at 100 BaseT and to the RTE machines at 10Mbit/sec, half duplex. Microsoft Windows 2000 Advanced Server was the operating system used on the server. Microsoft Windows 2000 Server was used on the clients. Microsoft SQL Server 2000 Enterprise Edition was the database on the server machine.

The PowerEdge 6400 motherboard uses the ServerWorks Champion High End 2.5 chipset and can hold up to four Pentium® III Xeon™ processors (700 MHz with 2 MB L2 cache on each). The system has 7 PCI I/O slots (2 x 64bit/66MHz; 4 x 64-bit/33MHz; 1 x 32-bit/33MHz). The measured configuration used 8 Gbytes of RAM, which was achieved by using sixteen 512 Mbyte DIMMs.

The PowerEdge 6400 has an integrated Adaptec AIC-7899 U160 SCSI controller to which was attached one 9 GB disk drive containing the operating system. In addition, four Mylex ExtremeRAID 2000 4-channel RAID controllers were installed in four PCI slots and connected to 11 PowerVault 210S disk pods, which can hold 12 disks each. 9 of the pods were filled with 108 18 GB disks, all containing the database data. Additionally, 2 of the diskpods held 5 disk drives each. The 10 disk drives were mirrored using RAID 10 and were configured for transaction log data. There were 2 empty slots. The final PCI slot was used for an Intel Pro 100 Network Interface Card.

Each client had a single Pentium® III processor (three at 600 MHz and one at 550 MHz), each with 512 Kbytes of L2 cache. Each client had 512 Mbytes of RAM, one 9 GB hard disk, one Intel Ether Express Pro100+ PCI Ethernet adapter and one Intel Pro 100 Network Interface Card. On each client the Intel Ethernet adapter was connected to the RTE machines through a 10/100 BaseT switch and the Intel Pro NIC was connected to the Database Server through a 10/100 Base T switch. The four clients were driven through eight network segments each for a total of 32 network segments. 760 emulated users were run on each network segment for a total of 24,320 emulated users. The network segments between the switches and RTEs were fixed at 10 Mbit/sec, half duplex.

General Items

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 2000 Advanced Server, Windows 2000 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

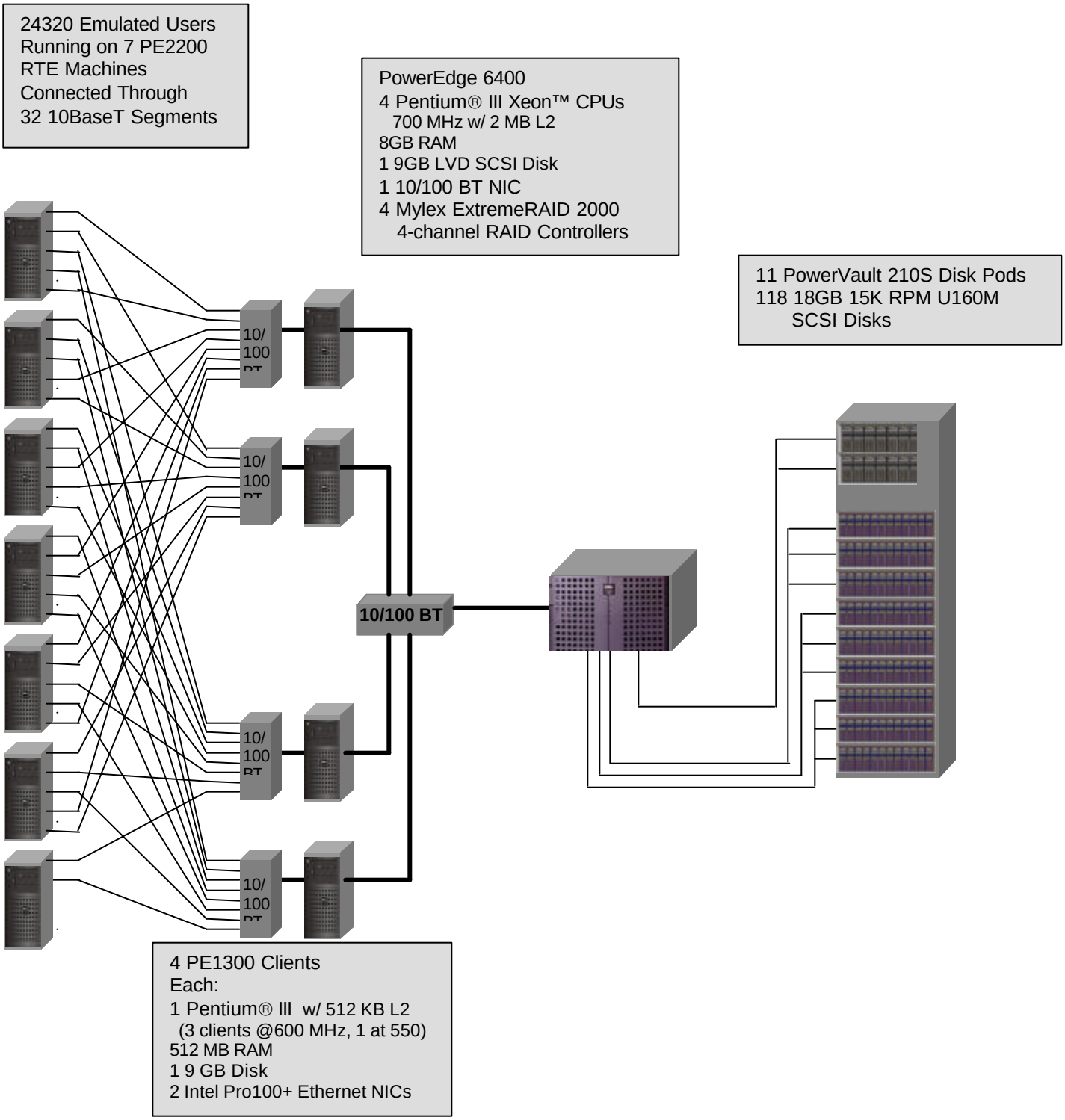
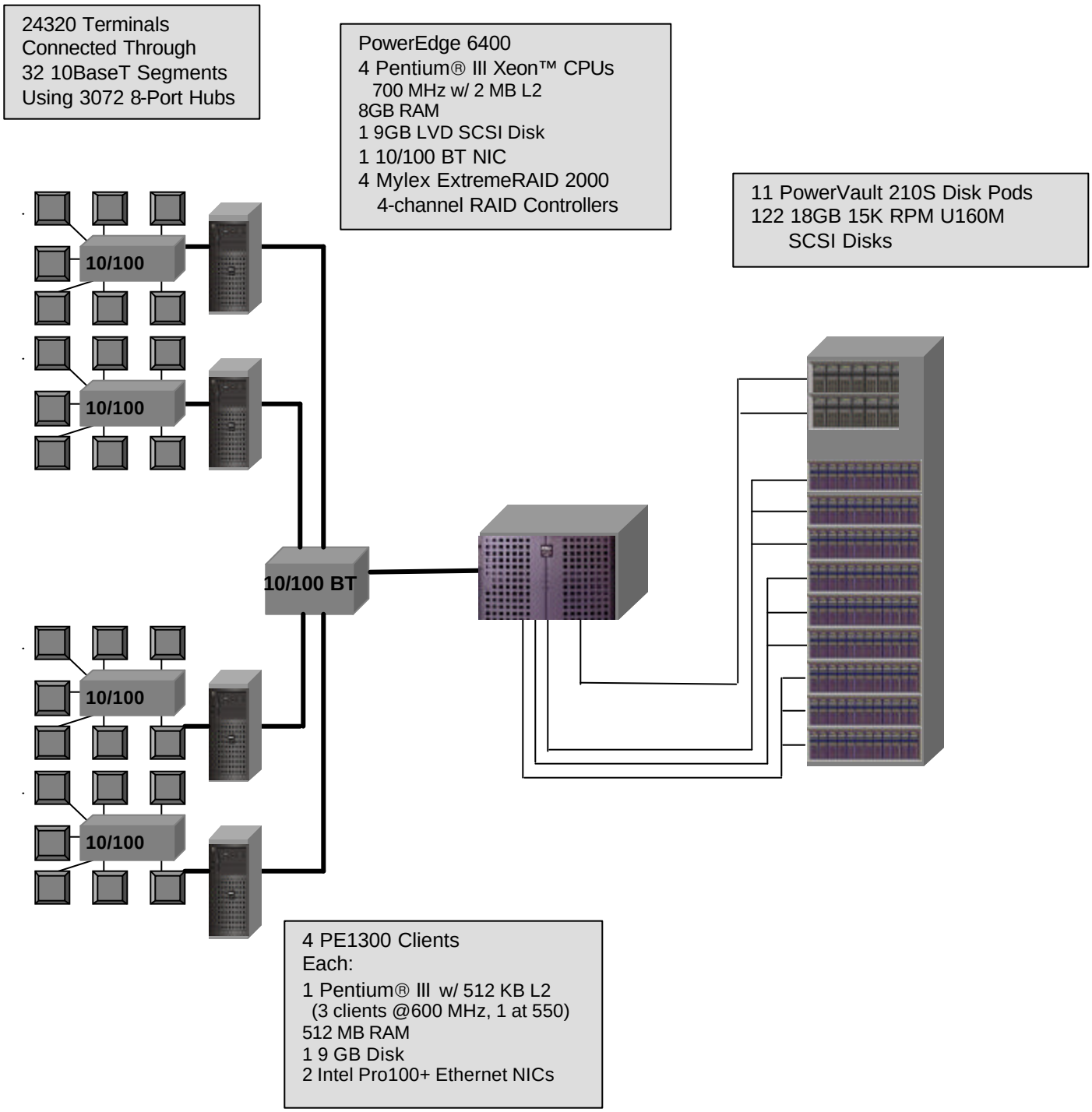


Figure 2: Priced Configuration



lause 1 -- Logical Database Design Related Items

Table Definitions

Listings must be provided for all table definition statements and all other statements used to set-up the database. (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 118 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.

Clause 2 -- Transaction and Terminal Profiles Related Items

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	0.99%
	Average Lines Per Order	10.00
Payment	Home Warehouse	84.94%
	Remote Warehouse	15.06%
	Non-Primary Key Access	60.03%
Order Status	Non-Primary Key Access	60.20%
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	44.84%
Payment	43.02%
Order Status	4.04%
Delivery	4.05%
Stock Level	4.05%

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.

Clause 3 -- Transaction and System Properties Related Items

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

For convenience, durability from media failure was demonstrated on a 10 Warehouse database having similar characteristics to the fully scaled database. The standard driving mechanism was used to generate the transaction load of 100 users for the Loss of Data. The fully scaled database under full load would also have passed the following test.

Loss of Data

Loss of data was demonstrated on a 10 Warehouse database for convenience. The standard driving mechanism was used to generate the transaction load of 100 users for the test. To demonstrate recovery from a permanent failure of durable media containing TPC-C tables, the following steps were executed:

1. A 10 Warehouse database was built having similar characteristics to the large database.
2. The database was backed up using SQL Server backup facilities.
3. A sum of D_NEXT_O_ID was taken.
4. 100 users were logged in to the database and ran transactions.
5. One disk drive in the data array was removed causing SQL Server errors.
6. The RTE was allowed to continue running. Completed transactions enroute from the clients were recorded. Error messages began appearing on the RTE screen.
7. The RTE was stopped.
8. SQL Server was stopped and restarted and a dump of the transaction log was taken.
9. SQL Server was stopped, Windows 2000 was shutdown and the machine powered off.
10. The failed disk was replaced.
11. The machine was powered up, Windows 2000 and SQL Server were started.
12. The TPC-C database was dropped and restored from backup.
13. The transaction log was restored and transactions rolled forward.
14. 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.

Instantaneous Interruption and Loss of Memory/Loss of Log

Instantaneous Interruption and Loss of Memory were demonstrated on the full database with 2560 warehouses in a single test. The standard driving mechanism was used to generate the transaction load of 25,600 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. 25,600 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 2000 or SQL Server.
6. The system ran for an additional 5 minutes.

6. The Server was powered off by normal means, causing instantaneous interruption.
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. The server was powered on again and rebooted.
10. SQL Server was restarted and automatically recovered.
11. A new count of D_NEXT_O_ID was taken.
12. This number was compared with the number of new orders reported by the RTE

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 2450 warehouses. The performance run used 2432 warehouses and this is verified by runcheck

Table 3: Table Cardinality

Table	Cardinality as Benchmarked
Warehouse	2,450
District	24,500
Customer	73,500,000
History	73,500,000
NewOrder	22,050,000
Orders	73,500,000
OrderLine	734,999,144
Item	100,000
Stock	245,000,000
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 118 disks: 108 18GB for data, 10 18GB for log, and 1 9GB for OS and application software. The data drives were configured as hardware RAID 0. Logs were configured as hardware RAID 10. Mylex ExtremeRAID 2000 RAID Controllers 2, 3, and 4 were configured with 36 disk drives per logical drive. Disk 1 (controller 1) contained 10 18GB drives. Each Windows 2000 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	Adaptec 7899 Configuration					
Disk **0 8673MB**	On-Board Controller # **1**					
Partition	On-Board		Channels			
1	Internal	SCSI ID	0			
C: OS NTFS 8673 MB		0	A0-1			
		1				
		2				
		3				

W2K Disk Administration		MYLEX EX2000P Configuration					
Disk **1 85790MB**		Controller # **1**					
Partition		Slot# **1**		Channels			
1	2		SCSI ID	A	B	C	D
S: LOG Unknown 55296MB	**Freespace 30494MB**		0	A1-1	A1-2		
			1	A2-1	A2-2		
			2	A3-1	A3-2		
			3	A4-1	A4-2		
			4	A5-1	A5-2		
			5				
			8				
			9				
			10				
			11				
			12				
			13				

W2K Disk Administration			MYLEX EX2000P Configuration					
Disk **2 617758MB**			Controller # **2**					
Partition			Slot# **2**		Channels			
1	2	3		SCSI ID	A	B	C	D
E:	**F:**	**X:**		0	A1-1	A2-1		A3-1
CS1	**MS1**	**Backup1**		1	A1-2	A2-2		A3-2
Unknown	**Unknown**	**NTFS**		2	A1-3	A2-3		A3-3
47616MB	**26624MB**	**543518MB**		3	A1-4	A2-4		A3-4
				4	A1-5	A2-5		A3-5
				5	A1-6	A2-6		A3-6
				8	A1-7	A2-7		A3-7
				9	A1-8	A2-8		A3-8
				10	A1-9	A2-9		A3-9
				11	A1-10	A2-10		A3-10
				12	A1-11	A2-11		A3-11
				13	A1-12	A2-12		A3-12

W2K Disk Administration			MYLEX EX2000P Configuration					
Disk **3 617758MB**			Controller # **3**					
Partition			Slot# **3**		Channels			
1	2	3		SCSI ID	A	B	C	D
G:	**H:**	**Y:**		0	A1-1	A2-1		A3-1
CS2	**MS2**	**Backup2**		1	A1-2	A2-2		A3-2
Unknown	**Unknown**	**NTFS**		2	A1-3	A2-3		A3-3
47616MB	**26624MB**	**543518MB**		3	A1-4	A2-4		A3-4
				4	A1-5	A2-5		A3-5
				5	A1-6	A2-6		A3-6
				8	A1-7	A2-7		A3-7
				9	A1-8	A2-8		A3-8
				10	A1-9	A2-9		A3-9
				11	A1-10	A2-10		A3-10
				12	A1-11	A2-11		A3-11
				13	A1-12	A2-12		A3-12

W2K Disk Administration			MYLEX EX2000P Configuration					
Disk **4 617758MB**			Controller # **4**					
Partition			Slot# **4**		Channels			
1	2	3		SCSI ID	A	B	C	D
I:	**J:**	**U:**		0	A1-1	A2-1		A3-1
CS2	**MS2**	**Backup3**		1	A1-2	A2-2		A3-2
Unknown	**Unknown**	**NTFS**		2	A1-3	A2-3		A3-3
47616MB	**26624MB**	**543518MB**		3	A1-4	A2-4		A3-4
				4	A1-5	A2-5		A3-5
				5	A1-6	A2-6		A3-6
				8	A1-7	A2-7		A3-7
				9	A1-8	A2-8		A3-8
				10	A1-9	A2-9		A3-9
				11	A1-10	A2-10		A3-10
				12	A1-11	A2-11		A3-11
				13	A1-12	A2-12		A3-12

***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 2000 Enterprise 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 of 143.57 GB (including mirror) to sustain the log for 8 hours. Space available on the transaction log volume was 167.56 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 180-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	30,231.37
Price per TpmC	$7.00

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	0.48	0.86	5.54
Payment	0.38	0.76	2.73
Order Status	0.41	0.79	5.45
Interactive Delivery	0.16	0.34	1.30
Deferred Delivery	0.32	0.55	1.86
Stock Level	1.37	2.18	5.12
Menu	0.17	0.35	1.32

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	18.01	18.02	18.05
Payment	3.01	3.02	3.05
Order Status	2.01	2.02	2.05
Delivery	2.01	2.02	2.04
Stock Level	2.01	2.02	2.04

Table 8: Transaction Think Times

Transaction	Minimum	Average	Maximum
New Order	0.00	12.04	120.41
Payment	0.00	12.04	120.41
Order Status	0.00	10.02	100.41
Delivery	0.00	5.06	50.40
Stock Level	0.00	5.06	50.40

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

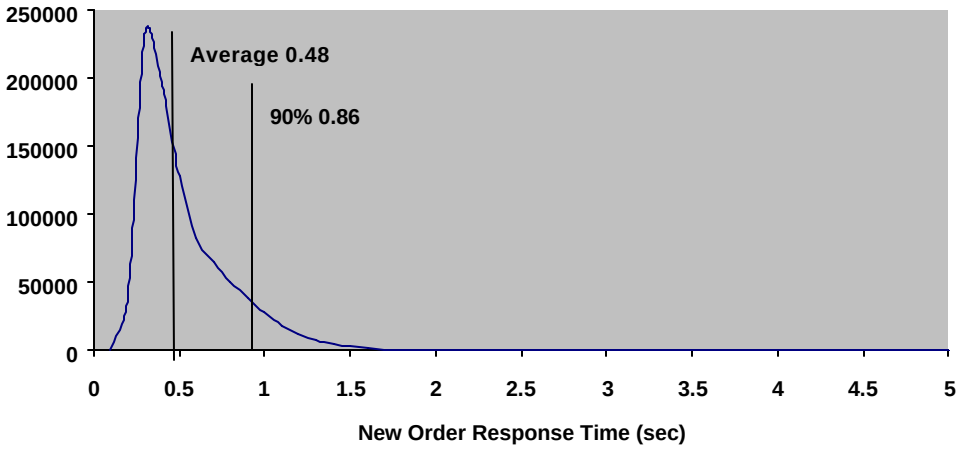


Figure 4: Payment Response Time Distribution

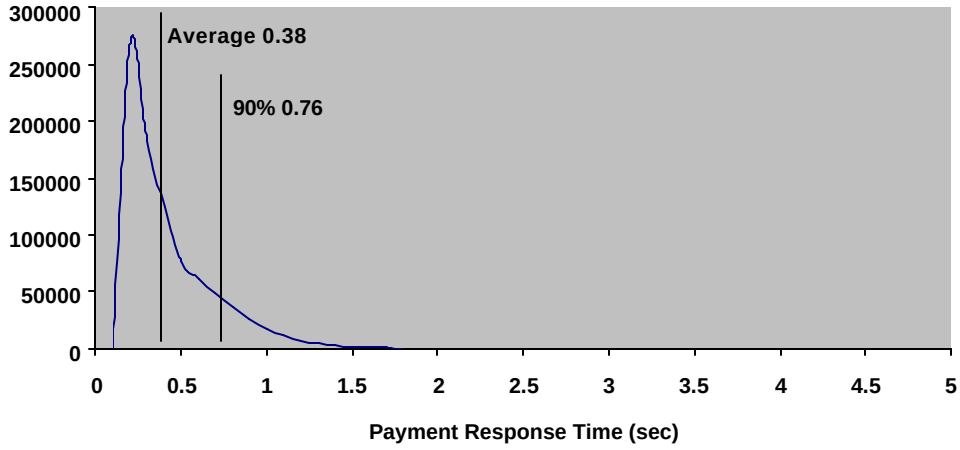


Figure 5: Order Status Response Time Distribution

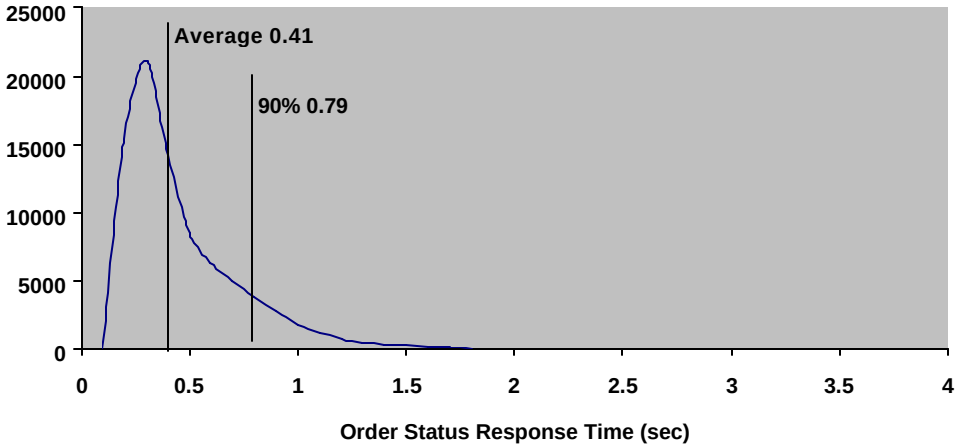


Figure 6: Delivery Response Time Distribution

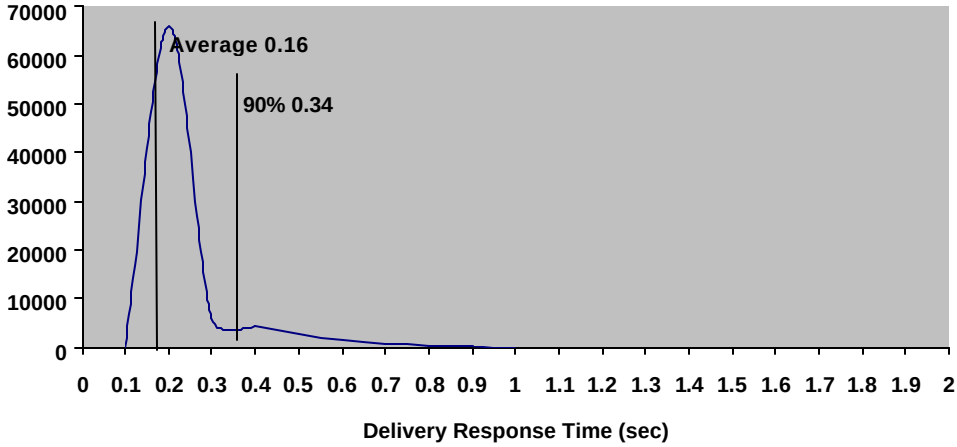
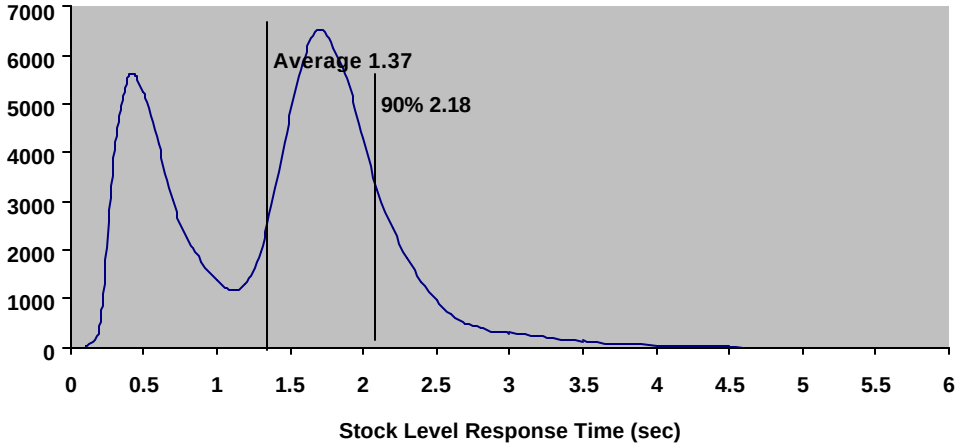


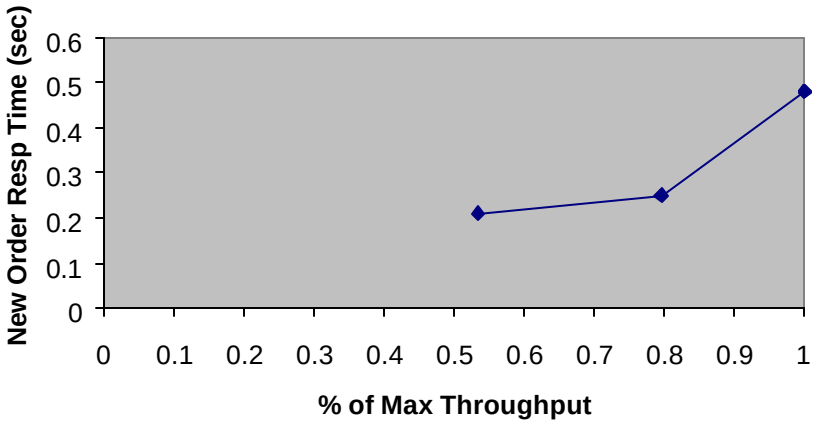
Figure 7: Stock Level Response Time Distribution



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)

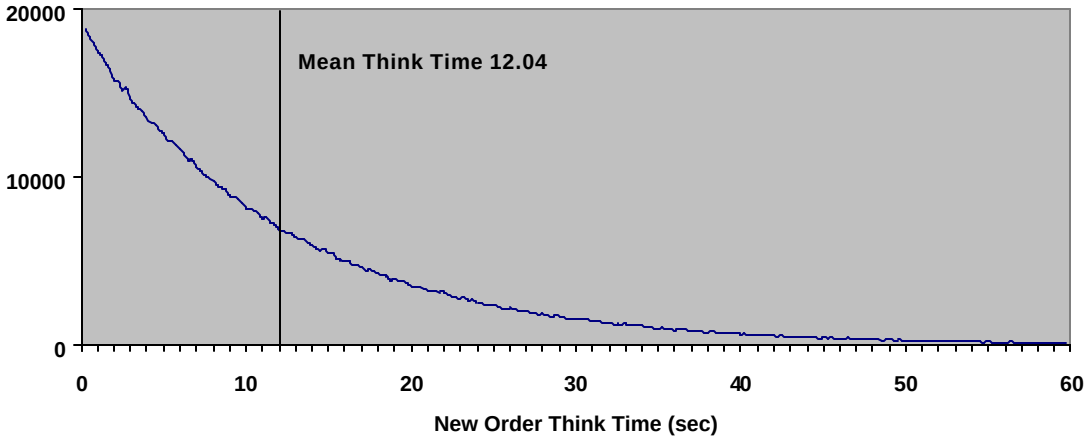
Figure 8: New Order Response Time vs. Throughput



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)

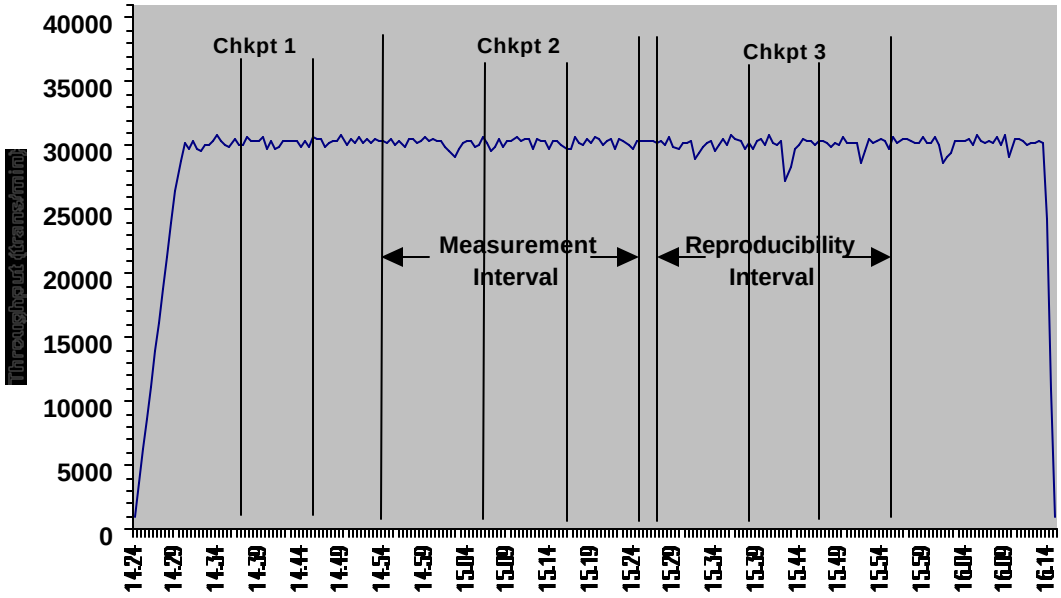
Figure 9: New Order Think Time Distribution



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. The positioning of the checkpoint was verified to be clear of the guard zones and is depicted on the graph in Figure 8.

Reproducibility Methodology

A description of the method used to determine the reproducibility of the measurement results must be reported. (8.1.6.11)

The RTE master program was invoked with the configuration file shown in **Appendix C - Tunable Parameters** and the number of users logged in and issuing transactions was ramped up from 0 to 24,320 over 5 minutes. We allowed the database to warm up and to reach a steady state for an additional 30 minutes, including one checkpoint. The steady state was sustained for a 30-minute performance interval, including a checkpoint, followed 30 seconds later by a 30-minute reproducibility interval. Twenty nine minutes later a command was issued to the RTE to stop issuing transactions and the users were logged out of the web server. The reproducibility interval thoughput was within 0.47% of that of the performance interval

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 30 minutes.

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	44.84%
Payment	43.02%
Order Status	4.04%
Delivery	4.05%
Stock Level	4.05%

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	0.99%
	Average Lines Per Order	10.00
Payment	Home Warehouse	84.94%
	Remote Warehouse	15.06%
	Non-Primary Key Access	60.03%
Order Status	Non-Primary Key Access	60.20%
Delivery	Skipped Transactions	0

Checkpoints

The number of checkpoints in the Measurement Interval, the time in seconds from the start of the Measurement Interval to the first checkpoint and the Checkpoint Interval must be disclosed. (8.1.6.21)

There was 1 checkpoint in the measurement interval. It started 744 sec after the start of the measurement interval. The checkpoint in the measurement interval lasted 600 seconds.

Clause 6 -- SUT, Driver, and Communication Definition Related Items

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:

- 10 BaseT (10 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: Oct 23, 2000
Software Availability Date: Oct 23, 2000

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: 30,231.37 tpmC
Price Performance Metric: $7.00

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:

- 4 Microsoft Windows 2000 Server Licenses
- 1 Microsoft Windows 2000 Advanced Server License
- 1 Microsoft SQL Server 2000 Enterprise Edition License.
- 1 Microsoft Visual C++ 32 bit Edition
- 5 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 Tom Sawyer 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 Shanley Public Relations
777 North First Street, Suite 6000
San Jose, CA 95112-6311
www.tpc.org

or:

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

March 16, 2001

Mike Molloy
Manager, Enterprise Systems Performance
Dell
One Dell Way
Round Rock, TX 78682

In my opinion, the data provided for the PowerEdge 6400 result of October 23, 2000 complies with the TPC-C Version 5 upgrade requirements.

The following attributes of the benchmark were given special attention:

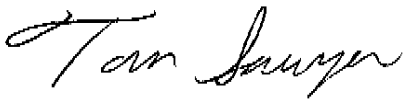
- The data for the 60 day space calculation was verified. Four 18Gb drive were removed from the original configuration – they were added to satisfy the 180-day space requirement.
- Maintenance was verified to be 3-year, 7 X 24.
- The system pricing was checked for major components and maintenance.

Auditor Notes:

The Dell PowerEdge 1300 client systems were replaced by Dell PowerEdge 1400 systems per TAB decision of March 12, 2001. The price is the 1400 price which is higher than the last published 1300 price.

Sincerely,

Tom Sawyer



Auditor

Auditor's Letter of Attestation

October 19, 2000

Mike Molloy
Manager, Enterprise Systems Performance
Dell
One Dell Way
Round Rock, TX 78682

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

Platform: Dell PowerEdge 6400 Server
Database Manager: Microsoft SQL Server 2000 Enterprise Edition (Version 8.0)
Operating System:
Server: Microsoft Windows 2000 Advanced Server
Clients: Microsoft Windows 2000 Server
Transaction Manager: Microsoft COM+

Server: Dell PowerEdge 6400 Server				
CPU's	Memory	Disks	90% Response	tpmC
4 Pentium III Xeon @ 700 MHz	Main: 8 GB Cache: 2MB	1 @ 9 GB 118 @ 18 GB	**0.86 sec**	**30,231.37**
4 Clients: Dell PowerEdge 1300 (each)				
1 Pentium III 3 clients @600MHz 1 clients @550MHz	Main: 512 MB Cache: 512 KB	1 @ 9 GB	Na	Na

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

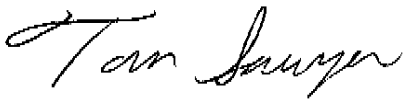
- The transactions were correctly implemented.
- The database files were properly sized and populated.
- The database was properly scaled with 2,450 warehouses. The measurement used 2,432 warehouses; I verified that d_next_o_id and w_ytd did not change for the unused warehouses
- The ACID properties were met.
- The Durability tests for loss-of-log and loss-of-data disks were performed on a 10-warehouse system.
- 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 180 day space calculation was verified – 4 18GB drives were added to the priced configuration.
- The steady state portion of the test was 30 minutes.
- One checkpoint was taken before the measured interval.
- One checkpoint was taken during the measured interval.
- The checkpoints were verified to be clear of the guard zone.
- The system pricing was checked for major components and maintenance.

Auditor Notes:

none

Sincerely,

Tom Sawyer



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
```

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

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

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

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

                                // make a local copy of current entry from
delivery buffer and increment buffer index
                                EnterCriticalSection(&DelBuffCriticalSection);
                                delivery = *(pDelBuff+dwDelBuffBusyIndex);
                                dwDelBuffFreeCount++;
                                dwDelBuffBusyIndex++;
                                if (dwDelBuffBusyIndex == dwDelBuffSize)
        // wrap-around if at end of buffer
                                        dwDelBuffBusyIndex = 0;

                                LeaveCriticalSection(&DelBuffCriticalSection);

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


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

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

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

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

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

                        delete e;
                }
                catch (...)
                {
                        // unhandled exception; shouldn't happen; not much we can
do...
                        WriteMessageToEventLog(TEXT("Unhandled exception caught in
DeliveryWorkerThread."));
                }
        }

ErrorExit:
        delete pTxn;
        _endthread();
}

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

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

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

                dwDelBuffFreeCount--;
                dwDelBuffFreeIndex++;
                if (dwDelBuffFreeIndex == dwDelBuffSize)
                        dwDelBuffFreeIndex = 0;               // wrap-around if
at end of buffer
```

```
        }
        else
                // No free buffers.  Return an error, which indicates that the
delivery buffer is full.
                // Most likely, the number of delivery worker threads needs to be
increased to keep up
                // with the txn rate.
                bError = TRUE;
        LeaveCriticalSection(&DelBuffCriticalSection);

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

        return bError;
}

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

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

        //allowable client command strings i.e. CMD=command
        static char *szCmds[] =
        {
                "Process", "..NewOrder..", "..Payment..", "..Delivery..", "..Order-
Status..", "..Stock-Level..",
                "..Exit..", "Submit", "Menu", "Clear", "Stats", ""
        };

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

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

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

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

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

/* FUNCTION: void WelcomeForm
 *
 */

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

        //welcome to tpc-c html form buffer, this is first form client sees.
        strcpy( szBuffer,  "<HTML><HEAD><TITLE>TPC-C Web Client</TITLE></HEAD><BODY>"
                                                        "<B><BIG>Microsoft TPC-C Web
Client (ver 4.20)</BIG></B> <BR> <BR>"
                                                        "<font face=\"Courier
New\"><PRE>"
                                                        "Compiled: "__DATE__",
"__TIME__" <BR>"
                                                        "Source:   "__FILE__"
("__TIMESTAMP__") <BR>"
                                                        "</PRE></font>"
                                                        "<FORM ACTION=\"tpcc.dll\"
METHOD=\"GET\">"
                                                        "<INPUT TYPE=\"hidden\"
NAME=\"STATUSID\" VALUE=\"0\">"
                                                        "<INPUT TYPE=\"hidden\"
NAME=\"ERROR\" VALUE=\"0\">"
                                                        "<INPUT TYPE=\"hidden\"
NAME=\"FORMID\" VALUE=\"1\">"
                                                        "<INPUT TYPE=\"hidden\"
NAME=\"TERMID\" VALUE=\"0\">"
                                                        "<INPUT TYPE=\"hidden\"
NAME=\"SYNCID\" VALUE=\"0\">"
                                                        "<INPUT TYPE=\"hidden\"
NAME=\"VERSION\" VALUE=\"" WEBCLIENT_VERSION "\">"
                                                        );

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

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

        if (Reg.eTxnMon == None)
                // connection options may be specified when not using a txn monitor
                sprintf( szTmp,    "Please enter your database options for this
connection:<BR>"
                                                        "<font face=\"Courier New\"
color=\"blue\"><PRE>"
                                                        "DB Server    = <INPUT
NAME=\"db_server\" SIZE=20 VALUE=\"%s\"><BR>"
                                                        "DB User ID   = <INPUT
NAME=\"db_user\" SIZE=20 VALUE=\"%s\"><BR>"
                                                        "DB Password  = <INPUT
NAME=\"db_passwd\" SIZE=20 VALUE=\"%s\"><BR>"
                                                        "DB Name      = <INPUT
NAME=\"db_name\" SIZE=20 VALUE=\"%s\"><BR>"
                                                        "</PRE></font>"
                                        , Reg.szDbServer, Reg.szDbUser,
Reg.szDbPassword, Reg.szDbName );
        else
                // if using a txn monitor, connection options are determined from
registry; can't
                // set per user.  show options fyi
                sprintf( szTmp,    "Database options which will be used by the
transaction monitor:<BR>"
                                                        "<font face=\"Courier New\"
color=\"blue\"><PRE>"
                                                        "DB Server              =
<B>%s</B><BR>"
                                                        "DB User ID             =
<B>%s</B><BR>"
                                                        "DB Password            =
<B>%s</B><BR>"
                                                        "DB Name                =
<B>%s</B><BR>"
                                                        "</PRE></font>"
                                        , Reg.szDbServer, Reg.szDbUser,
Reg.szDbPassword, Reg.szDbName );
        strcat( szBuffer, szTmp);

        sprintf( szTmp,    "Please enter your Warehouse and District for this
session:<BR>"
                                                "<font face=\"Courier New\"
color=\"blue\"><PRE>" );
        strcat( szBuffer, szTmp);
        strcat( szBuffer,  "Warehouse ID = <INPUT NAME=\"w_id\" SIZE=4><BR>"
                                                        "District ID  = <INPUT
NAME=\"d_id\" SIZE=2><BR>"
                                                        "</PRE></font><HR>"
                                                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Submit\">"
                                                        "</FORM></BODY></HTML>");
}

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

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

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

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

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

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

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


        iNewTerm = TermAdd();

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

        try
        {
                if (Reg.eTxnMon == TUXEDO)
                        Term.pClientData[iNewTerm].pTxn = pCTPCC_TUXEDO_new();
                else if (Reg.eTxnMon == ENCINA)
                        Term.pClientData[iNewTerm].pTxn = pCTPCC_ENCINA_new();
                else if (Reg.eTxnMon == COM)
                        Term.pClientData[iNewTerm].pTxn = pCTPCC_COM_new(
Reg.bCOM_SinglePool );
                else if (Reg.eDB_Protocol == ODBC)
```

```
                        Term.pClientData[iNewTerm].pTxn = pCTPCC_ODBC_new(
szServer, szUser, szPassword, szMyComputerName, szDatabase );
                else if (Reg.eDB_Protocol == DBLIB)
                        Term.pClientData[iNewTerm].pTxn = pCTPCC_DBLIB_new(
szServer, szUser, szPassword, szMyComputerName, szDatabase );
        }
        catch (...)
        {
                TermDelete(iNewTerm);
                throw;              // pass exception upward
        }

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

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

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

        EnterCriticalSection(&TermCriticalSection);

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

        LeaveCriticalSection(&TermCriticalSection);

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

char *CWEBCLNT_ERR::ErrorText()
{
        static SERRORMSG errorMsgs[] =
        {
                {       ERR_COMMAND_UNDEFINED,
        "Command undefined."                                            },
                {       ERR_D_ID_INVALID,
        "Invalid District ID Must be 1 to 10."
                        },
                {       ERR_DELIVERY_CARRIER_ID_RANGE,
        "Delivery Carrier ID out of range must be 1 - 10."
                },
                {       ERR_DELIVERY_CARRIER_INVALID,                   "Delivery
Carrier ID invalid must be numeric 1 - 10."                             },
                {       ERR_DELIVERY_MISSING_OCD_KEY,                   "Delivery
missing Carrier ID key \"OCD*\"."
        },
                {       ERR_DELIVERY_THREAD_FAILED,
        "Could not start delivery worker thread."
                        },
                {       ERR_GETPROCADDR_FAILED,
        "Could not map proc in DLL.  GetProcAddr error.  DLL="
        },
                {       ERR_HTML_ILL_FORMED,
        "Required key field is missing from HTML string."
        },
                {       ERR_INVALID_SYNC_CONNECTION,                    "Invalid
Terminal Sync ID."
                        },
                {       ERR_INVALID_TERMID,
        "Invalid Terminal ID."
                                                                },
                {       ERR_LOADDLL_FAILED,
        "Load of DLL failed.  DLL="
                                                        },
                {       ERR_MAX_CONNECTIONS_EXCEEDED,                   "No
connections available.  Max Connections is probably too low."   },
                {       ERR_MISSING_REGISTRY_ENTRIES,                   "Required
registry entries are missing.  Rerun INSTALL to correct." },
                {       ERR_NEWORDER_CUSTOMER_INVALID,
        "New Order customer id invalid data type, range = 1 to 3000."
        },
                {       ERR_NEWORDER_CUSTOMER_KEY,
        "New Order missing Customer key \"CID*\"."
                        },
                {       ERR_NEWORDER_DISTRICT_INVALID,
        "New Order District ID Invalid range 1 - 10."
                        },
                {       ERR_NEWORDER_FORM_MISSING_DID,
        "New Order missing District key \"DID*\"."
                        },
                {       ERR_NEWORDER_ITEMID_INVALID,                    "New
Order Item Id is wrong data type, must be numeric."                     },
                {       ERR_NEWORDER_ITEMID_RANGE,
        "New Order Item Id is out of range. Range = 1 to 999999."
        },
                {       ERR_NEWORDER_ITEMID_WITHOUT_SUPPW,              "New
Order Item_Id field entered without a corresponding Supp_W."       },
                {       ERR_NEWORDER_MISSING_IID_KEY,                   "New
Order missing Item Id key \"IID*\"."
        },
                {       ERR_NEWORDER_MISSING_QTY_KEY,                   "New
Order Missing Qty key \"Qty##*\"."
                        },
                {       ERR_NEWORDER_MISSING_SUPPW_KEY,
        "New Order missing Supp_W key \"SP##*\"."
                        },
                {       ERR_NEWORDER_NOITEMS_ENTERED,                   "New
Order No order lines entered."
                        },
                {       ERR_NEWORDER_QTY_INVALID,
        "New Order Qty invalid must be numeric range 1 - 99."
        },
                {       ERR_NEWORDER_QTY_RANGE,
        "New Order Qty is out of range. Range = 1 to 99."
        },
```

```
                {       ERR_NEWORDER_QTY_WITHOUT_SUPPW,
        "New Order Qty field entered without a corresponding Supp_W."
        },
                {       ERR_NEWORDER_SUPPW_INVALID,
        "New Order Supp_W invalid data type must be numeric."
        },
                {       ERR_NO_SERVER_SPECIFIED,
        "No Server name specified."
                                        },
                {       ERR_ORDERSTATUS_CID_AND_CLT,                    "Order
Status Only Customer ID or Last Name may be entered, not both."    },
                {       ERR_ORDERSTATUS_CID_INVALID,                    "Order
Status Customer ID invalid, range must be numeric 1 - 3000."       },
                {       ERR_ORDERSTATUS_CLT_RANGE,
        "Order Status Customer last name longer than 16 characters."
        },
                {       ERR_ORDERSTATUS_DID_INVALID,                    "Order
Status District invalid, value must be numeric 1 - 10."            },
                {       ERR_ORDERSTATUS_MISSING_CID_CLT,                "Order
Status Either Customer ID or Last Name must be entered."           },
                {       ERR_ORDERSTATUS_MISSING_CID_KEY,                "Order
Status missing Customer key \"CID*\"."
        },
                {       ERR_ORDERSTATUS_MISSING_CLT_KEY,                "Order
Status missing Customer Last Name key \"CLT*\"."                    },
                {       ERR_ORDERSTATUS_MISSING_DID_KEY,                "Order
Status missing District key \"DID*\"."
        },
                {       ERR_PAYMENT_CDI_INVALID,
        "Payment Customer district invalid must be numeric."
        },
                {       ERR_PAYMENT_CID_AND_CLT,
        "Payment Only Customer ID or Last Name may be entered, not both."  },
                {       ERR_PAYMENT_CUSTOMER_INVALID,                   "Payment
Customer data type invalid, must be numeric."                       },
                {       ERR_PAYMENT_CWI_INVALID,
        "Payment Customer Warehouse invalid, must be numeric."
        },
                {       ERR_PAYMENT_DISTRICT_INVALID,                   "Payment
District ID is invalid, must be 1 - 10."
        },
                {       ERR_PAYMENT_HAM_INVALID,
        "Payment Amount invalid data type must be numeric."
                },
                {       ERR_PAYMENT_HAM_RANGE,
        "Payment Amount out of range, 0 - 9999.99."
                        },
                {       ERR_PAYMENT_LAST_NAME_TO_LONG,
        "Payment Customer last name longer than 16 characters."
        },
                {       ERR_PAYMENT_MISSING_CDI_KEY,                    "Payment
missing Customer district key \"CDI*\"."
        },
                {       ERR_PAYMENT_MISSING_CID_CLT,                    "Payment
Either Customer ID or Last Name must be entered."                   },
                {       ERR_PAYMENT_MISSING_CID_KEY,                    "Payment
missing Customer Key \"CID*\"."
        },
                {       ERR_PAYMENT_MISSING_CLT_KEY,                    "Payment
missing Customer Last Name key \"CLT*\"."
        },
                {       ERR_PAYMENT_MISSING_CWI_KEY,                    "Payment
missing Customer Warehouse key \"CWI*\"."
        },
                {       ERR_PAYMENT_MISSING_DID_KEY,                    "Payment
missing District Key \"DID*\"."
        },
                {       ERR_PAYMENT_MISSING_HAM_KEY,                    "Payment
missing Amount key \"HAM*\"."
        },
                {       ERR_STOCKLEVEL_MISSING_THRESHOLD_KEY,  "Stock Level;
missing Threshold key \"TT*\"."
        },
                {       ERR_STOCKLEVEL_THRESHOLD_INVALID,               "Stock
Level; Threshold value must be in the range = 1 - 99."              },
                {       ERR_STOCKLEVEL_THRESHOLD_RANGE,
        "Stock Level Threshold out of range, range must be 1 - 99."
        },
                {       ERR_VERSION_MISMATCH,
        "Invalid version field.  RTE and Web Client are probably out of sync." },
                {       ERR_W_ID_INVALID,
        "Invalid Warehouse ID."
                                                        },
                {       0,
                                ""


                        }
        };

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

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

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

}

/* FUNCTION: GetKeyValue
 *
 * PURPOSE:        This function parses a http formatted string for specific key values.
 *
 * ARGUMENTS:      char                        *pQueryString      http string from
client browser
```

```
 *                                  char                        *pKey
        key value to look for
 *                                  char                        *pValue
        character array into which to place key's value
 *                                  int                                 iMax
                maximum length of key value array.
 *                                  WEBERROR            err
        error value to throw
 *
 * RETURNS:                  nothing.
 *
 * ERROR:           if (the pKey value is not found) then
 *                                          if (err == 0)
 *                                                  return (empty string)
 *                                          else
 *                                                  throw CWEBCLNT_ERR(err)
 *
 * COMMENTS:        http keys are formatted either KEY=value& or KEY=value\0. This DLL
formats
 *                                  TPC-C input fields in such a manner that the keys
can be extracted in the
 *                                  above manner.
 */

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

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

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

        *pQueryString = ptr;
        return;

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

/* FUNCTION: GetIntKeyValue
 *
 * PURPOSE:         This function parses a http formatted string for a specific key
value.
 *
 * ARGUMENTS:       char                        *pQueryString       http string from
client browser
 *                                  char                        *pKey
        key value to look for
 *                                  WEBERROR            NoKeyErr            error
value to throw if key not found
 *                                  WEBERROR            NotIntErr           error
value to throw if value not numeric
 *
 * RETURNS:                  integer
 *
 * ERROR:           if (the pKey value is not found) then
 *                                                  if (NoKeyErr != NO_ERR)
 *                                                          throw CWEBCLNT_ERR(err)
 *                                                  else
 *                                                          return 0
 *                                  else if (non-numeric char found) then
 *                                                  if (NotIntErr != NO_ERR) then
 *                                                          throw CWEBCLNT_ERR(err)
 *                                                  else
 *                                                          return 0
 *
 * COMMENTS:        http keys are formatted either KEY=value& or KEY=value\0. This DLL
formats
 *                                  TPC-C input fields in such a manner that the keys
can be extracted in the
 *                                  above manner.
 */

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

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

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

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

        *pQueryString = ptr;
        return atoi(ptr0);

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

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

```
 *
 */

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

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

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

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

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

         LeaveCriticalSection(&TermCriticalSection);
}

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

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

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

         Term.iFreeList               = 0;
         Term.iNumEntries   = 0;
         if ( Term.pClientData )
                  free(Term.pClientData);
         Term.pClientData   = NULL;
         LeaveCriticalSection(&TermCriticalSection);
}

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

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

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

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

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

         LeaveCriticalSection(&TermCriticalSection);
         return iNewTerm;
}

/* FUNCTION: TermDelete
 *
```

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

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

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

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

                LeaveCriticalSection(&TermCriticalSection);
        }
}


/* FUNCTION: MakeErrorForm
 */

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

/* FUNCTION: MakeMainMenuForm
 */

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

                if ( bValid )
```

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

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

                        i = 0;
                }

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

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

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

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

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

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

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

        if ( bInput )
        {
                c += wsprintf(szForm+c,
                        "<BR> <BR>Warehouse: %4.4d"
                        "                               District: <INPUT NAME=\"DID*\"
SIZE=1><BR> <BR> <BR> <BR> <BR>"
                        "Customer: <INPUT NAME=\"CID*\" SIZE=4>"
                        "Cust-Warehouse: <INPUT NAME=\"CWI*\" SIZE=4>  "
                        "Cust-District: <INPUT NAME=\"CDI*\" SIZE=1><BR>"
                        "Name:                          <INPUT NAME=\"CLT*\" SIZE=16>
Since:<BR>"
                        "
Credit:<BR>"
                        "
Disc:<BR>"
                        "
Phone:<BR> <BR>"
                        "Amount Paid:          $<INPUT NAME=\"HAM*\" SIZE=7>
New Cust-Balance:<BR>"
```

```
                        "Credit Limit:<BR> <BR>Cust-Data: <BR> <BR> <BR> <BR>
<BR></font></PRE><HR>"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"Process\"><INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Menu\">"
                        "</BODY></FORM></HTML>"
                        , Term.pClientData[iTermId].w_id);
        }
        else
        {
                c += wsprintf(szForm+c,
                        "<BR> <BR>Warehouse: %4.4d
District: %2.2d<BR>"
                        "%-20s                  %-20s<BR>"
                        "%-20s                  %-20s<BR>"
                        "%-20s %-2s %5.5s-%4.4s       %-20s %-2s %5.5s-%4.4s<BR>
<BR>"
                        "Customer: %4.4d  Cust-Warehouse: %4.4d  Cust-District:
%2.2d<BR>"
                        "Name:   %-16s %-2s %-16s     Since:  %2.2d-%2.2d-
%4.4d<BR>"
                        "        %-20s                  Credit: %-2s<BR>"

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

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

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

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

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

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

}

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

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

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

        if ( bInput )
        {
                strcpy(szForm+c,
                        "District: <INPUT NAME=\"DID*\" SIZE=1><BR>"
                        "Customer: <INPUT NAME=\"CID*\" SIZE=4>   Name:
<INPUT NAME=\"CLT*\" SIZE=23><BR>"
                        "Cust-Balance:<BR> <BR>"
                        "Order-Number:            Entry-Date:
Carrier-Number:<BR>"
                        "Supply-W     Item-Id    Qty     Amount      Delivery-
Date<BR> <BR> <BR> <BR> <BR>"
```

```
                        " <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR> <BR>
<BR></font></PRE>"
                        "<HR><INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"Process\"><INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Menu\">"
                        "</BODY></FORM></HTML>" );
        }
        else
        {
                c += wsprintf(szForm+c,
                        "District: %2.2d<BR>"
                        "Customer: %4.4d   Name: %-16s %-2s %-16s<BR>",
                        pOrderStatusData->d_id, pOrderStatusData->c_id,
                        pOrderStatusData->c_first, pOrderStatusData->c_middle,
pOrderStatusData->c_last);

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

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

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

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

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

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

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

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

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

                        , pDeliveryData->o_carrier_id,
```

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

        PDELIVERY_DATA     pDelivery;

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

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

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

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

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

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

        PSTOCK_LEVEL_DATA  pStockLevel;

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

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

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

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

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

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

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

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

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

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

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

                        ol_quantity = pNewOrderData->OL[items].ol_quantity =
                                GetIntKeyValue(&ptr, szQty[i],
ERR_NEWORDER_MISSING_QTY_KEY, ERR_NEWORDER_QTY_INVALID);
                        if ( ol_quantity > 99 || ol_quantity < 1 )
                                throw new CWEBCLNT_ERR( ERR_NEWORDER_QTY_RANGE );

                        items++;
                }
                else
                {       // nothing entered for supply warehouse, so item id and qty
must also be blank
                        GetKeyValue(&ptr, szIID[i], szTmp, sizeof(szTmp),
ERR_NEWORDER_MISSING_IID_KEY);
                        if ( szTmp[0] )
```

```
                                        throw new CWEBCLNT_ERR(
ERR_NEWORDER_ITEMID_WITHOUT_SUPPW );

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

                pNewOrderData->o_ol_cnt = items;
}

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

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

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

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

        pPaymentData->c_w_id = GetIntKeyValue(&ptr, "CWI*",
ERR_PAYMENT_MISSING_CWI_KEY, ERR_PAYMENT_CWI_INVALID);
        pPaymentData->c_d_id = GetIntKeyValue(&ptr, "CDI*",
ERR_PAYMENT_MISSING_CDI_KEY, ERR_PAYMENT_CDI_INVALID);

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

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

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

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

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

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

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

}

/* FUNCTION: BOOL IsNumeric(char *ptr)
```

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

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

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

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

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

         if ( *ptr == 0 )
                  return FALSE;

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

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

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

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

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;

        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];
} 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;

#define ERR_FATAL_LEVEL                 1
#define ERR_WARNING_LEVEL           2
#define ERR_INFORMATION_LEVEL3


#define ERR_TYPE_LOGIC
        -1              //logic error in program; internal error
#define ERR_SUCCESS
        0               //success (a non-error error)
#define ERR_BAD_ITEM_ID
        1               //expected abort record in txnRecord
#define ERR_TYPE_DELIVERY_POST                                          2
        //expected delivery post failed
#define   ERR_TYPE_WEBDLL
        3               //tpcc web generated error
#define   ERR_TYPE_SQL
        4               //sql server generated error
#define   ERR_TYPE_DBLIB
        5               //dblib generated error
#define   ERR_TYPE_ODBC
        6               //odbc generated error
#define ERR_TYPE_SOCKET
        7               //error on communication socket client rte only
#define ERR_TYPE_DEADLOCK                                               8
        //dblib and odbc only deadlock condition
#define ERR_TYPE_COM
        9               //error from COM call
#define ERR_TYPE_TUXEDO
        10              //tuxedo error
#define ERR_TYPE_OS
        11              //operating system error
#define ERR_TYPE_MEMORY
        12              //memory allocation error
#define ERR_TYPE_TPCC_ODBC                                              13
        //error from tpcc odbc txn module
#define ERR_TYPE_TPCC_DBLIB                                             14
        //error from tpcc dblib txn module
#define ERR_TYPE_DELISRV                                                15
        //delivery server error
#define ERR_TYPE_TXNLOG
        16              //txn log error
#define ERR_TYPE_BCCONN
        17              //Benchcraft connection class
#define ERR_TYPE_TPCC_CONN                                              18
        //Benchcraft connection class
#define ERR_TYPE_ENCINA
        19              //Encina error
#define ERR_TYPE_COMPONENT                                              20
        //error from COM component
#define ERR_TYPE_RTE
        21              //Benchcraft rte
#define ERR_TYPE_AUTOMATION                                             22
        //Benchcraft automation errors


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

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

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

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

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

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

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

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

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

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

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

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

        if (szStr)
                j = wsprintf(szTmp, "%s\n",szStr);
        if (m_szLoc)
                j += wsprintf(szTmp+j, "Location=%s\n",m_szLoc);
        if (m_szMsg)
                j += wsprintf(szTmp+j, "%s\n", m_szMsg);
                ::MessageBox(hwnd, szTmp, m_szApp, MB_OK);
        }

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

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

};

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

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

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

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

```
                eRegQueryValueEx,
        };

        CSystemErr(Action eAction, LPCTSTR szLocation);

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

        int               m_errId;
        Action    m_eAction;

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

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

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

common/src/trans.h

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

// String length constants
#define SERVER_NAME_LEN           20
#define DATABASE_NAME_LEN         20
#define USER_NAME_LEN             20
#define PASSWORD_LEN              20
#define TABLE_NAME_LEN            20
#define I_DATA_LEN                50
#define I_NAME_LEN                24
#define BRAND_LEN                  1
#define LAST_NAME_LEN             16
#define W_NAME_LEN                10
#define ADDRESS_LEN               20
#define STATE_LEN                  2
#define ZIP_LEN                    9
#define S_DIST_LEN                24
#define S_DATA_LEN                50
#define D_NAME_LEN                10
#define FIRST_NAME_LEN            16
#define MIDDLE_NAME_LEN            2
#define PHONE_LEN                 16
#define DATETIME_LEN              30
#define CREDIT_LEN                 2
#define C_DATA_LEN               250
#define H_DATA_LEN                24
#define DIST_INFO_LEN             24
#define MAX_OL_NEW_ORDER_ITEMS    15
#define MAX_OL_ORDER_STATUS_ITEMS 15
#define STATUS_LEN                25
#define OL_DIST_INFO_LEN                24

// TIMESTAMP_STRUCT is provided by the ODBC header file sqltypes.h, but is not available
// when compiling with dblib, so redefined here.  Note: we are using the symbol
"__SQLTYPES"
// (declared in sqltypes.h) as a way to determine if TIMESTAMP_STRUCT has been declared.
#ifndef __SQLTYPES
        typedef struct
        {
                        short                       /* SQLSMALLINT */  year;
                        unsigned short     /* SQLUSMALLINT */ month;
                        unsigned short     /* SQLUSMALLINT */ day;
                        unsigned short     /* SQLUSMALLINT */ hour;
                        unsigned short     /* SQLUSMALLINT */ minute;
                        unsigned short     /* SQLUSMALLINT */ second;
                        unsigned long      /* SQLUINTEGER */  fraction;
        } TIMESTAMP_STRUCT;
#endif

// possible values for exec_status_code after transaction completes
enum EXEC_STATUS
{
        eOK,                        // 0     "Transaction commited."
        eInvalidItem,      // 1     "Item number is not valid."
        eDeliveryFailed    // 2     "Delivery Post Failed."
};

// transaction structures
typedef struct
{
        // input params
        short                                   ol_supply_w_id;
        long                                    ol_i_id;
        short                                   ol_quantity;

        // output params
        char                                    ol_i_name[I_NAME_LEN+1];
        char                                    ol_brand_generic[BRAND_LEN+1];
        double                                  ol_i_price;
        double                                  ol_amount;
        short                                   ol_stock;
} OL_NEW_ORDER_DATA;

typedef struct
{
        // input params
        short              w_id;
        short              d_id;
        long               c_id;
        short              o_ol_cnt;
```

```
        // output params
        EXEC_STATUS                         exec_status_code;
        char            c_last[LAST_NAME_LEN+1];
        char            c_credit[CREDIT_LEN+1];
        double          c_discount;
        double          w_tax;
        double          d_tax;
        long                    o_id;
        short                           o_commit_flag;
        TIMESTAMP_STRUCT   o_entry_d;
        short           o_all_local;
        double          total_amount;
        OL_NEW_ORDER_DATA  OL[MAX_OL_NEW_ORDER_ITEMS];
} NEW_ORDER_DATA, *PNEW_ORDER_DATA;

typedef struct
{       // input params
        short                                   w_id;
        short                                   d_id;
        long                                    c_id;
        short                                   c_d_id;
        short                                   c_w_id;
        double                                  h_amount;
        char                            c_last[LAST_NAME_LEN+1];

        // output params
        EXEC_STATUS                             exec_status_code;
        TIMESTAMP_STRUCT    h_date;
        char                                    w_street_1[ADDRESS_LEN+1];
        char                                    w_street_2[ADDRESS_LEN+1];
        char                                    w_city[ADDRESS_LEN+1];
        char                                    w_state[STATE_LEN+1];
        char                                    w_zip[ZIP_LEN+1];
        char                                    d_street_1[ADDRESS_LEN+1];
        char                                    d_street_2[ADDRESS_LEN+1];
        char                                    d_city[ADDRESS_LEN+1];
        char                                    d_state[STATE_LEN+1];
        char                                d_zip[ZIP_LEN+1];
        char                                    c_first[FIRST_NAME_LEN+1];
        char                                    c_middle[MIDDLE_NAME_LEN + 1];
        char                                    c_street_1[ADDRESS_LEN+1];
        char                                    c_street_2[ADDRESS_LEN+1];
        char                                    c_city[ADDRESS_LEN+1];
        char                                    c_state[STATE_LEN+1];
        char                                    c_zip[ZIP_LEN+1];
        char                                    c_phone[PHONE_LEN+1];
        TIMESTAMP_STRUCT    c_since;
        char                                    c_credit[CREDIT_LEN+1];
        double                                  c_credit_lim;
        double                                  c_discount;
        double                                  c_balance;
        char                                    c_data[200+1];
} PAYMENT_DATA, *PPAYMENT_DATA;

typedef struct
{
        long                                    ol_i_id;
        short                                   ol_supply_w_id;
        short                                   ol_quantity;
        double                                  ol_amount;
        TIMESTAMP_STRUCT   ol_delivery_d;
} OL_ORDER_STATUS_DATA;
```

```
typedef struct
{       // input params
        short                   w_id;
        short                   d_id;
        long                    c_id;
        char                    c_last[LAST_NAME_LEN+1];

        // output params
        EXEC_STATUS                             exec_status_code;
        char                    c_first[FIRST_NAME_LEN+1];
        char                    c_middle[MIDDLE_NAME_LEN+1];
        double                  c_balance;
        long                    o_id;
        TIMESTAMP_STRUCT    o_entry_d;
        short                   o_carrier_id;
        OL_ORDER_STATUS_DATA OL[MAX_OL_ORDER_STATUS_ITEMS];
        short                   o_ol_cnt;
} ORDER_STATUS_DATA, *PORDER_STATUS_DATA;


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

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

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

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

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

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;
};
```

db_dblib_dll/src/tpcc_dblib.cpp

```
/*       FILE:              TPCC_DBLIB.CPP
 *                                  Microsoft TPC-C Kit Ver. 4.20.000
 *                                  Copyright Microsoft, 1999
 *             All Rights Reserved
 *
 *                                  Version 4.10.000 audited by Richard Gimarc,
Performance Metrics, 3/17/99
 *
 *       PURPOSE:  Implements dblib calls for TPC-C txns.
 *       Contact:  Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *                 4.20.000 - updated rev number to match kit
 *                 4.10.001 - not deleting error class in catch handler on deadlock
retry;
 *                                    not a functional bug, but a memory leak
 *                                  - had to tweak some declarations to compile with
latest SDK; no functional change
 */

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

#define DBNTWIN32
#include <sqlfront.h>
#include <sqldb.h>

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

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

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

#define   DEFCLPACKSIZE                         4096

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

const                        iMaxRetries = 10;            // how many retries on
deadlock
static    long     iConnectionCount = 0;  // number of current dblib connections

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."                                                  },
                { 0,                                                        ""

                        }
        };

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

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

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_DBLIB* CTPCC_DBLIB_new(
        LPCSTR szServer,            // name of SQL server
        LPCSTR szUser,                      // user name for login
        LPCSTR szPassword,          // password for login
        LPCSTR szHost,                      // workstation name; shows up in
sp_who; max 30 chars, only first 10 kept by SQL Server
        LPCSTR szDatabase )         // name of database to use
{
        return new CTPCC_DBLIB( szServer, szUser, szPassword, szHost, szDatabase );
}


CTPCC_DBLIB::CTPCC_DBLIB (
```

```
        LPCSTR szServer,            // name of SQL server
        LPCSTR szUser,                      // user name for login
        LPCSTR szPassword,          // password for login
        LPCSTR szHost,                      // workstation name; shows up in
sp_who; max 30 chars, only first 10 kept by SQL Server
        LPCSTR szDatabase )         // name of database to use
{
        LOGINREC  *login;
        const BYTE         *pData;

        // initialization
        m_dbproc = NULL;
        m_DbLibErr = (CDBLIBERR*)NULL;
        m_SqlErr = (CSQLERR*)NULL;

        m_MaxRetries = 10;          // how many retries on deadlock

        // increase max number of connections if getting close
        if ( dbgetmaxprocs() < (iConnectionCount+5) )
        {
                if ( dbsetmaxprocs(iConnectionCount+10) == FAIL )
                        ThrowError(CDBLIBERR::eDbSetMaxProcs);
        }

        // allocate a login structure
        login = dblogin();
        if (login == NULL)
                ThrowError(CDBLIBERR::eLogin);
        InterlockedIncrement( &iConnectionCount );

        // register error and message handler functions
        if (dbprocerrhandle(login, err_handler) == NULL)
                ThrowError(CDBLIBERR::eDbProcHandler);

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


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

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

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

        m_dbproc = dbopen(login, szServer);

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

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

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

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

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

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

        DiscardNextResults(2);

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

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

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

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

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


        DiscardNextRows(0);
        DiscardNextResults(0);
}


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

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

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

```
                strcpy( m_DbLibErr->m_dberrstr, dberrstr );
        }

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

}

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

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

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

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

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

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

        throw pDbLibErr;
}
```

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

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

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

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

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

                DiscardNextRows(-1);
                iResultsRead++;
        }

        if ((iExpectedCount >= 0) &&
                (iExpectedCount != iResultsRead))
```

```
                ThrowError(CDBLIBERR::eWrongRowCount);
}

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

        ResetError();

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

                        dbrpcparam(m_dbproc, NULL, 0, SQLINT2, -1, -1, (BYTE *)
&m_txn.StockLevel.w_id);            // @w_id smallint
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.StockLevel.d_id);            // @d_id tinyint
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT2, -1, -1, (BYTE *)
&m_txn.StockLevel.threshold);   // @threshhold smallint

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

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

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

                        if (pData=dbdata(m_dbproc, 1))
                                m_txn.StockLevel.low_stock = *((long *) pData);

                        DiscardNextRows(0);
                        DiscardNextResults(0);

                        m_txn.StockLevel.exec_status_code = eOK;
                        return;
                }
                catch (CSQLERR *e)
                {
                        if ((e->m_msgno != 1205) || (++iTryCount > iMaxRetries))
                                throw;

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


void CTPCC_DBLIB::NewOrder()
{
        int                     i;
        DBINT           commit_flag;
        DBDATETIME      datetime;
        DBDATEREC daterec;

        int                     iTryCount = 0;
        const BYTE      *pData;

        ResetError();

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

                        dbrpcparam(m_dbproc, NULL, 0, SQLINT2, -1, -1, (BYTE *)
&m_txn.NewOrder.w_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.NewOrder.d_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.NewOrder.c_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.NewOrder.o_ol_cnt);

                        // check whether any order lines are for a remote warehouse
                        m_txn.NewOrder.o_all_local = 1;
                        for (i = 0; i < m_txn.NewOrder.o_ol_cnt; i++)
                        {
                                if (m_txn.NewOrder.OL[i].ol_supply_w_id !=
m_txn.NewOrder.w_id)
                                {
                                        m_txn.NewOrder.o_all_local = 0;  // at
least one remote warehouse
                                        break;
                                }
                        }
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.NewOrder.o_all_local);

                        for (i = 0; i < m_txn.NewOrder.o_ol_cnt; i++)
                        {
                                dbrpcparam(m_dbproc, NULL, 0, SQLINT4, -1, -1,
(BYTE *) &m_txn.NewOrder.OL[i].ol_i_id);
                                dbrpcparam(m_dbproc, NULL, 0, SQLINT2, -1, -1,
(BYTE *) &m_txn.NewOrder.OL[i].ol_supply_w_id);
                                dbrpcparam(m_dbproc, NULL, 0, SQLINT2, -1, -1,
(BYTE *) &m_txn.NewOrder.OL[i].ol_quantity);
                        }

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


                        // Get order line results
                        m_txn.NewOrder.total_amount = 0;
                        for (i = 0; i<m_txn.NewOrder.o_ol_cnt; i++)
                        {
                                if (dbresults(m_dbproc) != SUCCEED)
                                        ThrowError(CDBLIBERR::eDbResults);

                                if (dbnumcols(m_dbproc) != 5)
                                        ThrowError(CDBLIBERR::eWrongNumCols);

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

                                if(pData=dbdata(m_dbproc, 1))
        UtilStrCpy(m_txn.NewOrder.OL[i].ol_i_name, pData, dbdatlen(m_dbproc, 1));
```

```
                                if(pData=dbdata(m_dbproc, 2))
                                        m_txn.NewOrder.OL[i].ol_stock =
(*(DBSMALLINT *) pData);
                                if(pData=dbdata(m_dbproc, 3))

        UtilStrCpy(m_txn.NewOrder.OL[i].ol_brand_generic, pData, dbdatlen(m_dbproc,
3));
                                if(pData=dbdata(m_dbproc, 4))
                                        dbconvert(m_dbproc, SQLNUMERIC, 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, 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, pData,
dbdatlen(m_dbproc,1), SQLFLT8, (BYTE *)&m_txn.NewOrder.w_tax, 8);
                        if (pData=dbdata(m_dbproc, 2))

                                dbconvert(m_dbproc, SQLNUMERIC, 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, 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) || (++iTryCount > iMaxRetries))
                                throw;

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


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

        int                         iTryCount = 0;
        const BYTE          *pData;

        ResetError();

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

                        dbrpcparam(m_dbproc, NULL, 0, SQLINT2, -1, -1, (BYTE *)
&m_txn.Payment.w_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT2, -1, -1, (BYTE *)
&m_txn.Payment.c_w_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLFLT8, -1, -1, (BYTE *)
&m_txn.Payment.h_amount);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.Payment.d_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.Payment.c_d_id);
```

```
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.Payment.c_id);

                        // if customer id is zero, then payment is by name
                        if (m_txn.Payment.c_id == 0)
                                dbrpcparam(m_dbproc, NULL, 0, SQLCHAR, -1,
strlen(m_txn.Payment.c_last), (unsigned char *)m_txn.Payment.c_last);

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

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

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

                        if (dbnumcols(m_dbproc) != 27)
                                ThrowError(CDBLIBERR::eWrongNumCols);

                        if (pData=dbdata(m_dbproc, 1))
                                m_txn.Payment.c_id = *((DBINT *) pData);
                        if (pData=dbdata(m_dbproc, 2))
                                UtilStrCpy(m_txn.Payment.c_last, pData,
dbdatlen(m_dbproc, 2));
                        if (pData=dbdata(m_dbproc, 3))
                        {
                                datetime = *((DBDATETIME *) pData);
                                dbdatecrack(m_dbproc, &daterec, &datetime);
                                m_txn.Payment.h_date.year   = daterec.year;
                                m_txn.Payment.h_date.month  = daterec.month;
                                m_txn.Payment.h_date.day    = daterec.day;
                                m_txn.Payment.h_date.hour   = daterec.hour;
                                m_txn.Payment.h_date.minute = daterec.minute;
                                m_txn.Payment.h_date.second = daterec.second;
                        }
                        if (pData=dbdata(m_dbproc, 4))
                                UtilStrCpy(m_txn.Payment.w_street_1, pData,
dbdatlen(m_dbproc, 4));
                        if (pData=dbdata(m_dbproc, 5))
                                UtilStrCpy(m_txn.Payment.w_street_2, pData,
dbdatlen(m_dbproc, 5));
                        if (pData=dbdata(m_dbproc, 6))
                                UtilStrCpy(m_txn.Payment.w_city, pData,
dbdatlen(m_dbproc, 6));
                        if (pData=dbdata(m_dbproc, 7))
                                UtilStrCpy(m_txn.Payment.w_state, pData,
dbdatlen(m_dbproc, 7));
                        if (pData=dbdata(m_dbproc, 8))
                                UtilStrCpy(m_txn.Payment.w_zip, pData,
dbdatlen(m_dbproc, 8));
                        if (pData=dbdata(m_dbproc, 9))
                                UtilStrCpy(m_txn.Payment.d_street_1, pData,
dbdatlen(m_dbproc, 9));
                        if (pData=dbdata(m_dbproc, 10))
                                UtilStrCpy(m_txn.Payment.d_street_2, pData,
dbdatlen(m_dbproc, 10));
                        if (pData=dbdata(m_dbproc, 11))
                                UtilStrCpy(m_txn.Payment.d_city, pData,
dbdatlen(m_dbproc, 11));
                        if (pData=dbdata(m_dbproc, 12))
                                UtilStrCpy(m_txn.Payment.d_state, pData,
dbdatlen(m_dbproc, 12));
                        if (pData=dbdata(m_dbproc, 13))
                                UtilStrCpy(m_txn.Payment.d_zip, pData,
dbdatlen(m_dbproc, 13));
                        if (pData=dbdata(m_dbproc, 14))
                                UtilStrCpy(m_txn.Payment.c_first, pData,
dbdatlen(m_dbproc, 14));
                        if (pData=dbdata(m_dbproc, 15))
                                UtilStrCpy(m_txn.Payment.c_middle, pData,
dbdatlen(m_dbproc, 15));
                        if (pData=dbdata(m_dbproc, 16))
                                UtilStrCpy(m_txn.Payment.c_street_1, pData,
dbdatlen(m_dbproc, 16));
                        if (pData=dbdata(m_dbproc, 17))
                                UtilStrCpy(m_txn.Payment.c_street_2, pData,
dbdatlen(m_dbproc, 17));
                        if (pData=dbdata(m_dbproc, 18))
                                UtilStrCpy(m_txn.Payment.c_city, pData,
dbdatlen(m_dbproc, 18));
                        if (pData=dbdata(m_dbproc, 19))
                                UtilStrCpy(m_txn.Payment.c_state, pData,
dbdatlen(m_dbproc, 19));
                        if (pData=dbdata(m_dbproc, 20))
                                UtilStrCpy(m_txn.Payment.c_zip, pData,
dbdatlen(m_dbproc, 20));
                        if (pData=dbdata(m_dbproc, 21))
                                UtilStrCpy(m_txn.Payment.c_phone, pData,
dbdatlen(m_dbproc, 21));
                        if (pData=dbdata(m_dbproc, 22))
                        {
                                datetime = *((DBDATETIME *) pData);
                                dbdatecrack(m_dbproc, &daterec, &datetime);
                                m_txn.Payment.c_since.year   = daterec.year;
                                m_txn.Payment.c_since.month  = daterec.month;
                                m_txn.Payment.c_since.day    = daterec.day;
                                m_txn.Payment.c_since.hour   = daterec.hour;
                                m_txn.Payment.c_since.minute = daterec.minute;
                                m_txn.Payment.c_since.second = daterec.second;
                        }
                        if(pData=dbdata(m_dbproc, 23))
                                UtilStrCpy(m_txn.Payment.c_credit, pData,
dbdatlen(m_dbproc, 23));
                        if(pData=dbdata(m_dbproc, 24))
                                dbconvert(m_dbproc, SQLNUMERIC, pData,
dbdatlen(m_dbproc,24), SQLFLT8, (BYTE *)&m_txn.Payment.c_credit_lim, 8);
                        if(pData=dbdata(m_dbproc, 25))
                                dbconvert(m_dbproc, SQLNUMERIC, pData,
dbdatlen(m_dbproc,25), SQLFLT8, (BYTE *)&m_txn.Payment.c_discount, 8);
                        if(pData=dbdata(m_dbproc, 26))
                                dbconvert(m_dbproc, SQLNUMERIC, 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) || (++iTryCount > iMaxRetries))
                                throw;

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


void CTPCC_DBLIB::OrderStatus()
{
        int                     i;
        DBDATETIME      datetime;
        DBDATEREC daterec;

        int                     iTryCount = 0;
        RETCODE         rc;
        const BYTE      *pData;

        ResetError();

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

                        dbrpcparam(m_dbproc, NULL, 0, SQLINT2, -1, -1, (BYTE *)
&m_txn.OrderStatus.w_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.OrderStatus.d_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.OrderStatus.c_id);

                        // if customer id is zero, then order status is by name
                        if (m_txn.OrderStatus.c_id == 0)
                                dbrpcparam(m_dbproc, NULL, 0, SQLCHAR, -1,
strlen(m_txn.OrderStatus.c_last), (unsigned char *)m_txn.OrderStatus.c_last);


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

                        // Get order lines
                        if (dbresults(m_dbproc) != SUCCEED)
                        {
                                if ((m_DbLibErr == NULL) && (m_SqlErr == NULL))
                                        throw new CTPCC_DBLIB_ERR(
CTPCC_DBLIB_ERR::ERR_NO_SUCH_ORDER );
                                else
                                        ThrowError(CDBLIBERR::eDbResults);
                        }

                        if (dbnumcols(m_dbproc) != 5)
                                ThrowError(CDBLIBERR::eWrongNumCols);

                        i = 0;
                        while (TRUE)
                        {
                                rc = dbnextrow(m_dbproc);
                                if (rc == NO_MORE_ROWS)
                                        break;
                                if (rc != REG_ROW)
                                        ThrowError(CDBLIBERR::eDbNextRow);

                                if(pData=dbdata(m_dbproc, 1))
                                        m_txn.OrderStatus.OL[i].ol_supply_w_id
= (*(DBSMALLINT *) pData);
                                if(pData=dbdata(m_dbproc, 2))
                                        m_txn.OrderStatus.OL[i].ol_i_id =
(*(DBINT *) pData);
                                if(pData=dbdata(m_dbproc, 3))
                                        m_txn.OrderStatus.OL[i].ol_quantity =
(*(DBSMALLINT *) pData);
                                if(pData=dbdata(m_dbproc, 4))
                                        dbconvert(m_dbproc, SQLNUMERIC, 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, 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) || (++iTryCount > iMaxRetries))
                                        throw;

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


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

        ResetError();

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

                        dbrpcparam(m_dbproc, NULL, 0, SQLINT2, -1, -1, (BYTE *)
&m_txn.Delivery.w_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.Delivery.o_carrier_id);

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

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

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

                        if (dbnumcols(m_dbproc) != 10)
                                ThrowError(CDBLIBERR::eWrongNumCols);

                        for (i=0; i<10; i++)
                        {
                                if (pData = dbdata(m_dbproc, i+1))
                                        m_txn.Delivery.o_id[i] = *((DBINT
*)pData);
                        }

                        DiscardNextRows(0);
                        DiscardNextResults(0);

                        m_txn.Delivery.exec_status_code = eOK;
                        return;
                }
                catch (CSQLERR *e)
                {
                        if ((e->m_msgno != 1205) || (++iTryCount > iMaxRetries))
                                throw;

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

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
defination 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( 0xffffffd4 ),    /* Offset= -44 (420) */
/* 466 */
                            0x5b,               /* FC_END */

                            0x8,                /* FC_LONG */
/* 468 */ 0x8,               /* FC_LONG */
                            0x5b,               /* FC_END */
/* 470 */
                            0x21,               /* FC_BOGUS_ARRAY */
                            0x3,                /* 3 */
/* 472 */ NdrFcShort( 0x0 ), /* 0 */
/* 474 */ 0x19,              /* Corr desc:  field pointer, FC_ULONG */
                            0x0,                /*  */
/* 476 */ NdrFcShort( 0x0 ), /* 0 */
/* 478 */ NdrFcLong( 0xffffffff ),     /* -1 */
/* 482 */ 0x4c,              /* FC_EMBEDDED_COMPLEX */
                            0x0,                /* 0 */
/* 484 */ NdrFcShort( 0xffffff50 ),    /* Offset= -176 (308) */
/* 486 */ 0x5c,              /* FC_PAD */
                            0x5b,               /* FC_END */
/* 488 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x3,                /* 3 */
/* 490 */ NdrFcShort( 0x8 ), /* 8 */
/* 492 */ NdrFcShort( 0x0 ), /* 0 */
/* 494 */ NdrFcShort( 0x6 ), /* Offset= 6 (500) */
```

```
/* 496 */ 0x8,              /* FC_LONG */
          0x36,             /* FC_POINTER */
/* 498 */ 0x5c,             /* FC_PAD */
          0x5b,             /* FC_END */
/* 500 */
          0x11, 0x0,        /* FC_RP */
/* 502 */ NdrFcShort( 0xfffffe0 ),    /* Offset= -32 (470) */
/* 504 */
          0x21,             /* FC_BOGUS_ARRAY */
          0x3,              /* 3 */
/* 506 */ NdrFcShort( 0x0 ), /* 0 */
/* 508 */ 0x19,             /* Corr desc:  field pointer, FC_ULONG */
          0x0,              /*  */
/* 510 */ NdrFcShort( 0x0 ), /* 0 */
/* 512 */ NdrFcLong( 0xffffffff ),     /* -1 */
/* 516 */ 0x4c,             /* FC_EMBEDDED_COMPLEX */
          0x0,              /* 0 */
/* 518 */ NdrFcShort( 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( 0xfffffe0 ),    /* Offset= -32 (504) */
/* 538 */
          0x1b,             /* FC_CARRAY */
          0x3,              /* 3 */
/* 540 */ NdrFcShort( 0x4 ), /* 4 */
/* 542 */ 0x19,             /* Corr desc:  field pointer, FC_ULONG */
          0x0,              /*  */
/* 544 */ NdrFcShort( 0x0 ), /* 0 */
/* 546 */
          0x4b,             /* FC_PP */
          0x5c,             /* FC_PAD */
/* 548 */
          0x48,             /* FC_VARIABLE_REPEAT */
          0x49,             /* FC_FIXED_OFFSET */
/* 550 */ NdrFcShort( 0x4 ), /* 4 */
/* 552 */ NdrFcShort( 0x0 ), /* 0 */
/* 554 */ NdrFcShort( 0x1 ), /* 1 */
/* 556 */ NdrFcShort( 0x0 ), /* 0 */
/* 558 */ NdrFcShort( 0x0 ), /* 0 */
/* 560 */ 0x12, 0x0,         /* FC_UP */
/* 562 */ NdrFcShort( 0x182 ),         /* Offset= 386 (948) */
/* 564 */
          0x5b,             /* FC_END */

          0x8,              /* FC_LONG */
/* 566 */ 0x5c,             /* FC_PAD */
          0x5b,             /* FC_END */
/* 568 */
          0x1a,             /* FC_BOGUS_STRUCT */
          0x3,              /* 3 */
/* 570 */ NdrFcShort( 0x8 ), /* 8 */
/* 572 */ NdrFcShort( 0x0 ), /* 0 */
/* 574 */ NdrFcShort( 0x6 ), /* Offset= 6 (580) */
/* 576 */ 0x8,              /* FC_LONG */
          0x36,             /* FC_POINTER */
/* 578 */ 0x5c,             /* FC_PAD */
          0x5b,             /* FC_END */
/* 580 */
          0x11, 0x0,        /* FC_RP */
/* 582 */ NdrFcShort( 0xffffffd4 ),    /* Offset= -44 (538) */
/* 584 */
          0x2f,             /* FC_IP */
          0x5a,             /* FC_CONSTANT_IID */
/* 586 */ NdrFcLong( 0x2f ), /* 47 */
/* 590 */ NdrFcShort( 0x0 ), /* 0 */
/* 592 */ NdrFcShort( 0x0 ), /* 0 */
/* 594 */ 0xc0,             /* 192 */
          0x0,              /* 0 */
/* 596 */ 0x0,              /* 0 */
          0x0,              /* 0 */
/* 598 */ 0x0,              /* 0 */
          0x0,              /* 0 */
/* 600 */ 0x0,              /* 0 */
          0x46,             /* 70 */
/* 602 */
          0x1b,             /* FC_CARRAY */
          0x0,              /* 0 */
/* 604 */ NdrFcShort( 0x1 ), /* 1 */
/* 606 */ 0x19,             /* Corr desc:  field pointer, FC_ULONG */
          0x0,              /*  */
/* 608 */ NdrFcShort( 0x4 ), /* 4 */
/* 610 */ 0x1,              /* FC_BYTE */
          0x5b,             /* FC_END */
/* 612 */
          0x1a,             /* FC_BOGUS_STRUCT */
          0x3,              /* 3 */
/* 614 */ NdrFcShort( 0x10 ),/* 16 */
/* 616 */ NdrFcShort( 0x0 ), /* 0 */
/* 618 */ NdrFcShort( 0xa ), /* Offset= 10 (628) */
/* 620 */ 0x8,              /* FC_LONG */
          0x8,              /* FC_LONG */
/* 622 */ 0x4c,             /* FC_EMBEDDED_COMPLEX */
          0x0,              /* 0 */
/* 624 */ NdrFcShort( 0xffffffd8 ),    /* Offset= -40 (584) */
/* 626 */ 0x36,             /* FC_POINTER */
          0x5b,             /* FC_END */
/* 628 */
          0x12, 0x0,        /* FC_UP */
/* 630 */ NdrFcShort( 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( 0xffffffd4 ),    /* Offset= -44 (612) */
/* 658 */
                             0x5b,              /* FC_END */

                             0x8,               /* FC_LONG */
/* 660 */ 0x5c,              /* FC_PAD */
                             0x5b,              /* FC_END */
/* 662 */
                             0x1a,              /* FC_BOGUS_STRUCT */
                             0x3,               /* 3 */
/* 664 */ NdrFcShort( 0x8 ), /* 8 */
/* 666 */ NdrFcShort( 0x0 ), /* 0 */
/* 668 */ NdrFcShort( 0x6 ), /* Offset= 6 (674) */
/* 670 */ 0x8,               /* FC_LONG */
                             0x36,              /* FC_POINTER */
/* 672 */ 0x5c,              /* FC_PAD */
                             0x5b,              /* FC_END */
/* 674 */
                             0x11, 0x0,         /* FC_RP */
/* 676 */ NdrFcShort( 0xffffffd4 ),    /* Offset= -44 (632) */
/* 678 */
                             0x1d,              /* FC_SMFARRAY */
                             0x0,               /* 0 */
/* 680 */ NdrFcShort( 0x8 ), /* 8 */
/* 682 */ 0x2,               /* FC_CHAR */
                             0x5b,              /* FC_END */
/* 684 */
                             0x15,              /* FC_STRUCT */
                             0x3,               /* 3 */
/* 686 */ NdrFcShort( 0x10 ),/* 16 */
/* 688 */ 0x8,               /* FC_LONG */
                             0x6,               /* FC_SHORT */
/* 690 */ 0x6,               /* FC_SHORT */
                             0x4c,              /* FC_EMBEDDED_COMPLEX */
/* 692 */ 0x0,               /* 0 */
                             NdrFcShort( 0xfffffff1 ),    /* Offset= -15 (678) */
                             0x5b,              /* FC_END */
/* 696 */
                             0x1a,              /* FC_BOGUS_STRUCT */
                             0x3,               /* 3 */
/* 698 */ NdrFcShort( 0x18 ),/* 24 */
/* 700 */ NdrFcShort( 0x0 ), /* 0 */
/* 702 */ NdrFcShort( 0xa ), /* Offset= 10 (712) */
/* 704 */ 0x8,               /* FC_LONG */
                             0x36,              /* FC_POINTER */
/* 706 */ 0x4c,              /* FC_EMBEDDED_COMPLEX */
                             0x0,               /* 0 */
/* 708 */ NdrFcShort( 0xfffffff8 ),    /* Offset= -24 (684) */
/* 710 */ 0x5c,              /* FC_PAD */
                             0x5b,              /* FC_END */
/* 712 */
                             0x11, 0x0,         /* FC_RP */
/* 714 */ NdrFcShort( 0xffffff0c ),    /* Offset= -244 (470) */
/* 716 */
                             0x1b,              /* FC_CARRAY */
                             0x0,               /* 0 */
/* 718 */ NdrFcShort( 0x1 ), /* 1 */
/* 720 */ 0x19,              /* Corr desc:  field pointer, FC_ULONG */
                             0x0,               /*  */
/* 722 */ NdrFcShort( 0x0 ), /* 0 */
/* 724 */ 0x1,               /* FC_BYTE */
                             0x5b,              /* FC_END */
/* 726 */
                             0x16,              /* FC_PSTRUCT */
                             0x3,               /* 3 */
/* 728 */ NdrFcShort( 0x8 ), /* 8 */
/* 730 */
                             0x4b,              /* FC_PP */
                             0x5c,              /* FC_PAD */
/* 732 */
                             0x46,              /* FC_NO_REPEAT */
                             0x5c,              /* FC_PAD */
/* 734 */ NdrFcShort( 0x4 ), /* 4 */
/* 736 */ NdrFcShort( 0x4 ), /* 4 */
/* 738 */ 0x12, 0x0,         /* FC_UP */
/* 740 */ NdrFcShort( 0xfffffff8 ),    /* 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( 0xfffffff8 ),    /* 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( 0xfffffe8 ),    /* 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( 0xfffffe8 ),    /* Offset= -24 (806) */
/* 832 */
                            0x5b,               /* FC_END */

                            0x8,                /* FC_LONG */
/* 834 */ 0x8,               /* FC_LONG */
                            0x5b,               /* FC_END */
/* 836 */
                            0x15,               /* FC_STRUCT */
                            0x3,                /* 3 */
/* 838 */ NdrFcShort( 0x8 ), /* 8 */
/* 840 */ 0x8,               /* FC_LONG */
                            0x8,                /* FC_LONG */
/* 842 */ 0x5c,              /* FC_PAD */
                            0x5b,               /* FC_END */
/* 844 */
                            0x1b,               /* FC_CARRAY */
                            0x3,                /* 3 */
/* 846 */ NdrFcShort( 0x8 ), /* 8 */
/* 848 */ 0x7,               /* Corr desc: FC_USHORT */
                            0x0,                /*  */
/* 850 */ NdrFcShort( 0xffd8 ),       /* -40 */
/* 852 */ 0x4c,              /* FC_EMBEDDED_COMPLEX */
                            0x0,                /* 0 */
/* 854 */ NdrFcShort( 0xffffffee ),    /* Offset= -18 (836) */
/* 856 */ 0x5c,              /* FC_PAD */
                            0x5b,               /* FC_END */
/* 858 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x3,                /* 3 */
/* 860 */ NdrFcShort( 0x28 ),/* 40 */
/* 862 */ NdrFcShort( 0xffffffee ),    /* Offset= -18 (844) */
/* 864 */ NdrFcShort( 0x0 ), /* Offset= 0 (864) */
/* 866 */ 0x6,               /* FC_SHORT */
                            0x6,                /* FC_SHORT */
/* 868 */ 0x38,              /* FC_ALIGNM4 */
                            0x8,                /* FC_LONG */
/* 870 */ 0x8,               /* FC_LONG */
                            0x4c,               /* FC_EMBEDDED_COMPLEX */
/* 872 */ 0x0,               /* 0 */
                            NdrFcShort( 0xfffffdf7 ),    /* Offset= -521 (352) */
                            0x5b,               /* FC_END */
/* 876 */
                            0x12, 0x0,          /* FC_UP */
/* 878 */ NdrFcShort( 0xfffffef6 ),    /* Offset= -266 (612) */
/* 880 */
                            0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 882 */ 0x1,               /* FC_BYTE */
                            0x5c,               /* FC_PAD */
/* 884 */
                            0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 886 */ 0x6,               /* FC_SHORT */
                            0x5c,               /* FC_PAD */
/* 888 */
                            0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 890 */ 0x8,               /* FC_LONG */
                            0x5c,               /* FC_PAD */
/* 892 */
                            0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 894 */ 0xa,               /* FC_FLOAT */
                            0x5c,               /* FC_PAD */
/* 896 */
                            0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 898 */ 0xc,               /* FC_DOUBLE */
                            0x5c,               /* FC_PAD */
/* 900 */
                            0x12, 0x0,          /* FC_UP */
/* 902 */ NdrFcShort( 0xfffffd90 ),    /* Offset= -624 (278) */
/* 904 */
                            0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 906 */ NdrFcShort( 0xfffffd92 ),    /* Offset= -622 (284) */
/* 908 */
                            0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 910 */ NdrFcShort( 0xfffffda6 ),    /* Offset= -602 (308) */
/* 912 */
                            0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 914 */ NdrFcShort( 0xfffffdb4 ),    /* Offset= -588 (326) */
/* 916 */
                            0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 918 */ NdrFcShort( 0xfffffdc2 ),    /* Offset= -574 (344) */
/* 920 */
                            0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 922 */ NdrFcShort( 0x2 ), /* Offset= 2 (924) */
/* 924 */
                            0x12, 0x0,          /* FC_UP */
/* 926 */ NdrFcShort( 0x16 ),/* Offset= 22 (948) */
```

```
/* 928 */
                            0x15,               /* FC_STRUCT */
                            0x7,                /* 7 */
/* 930 */ NdrFcShort( 0x10 ),/* 16 */
/* 932 */ 0x6,                /* FC_SHORT */
                            0x1,                /* FC_BYTE */
/* 934 */ 0x1,                /* FC_BYTE */
                            0x38,               /* FC_ALIGNM4 */
/* 936 */ 0x8,                /* FC_LONG */
                            0x39,               /* FC_ALIGNM8 */
/* 938 */ 0xb,                /* FC_HYPER */
                            0x5b,               /* FC_END */
/* 940 */
                            0x12, 0x0,          /* FC_UP */
/* 942 */ NdrFcShort( 0xfffffff2 ),    /* Offset= -14 (928) */
/* 944 */
                            0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 946 */ 0x2,                /* FC_CHAR */
                            0x5c,               /* FC_PAD */
/* 948 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x7,                /* 7 */
/* 950 */ NdrFcShort( 0x20 ),/* 32 */
/* 952 */ NdrFcShort( 0x0 ), /* 0 */
/* 954 */ NdrFcShort( 0x0 ), /* Offset= 0 (954) */
/* 956 */ 0x8,                /* FC_LONG */
                            0x8,                /* FC_LONG */
/* 958 */ 0x6,                /* FC_SHORT */
                            0x6,                /* FC_SHORT */
/* 960 */ 0x6,                /* FC_SHORT */
                            0x6,                /* FC_SHORT */
/* 962 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
                            0x0,                /* 0 */
/* 964 */ NdrFcShort( 0xfffffc42 ),    /* Offset= -958 (6) */
/* 966 */ 0x5c,               /* FC_PAD */
                            0x5b,               /* FC_END */
/* 968 */ 0xb4,               /* FC_USER_MARSHAL */
                            0x83,               /* 131 */
/* 970 */ NdrFcShort( 0x0 ), /* 0 */
/* 972 */ NdrFcShort( 0x10 ),/* 16 */
/* 974 */ NdrFcShort( 0x0 ), /* 0 */
/* 976 */ NdrFcShort( 0xfffffc32 ),    /* Offset= -974 (2) */
/* 978 */
                            0x11, 0x4,          /* FC_RP [alloced_on_stack] */
/* 980 */ NdrFcShort( 0x6 ), /* Offset= 6 (986) */
/* 982 */
                            0x13, 0x0,          /* FC_OP */
/* 984 */ NdrFcShort( 0xfffffffc ),    /* 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( 0xfffffffc ),    /* 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( 0xfffffffc ),    /* 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( 0xfffffffc ),    /* 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( 0xfffffdc ),    /* 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( 0xfffffd6 ),    /* 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( 0xfffffff7 ),    /* Offset= -25 (672) */
                            0x5b,               /* FC_END */
```

```
/* 700 */
                        0x11, 0x0,          /* FC_RP */
/* 702 */ NdrFcShort( 0xffffff10 ),    /* Offset= -240 (462) */
/* 704 */
                        0x1b,               /* FC_CARRAY */
                        0x0,                /* 0 */
/* 706 */ NdrFcShort( 0x1 ),  /* 1 */
/* 708 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                        0x0,                /*  */
/* 710 */ NdrFcShort( 0x0 ),  /* 0 */
/* 712 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 714 */ 0x1,                /* FC_BYTE */
                        0x5b,               /* FC_END */
/* 716 */
                        0x1a,               /* FC_BOGUS_STRUCT */
                        0x3,                /* 3 */
/* 718 */ NdrFcShort( 0x10 ),/* 16 */
/* 720 */ NdrFcShort( 0x0 ),  /* 0 */
/* 722 */ NdrFcShort( 0x6 ),  /* Offset= 6 (728) */
/* 724 */ 0x8,                /* FC_LONG */
                        0x39,               /* FC_ALIGNM8 */
/* 726 */ 0x36,               /* FC_POINTER */
                        0x5b,               /* FC_END */
/* 728 */
                        0x12, 0x0,          /* FC_UP */
/* 730 */ NdrFcShort( 0xffffffe6 ),    /* Offset= -26 (704) */
/* 732 */
                        0x1b,               /* FC_CARRAY */
                        0x1,                /* 1 */
/* 734 */ NdrFcShort( 0x2 ),  /* 2 */
/* 736 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                        0x0,                /*  */
/* 738 */ NdrFcShort( 0x0 ),  /* 0 */
/* 740 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 742 */ 0x6,                /* FC_SHORT */
                        0x5b,               /* FC_END */
/* 744 */
                        0x1a,               /* FC_BOGUS_STRUCT */
                        0x3,                /* 3 */
/* 746 */ NdrFcShort( 0x10 ),/* 16 */
/* 748 */ NdrFcShort( 0x0 ),  /* 0 */
/* 750 */ NdrFcShort( 0x6 ),  /* Offset= 6 (756) */
/* 752 */ 0x8,                /* FC_LONG */
                        0x39,               /* FC_ALIGNM8 */
/* 754 */ 0x36,               /* FC_POINTER */
                        0x5b,               /* FC_END */
/* 756 */
                        0x12, 0x0,          /* FC_UP */
/* 758 */ NdrFcShort( 0xffffffe6 ),    /* Offset= -26 (732) */
/* 760 */
                        0x1b,               /* FC_CARRAY */
                        0x3,                /* 3 */
/* 762 */ NdrFcShort( 0x4 ),  /* 4 */
/* 764 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                        0x0,                /*  */
/* 766 */ NdrFcShort( 0x0 ),  /* 0 */
/* 768 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 770 */ 0x8,                /* FC_LONG */
                        0x5b,               /* FC_END */
/* 772 */
                        0x1a,               /* FC_BOGUS_STRUCT */
                        0x3,                /* 3 */
/* 774 */ NdrFcShort( 0x10 ),/* 16 */
/* 776 */ NdrFcShort( 0x0 ),  /* 0 */
/* 778 */ NdrFcShort( 0x6 ),  /* Offset= 6 (784) */
/* 780 */ 0x8,                /* FC_LONG */
                        0x39,               /* FC_ALIGNM8 */
/* 782 */ 0x36,               /* FC_POINTER */
                        0x5b,               /* FC_END */
/* 784 */
                        0x12, 0x0,          /* FC_UP */
/* 786 */ NdrFcShort( 0xffffffe6 ),    /* Offset= -26 (760) */
/* 788 */
                        0x1b,               /* FC_CARRAY */
                        0x7,                /* 7 */
/* 790 */ NdrFcShort( 0x8 ),  /* 8 */
/* 792 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                        0x0,                /*  */
/* 794 */ NdrFcShort( 0x0 ),  /* 0 */
/* 796 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 798 */ 0xb,                /* FC_HYPER */
                        0x5b,               /* FC_END */
/* 800 */
                        0x1a,               /* FC_BOGUS_STRUCT */
                        0x3,                /* 3 */
/* 802 */ NdrFcShort( 0x10 ),/* 16 */
/* 804 */ NdrFcShort( 0x0 ),  /* 0 */
/* 806 */ NdrFcShort( 0x6 ),  /* Offset= 6 (812) */
/* 808 */ 0x8,                /* FC_LONG */
                        0x39,               /* FC_ALIGNM8 */
/* 810 */ 0x36,               /* FC_POINTER */
                        0x5b,               /* FC_END */
/* 812 */
                        0x12, 0x0,          /* FC_UP */
/* 814 */ NdrFcShort( 0xffffffe6 ),    /* Offset= -26 (788) */
/* 816 */
                        0x15,               /* FC_STRUCT */
                        0x3,                /* 3 */
/* 818 */ NdrFcShort( 0x8 ),  /* 8 */
/* 820 */ 0x8,                /* FC_LONG */
                        0x8,                /* FC_LONG */
/* 822 */ 0x5c,               /* FC_PAD */
                        0x5b,               /* FC_END */
/* 824 */
                        0x1b,               /* FC_CARRAY */
                        0x3,                /* 3 */
/* 826 */ NdrFcShort( 0x8 ),  /* 8 */
/* 828 */ 0x7,                /* Corr desc: FC_USHORT */
                        0x0,                /*  */
/* 830 */ NdrFcShort( 0xffc8 ),        /* -56 */
/* 832 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 834 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
                        0x0,                /* 0 */
/* 836 */ NdrFcShort( 0xffffffec ),    /* Offset= -20 (816) */
/* 838 */ 0x5c,               /* FC_PAD */
                        0x5b,               /* FC_END */
/* 840 */
                        0x1a,               /* FC_BOGUS_STRUCT */
                        0x3,                /* 3 */
/* 842 */ NdrFcShort( 0x38 ),/* 56 */
/* 844 */ NdrFcShort( 0xffffffec ),    /* Offset= -20 (824) */
/* 846 */ NdrFcShort( 0x0 ),  /* Offset= 0 (846) */
/* 848 */ 0x6,                /* FC_SHORT */
                        0x6,                /* FC_SHORT */
/* 850 */ 0x38,               /* FC_ALIGNM4 */
                        0x8,                /* FC_LONG */
```

```
/* 852 */ 0x8,              /* FC_LONG */
          0x4c,             /* FC_EMBEDDED_COMPLEX */
/* 854 */ 0x4,              /* 4 */
          NdrFcShort( 0xfffffe0d ),    /* Offset= -499 (356) */
          0x5b,             /* FC_END */
/* 858 */
          0x12, 0x0,        /* FC_UP */
/* 860 */ NdrFcShort( 0xffffff02 ),    /* Offset= -254 (606) */
/* 862 */
          0x12, 0x8,        /* FC_UP [simple_pointer] */
/* 864 */ 0x1,              /* FC_BYTE */
          0x5c,             /* FC_PAD */
/* 866 */
          0x12, 0x8,        /* FC_UP [simple_pointer] */
/* 868 */ 0x6,              /* FC_SHORT */
          0x5c,             /* FC_PAD */
/* 870 */
          0x12, 0x8,        /* FC_UP [simple_pointer] */
/* 872 */ 0x8,              /* FC_LONG */
          0x5c,             /* FC_PAD */
/* 874 */
          0x12, 0x8,        /* FC_UP [simple_pointer] */
/* 876 */ 0xa,              /* FC_FLOAT */
          0x5c,             /* FC_PAD */
/* 878 */
          0x12, 0x8,        /* FC_UP [simple_pointer] */
/* 880 */ 0xc,              /* FC_DOUBLE */
          0x5c,             /* FC_PAD */
/* 882 */
          0x12, 0x0,        /* FC_UP */
/* 884 */ NdrFcShort( 0xfffffda4 ),    /* Offset= -604 (280) */
/* 886 */
          0x12, 0x10,       /* FC_UP [pointer_deref] */
/* 888 */ NdrFcShort( 0xfffffda6 ),    /* Offset= -602 (286) */
/* 890 */
          0x12, 0x10,       /* FC_UP [pointer_deref] */
/* 892 */ NdrFcShort( 0xfffffdbc ),    /* Offset= -580 (312) */
/* 894 */
          0x12, 0x10,       /* FC_UP [pointer_deref] */
/* 896 */ NdrFcShort( 0xfffffdca ),    /* Offset= -566 (330) */
/* 898 */
          0x12, 0x10,       /* FC_UP [pointer_deref] */
/* 900 */ NdrFcShort( 0xfffffdd8 ),    /* Offset= -552 (348) */
/* 902 */
          0x12, 0x10,       /* FC_UP [pointer_deref] */
/* 904 */ NdrFcShort( 0x2 ), /* Offset= 2 (906) */
/* 906 */
          0x12, 0x0,        /* FC_UP */
/* 908 */ NdrFcShort( 0x16 ),/* Offset= 22 (930) */
/* 910 */
          0x15,             /* FC_STRUCT */
          0x7,              /* 7 */
/* 912 */ NdrFcShort( 0x10 ),/* 16 */
/* 914 */ 0x6,              /* FC_SHORT */
          0x1,              /* FC_BYTE */
/* 916 */ 0x1,              /* FC_BYTE */
          0x38,             /* FC_ALIGNM4 */
/* 918 */ 0x8,              /* FC_LONG */
          0x39,             /* FC_ALIGNM8 */
/* 920 */ 0xb,              /* FC_HYPER */
          0x5b,             /* FC_END */
/* 922 */
          0x12, 0x0,        /* FC_UP */
/* 924 */ NdrFcShort( 0xfffffff2 ),    /* Offset= -14 (910) */
/* 926 */
                            0x12, 0x8,        /* FC_UP [simple_pointer] */
/* 928 */ 0x2,              /* FC_CHAR */
                            0x5c,             /* FC_PAD */
/* 930 */
                            0x1a,             /* FC_BOGUS_STRUCT */
                            0x7,              /* 7 */
/* 932 */ NdrFcShort( 0x20 ),/* 32 */
/* 934 */ NdrFcShort( 0x0 ), /* 0 */
/* 936 */ NdrFcShort( 0x0 ), /* Offset= 0 (936) */
/* 938 */ 0x8,              /* FC_LONG */
                            0x8,              /* FC_LONG */
/* 940 */ 0x6,              /* FC_SHORT */
                            0x6,              /* FC_SHORT */
/* 942 */ 0x6,              /* FC_SHORT */
                            0x6,              /* FC_SHORT */
/* 944 */ 0x4c,             /* FC_EMBEDDED_COMPLEX */
                            0x0,              /* 0 */
/* 946 */ NdrFcShort( 0xfffffc54 ),    /* Offset= -940 (6) */
/* 948 */ 0x5c,             /* FC_PAD */
                            0x5b,             /* FC_END */
/* 950 */ 0xb4,             /* FC_USER_MARSHAL */
                            0x83,             /* 131 */
/* 952 */ NdrFcShort( 0x0 ), /* 0 */
/* 954 */ NdrFcShort( 0x18 ),/* 24 */
/* 956 */ NdrFcShort( 0x0 ), /* 0 */
/* 958 */ NdrFcShort( 0xfffffc44 ),    /* Offset= -956 (2) */
/* 960 */
                            0x11, 0x4,        /* FC_RP [alloced_on_stack] */
/* 962 */ NdrFcShort( 0x6 ), /* Offset= 6 (968) */
/* 964 */
                            0x13, 0x0,        /* FC_OP */
/* 966 */ NdrFcShort( 0xfffffffc ),    /* Offset= -36 (930) */
/* 968 */ 0xb4,             /* FC_USER_MARSHAL */
                            0x83,             /* 131 */
/* 970 */ NdrFcShort( 0x0 ), /* 0 */
/* 972 */ NdrFcShort( 0x18 ),/* 24 */
/* 974 */ NdrFcShort( 0x0 ), /* 0 */
/* 976 */ NdrFcShort( 0xfffffff4 ),    /* Offset= -12 (964) */

                            0x0
        }
    };

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

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

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

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

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

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

    return 0;
}

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


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

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 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

echo on
```

createdb.sql

```
--  File:     CREATEDB.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.21
--            Copyright Microsoft, 1999, 2000
--  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               = MSSQL70_tpcc_root,
          FILENAME  = "C:\MSSQL70_tpcc_root.mdf",
          SIZE               = 8MB,
          FILEGROWTH         =0),
FILEGROUP MSSQL70_misc_fg
(         NAME               = MSSQL70_misc1,
          FILENAME  = "F:",
          SIZE               = 16560MB,
          FILEGROWTH         = 0),
(         NAME               = MSSQL70_misc2,
          FILENAME  = "H:",
          SIZE               = 16560MB,
          FILEGROWTH         = 0),
(         NAME               = MSSQL70_misc3,
          FILENAME  = "J:",
          SIZE               = 16560MB,
          FILEGROWTH         = 0),
(         NAME               = MSSQL70_misc4,
          FILENAME  = "L:",
          SIZE               = 16560MB,
          FILEGROWTH         = 0),
(         NAME               = MSSQL70_misc5,
          FILENAME  = "N:",
          SIZE               = 16560MB,
          FILEGROWTH         = 0),
FILEGROUP MSSQL70_cs_fg
(         NAME               = MSSQL70_cs1,
          FILENAME  = "E:",
          SIZE               = 30000MB,
          FILEGROWTH         = 0),
(         NAME               = MSSQL70_cs2,
          FILENAME  = "G:",
          SIZE               = 30000MB,
          FILEGROWTH         = 0),
(         NAME               = MSSQL70_cs3,
          FILENAME  = "I:",
```

```
        SIZE                = 30000MB,
        FILEGROWTH          = 0),
(       NAME                = MSSQL70_cs4,
        FILENAME  = "K:",
        SIZE                = 30000MB,
        FILEGROWTH          = 0),
(       NAME                = MSSQL70_cs5,
        FILENAME  = "M:",
        SIZE                = 30000MB,
        FILEGROWTH          = 0)
LOG ON
(       NAME                =MSSQL70_tpccv3_log,
        FILENAME  ="S:",
        SIZE                =58200MB,
        FILEGROWTH          =0)
go

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

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

--       remove temporary table

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

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. 4.21
--            Copyright Microsoft, 1999, 2000
--  Purpose:  Creates backup of tpcc database


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

dump database tpcc to tpccback1,tpccback2,tpccback3,tpccback4 with init, stats = 5

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. 4.21
--            Copyright Microsoft, 1999, 2000
--  Purpose:  Loads database backup from backup files


declare @startdate datetime
declare @enddate datetime

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

load database tpcc from tpccback1,tpccback2,tpccback3,tpccback4 with stats = 5

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,
                                                                        @d_id
          tinyint,
                                                                        @c_id
          int,
                                                                        @c_last  char(16)
= ""

as

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

begin tran o

          if (@c_id = 0)
                    begin

--  get customer id and info using last name

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

                    set rowcount @cnt

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

                    set rowcount 0
                    end

          else
                    begin

--  get customer info if by id

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

                    select @cnt = @@rowcount

                    end
```

```
--  if no such customer

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

--  get order info

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

--  select order lines for the current order

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

custnotfound:

commit tran o

--  return data to client

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

go
```

delivery.sql

```
--  File:     DELIVERY.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.00
--            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 2000 Advanced 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 2000 Advanced Server Configuration

The following services were disabled on the server:

- Alerter
- Computer Browser
- DHCP Client
- Distributed File System
- Distributed Link Tracking Client
- DNS Client
- Global Array Manager Server
- IPSEC Policy Agent
- License Logging Service
- Messenger
- Microsoft Search
- Print Spooler
- Process Control Service
- Remote Registry Service
- Removable Storage
- Run as Service
- System Event Notification
- Task Scheduler

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.
-g100	Reserve 100 MB for non-buffer pool allocations

Appendix C – Tunable Parameters

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++ V5.0. The command used was editbin /stack:131072 sqlservr.exe.

Mylex Device Drivers and Firmware

The following device drivers were added:

- Mylex BIOS: 6:00-05
- Mylex Firmware: 6.00-02 bld 127
- Miniport driver : 6.00-03 (dac2w2k.sys)
- Accelerated Driver : 5.50-20 (macdw2k.sys)

Mylex Registry Key

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\dac2w2k\Parameters\Device]
"DriverParameter"="ConfigureSIR=16"

Microsoft SQL Server 2000 Configuration Parameters

name	minimum	maximum	config_value	run_value
affinity mask	0	2147483647	15	15
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	7000	7000
max text repl size (B)	0	2147483647	65536	65536
max worker threads	10	1024	220	220
media retention	0	365	0	0
min memory per query (KB)	512	2147483647	1024	1024
min server memory (MB)	0	2147483647	100	100
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	40	40
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

Windows 2000 Advanced Server System Information Report For PE6400

```
System Information report written at: 10/15/2000 05:02:39 PM
[System Information]

[ Following are sub-categories of this main category ]

[System Summary]

Item  Value
OS Name     Microsoft Windows 2000 Advanced Server
Version     5.0.2195 Service Pack 1 Build 2195
OS Manufacturer   Microsoft Corporation
System Name PE6400_01
System Manufacturer     Dell Computer Corporation
System Model      PowerEdge 6400/700
System Type X86-based PC
Processor   x86 Family 6 Model 10 Stepping 0 GenuineIntel ~700 Mhz
Processor   x86 Family 6 Model 10 Stepping 0 GenuineIntel ~700 Mhz
Processor   x86 Family 6 Model 10 Stepping 0 GenuineIntel ~700 Mhz
Processor   x86 Family 6 Model 10 Stepping 0 GenuineIntel ~700 Mhz
BIOS Version      Phoenix ROM BIOS PLUS Version 1.10 X27
Windows Directory C:\WINNT
System Directory  C:\WINNT\System32
Boot Device \Device\Harddisk0\Partition1
Locale      United States
User Name   PE6400_01\Administrator
Time Zone   Central Daylight Time
Total Physical Memory   7,318,888 KB
Available Physical Memory     7,145,812 KB
Total Virtual Memory    16,597,708 KB
Available Virtual Memory      16,366,996 KB
Page File Space   9,278,820 KB
Page File   C:\pagefile.sys

[Hardware Resources]

[ Following are sub-categories of this main category ]

[Conflicts/Sharing]

Resource    Device
No conflicted/shared resources

[DMA]

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

[Forced Hardware]
```

```
Device      PNP Device ID
No Forced Hardware

[I/O]

Address Range     Device      Status
0x0000-0x03AF     PCI bus     OK
0x0000-0x03AF     Direct memory access controller     OK
0x03B0-0x03DF     PCI bus     OK
0x03B0-0x03DF     ATI Technologies Inc. 3D RAGE IIC PCI     OK
0x03E0-0x0FFF     PCI bus     OK
0xE000-0xFFFF     PCI bus     OK
0xFC00-0xFCFF     ATI Technologies Inc. 3D RAGE IIC PCI     OK
0x03C0-0x03DF     ATI Technologies Inc. 3D RAGE IIC PCI     OK
0xF800-0xF8FF     Adaptec AIC-7899 Ultra160/m PCI SCSI Card OK
0xF400-0xF4FF     Adaptec AIC-7899 Ultra160/m PCI SCSI Card OK
0xF0E0-0xF0FF     Intel(R) PRO/100+ PCI Adapter OK
0x0A79-0x0A79     ISAPNP Read Data Port   OK
0x0279-0x0279     ISAPNP Read Data Port   OK
0x02F4-0x02F7     ISAPNP Read Data Port   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
0x0040-0x005F     System timer      OK
0x03F0-0x03F5     Standard floppy disk controller     OK
0x03F7-0x03F7     Standard floppy disk controller     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
0x03F8-0x03FF     Communications Port (COM1)    OK
0x02F8-0x02FF     Communications Port (COM2)    OK
0x0378-0x037F     ECP Printer Port (LPT1) OK
0x0778-0x077F     ECP Printer Port (LPT1) OK
0x0070-0x007F     System CMOS/real time clock   OK
0x0814-0x085B     System board      OK
0x08A0-0x08AF     System board      OK
0x0C00-0x0CD7     System board      OK
0x0F50-0x0F58     System board      OK
0x00E0-0x00EF     System board      OK
0x8000-0xDFFF     PCI bus     OK
0xD000-0xDFFF     DEC 21154 PCI to PCI bridge   OK
0xDC80-0xDCFF     Mylex eXtremeRAID 2000 Disk Array Controller    OK
0xC000-0xCFFF     DEC 21154 PCI to PCI bridge   OK
0xCC80-0xCCFF     Mylex eXtremeRAID 2000 Disk Array Controller    OK
0xB000-0xBFFF     DEC 21154 PCI to PCI bridge   OK
0xBC80-0xBCFF     Mylex eXtremeRAID 2000 Disk Array Controller    OK
0xA000-0xAFFF     DEC 21154 PCI to PCI bridge   OK
0xAC80-0xACFF     Mylex eXtremeRAID 2000 Disk Array Controller    OK
0x6000-0x7FFF     PCI bus     OK
```

```
[IRQs]

IRQ Number  Device
9     Microsoft ACPI-Compliant System
17    Adaptec AIC-7899 Ultra160/m PCI SCSI Card
18    Adaptec AIC-7899 Ultra160/m PCI SCSI Card
21    Intel(R) PRO/100+ PCI Adapter
13    Numeric data processor
6     Standard floppy disk controller
1     Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
12    PS/2 Compatible Mouse
4     Communications Port (COM1)
3     Communications Port (COM2)
8     System CMOS/real time clock
15    System board
22    Mylex eXtremeRAID 2000 Disk Array Controller
23    Mylex eXtremeRAID 2000 Disk Array Controller
24    Mylex eXtremeRAID 2000 Disk Array Controller
25    Mylex eXtremeRAID 2000 Disk Array Controller

[Memory]

Range Device      Status
0xA0000-0xBFFFF   PCI bus     OK
0xA0000-0xBFFFF   ATI Technologies Inc. 3D RAGE IIC PCI     OK
0xDC000-0xEFFFF   PCI bus     OK
0xFAD00000-0xFBFFFFFF   PCI bus     OK
0xFC000000-0xFD4FFFFF   PCI bus     OK
0xFC000000-0xFD4FFFFF   ATI Technologies Inc. 3D RAGE IIC PCI     OK
0xFE000000-0xFFFFFFFF   PCI bus     OK
0xFBEFF000-0xFBEFFFFF   ATI Technologies Inc. 3D RAGE IIC PCI     OK
0xFBEFE000-0xFBEFEFFF   Adaptec AIC-7899 Ultra160/m PCI SCSI Card OK
0xFBEFD000-0xFBEFDFFF   Adaptec AIC-7899 Ultra160/m PCI SCSI Card OK
0xFD4FF000-0xFD4FFFFF   Intel(R) PRO/100+ PCI Adapter OK
0xFBD00000-0xFBDFFFFF   Intel(R) PRO/100+ PCI Adapter OK
0x0000-0x9FFFF    System board      OK
0x100000-0xBFFFFFFF     System board      OK
0xF0000-0xFFFFF   System board      OK
0xFEC00000-0xFEC0FFFF   System board      OK
0xFEE00000-0xFEE0FFFF   System board      OK
0xFFE00000-0xFFFFFFFF   System board      OK
0xDE000000-0xEFFFFFFF   PCI bus     OK
0xF0000000-0xF9FFFFFF   PCI bus     OK
0xF0000000-0xF9FFFFFF   DEC 21154 PCI to PCI bridge   OK
0xF0000000-0xF9FFFFFF   Mylex eXtremeRAID 2000 Disk Array Controller
      OK
0xEC000000-0xEFFFFFFF   DEC 21154 PCI to PCI bridge   OK
0xEC000000-0xEFFFFFFF   Mylex eXtremeRAID 2000 Disk Array Controller
      OK
0xF4000000-0xF7FFFFFF   DEC 21154 PCI to PCI bridge   OK
0xF6000000-0xF7FFFFFF   Mylex eXtremeRAID 2000 Disk Array Controller
      OK
0xE8000000-0xEBFFFFFF   DEC 21154 PCI to PCI bridge   OK
```

```
0xE8000000-0xEBFFFFFF   Mylex eXtremeRAID 2000 Disk Array Controller
      OK
0xF8000000-0xF9FFFFFF   DEC 21154 PCI to PCI bridge   OK
0xF8000000-0xF9FFFFFF   Mylex eXtremeRAID 2000 Disk Array Controller
      OK
0xE4000000-0xE7FFFFFF   DEC 21154 PCI to PCI bridge   OK
0xE4000000-0xE7FFFFFF   Mylex eXtremeRAID 2000 Disk Array Controller
      OK
0xF2000000-0xF3FFFFFF   DEC 21154 PCI to PCI bridge   OK
0xF2000000-0xF3FFFFFF   Mylex eXtremeRAID 2000 Disk Array Controller
      OK
0xE0000000-0xE3FFFFFF   DEC 21154 PCI to PCI bridge   OK
0xE0000000-0xE3FFFFFF   Mylex eXtremeRAID 2000 Disk Array Controller
      OK
0xDCF00000-0xDDFFFFFF   PCI bus     OK
0xFDC00000-0xFDFFFFFF   PCI bus     OK

[Components]

[ Following are sub-categories of this main category ]

[Multimedia]

[ Following are sub-categories of this main category ]

[Audio Codecs]

Codec Manufacturer      Description Status      File  Version     Size
      Creation Date
c:\winnt\system32\iac25_32.ax Intel Corporation Indeo® audio software
      OK    C:\WINNT\System32\IAC25_32.AX 2.05.53     195.00 KB
(199,680 bytes)   12/7/1999 6:00:00 AM
c:\winnt\system32\imaadp32.acm      Microsoft Corporation         OK
      C:\WINNT\System32\IMAADP32.ACM      5.00.2134.1 16.27 KB (16,656
bytes)      12/7/1999 6:00:00 AM
c:\winnt\system32\msg723.acm  Microsoft Corporation         OK
      C:\WINNT\System32\MSG723.ACM  4.4.3385    106.77 KB (109,328
bytes)      9/13/2000 11:18:04 AM
c:\winnt\system32\msgsm32.acm Microsoft Corporation         OK
      C:\WINNT\System32\MSGSM32.ACM 5.00.2134.1 22.27 KB (22,800 bytes)
      12/7/1999 6:00:00 AM
c:\winnt\system32\tssoft32.acm      DSP GROUP, INC.         OK
      C:\WINNT\System32\TSSOFT32.ACM      1.01  9.27 KB (9,488 bytes)
      12/7/1999 6:00:00 AM
c:\winnt\system32\lhacm.acm   Microsoft Corporation         OK
      C:\WINNT\System32\LHACM.ACM   4.4.3385    33.27 KB (34,064 bytes)
      9/13/2000 11:18:04 AM
c:\winnt\system32\msg711.acm  Microsoft Corporation         OK
      C:\WINNT\System32\MSG711.ACM  5.00.2134.1 10.27 KB (10,512 bytes)
      12/7/1999 6:00:00 AM
c:\winnt\system32\msadp32.acm Microsoft Corporation         OK
      C:\WINNT\System32\MSADP32.ACM 5.00.2134.1 14.77 KB (15,120 bytes)
      12/7/1999 6:00:00 AM

[Video Codecs]
```

```
Codec Manufacturer      Description Status      File  Version     Size
      Creation Date
c:\winnt\system32\ir50_32.dll Intel Corporation Indeo® video 5.10 OK
      C:\WINNT\System32\IR50_32.DLL R.5.10.15.2.55    737.50 KB
(755,200 bytes)   12/7/1999 6:00:00 AM
c:\winnt\system32\msh261.drv  Microsoft Corporation         OK
      C:\WINNT\System32\MSH261.DRV  4.4.3385    163.77 KB (167,696
bytes)      9/13/2000 11:18:04 AM
c:\winnt\system32\msh263.drv  Microsoft Corporation         OK
      C:\WINNT\System32\MSH263.DRV  4.4.3385    252.27 KB (258,320
bytes)      9/13/2000 11:17:41 AM
c:\winnt\system32\msvidc32.dll      Microsoft Corporation         OK
      C:\WINNT\System32\MSVIDC32.DLL      5.00.2134.1 27.27 KB (27,920
bytes)      12/7/1999 6:00:00 AM
c:\winnt\system32\ir32_32.dll Intel(R) Corporation          OK
      C:\WINNT\System32\IR32_32.DLL Not Available     194.50 KB
(199,168 bytes)   12/7/1999 6:00:00 AM
c:\winnt\system32\iccvid.dll  Radius Inc.       OK
      C:\WINNT\System32\ICCVID.DLL  1.10.0.6    108.00 KB (110,592
bytes)      12/7/1999 6:00:00 AM
c:\winnt\system32\msrle32.dll Microsoft Corporation         OK
      C:\WINNT\System32\MSRLE32.DLL 5.00.2134.1 10.77 KB (11,024 bytes)
      12/7/1999 6:00:00 AM

[CD-ROM]

Item  Value
No CD-ROM drives

[Sound Device]

Item  Value
No sound devices

[Display]

Item  Value
Name  ATI Technologies Inc. 3D RAGE IIC PCI
PNP Device ID
      PCI\VEN_1002&DEV_4759&SUBSYS_00000000&REV_7A\3&13C0B0C5&0&20
Adapter Type      ATI 3D RAGE IIC PCI (A21), ATI Technologies Inc.
compatible
Adapter Description     ATI Technologies Inc. 3D RAGE IIC PCI
Adapter RAM 4.00 MB (4,194,304 bytes)
Installed Drivers atiraged.dll
Driver Version    5.00.2174.1
INF File    display.inf (atirage section)
Color Planes      1
Color Table Entries     256
Resolution  1024 x 768 x 60 hertz
Bits/Pixel  8


[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&3B8C0623&0
NumberOfFunctionKeys    12


[Pointing Device]

Item  Value
Hardware Type     PS/2 Compatible Mouse
Number of Buttons 2
Status      OK
PNP Device ID     ACPI\PNP0F13\4&3B8C0623&0
Power Management Supported    False
Double Click Threshold  6
Handedness  Right Handed Operation


[Modem]

Item  Value
No modems

[Network]

[ Following are sub-categories of this main category ]

[Adapter]

Item  Value
Name  [00000000] RAS Async Adapter
Adapter Type      Not Available
Product Name      RAS Async Adapter
Installed   True
PNP Device ID     Not Available
Last Reset  10/12/2000 6:49:26 AM
Index 0
Service Name      AsyncMac
IP Address  Not Available
IP Subnet   Not Available
Default IP Gateway      Not Available
DHCP Enabled      False
DHCP Server Not Available
```

```
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address Not Available
Service Name      Not Available

Name  [00000001] WAN Miniport (L2TP)
Adapter Type      Not Available
Product Name      WAN Miniport (L2TP)
Installed   True
PNP Device ID     ROOT\MS_L2TPMINIPORT\0000
Last Reset  10/12/2000 6:49:26 AM
Index 1
Service Name      Rasl2tp
IP Address  Not Available
IP Subnet   Not Available
Default IP Gateway      Not Available
DHCP Enabled      False
DHCP Server Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address Not Available
Service Name      Rasl2tp
Driver      c:\winnt\system32\drivers\rasl2tp.sys (50800, 5.00.2179.1)

Name  [00000002] WAN Miniport (PPTP)
Adapter Type      Wide Area Network (WAN)
Product Name      WAN Miniport (PPTP)
Installed   True
PNP Device ID     ROOT\MS_PPTPMINIPORT\0000
Last Reset  10/12/2000 6:49:26 AM
Index 2
Service Name      PptpMiniport
IP Address  Not Available
IP Subnet   Not Available
Default IP Gateway      Not Available
DHCP Enabled      False
DHCP Server Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address 50:50:54:50:30:30
Service Name      PptpMiniport
Driver      c:\winnt\system32\drivers\raspptp.sys (47856, 5.00.2160.1)

Name  [00000003] Direct Parallel
Adapter Type      Not Available
Product Name      Direct Parallel
Installed   True
PNP Device ID     ROOT\MS_PTIMINIPORT\0000
Last Reset  10/12/2000 6:49:26 AM
Index 3
Service Name      Raspti
IP Address  Not Available
IP Subnet   Not Available
Default IP Gateway      Not Available
DHCP Enabled      False
```

```
DHCP Server Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address Not Available
Service Name      Raspti
Driver      c:\winnt\system32\drivers\raspti.sys (16880, 5.00.2146.1)

Name  [00000004] WAN Miniport (IP)
Adapter Type      Not Available
Product Name      WAN Miniport (IP)
Installed   True
PNP Device ID     ROOT\MS_NDISWANIP\0000
Last Reset  10/12/2000 6:49:26 AM
Index 4
Service Name      NdisWan
IP Address  Not Available
IP Subnet   Not Available
Default IP Gateway      Not Available
DHCP Enabled      False
DHCP Server Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address Not Available
Service Name      NdisWan
Driver      c:\winnt\system32\drivers\ndiswan.sys (90768, 5.00.2184.1)

Name  [00000005] Intel(R) PRO/100+ PCI Adapter
Adapter Type      Ethernet 802.3
Product Name      Intel(R) PRO/100+ PCI Adapter
Installed   True
PNP Device ID
      PCI\VEN_8086&DEV_1229&SUBSYS_00098086&REV_05\3&13C0B0C5&0&38
Last Reset  10/12/2000 6:49:26 AM
Index 5
Service Name      E100B
IP Address  192.1.1.100
IP Subnet   255.255.255.0
Default IP Gateway      Not Available
DHCP Enabled      False
DHCP Server Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address 00:90:27:5C:D1:CC
Service Name      E100B
IRQ Number  21
I/O Port    0xF0E0-0xF0FF
Driver      c:\winnt\system32\drivers\e100bnt5.sys (85776,
4.02.38.0000)


[Protocol]

Item  Value
Name  MSAFD Tcpip [TCP/IP]
ConnectionlessService   False
```

```
GuaranteesDelivery      True
GuaranteesSequencing    True
MaximumAddressSize      16 bytes
MaximumMessageSize      0 bytes
MessageOriented   False
MinimumAddressSize      16 bytes
PseudoStreamOriented    False
SupportsBroadcasting    False
SupportsConnectData     False
SupportsDisconnectData  False
SupportsEncryption      False
SupportsExpeditedData   True
SupportsGracefulClosing True
SupportsGuaranteedBandwidth   False
SupportsMulticasting    False

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

Name  RSVP UDP Service Provider
ConnectionlessService   True
GuaranteesDelivery      False
GuaranteesSequencing    False
MaximumAddressSize      16 bytes
MaximumMessageSize      65467 bytes
MessageOriented   True
MinimumAddressSize      16 bytes
PseudoStreamOriented    False
SupportsBroadcasting    True
SupportsConnectData     False
SupportsDisconnectData  False
SupportsEncryption      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_{0DC866E6-EF58-4EFA-B115-
9F3BC62E1FD2}] 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_{0DC866E6-EF58-4EFA-B115-
9F3BC62E1FD2}] 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_{C83532C1-86E8-4FFC-BC86-
889C649D4A9A}] 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_{C83532C1-86E8-4FFC-BC86-
889C649D4A9A}] 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_{E063AE69-22A9-49A3-B09C-
693FC911F157}] 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_{E063AE69-22A9-49A3-B09C-
693FC911F157}] 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     5.00.2195.1207
Size  21.27 KB (21,776 bytes)


[Ports]

[ Following are sub-categories of this main category ]

[Serial]

Item  Value
Name  COM1
Status      OK
PNP Device ID     ACPI\PNP0501\1
Maximum Input Buffer Size     0
Maximum Output Buffer Size    False
Settable Baud Rate      True
Settable Data Bits      True
Settable Flow Control   True
Settable Parity   True
Settable Parity Check   True
Settable Stop Bits      True
Settable RLSD     True
Supports RLSD     True
Supports 16 Bit Mode    False
Supports Special Characters   False
Baud Rate   9600
```

```
Bits/Byte   8
Stop Bits   1
Parity      None
Busy  0
Abort Read/Write on Error     0
Binary Mode Enabled     -1
Continue XMit on XOff   0
CTS Outflow Control     0
Discard NULL Bytes      0
DSR Outflow Control     0
DSR Sensitivity   0
DTR Flow Control Type   Enable
EOF Character     0
Error Replace Character 0
Error Replacement Enabled     0
Event Character   0
Parity Check Enabled    0
RTS Flow Control Type   Enable
XOff Character    19
XOffXMit Threshold      512
XOn Character     17
XOnXMit Threshold 2048
XOnXOff InFlow Control  0
XOnXOff OutFlow Control 0
IRQ Number  4
I/O Port    0x03F8-0x03FF
Driver      c:\winnt\system32\drivers\serial.sys (62448, 5.00.2134.1)

Name  COM2
Status      OK
PNP Device ID     ACPI\PNP0501\2
Maximum Input Buffer Size     0
Maximum Output Buffer Size    False
Settable Baud Rate      True
Settable Data Bits      True
Settable Flow Control   True
Settable Parity   True
Settable Parity Check   True
Settable Stop Bits      True
Settable RLSD     True
Supports RLSD     True
Supports 16 Bit Mode    False
Supports Special Characters   False
Baud Rate   9600
Bits/Byte   8
Stop Bits   1
Parity      None
Busy  0
Abort Read/Write on Error     0
Binary Mode Enabled     -1
Continue XMit on XOff   0
CTS Outflow Control     0
Discard NULL Bytes      0
DSR Outflow Control     0
DSR Sensitivity   0
```

```
DTR Flow Control Type   Enable
EOF Character     0
Error Replace Character 0
Error Replacement Enabled     0
Event Character   0
Parity Check Enabled    0
RTS Flow Control Type   Enable
XOff Character    19
XOffXMit Threshold      512
XOn Character     17
XOnXMit Threshold 2048
XOnXOff InFlow Control  0
XOnXOff OutFlow Control 0
IRQ Number  3
I/O Port    0x02F8-0x02FF
Driver      c:\winnt\system32\drivers\serial.sys (62448, 5.00.2134.1)


[Parallel]

Item  Value
Name  LPT1
PNP Device ID     ACPI\PNP0401\4&3B8C0623&0


[Storage]

[ Following are sub-categories of this main category ]

[Drives]

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

Drive C:
Description Local Fixed Disk
Compressed  False
File System NTFS
Size  8.47 GB (9,097,125,888 bytes)
Free Space  4.34 GB (4,665,028,608 bytes)
Volume Name
Volume Serial Number    886E46A1
Partition   Disk #0, Partition #0
Partition Size    8.47 GB (9,097,127,424 bytes)
Starting Offset   32256 bytes
Drive Description Disk drive
Drive Manufacturer      (Standard disk drives)
Drive Model SEAGATE ST39102LC 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    0
Drive SCSITargetId      0
Drive SectorsPerTrack   63
Drive Size  9097159680 bytes
Drive TotalCylinders    1106
Drive TotalSectors      17767890
Drive TotalTracks 282030
Drive TracksPerCylinder 255

Drive E:
Description 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
Partition   Disk #2, Partition #0
Partition Size    46.50 GB (49,927,417,344 bytes)
Starting Offset   32256 bytes
Drive Description \\.\PHYSICALDRIVE2
Drive Manufacturer      Not Available
Drive Model Not Available
Drive BytesPerSector    512
Drive MediaLoaded True
Drive MediaType   Fixed hard disk media
Drive Partitions  3
Drive SCSIBus     4
Drive SCSILogicalUnit   0
Drive SCSIPort    3
Drive SCSITargetId      0
Drive SectorsPerTrack   63
Drive Size  647765475840 bytes
Drive TotalCylinders    78753
Drive TotalSectors      1265166945
Drive TotalTracks 20082015
Drive TracksPerCylinder 255

Drive F:
Description Local Fixed Disk
Compressed  Not Available
File System Not Available
Size  Not Available
Free Space  Not Available
Volume Name Not Available
Volume Serial Number    Not Available
Partition   Disk #2, Partition #1
Partition Size    26.00 GB (27,916,600,320 bytes)
Starting Offset   Not Available
Drive Description \\.\PHYSICALDRIVE2
Drive Manufacturer      Not Available
Drive Model Not Available
Drive BytesPerSector    512
Drive MediaLoaded True
Drive MediaType   Fixed hard disk media
```

```
Drive Partitions  3
Drive SCSIBus     4
Drive SCSILogicalUnit   0
Drive SCSIPort    3
Drive SCSITargetId      0
Drive SectorsPerTrack   63
Drive Size  647765475840 bytes
Drive TotalCylinders    78753
Drive TotalSectors      1265166945
Drive TotalTracks 20082015
Drive TracksPerCylinder 255

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
Partition   Disk #3, Partition #0
Partition Size    46.50 GB (49,927,417,344 bytes)
Starting Offset   32256 bytes
Drive Description \\.\PHYSICALDRIVE3
Drive Manufacturer      Not Available
Drive Model Not Available
Drive BytesPerSector    512
Drive MediaLoaded True
Drive MediaType   Fixed hard disk media
Drive Partitions  3
Drive SCSIBus     4
Drive SCSILogicalUnit   0
Drive SCSIPort    4
Drive SCSITargetId      0
Drive SectorsPerTrack   63
Drive Size  647765475840 bytes
Drive TotalCylinders    78753
Drive TotalSectors      1265166945
Drive TotalTracks 20082015
Drive TracksPerCylinder 255

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
Partition   Disk #3, Partition #1
Partition Size    26.00 GB (27,916,600,320 bytes)
Starting Offset   Not Available
Drive Description \\.\PHYSICALDRIVE3
Drive Manufacturer      Not Available
Drive Model Not Available
```

```
Drive BytesPerSector    512
Drive MediaLoaded True
Drive MediaType   Fixed hard disk media
Drive Partitions  3
Drive SCSIBus     4
Drive SCSILogicalUnit   0
Drive SCSIPort    4
Drive SCSITargetId      0
Drive SectorsPerTrack   63
Drive Size  647765475840 bytes
Drive TotalCylinders    78753
Drive TotalSectors      1265166945
Drive TotalTracks 20082015
Drive TracksPerCylinder 255

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
Partition   Disk #4, Partition #0
Partition Size    46.50 GB (49,927,417,344 bytes)
Starting Offset   32256 bytes
Drive Description \\.\PHYSICALDRIVE4
Drive Manufacturer      Not Available
Drive Model Not Available
Drive BytesPerSector    512
Drive MediaLoaded True
Drive MediaType   Fixed hard disk media
Drive Partitions  3
Drive SCSIBus     4
Drive SCSILogicalUnit   0
Drive SCSIPort    5
Drive SCSITargetId      0
Drive SectorsPerTrack   63
Drive Size  647765475840 bytes
Drive TotalCylinders    78753
Drive TotalSectors      1265166945
Drive TotalTracks 20082015
Drive TracksPerCylinder 255

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
Partition   Disk #4, Partition #1
Partition Size    26.00 GB (27,916,600,320 bytes)
Starting Offset   Not Available
```

```
Drive Description \\.\PHYSICALDRIVE4
Drive Manufacturer      Not Available
Drive Model Not Available
Drive BytesPerSector    512
Drive MediaLoaded True
Drive MediaType   Fixed hard disk media
Drive Partitions  3
Drive SCSIBus     4
Drive SCSILogicalUnit   0
Drive SCSIPort    5
Drive SCSITargetId      0
Drive SectorsPerTrack   63
Drive Size  647765475840 bytes
Drive TotalCylinders    78753
Drive TotalSectors      1265166945
Drive TotalTracks 20082015
Drive TracksPerCylinder 255

Drive S:
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
Partition   Disk #1, Partition #0
Partition Size    54.00 GB (57,979,966,464 bytes)
Starting Offset   32256 bytes
Drive Description \\.\PHYSICALDRIVE1
Drive Manufacturer      Not Available
Drive Model Not Available
Drive BytesPerSector    512
Drive MediaLoaded True
Drive MediaType   Fixed hard disk media
Drive Partitions  1
Drive SCSIBus     4
Drive SCSILogicalUnit   0
Drive SCSIPort    2
Drive SCSITargetId      0
Drive SectorsPerTrack   63
Drive Size  89959887360 bytes
Drive TotalCylinders    10937
Drive TotalSectors      175702905
Drive TotalTracks 2788935
Drive TracksPerCylinder 255

Drive U:
Description Local Fixed Disk
Compressed  False
File System NTFS
Size  530.78 GB (569,921,372,160 bytes)
Free Space  470.58 GB (505,279,741,952 bytes)
Volume Name
Volume Serial Number    C46C90D7
```

```
Partition   Disk #4, Partition #2
Partition Size    530.78 GB (569,921,425,920 bytes)
Starting Offset   Not Available
Drive Description \\.\PHYSICALDRIVE4
Drive Manufacturer      Not Available
Drive Model Not Available
Drive BytesPerSector    512
Drive MediaLoaded True
Drive MediaType   Fixed hard disk media
Drive Partitions  3
Drive SCSIBus     4
Drive SCSILogicalUnit   0
Drive SCSIPort    5
Drive SCSITargetId      0
Drive SectorsPerTrack   63
Drive Size  647765475840 bytes
Drive TotalCylinders    78753
Drive TotalSectors      1265166945
Drive TotalTracks 20082015
Drive TracksPerCylinder 255

Drive X:
Description Local Fixed Disk
Compressed  False
File System NTFS
Size  530.78 GB (569,921,372,160 bytes)
Free Space  470.58 GB (505,279,741,952 bytes)
Volume Name
Volume Serial Number    8C54BE1A
Partition   Disk #2, Partition #2
Partition Size    530.78 GB (569,921,425,920 bytes)
Starting Offset   Not Available
Drive Description \\.\PHYSICALDRIVE2
Drive Manufacturer      Not Available
Drive Model Not Available
Drive BytesPerSector    512
Drive MediaLoaded True
Drive MediaType   Fixed hard disk media
Drive Partitions  3
Drive SCSIBus     4
Drive SCSILogicalUnit   0
Drive SCSIPort    3
Drive SCSITargetId      0
Drive SectorsPerTrack   63
Drive Size  647765475840 bytes
Drive TotalCylinders    78753
Drive TotalSectors      1265166945
Drive TotalTracks 20082015
Drive TracksPerCylinder 255

Drive Y:
Description Local Fixed Disk
Compressed  False
File System NTFS
Size  530.78 GB (569,921,372,160 bytes)
```

```
Free Space  470.58 GB (505,279,741,952 bytes)
Volume Name
Volume Serial Number    C4600A11
Partition   Disk #3, Partition #2
Partition Size    530.78 GB (569,921,425,920 bytes)
Starting Offset   Not Available
Drive Description \\.\PHYSICALDRIVE3
Drive Manufacturer      Not Available
Drive Model Not Available
Drive BytesPerSector    512
Drive MediaLoaded True
Drive MediaType   Fixed hard disk media
Drive Partitions  3
Drive SCSIBus     4
Drive SCSILogicalUnit   0
Drive SCSIPort    4
Drive SCSITargetId      0
Drive SectorsPerTrack   63
Drive Size  647765475840 bytes
Drive TotalCylinders    78753
Drive TotalSectors      1265166945
Drive TotalTracks 20082015
Drive TracksPerCylinder 255


[SCSI]

Item  Value
Name  Adaptec AIC-7899 Ultra160/m PCI SCSI Card
Caption     Adaptec AIC-7899 Ultra160/m PCI SCSI Card
Driver      adpu160m
Status      OK
PNP Device ID
      PCI\VEN_9005&DEV_00CF&SUBSYS_009C1028&REV_01\3&13C0B0C5&0&28
Device ID
      PCI\VEN_9005&DEV_00CF&SUBSYS_009C1028&REV_01\3&13C0B0C5&0&28
Device Map  Not Available
Index Not Available
Max Number Controlled   Not Available
IRQ Number  17
I/O Port    0xF800-0xF8FF
Driver      c:\winnt\system32\drivers\adpu160m.sys (64432, v3.10a)

Name  Adaptec AIC-7899 Ultra160/m PCI SCSI Card
Caption     Adaptec AIC-7899 Ultra160/m PCI SCSI Card
Driver      adpu160m
Status      OK
PNP Device ID
      PCI\VEN_9005&DEV_00CF&SUBSYS_009C1028&REV_01\3&13C0B0C5&0&29
Device ID
      PCI\VEN_9005&DEV_00CF&SUBSYS_009C1028&REV_01\3&13C0B0C5&0&29
Device Map  Not Available
Index Not Available
Max Number Controlled   Not Available
IRQ Number  18
```

```
I/O Port    0xF400-0xF4FF
Driver      c:\winnt\system32\drivers\adpu160m.sys (64432, v3.10a)

Name  Mylex eXtremeRAID 2000 Disk Array Controller
Caption     Mylex eXtremeRAID 2000 Disk Array Controller
Driver      dac2w2k
Status      OK
PNP Device ID
      PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&254DAD54&0&4040
Device ID
      PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&254DAD54&0&4040
Device Map  Not Available
Index Not Available
Max Number Controlled   Not Available
IRQ Number  22
I/O Port    0xDC80-0xDCFF
Driver      c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name  Mylex eXtremeRAID 2000 Disk Array Controller
Caption     Mylex eXtremeRAID 2000 Disk Array Controller
Driver      dac2w2k
Status      OK
PNP Device ID
      PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&94A037D&0&4048
Device ID
      PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&94A037D&0&4048
Device Map  Not Available
Index Not Available
Max Number Controlled   Not Available
IRQ Number  23
I/O Port    0xCC80-0xCCFF
Driver      c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name  Mylex eXtremeRAID 2000 Disk Array Controller
Caption     Mylex eXtremeRAID 2000 Disk Array Controller
Driver      dac2w2k
Status      OK
PNP Device ID
      PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&15BEFF34&0&4050
Device ID
      PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&15BEFF34&0&4050
Device Map  Not Available
Index Not Available
Max Number Controlled   Not Available
IRQ Number  24
I/O Port    0xBC80-0xBCFF
Driver      c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name  Mylex eXtremeRAID 2000 Disk Array Controller
Caption     Mylex eXtremeRAID 2000 Disk Array Controller
Driver      dac2w2k
Status      OK
PNP Device ID
      PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&18D8B19D&0&4058
```

```
Device ID
      PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&18D8B19D&0&4058
Device Map  Not Available
Index Not Available
Max Number Controlled   Not Available
IRQ Number  25
I/O Port    0xAC80-0xACFF
Driver      c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)


[Printing]

Name  Port Name   Server Name
No printing information

[Problem Devices]

Device      PNP Device ID     Error Code
Dell 12 BAY U2W CU SCSI Processor Device
      SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0209\5&2D708BC0&0&
0F0   28
Dell 12 BAY U2W CU SCSI Processor Device
      SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0209\5&2D708BC0&0&
1F0   28
Dell 12 BAY U2W CU SCSI Processor Device
      SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0209\5&2CB960EC&0&
0F0   28
Dell 12 BAY U2W CU SCSI Processor Device
      SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0209\5&2CB960EC&0&
1F0   28
Dell 12 BAY U2W CU SCSI Processor Device
      SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0209\5&2CB960EC&0&
3F0   28
Dell 12 BAY U2W CU SCSI Processor Device
      SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0209\5&3CAF76E&0&0
F0    28
Dell 12 BAY U2W CU SCSI Processor Device
      SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0209\5&3CAF76E&0&1
F0    28
Dell 12 BAY U2W CU SCSI Processor Device
      SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0209\5&3CAF76E&0&3
F0    28
Dell 12 BAY U2W CU SCSI Processor Device
      SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0209\5&84D9F80&0&0
F0    28
Dell 12 BAY U2W CU SCSI Processor Device
      SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0209\5&84D9F80&0&1
F0    28
Dell 12 BAY U2W CU SCSI Processor Device
      SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0209\5&84D9F80&0&3
F0    28

[USB]

Device      PNP Device ID
```

```
No USB Devices

[Software Environment]

[ Following are sub-categories of this main category ]

[Drivers]

Name  Description File  Type  Started     Start Mode  State Status
      Error Control     Accept Pause      Accept Stop
abiosdsk    Abiosdsk    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Ignore      False False
abp480n5    abp480n5    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
acpi  Microsoft ACPI Driver   c:\winnt\system32\drivers\acpi.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
acpiec      ACPIEC      c:\winnt\system32\drivers\acpiec.sys
      Kernel Driver     False Disabled    Stopped     OK    Normal
      False False
adpu160m    adpu160m    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     c:\winnt\system32\drivers\aic78xx.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
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 atapi c:\winnt\system32\drivers\atapi.sys Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
atdisk      Atdisk      Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Ignore      False False
atirage     atirage     c:\winnt\system32\drivers\atiragem.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
      False Disabled    Stopped     OK    Normal      False False
cdrom CD-ROM Driver     c:\winnt\system32\drivers\cdrom.sys Kernel
Driver      False System      Stopped     OK    Normal      False False
changer     Changer     Not Available     Kernel Driver     False
      System      Stopped     OK    Ignore      False False
cpqarray    Cpqarray    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
cpqarry2    cpqarry2    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
cpqfcalm    cpqfcalm    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
cpqfws2e    cpqfws2e    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
dac2w2k     dac2w2k     c:\winnt\system32\drivers\dac2w2k.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
dac960nt    dac960nt    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
deckzpsx    deckzpsx    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
dfsdriver   DfsDriver   c:\winnt\system32\drivers\dfs.sys   File System
Driver      True  Boot  Running     OK    Normal      False True
disk  Disk Driver c:\winnt\system32\drivers\disk.sys  Kernel Driver
      True  Boot  Running     OK    Normal      False True
diskperf    Diskperf    c:\winnt\system32\drivers\diskperf.sys
      Kernel Driver     False Disabled    Stopped     OK    Normal
      False False
dmboot      dmboot      c:\winnt\system32\drivers\dmboot.sys
      Kernel Driver     False Disabled    Stopped     OK    Normal
      False False
dmio  Logical Disk Manager Driver   c:\winnt\system32\drivers\dmio.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
dmload      dmload      c:\winnt\system32\drivers\dmload.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
e1000 Intel(R) PRO/1000 Gigabit Server Adapter Driver
      c:\winnt\system32\drivers\e1000nt5.sys    Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
```

```
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   Floppy Disk Controller Driver c:\winnt\system32\drivers\fdc.sys
      Kernel Driver     True  Manual      Running     OK    Normal
      False True
fireport    fireport    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
flashpnt    flashpnt    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
flpydisk    Floppy Disk Driver
      c:\winnt\system32\drivers\flpydisk.sys    Kernel Driver     True
      Manual      Running     OK    Normal      False True
ftdisk      Volume Manager Driver
      c:\winnt\system32\drivers\ftdisk.sys      Kernel Driver     True
      Boot  Running     OK    Normal      False True
gamdrv      gamdrv      c:\winnt\system32\drivers\gamdrv.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
gnindis     cLAN NDIS Driver  c:\winnt\system32\drivers\gnindis.sys
      Kernel Driver     False Auto  Stopped     OK    Normal      False
      False
gnivia      cLAN VIA Driver   c:\winnt\system32\drivers\gnivia.sys
      Kernel Driver     True  Auto  Running     OK    Normal      False
      True
gpc   Generic Packet Classifier     c:\winnt\system32\drivers\msgpc.sys
      Kernel Driver     True  Manual      Running     OK    Normal
      False True
i8042prt    i8042 Keyboard and PS/2 Mouse Port Driver
      c:\winnt\system32\drivers\i8042prt.sys    Kernel Driver     True
      System      Running     OK    Normal      False True
ini910u     ini910u     Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
intelide    IntelIde    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
ipfilterdriver    IP Traffic Filter Driver
      c:\winnt\system32\drivers\ipfltdrv.sys    Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
ipinip      IP in IP Tunnel Driver
      c:\winnt\system32\drivers\ipinip.sys      Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
ipnat IP Network Address Translator c:\winnt\system32\drivers\ipnat.sys
      Kernel Driver     False Manual      Stopped     OK    Normal
      False False
ipsec IPSEC driver      c:\winnt\system32\drivers\ipsec.sys Kernel
Driver      False Manual      Stopped     OK    Normal      False False
ipsraidn    ipsraidn    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
```

```
isapnp      PnP ISA/EISA Bus Driver
      c:\winnt\system32\drivers\isapnp.sys      Kernel Driver     True
      Boot  Running     OK    Critical    False True
kbdclass    Keyboard Class Driver
      c:\winnt\system32\drivers\kbdclass.sys    Kernel Driver     True
      System      Running     OK    Normal      False True
ksecdd      KSecDD      c:\winnt\system32\drivers\ksecdd.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
lbrtfdc     lbrtfdc     Not Available     Kernel Driver     False
      System      Stopped     OK    Ignore      False False
lp6nds35    lp6nds35    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
macdisk     macdisk     c:\winnt\system32\drivers\mac2w2k.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
mnmdd mnmdd c:\winnt\system32\drivers\mnmdd.sys Kernel Driver     True
      System      Running     OK    Ignore      False True
modem Modem c:\winnt\system32\drivers\modem.sys Kernel Driver     False
      Manual      Stopped     OK    Ignore      False False
mouclass    Mouse Class Driver
      c:\winnt\system32\drivers\mouclass.sys    Kernel Driver     True
      System      Running     OK    Normal      False True
mountmgr    MountMgr    c:\winnt\system32\drivers\mountmgr.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
mraid35x    mraid35x    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
mrxsmb      MRXSMB      c:\winnt\system32\drivers\mrxsmb.sys      File
System Driver     True  System      Running     OK    Normal      False
      True
msfs  Msfs  c:\winnt\system32\drivers\msfs.sys  File System Driver
      True  System      Running     OK    Normal      False True
mskssrv     Microsoft Streaming Service Proxy
      c:\winnt\system32\drivers\mskssrv.sys     Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
mspclock    Microsoft Streaming Clock Proxy
      c:\winnt\system32\drivers\mspclock.sys    Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
mspqm Microsoft Streaming Quality Manager Proxy
      c:\winnt\system32\drivers\mspqm.sys Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
mup   Mup   c:\winnt\system32\drivers\mup.sys   File System Driver
      True  Boot  Running     OK    Normal      False True
ncrc710     Ncrc710     Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
ndis  NDIS System Driver      c:\winnt\system32\drivers\ndis.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
ndistapi    Remote Access NDIS TAPI Driver
      c:\winnt\system32\drivers\ndistapi.sys    Kernel Driver     True
      Manual      Running     OK    Normal      False True
ndiswan     Remote Access NDIS WAN Driver
      c:\winnt\system32\drivers\ndiswan.sys     Kernel Driver     True
      Manual      Running     OK    Normal      False True
```

```
ndproxy     NDIS Proxy  c:\winnt\system32\drivers\ndproxy.sys
      Kernel Driver     True  Manual      Running     OK    Normal
      False True
netbios     NetBIOS Interface c:\winnt\system32\drivers\netbios.sys
      File System Driver      True  System      Running     OK
      Normal      False True
netbt NetBios over Tcpip      c:\winnt\system32\drivers\netbt.sys
      Kernel Driver     True  System      Running     OK    Normal
      False True
netdetect   NetDetect   c:\winnt\system32\drivers\netdtect.sys
      Kernel Driver     False Manual      Stopped     OK    Normal
      False False
npfs  Npfs  c:\winnt\system32\drivers\npfs.sys  File System Driver
      True  System      Running     OK    Normal      False True
ntfs  Ntfs  c:\winnt\system32\drivers\ntfs.sys  File System Driver
      True  Disabled    Running     OK    Normal      False True
null  Null  c:\winnt\system32\drivers\null.sys  Kernel Driver     True
      System      Running     OK    Normal      False True
nwlnkflt    IPX Traffic Filter Driver
      c:\winnt\system32\drivers\nwlnkflt.sys    Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
nwlnkfwd    IPX Traffic Forwarder Driver
      c:\winnt\system32\drivers\nwlnkfwd.sys    Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
parallel    Parallel class driver
      c:\winnt\system32\drivers\parallel.sys    Kernel Driver     True
      Manual      Running     OK    Normal      False True
parport     Parallel port driver
      c:\winnt\system32\drivers\parport.sys     Kernel Driver     True
      System      Running     OK    Ignore      False True
partmgr     PartMgr     c:\winnt\system32\drivers\partmgr.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
parvdm      ParVdm      c:\winnt\system32\drivers\parvdm.sys
      Kernel Driver     True  Auto  Running     OK    Ignore      False
      True
pci   PCI Bus Driver    c:\winnt\system32\drivers\pci.sys   Kernel
Driver      True  Boot  Running     OK    Critical    False True
pcidump     PCIDump     Not Available     Kernel Driver     False
      System      Stopped     OK    Ignore      False False
pciide      PCIIde      Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
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
ql2200      ql2200      c:\winnt\system32\drivers\ql2200.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
rasacd      Remote Access Auto Connection Driver
      c:\winnt\system32\drivers\rasacd.sys      Kernel Driver     True
      System      Running     OK    Normal      False True
rasl2tp     WAN Miniport (L2TP)
      c:\winnt\system32\drivers\rasl2tp.sys     Kernel Driver     True
      Manual      Running     OK    Normal      False True
raspti      Direct Parallel   c:\winnt\system32\drivers\raspti.sys
      Kernel Driver     True  Manual      Running     OK    Normal
      False True
rca   Microsoft Streaming Network Raw Channel Access
      c:\winnt\system32\drivers\rca.sys   Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
rdbss Rdbss c:\winnt\system32\drivers\rdbss.sys File System Driver
      True  System      Running     OK    Normal      False True
rdpwd RDPWD c:\winnt\system32\drivers\rdpwd.sys Kernel Driver     False
      Manual      Stopped     OK    Ignore      False False
redbook     Digital CD Audio Playback Filter Driver
      c:\winnt\system32\drivers\redbook.sys     Kernel Driver     False
      System      Stopped     OK    Normal      False False
serenum     Serenum Filter Driver
      c:\winnt\system32\drivers\serenum.sys     Kernel Driver     True
      Manual      Running     OK    Normal      False True
serial      Serial port driver
      c:\winnt\system32\drivers\serial.sys      Kernel Driver     True
      System      Running     OK    Ignore      False True
sfloppy     Sfloppy     c:\winnt\system32\drivers\sfloppy.sys
      Kernel Driver     False System      Stopped     OK    Ignore
      False False
sglfb sglfb Not Available     Kernel Driver     False System
      Stopped     OK    Normal      False False
simbad      Simbad      Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
sparrow     Sparrow     Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
srv   Srv   c:\winnt\system32\drivers\srv.sys   File System Driver
      True  Manual      Running     OK    Normal      False True
```

```
swenum      Software Bus Driver
      c:\winnt\system32\drivers\swenum.sys      Kernel Driver     True
      Manual      Running     OK    Normal      False True
symc810     symc810     Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
symc8xx     symc8xx     Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
sym_hi      sym_hi      Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
tcpip TCP/IP Protocol Driver  c:\winnt\system32\drivers\tcpip.sys
      Kernel Driver     True  System      Running     OK    Normal
      False True
tdasync     TDASYNC     c:\winnt\system32\drivers\tdasync.sys
      Kernel Driver     False Manual      Stopped     OK    Ignore
      False False
tdipx TDIPX c:\winnt\system32\drivers\tdipx.sys Kernel Driver     False
      Manual      Stopped     OK    Ignore      False False
tdnetb      TDNETB      c:\winnt\system32\drivers\tdnetb.sys
      Kernel Driver     False Manual      Stopped     OK    Ignore
      False False
tdpipe      TDPIPE      c:\winnt\system32\drivers\tdpipe.sys
      Kernel Driver     False Manual      Stopped     OK    Ignore
      False False
tdspx TDSPX c:\winnt\system32\drivers\tdspx.sys Kernel Driver     False
      Manual      Stopped     OK    Ignore      False False
tdtcp TDTCP c:\winnt\system32\drivers\tdtcp.sys Kernel Driver     False
      Manual      Stopped     OK    Ignore      False False

termdd      Terminal Device Driver
      c:\winnt\system32\drivers\termdd.sys      Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
tga   tga   Not Available     Kernel Driver     False System
      Stopped     OK    Ignore      False False
udfs  Udfs  c:\winnt\system32\drivers\udfs.sys  File System Driver
      False Disabled    Stopped     OK    Normal      False False
ultra66     ultra66     Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
update      Microcode Update Driver
      c:\winnt\system32\drivers\update.sys      Kernel Driver     True
      Manual      Running     OK    Normal      False True
vgasave     VgaSave     c:\winnt\system32\drivers\vga.sys   Kernel
Driver      True  System      Running     OK    Ignore      False True
wanarp      Remote Access IP ARP Driver
      c:\winnt\system32\drivers\wanarp.sys      Kernel Driver     True
      Manual      Running     OK    Normal      False True
wdica WDICA Not Available     Kernel Driver     False Manual
      Stopped     OK    Ignore      False False

[Environment Variables]

Variable    Value User Name
ComSpec     %SystemRoot%\system32\cmd.exe <SYSTEM>
HOME  C:/   <SYSTEM>
NUMBER_OF_PROCESSORS    4     <SYSTEM>
OS    Windows_NT  <SYSTEM>
```

```
Os2LibPath  %SystemRoot%\system32\os2\dll;      <SYSTEM>
Path
      C:\MKS\mksnt;C:\WINNT\system32;C:\WINNT;C:\WINNT\System32\Wbem;C:
\PROGRA~1\MICROS~2\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 6 Model 10 Stepping 0, GenuineIntel
      <SYSTEM>
PROCESSOR_LEVEL   6     <SYSTEM>
PROCESSOR_REVISION      0a00  <SYSTEM>
ROOTDIR     C:/MKS      <SYSTEM>
SHELL C:/MKS/mksnt/sh.exe     <SYSTEM>
TEMP  %SystemRoot%\TEMP <SYSTEM>
TMP   %SystemRoot%\TEMP <SYSTEM>
TMPDIR      C:/WINNT/TEMP     <SYSTEM>
windir      %SystemRoot%      <SYSTEM>
TEMP  %USERPROFILE%\Local Settings\Temp   PE6400_01\Administrator
TMP   %USERPROFILE%\Local Settings\Temp   PE6400_01\Administrator

[Jobs]

[ Following are sub-categories of this main category ]

[Print]

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

[Network Connections]

Local Name  Remote Name Type  Status      User Name
No network connections information

[Running Tasks]

Name  Path  Process ID  Priority    Min Working Set   Max Working Set
      Start Time  Version     Size  File Date
system idle process     Not Available     0     0     Not Available
      Not Available     Not Available     Unknown     Unknown
      Unknown
system      Not Available     8     8     0     1413120     Not
Available   Unknown     Unknown     Unknown
smss.exe    c:\winnt\system32\smss.exe    172   11    204800
      1413120     10/12/2000 11:49:47 AM  5.00.2195.31      44.27 KB
(45,328 bytes)    12/7/1999 6:00:00 AM
csrss.exe   Not Available     196   13    Not Available     Not
Available   10/12/2000 11:49:51 AM  Unknown     Unknown     Unknown
```

```
winlogon.exe      c:\winnt\system32\winlogon.exe      216   13
      204800      1413120     10/12/2000 11:49:52 AM  5.00.2195.1600
      172.77 KB (176,912 bytes)     12/7/1999 6:00:00 AM
services.exe      c:\winnt\system32\services.exe      244   9
      204800      1413120     10/12/2000 11:49:54 AM  5.00.2134.1 86.77
KB (88,848 bytes) 12/7/1999 6:00:00 AM
lsass.exe   c:\winnt\system32\lsass.exe   256   13    204800
      1413120     10/12/2000 11:49:54 AM  5.00.2195.1620    32.77 KB
(33,552 bytes)    12/7/1999 6:00:00 AM
svchost.exe c:\winnt\system32\svchost.exe 412   8     204800
      1413120     10/12/2000 11:49:57 AM  5.00.2134.1 7.77 KB (7,952
bytes)      12/7/1999 6:00:00 AM
svchost.exe c:\winnt\system32\svchost.exe 612   8     204800
      1413120     10/12/2000 11:50:00 AM  5.00.2134.1 7.77 KB (7,952
bytes)      12/7/1999 6:00:00 AM
winmgmt.exe c:\winnt\system32\wbem\winmgmt.exe  628   8     204800
      1413120     10/12/2000 11:50:01 AM  1.50.1085.0009    192.08 KB
(196,685 bytes)   9/15/2000 3:20:22 PM
explorer.exe      c:\winnt\explorer.exe   732   8     204800
      1413120     10/12/2000 11:50:09 AM  5.00.3103.1000    237.27 KB
(242,960 bytes)   9/15/2000 3:20:20 PM
svchost.exe c:\winnt\system32\svchost.exe 900   8     204800
      1413120     10/12/2000 11:50:16 AM  5.00.2134.1 7.77 KB (7,952
bytes)      12/7/1999 6:00:00 AM
cmd.exe     c:\winnt\system32\cmd.exe     948   8     204800
      1413120     10/13/2000 6:39:49 PM   5.00.2195.1600    230.77 KB
(236,304 bytes)   12/7/1999 6:00:00 AM
mmc.exe     c:\winnt\system32\mmc.exe     672   8     204800
      1413120     10/15/2000 5:00:53 PM   5.00.2153.1 589.27 KB
(603,408 bytes)   12/7/1999 6:00:00 AM
rsvp.exe    c:\winnt\system32\rsvp.exe    684   8     204800
      1413120     10/15/2000 5:02:14 PM   5.00.2167.1 172.77 KB
(176,912 bytes)   12/7/1999 6:00:00 AM

[Loaded Modules]

Name  Version     Size  File Date   Manufacturer      Path
traffic.dll 5.00.2139.1 30.77 KB (31,504 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\traffic.dll
rsvp.exe    5.00.2167.1 172.77 KB (176,912 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\rsvp.exe
wbemprox.dll      1.50.1085.0015    40.08 KB (41,040 bytes) 9/15/2000
3:20:23 PM  Microsoft Corporation   c:\winnt\system32\wbem\wbemprox.dll
mlang.dll   5.00.3103.1000    510.77 KB (523,024 bytes)     9/15/2000
3:20:13 PM  Microsoft Corporation   c:\winnt\system32\mlang.dll
rassapi.dll 5.00.2188.1 14.27 KB (14,608 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\rassapi.dll
adsnt.dll   5.00.2195.1600    194.27 KB (198,928 bytes)     9/15/2000
3:20:18 PM  Microsoft Corporation   c:\winnt\system32\adsnt.dll
dbghelp.dll 5.00.2195.1 159.27 KB (163,088 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\dbghelp.dll
localsec.dll      5.00.2195.1340    227.27 KB (232,720 bytes)
      9/15/2000 3:20:13 PM    Microsoft Corporation
      c:\winnt\system32\localsec.dll
```

```
devmgr.dll  5.00.2166.1 215.77 KB (220,944 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\devmgr.dll
filemgmt.dll      5.00.2134.1 287.27 KB (294,160 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\filemgmt.dll
pdh.dll     5.00.2195.1600    143.27 KB (146,704 bytes)     9/15/2000
3:20:09 PM  Microsoft Corporation   c:\winnt\system32\pdh.dll
smlogcfg.dll      5.00.2163.1 273.27 KB (279,824 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\smlogcfg.dll
cabinet.dll 5.00.2147.1 54.77 KB (56,080 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\cabinet.dll
msinfo32.dll      5.00.2177.1 312.27 KB (319,760 bytes)     9/13/2000
11:18:01 AM Microsoft Corporation   c:\program files\common
files\microsoft shared\msinfo\msinfo32.dll
riched20.dll      5.30.23.1203      421.27 KB (431,376 bytes)
      9/15/2000 3:20:08 PM    Microsoft Corporation
      c:\winnt\system32\riched20.dll
riched32.dll      5.00.2134.1 3.77 KB (3,856 bytes)   12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\riched32.dll
els.dll     5.00.2175.1 151.27 KB (154,896 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\els.dll
ntmsmgr.dll 1,0,0,1     427.77 KB (438,032 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation and HighGround Systems, Inc.
      c:\winnt\system32\ntmsmgr.dll
mmfutil.dll 1.50.1085.0000    32.06 KB (32,829 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\mmfutil.dll
logdrive.dll      1.50.1085.0000    200.06 KB (204,863 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\logdrive.dll
dfrgres.dll 5.00.2150.1 27.50 KB (28,160 bytes) 12/7/1999 6:00:00 AM
      Executive Software International, Inc.
      c:\winnt\system32\dfrgres.dll
dfrgsnap.dll      5.00.2195.31      41.77 KB (42,768 bytes) 9/15/2000
3:20:16 PM  Executive Software International, Inc.
      c:\winnt\system32\dfrgsnap.dll
dmdskres.dll      2191.1.296.2      119.00 KB (121,856 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corp., VERITAS Software
      c:\winnt\system32\dmdskres.dll
dmutil.dll  2195.23.297.2     42.27 KB (43,280 bytes) 9/15/2000 3:20:16
PM    VERITAS Software Corp.  c:\winnt\system32\dmutil.dll
ntmsapi.dll 5.00.1948.1 50.27 KB (51,472 bytes) 9/15/2000 3:20:09 PM
      Microsoft Corporation   c:\winnt\system32\ntmsapi.dll
dmdskmgr.dll      2195.1600.297.3   160.27 KB (164,112 bytes)
      9/15/2000 3:20:16 PM    Microsoft Corp., VERITAS Software
      c:\winnt\system32\dmdskmgr.dll
mycomput.dll      5.00.2134.1 107.77 KB (110,352 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\mycomput.dll
comdlg32.dll      5.00.3103.1000    236.77 KB (242,448 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\comdlg32.dll
mmcndmgr.dll      5.00.2178.1 815.27 KB (834,832 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\mmcndmgr.dll
msvcp50.dll 5.00.7051   552.50 KB (565,760 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\msvcp50.dll
mfc42u.dll  6.00.8665.0 972.05 KB (995,384 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\mfc42u.dll
```

```
mmc.exe     5.00.2153.1 589.27 KB (603,408 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\mmc.exe
cmd.exe     5.00.2195.1600    230.77 KB (236,304 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\cmd.exe
tapisrv.dll 5.00.2186.1 168.77 KB (172,816 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\tapisrv.dll
faxshell.dll      5.00.2134.1 8.27 KB (8,464 bytes)   12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\faxshell.dll
msacm32.dll 5.00.2134.1 65.27 KB (66,832 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\msacm32.dll
avifil32.dll      5.00.2134.1 76.27 KB (78,096 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\avifil32.dll
msvfw32.dll 5.00.2134.1 113.77 KB (116,496 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\msvfw32.dll
docprop2.dll      5.00.2178.1 297.77 KB (304,912 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\docprop2.dll
query.dll   5.00.2195.1600    1.35 MB (1,411,344 bytes)     9/15/2000
3:20:08 PM  Microsoft Corporation   c:\winnt\system32\query.dll
wininet.dll 5.00.3103.1000    456.77 KB (467,728 bytes)     9/15/2000
3:20:06 PM  Microsoft Corporation   c:\winnt\system32\wininet.dll
shdoclc.dll 5.00.3103.1000    324.50 KB (332,288 bytes)     9/15/2000
3:20:07 PM  Microsoft Corporation   c:\winnt\system32\shdoclc.dll
mydocs.dll  5.00.2920.0000    55.77 KB (57,104 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\mydocs.dll
urlmon.dll  5.00.3103.1000    440.77 KB (451,344 bytes)     9/15/2000
3:20:06 PM  Microsoft Corporation   c:\winnt\system32\urlmon.dll
ntshrui.dll 5.00.2134.1 46.77 KB (47,888 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\ntshrui.dll
linkinfo.dll      5.00.2134.1 15.77 KB (16,144 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\linkinfo.dll
powrprof.dll      5.00.3103.1000    13.27 KB (13,584 bytes) 9/15/2000
3:20:08 PM  Microsoft Corporation   c:\winnt\system32\powrprof.dll
batmeter.dll      5.00.2920.0000    20.27 KB (20,752 bytes) 9/15/2000
3:20:18 PM  Microsoft Corporation   c:\winnt\system32\batmeter.dll
stobject.dll      5.00.2195.1387    79.27 KB (81,168 bytes) 9/15/2000
3:20:07 PM  Microsoft Corporation   c:\winnt\system32\stobject.dll
webcheck.dll      5.00.3103.1000    251.77 KB (257,808 bytes)
      9/15/2000 3:20:06 PM    Microsoft Corporation
      c:\winnt\system32\webcheck.dll
browselc.dll      5.00.3103.1000    34.50 KB (35,328 bytes) 9/15/2000
3:20:18 PM  Microsoft Corporation   c:\winnt\system32\browselc.dll
browseui.dll      5.00.3103.1000    788.77 KB (807,696 bytes)
      9/15/2000 3:20:18 PM    Microsoft Corporation
      c:\winnt\system32\browseui.dll
shdocvw.dll 5.00.3103.1000    1.05 MB (1,104,144 bytes)     9/15/2000
3:20:07 PM  Microsoft Corporation   c:\winnt\system32\shdocvw.dll
explorer.exe      5.00.3103.1000    237.27 KB (242,960 bytes)
      9/15/2000 3:20:20 PM    Microsoft Corporation
      c:\winnt\explorer.exe
netui1.dll  5.00.2134.1 210.27 KB (215,312 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\netui1.dll
netui0.dll  5.00.2134.1 70.27 KB (71,952 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\netui0.dll
ntlanman.dll      5.00.2157.1 35.27 KB (36,112 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\ntlanman.dll
```

```
wshnetbs.dll      5.00.2134.1 7.77 KB (7,952 bytes)   12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\wshnetbs.dll
rapilib.dll 5.00.2167.1 25.27 KB (25,872 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\rapilib.dll
rsvpsp.dll  5.00.2167.1 74.77 KB (76,560 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\rsvpsp.dll
ntmarta.dll 5.00.2158.1 98.77 KB (101,136 bytes)      12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\ntmarta.dll
provthrd.dll      1.50.1085.0000    68.07 KB (69,708 bytes) 9/13/2000
11:17:53 AM Microsoft Corporation   c:\winnt\system32\wbem\provthrd.dll
ntevt.dll   1.50.1085.0000    192.06 KB (196,669 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\wbem\ntevt.dll
perfos.dll  5.00.2155.1 21.27 KB (21,776 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\perfos.dll
psapi.dll   5.00.2134.1 28.27 KB (28,944 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\psapi.dll
framedyn.dll      1.50.1085.0000    164.05 KB (167,992 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\wbem\framedyn.dll
cimwin32.dll      1.50.1085.0016    1.02 MB (1,073,232 bytes)
      9/15/2000 3:20:23 PM    Microsoft Corporation
      c:\winnt\system32\wbem\cimwin32.dll
wbemsvc.dll 1.50.1085.0007    40.07 KB (41,036 bytes) 9/15/2000 3:20:23
PM    Microsoft Corporation   c:\winnt\system32\wbem\wbemsvc.dll
wbemess.dll 1.50.1085.0007    364.07 KB (372,804 bytes)     9/15/2000
3:20:23 PM  Microsoft Corporation   c:\winnt\system32\wbem\wbemess.dll
fastprox.dll      1.50.1085.0007    144.08 KB (147,536 bytes)
      9/15/2000 3:20:23 PM    Microsoft Corporation
      c:\winnt\system32\wbem\fastprox.dll
wbemcore.dll      1.50.1085.0008    628.07 KB (643,140 bytes)
      9/15/2000 3:20:23 PM    Microsoft Corporation
      c:\winnt\system32\wbem\wbemcore.dll
wbemcomn.dll      1.50.1085.0007    692.07 KB (708,675 bytes)
      9/15/2000 3:20:23 PM    Microsoft Corporation
      c:\winnt\system32\wbem\wbemcomn.dll
winmgmt.exe 1.50.1085.0009    192.08 KB (196,685 bytes)     9/15/2000
3:20:22 PM  Microsoft Corporation   c:\winnt\system32\wbem\winmgmt.exe
ntmsdba.dll 5.00.2195.1600    167.77 KB (171,792 bytes)     9/15/2000
3:20:09 PM  Microsoft Corporation   c:\winnt\system32\ntmsdba.dll
rasdlg.dll  5.00.2194.1 514.27 KB (526,608 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\rasdlg.dll
netcfgx.dll 5.00.2195.1618    533.77 KB (546,576 bytes)     9/15/2000
3:20:10 PM  Microsoft Corporation   c:\winnt\system32\netcfgx.dll
sens.dll    5.00.2163.1 36.77 KB (37,648 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\sens.dll
rasmans.dll 5.00.2195.27      146.77 KB (150,288 bytes)     9/15/2000
3:20:08 PM  Microsoft Corporation   c:\winnt\system32\rasmans.dll
wmi.dll     5.00.2191.1 6.27 KB (6,416 bytes)   12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\wmi.dll
netshell.dll      5.00.2195.1600    456.77 KB (467,728 bytes)
      9/15/2000 3:20:10 PM    Microsoft Corporation
      c:\winnt\system32\netshell.dll
netman.dll  5.00.2195.1600    89.27 KB (91,408 bytes) 9/15/2000 3:20:10
PM    Microsoft Corporation   c:\winnt\system32\netman.dll
```

```
txfaux.dll  1999.9.3422.24    341.27 KB (349,456 bytes)     9/13/2000
6:15:49 AM  Microsoft Corporation   c:\winnt\system32\txfaux.dll
es.dll      1999.9.3422.21    231.77 KB (237,328 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\es.dll
ntmssvc.dll 5.00.2187.1 390.77 KB (400,144 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\ntmssvc.dll
rasadhlp.dll      5.00.2168.1 7.27 KB (7,440 bytes)   12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\rasadhlp.dll
winrnr.dll  5.00.2160.1 18.77 KB (19,216 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\winrnr.dll
rnr20.dll   5.00.2195.1207    35.77 KB (36,624 bytes) 9/15/2000 3:20:08
PM    Microsoft Corporation   c:\winnt\system32\rnr20.dll
wshtcpip.dll      5.00.2134.1 17.27 KB (17,680 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\wshtcpip.dll
dhcpcsvc.dll      5.00.2153.1 88.77 KB (90,896 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\dhcpcsvc.dll
tapi32.dll  5.00.2182.1 123.27 KB (126,224 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\tapi32.dll
rasman.dll  5.00.2188.1 54.77 KB (56,080 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\rasman.dll
rasapi32.dll      5.00.2188.1 189.77 KB (194,320 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\rasapi32.dll
iphlpapi.dll      5.00.2173.2 67.77 KB (69,392 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\iphlpapi.dll
msafd.dll   5.00.2195.1614    102.77 KB (105,232 bytes)     9/15/2000
3:20:13 PM  Microsoft Corporation   c:\winnt\system32\msafd.dll
rpcss.dll   5.00.2195.1600    229.27 KB (234,768 bytes)     9/15/2000
3:20:08 PM  Microsoft Corporation   c:\winnt\system32\rpcss.dll
svchost.exe 5.00.2134.1 7.77 KB (7,952 bytes)   12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\svchost.exe
scecli.dll  5.00.2191.1 105.27 KB (107,792 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\scecli.dll
atl.dll     3.00.8449   57.56 KB (58,938 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\atl.dll
certcli.dll 5.00.2175.1 132.27 KB (135,440 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\certcli.dll
mswsock.dll 5.00.2195.1207    62.77 KB (64,272 bytes) 9/15/2000 3:20:10
PM    Microsoft Corporation   c:\winnt\system32\mswsock.dll
ntdsatq.dll 5.00.2195.1284    31.27 KB (32,016 bytes) 9/15/2000 3:20:09
PM    Microsoft Corporation   c:\winnt\system32\ntdsatq.dll
ntdsa.dll   5.00.2195.1600    987.27 KB (1,010,960 bytes)   9/15/2000
3:20:09 PM  Microsoft Corporation   c:\winnt\system32\ntdsa.dll
kdcsvc.dll  5.00.2195.1284    133.77 KB (136,976 bytes)     9/15/2000
3:20:13 PM  Microsoft Corporation   c:\winnt\system32\kdcsvc.dll
sfmapi.dll  5.00.2134.1 38.77 KB (39,696 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\sfmapi.dll
rtutils.dll 5.00.2168.1 43.77 KB (44,816 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\rtutils.dll
activeds.dll      5.00.2172.1 172.77 KB (176,912 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\activeds.dll
mprapi.dll  5.00.2181.1 79.27 KB (81,168 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\mprapi.dll
rassfm.dll  5.00.2195.1179    21.27 KB (21,776 bytes) 9/15/2000 3:20:08
PM    Microsoft Corporation   c:\winnt\system32\rassfm.dll
```

```
mpr.dll     5.00.2195.1340    53.27 KB (54,544 bytes) 9/15/2000 3:20:13
PM    Microsoft Corporation   c:\winnt\system32\mpr.dll
schannel.dll      5.00.2195.1163    137.27 KB (140,560 bytes)
      7/21/2000 12:05:02 PM   Microsoft Corporation
      c:\winnt\system32\schannel.dll
netlogon.dll      5.00.2195.1600    348.27 KB (356,624 bytes)
      9/15/2000 3:20:10 PM    Microsoft Corporation
      c:\winnt\system32\netlogon.dll
msv1_0.dll  5.00.2195.1620    92.77 KB (94,992 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\msv1_0.dll
kerberos.dll      5.00.2195.1378    197.77 KB (202,512 bytes)
      9/15/2000 3:20:13 PM    Microsoft Corporation
      c:\winnt\system32\kerberos.dll
msprivs.dll 5.00.2154.1 41.50 KB (42,496 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\msprivs.dll
samsrv.dll  5.00.2195.1609    343.27 KB (351,504 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\samsrv.dll
lsasrv.dll  5.00.2195.1620    475.27 KB (486,672 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\lsasrv.dll
lsass.exe   5.00.2195.1620    32.77 KB (33,552 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\lsass.exe
esent.dll   6.0.3940.4  1.08 MB (1,135,888 bytes)     9/15/2000 3:20:15
PM    Microsoft Corporation   c:\winnt\system32\esent.dll
msi.dll     1.11.1314.0 1.72 MB (1,798,928 bytes)     9/15/2000 3:20:12
PM    Microsoft Corporation   c:\winnt\system32\msi.dll
adsldpc.dll 5.00.2195.1600    125.77 KB (128,784 bytes)     9/15/2000
3:20:18 PM  Microsoft Corporation   c:\winnt\system32\adsldpc.dll
appmgmts.dll      5.00.2168.1 117.77 KB (120,592 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\appmgmts.dll
wmicore.dll 5.00.2178.1 70.77 KB (72,464 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\wmicore.dll
psbase.dll  5.00.2195.1600    111.77 KB (114,448 bytes)     9/15/2000
3:20:08 PM  Microsoft Corporation   c:\winnt\system32\psbase.dll
cryptsvc.dll      5.00.2181.1 61.77 KB (63,248 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\cryptsvc.dll
cryptdll.dll      5.00.2135.1 41.27 KB (42,256 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\cryptdll.dll
wkssvc.dll  5.00.2195.1175    95.27 KB (97,552 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\wkssvc.dll
srvsvc.dll  5.00.2178.1 79.27 KB (81,168 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\srvsvc.dll
cfgmgr32.dll      5.00.2134.1 16.77 KB (17,168 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\cfgmgr32.dll
dmserver.dll      2195.23.297.2     11.77 KB (12,048 bytes) 9/15/2000
3:20:16 PM  VERITAS Software Corp.  c:\winnt\system32\dmserver.dll
winsta.dll  5.00.2195.32      36.27 KB (37,136 bytes) 9/15/2000 3:20:06
PM    Microsoft Corporation   c:\winnt\system32\winsta.dll
icmp.dll    5.00.2134.1 7.27 KB (7,440 bytes)   12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\icmp.dll
lmhsvc.dll  5.00.2134.1 9.27 KB (9,488 bytes)   12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\lmhsvc.dll
eventlog.dll      5.00.2178.1 43.77 KB (44,816 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\eventlog.dll
ntdsapi.dll 5.00.2160.1 56.27 KB (57,616 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\ntdsapi.dll
```

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scesrv.dll  5.00.2188.1 225.77 KB (231,184 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\scesrv.dll
umpnpmgr.dll      5.00.2182.1 86.27 KB (88,336 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\umpnpmgr.dll
services.exe      5.00.2134.1 86.77 KB (88,848 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\services.exe
clbcatq.dll 2000.2.3449.0     496.27 KB (508,176 bytes)     9/15/2000
3:20:17 PM  Microsoft Corporation   c:\winnt\system32\clbcatq.dll
oleaut32.dll      2.40.4514   600.27 KB (614,672 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\oleaut32.dll
cscui.dll   5.00.2195.1387    227.27 KB (232,720 bytes)     9/15/2000
3:20:17 PM  Microsoft Corporation   c:\winnt\system32\cscui.dll
winspool.drv      5.00.2195.1340    109.77 KB (112,400 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\winspool.drv
winscard.dll      5.00.2134.1 77.27 KB (79,120 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\winscard.dll
wlnotify.dll      5.00.2195.1163    53.27 KB (54,544 bytes) 9/15/2000
3:20:06 PM  Microsoft Corporation   c:\winnt\system32\wlnotify.dll
cscdll.dll  5.00.2195.1600    98.27 KB (100,624 bytes)      9/15/2000
3:20:17 PM  Microsoft Corporation   c:\winnt\system32\cscdll.dll
lz32.dll    5.00.2134.1 9.77 KB (10,000 bytes)  12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\lz32.dll
version.dll 5.00.2134.1 15.77 KB (16,144 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\version.dll
rsabase.dll 5.00.2195.1391    129.27 KB (132,368 bytes)     7/21/2000
12:05:02 PM Microsoft Corporation   c:\winnt\system32\rsabase.dll
mscat32.dll 5.131.2134.1      7.77 KB (7,952 bytes)   12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\mscat32.dll
ole32.dll   5.00.2195.1607    965.27 KB (988,432 bytes)     9/15/2000
3:20:09 PM  Microsoft Corporation   c:\winnt\system32\ole32.dll
imagehlp.dll      5.00.2195.1 125.27 KB (128,272 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\imagehlp.dll
msasn1.dll  5.00.2134.1 51.27 KB (52,496 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\msasn1.dll
crypt32.dll 5.131.2195.1340   464.77 KB (475,920 bytes)     9/15/2000
3:20:17 PM  Microsoft Corporation   c:\winnt\system32\crypt32.dll
wintrust.dll      5.131.2143.1      162.27 KB (166,160 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\wintrust.dll
setupapi.dll      5.00.2195.1608    552.77 KB (566,032 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\setupapi.dll
winmm.dll   5.00.2161.1 184.77 KB (189,200 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\winmm.dll
comctl32.dll      5.81  537.77 KB (550,672 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\comctl32.dll
shlwapi.dll 5.00.3103.1000    282.27 KB (289,040 bytes)     9/15/2000
3:20:07 PM  Microsoft Corporation   c:\winnt\system32\shlwapi.dll
shell32.dll 5.00.3103.1000    2.25 MB (2,358,032 bytes)     9/15/2000
3:20:07 PM  Microsoft Corporation   c:\winnt\system32\shell32.dll
msgina.dll  5.00.2195.1600    323.27 KB (331,024 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\msgina.dll
wsock32.dll 5.00.2195.1207    21.27 KB (21,776 bytes) 9/15/2000 3:20:06
PM    Microsoft Corporation   c:\winnt\system32\wsock32.dll
```

```
dnsapi.dll  5.00.2195.1600    127.77 KB (130,832 bytes)     9/15/2000
3:20:16 PM  Microsoft Corporation   c:\winnt\system32\dnsapi.dll
wldap32.dll 5.00.2195.1175    155.27 KB (158,992 bytes)     9/15/2000
3:20:06 PM  Microsoft Corporation   c:\winnt\system32\wldap32.dll
ws2help.dll 5.00.2134.1 17.77 KB (18,192 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\ws2help.dll
ws2_32.dll  5.00.2195.1340    68.77 KB (70,416 bytes) 9/15/2000 3:20:06
PM    Microsoft Corporation   c:\winnt\system32\ws2_32.dll
samlib.dll  5.00.2160.1 46.27 KB (47,376 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\samlib.dll
netrap.dll  5.00.2134.1 11.27 KB (11,536 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\netrap.dll
netapi32.dll      5.00.2195.1600    303.27 KB (310,544 bytes)
      9/15/2000 3:20:10 PM    Microsoft Corporation
      c:\winnt\system32\netapi32.dll
profmap.dll 5.00.2181.1 29.27 KB (29,968 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\profmap.dll
secur32.dll 5.00.2195.1600    47.27 KB (48,400 bytes) 9/15/2000 3:20:07
PM    Microsoft Corporation   c:\winnt\system32\secur32.dll
sfc.dll     5.00.2195.1618    90.05 KB (92,216 bytes) 9/15/2000 3:20:07
PM    Microsoft Corporation   c:\winnt\system32\sfc.dll
nddeapi.dll 5.00.2137.1 15.27 KB (15,632 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\nddeapi.dll
userenv.dll 5.00.2195.1600    359.27 KB (367,888 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\userenv.dll
user32.dll  5.00.2195.1600    392.77 KB (402,192 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\user32.dll
gdi32.dll   5.00.2195.1340    228.77 KB (234,256 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\gdi32.dll
rpcrt4.dll  5.00.2195.1615    436.27 KB (446,736 bytes)     9/15/2000
3:20:08 PM  Microsoft Corporation   c:\winnt\system32\rpcrt4.dll
advapi32.dll      5.00.2195.1600    349.27 KB (357,648 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\advapi32.dll
kernel32.dll      5.00.2195.1600    713.27 KB (730,384 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\kernel32.dll
msvcrt.dll  6.10.8637.0 288.09 KB (295,000 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\msvcrt.dll
winlogon.exe      5.00.2195.1600    172.77 KB (176,912 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\winlogon.exe
sfcfiles.dll      5.00.2195.1 973.27 KB (996,624 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\sfcfiles.dll
ntdll.dll   5.00.2195.1600    475.27 KB (486,672 bytes)     7/21/2000
12:05:02 PM Microsoft Corporation   c:\winnt\system32\ntdll.dll
smss.exe    5.00.2195.31      44.27 KB (45,328 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\smss.exe

[Services]

Display Name      Name  State Start Mode  Service Type      Path  Error
Control     Start Name  Tag ID
Alerter     Alerter     Stopped     Manual      Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
```

```
Application Management  AppMgmt     Running     Manual      Share
Process     c:\winnt\system32\services.exe      Normal      LocalSystem
      0
Computer Browser  Browser     Stopped     Manual      Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
Indexing Service  cisvc Stopped     Manual      Share Process
      c:\winnt\system32\cisvc.exe   Normal      LocalSystem 0
ClipBook    ClipSrv     Stopped     Manual      Own Process
      c:\winnt\system32\clipsrv.exe Normal      LocalSystem 0
Distributed File System Dfs   Stopped     Manual      Own Process
      c:\winnt\system32\dfssvc.exe  Normal      LocalSystem 0
DHCP Client Dhcp  Stopped     Manual      Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
Logical Disk Manager Administrative Service     dmadmin     Stopped
      Manual      Share Process     c:\winnt\system32\dmadmin.exe /com
      Normal      LocalSystem 0
Logical Disk Manager    dmserver    Running     Auto  Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
DNS Client  Dnscache    Stopped     Manual      Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
Event Log   Eventlog    Running     Auto  Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
COM+ Event System EventSystem Stopped     Manual      Share Process
      c:\winnt\system32\svchost.exe -k netsvcs  Normal      LocalSystem
      0
Fax Service Fax   Stopped     Manual      Own Process
      c:\winnt\system32\faxsvc.exe  Normal      LocalSystem 0
Mylex Global Array Manager Server   gamscm      Stopped     Manual
      Own Process c:\winnt\system32\gamserv\gamscm.exe      Normal
      LocalSystem 0
cLAN Connection Manager GniConMgr   Stopped     Disabled    Own Process
      c:\winnt\system32\gnconmgr.exe      Normal      LocalSystem 0
Intersite Messaging     IsmServ     Stopped     Disabled    Own Process
      c:\winnt\system32\ismserv.exe Normal      LocalSystem 0
Kerberos Key Distribution Center    kdc   Stopped     Disabled    Share
Process     c:\winnt\system32\lsass.exe   Normal      LocalSystem 0
Server      lanmanserver      Running     Auto  Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
Workstation lanmanworkstation Running     Auto  Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
License Logging Service LicenseService    Stopped     Manual      Own
Process     c:\winnt\system32\llssrv.exe  Normal      LocalSystem 0
TCP/IP NetBIOS Helper Service LmHosts     Stopped     Auto  Share
Process     c:\winnt\system32\services.exe      Normal      LocalSystem
      0
Messenger   Messenger   Stopped     Manual      Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
NetMeeting Remote Desktop Sharing   mnmsrvc     Stopped     Manual
      Own Process c:\winnt\system32\mnmsrvc.exe Normal      LocalSystem
      0
Distributed Transaction Coordinator MSDTC Stopped     Auto  Own Process
      c:\winnt\system32\msdtc.exe   Normal      LocalSystem 0
Windows Installer MSIServer   Stopped     Manual      Share Process
      c:\winnt\system32\msiexec.exe /v    Normal      LocalSystem 0
```

```
MSSQLSERVER MSSQLSERVER Stopped     Manual      Own Process
      c:\progra~1\micros~2\mssql\binn\sqlservr.exe    Normal
      LocalSystem 0
MSSQLServerADHelper     MSSQLServerADHelper     Stopped     Manual
      Own Process c:\program files\microsoft sql
server\80\tools\binn\sqladhlp.exe   Normal      LocalSystem 0
Network DDE NetDDE      Stopped     Manual      Share Process
      c:\winnt\system32\netdde.exe  Normal      LocalSystem 0
Network DDE DSDM  NetDDEdsdm  Stopped     Manual      Share Process
      c:\winnt\system32\netdde.exe  Normal      LocalSystem 0
Net Logon   Netlogon    Stopped     Manual      Share Process
      c:\winnt\system32\lsass.exe   Normal      LocalSystem 0
Network Connections     Netman      Running     Manual      Share
Process     c:\winnt\system32\svchost.exe -k netsvcs  Normal
      LocalSystem 0
File Replication  NtFrs Stopped     Manual      Own Process
      c:\winnt\system32\ntfrs.exe   Ignore      LocalSystem 0
NT LM Security Support Provider     NtLmSsp     Stopped     Manual
      Share Process     c:\winnt\system32\lsass.exe   Normal
      LocalSystem 0
Removable Storage NtmsSvc     Stopped     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 Stopped     Manual      Share
Process     c:\winnt\system32\lsass.exe   Normal      LocalSystem 0
Protected Storage ProtectedStorage  Running     Auto  Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
Remote Access Auto Connection Manager     RasAuto     Stopped
      Manual      Share Process     c:\winnt\system32\svchost.exe -k
netsvcs     Normal      LocalSystem 0
Remote Access Connection Manager    RasMan      Stopped     Manual
      Share Process     c:\winnt\system32\svchost.exe -k netsvcs
      Normal      LocalSystem 0
Routing and Remote Access     RemoteAccess      Stopped     Disabled
      Share Process     c:\winnt\system32\svchost.exe -k netsvcs
      Normal      LocalSystem 0
Remote Registry Service RemoteRegistry    Stopped     Manual      Own
Process     c:\winnt\system32\regsvc.exe  Normal      LocalSystem 0
Remote Procedure Call (RPC) Locator RpcLocator  Stopped     Manual
      Own Process c:\winnt\system32\locator.exe Normal      LocalSystem
      0
Remote Procedure Call (RPC)   RpcSs Running     Auto  Share Process
      c:\winnt\system32\svchost -k rpcss  Normal      LocalSystem 0
QoS 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    Stopped     Manual      Share Process
      c:\winnt\system32\mstask.exe  Normal      LocalSystem 0
```

```
RunAs Service     seclogon    Stopped     Manual      Share Process
      c:\winnt\system32\services.exe      Ignore      LocalSystem 0
System Event Notification     SENS  Stopped     Manual      Share
Process     c:\winnt\system32\svchost.exe -k netsvcs  Normal
      LocalSystem 0
Internet Connection Sharing   SharedAccess      Stopped     Manual
      Share Process     c:\winnt\system32\svchost.exe -k netsvcs
      Normal      LocalSystem 0
Print Spooler     Spooler     Stopped     Manual      Own Process
      c:\winnt\system32\spoolsv.exe Normal      LocalSystem 0
SQLSERVERAGENT    SQLSERVERAGENT    Stopped     Manual      Own Process
      c:\progra~1\micros~2\mssql\binn\sqlagent.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      Stopped     Manual
      Share Process     c:\winnt\system32\services.exe      Normal
      LocalSystem 0
Uninterruptible Power Supply  UPS   Stopped     Manual      Own Process
      c:\winnt\system32\ups.exe     Normal      LocalSystem 0
Utility Manager   UtilMan     Stopped     Manual      Own Process
      c:\winnt\system32\utilman.exe Normal      LocalSystem 0
Windows Time      W32Time     Stopped     Manual      Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
Windows Management Instrumentation  WinMgmt     Running     Auto  Own
Process     c:\winnt\system32\wbem\winmgmt.exe  Ignore      LocalSystem
      0
Windows Management Instrumentation Driver Extensions  Wmi   Running
      Manual      Share Process     c:\winnt\system32\services.exe
      Normal      LocalSystem 0

[Program Groups]

Group Name  Name  User Name
Accessories Default User:Accessories      Default User
Accessories\Accessibility     Default User:Accessories\Accessibility
      Default User
Accessories\Entertainment     Default User:Accessories\Entertainment
      Default User
Accessories\System Tools      Default User:Accessories\System Tools
      Default User
Startup     Default User:Startup    Default User
Accessories All Users:Accessories   All Users
```

```
Accessories\Accessibility     All Users:Accessories\Accessibility All
Users
Accessories\Communications    All Users:Accessories\Communications
      All Users
Accessories\Entertainment     All Users:Accessories\Entertainment All
Users
Accessories\Games All Users:Accessories\Games   All Users
Accessories\System Tools      All Users:Accessories\System Tools  All
Users
Administrative Tools    All Users:Administrative Tools      All Users
GigaNet     All Users:GigaNet All Users
Microsoft SQL Server    All Users:Microsoft SQL Server      All Users
MKS Toolkit All Users:MKS Toolkit   All Users
Startup     All Users:Startup All Users
Accessories PE6400_01\Administrator:Accessories PE6400_01\Administrator
Accessories\Accessibility
      PE6400_01\Administrator:Accessories\Accessibility
      PE6400_01\Administrator
Accessories\Entertainment
      PE6400_01\Administrator:Accessories\Entertainment
      PE6400_01\Administrator
Accessories\System Tools
      PE6400_01\Administrator:Accessories\System Tools
      PE6400_01\Administrator
Administrative Tools    PE6400_01\Administrator:Administrative Tools
      PE6400_01\Administrator
Startup     PE6400_01\Administrator:Startup     PE6400_01\Administrator

[Startup Programs]

Program     Command     User Name   Location
No startup program information

[OLE Registration]

Object      Local Server
Sound (OLE2)      sndrec32.exe
Media Clip  mplay32.exe
Video Clip  mplay32.exe /avi
MIDI Sequence     mplay32.exe /mid
Sound Not Available
Media Clip  Not Available
Image Document    "C:\Program Files\Windows
NT\Accessories\ImageVue\KodakImg.exe"
WordPad Document  "%ProgramFiles%\Windows NT\Accessories\WORDPAD.EXE"
Windows Media Services DRM Storage object Not Available
Bitmap Image      mspaint.exe

[Internet Explorer 5]

[ Following are sub-categories of this main category ]

[Summary]

Item  Value
```

```
Version     5.00.3103.1000
Build 53103.1000
Product ID  51879-OEM-0000007-00000
Application Path  C:\Program Files\Internet Explorer

Language    English (United States)
Active Printer    Not Available

Cipher Strength   56-bit
Content Advisor   Disabled
IEAK Install      No

[File Versions]

File  Version     Size  Date  Path  Company
advapi32.dll      5.0.2195.1600     349 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
advapi32.dll      5.0.2195.1600     349 KB      7/21/2000 12:05:02 PM
      .     Microsoft Corporation
advpack.dll 5.0.3103.1000     87 KB 7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
advpack.dll 5.0.3103.1000     87 KB 7/21/2000 12:05:02 PM   .
      Microsoft Corporation
browselc.dll      5.0.3103.1000     35 KB 7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
browselc.dll      5.0.3103.1000     35 KB 7/21/2000 12:05:02 PM   .
      Microsoft Corporation
browseui.dll      5.0.3103.1000     789 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
browseui.dll      5.0.3103.1000     789 KB      7/21/2000 12:05:02 PM
      .     Microsoft Corporation
ckcnv.exe   5.0.2189.1  9 KB  12/7/1999 7:00:00 AM    C:\WINNT\system32
      Microsoft Corporation
ckcnv.exe   5.0.2189.1  9 KB  12/7/1999 7:00:00 AM    .     Microsoft
Corporation
comctl32.dll      5.81.3103.1000    538 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
comctl32.dll      5.81.3103.1000    538 KB      7/21/2000 12:05:02 PM
      .     Microsoft Corporation
crypt32.dll 5.131.2195.1340   465 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
crypt32.dll 5.131.2195.1340   465 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
enhsig.dll  <File Missing>    Not Available     Not Available     Not
Available   Not Available
iemigrat.dll      <File Missing>    Not Available     Not Available
      Not Available     Not Available
iesetup.dll 5.0.3103.1000     57 KB 7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
iesetup.dll 5.0.3103.1000     57 KB 7/21/2000 12:05:02 PM   .
      Microsoft Corporation
iexplore.exe      5.0.2920.0  59 KB 12/7/1999 7:00:00 AM    C:\Program
Files\Internet Explorer Microsoft Corporation
imagehlp.dll      5.0.2195.1  125 KB      12/7/1999 7:00:00 AM
      C:\WINNT\system32 Microsoft Corporation
```

```
imagehlp.dll      5.0.2195.1  125 KB      12/7/1999 7:00:00 AM    .
      Microsoft Corporation
imghelp.dll <File Missing>    Not Available     Not Available     Not
Available   Not Available
inseng.dll  5.0.3103.1000     72 KB 7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
inseng.dll  5.0.3103.1000     72 KB 7/21/2000 12:05:02 PM   .
      Microsoft Corporation
jobexec.dll 5.0.0.1     47 KB 12/7/1999 7:00:00 AM    C:\WINNT\system32
      Microsoft Corporation
jobexec.dll 5.0.0.1     47 KB 12/7/1999 7:00:00 AM    .     Microsoft
Corporation
jscript.dll 5.1.0.5010  476 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
jscript.dll 5.1.0.5010  476 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
jsproxy.dll 5.0.2920.0  13 KB 12/7/1999 7:00:00 AM    C:\WINNT\system32
      Microsoft Corporation
jsproxy.dll 5.0.2920.0  13 KB 12/7/1999 7:00:00 AM    .     Microsoft
Corporation
msaahtml.dll      <File Missing>    Not Available     Not Available
      Not Available     Not Available
mshtml.dll  5.0.3103.1000     2292 KB     7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
mshtml.dll  5.0.3103.1000     2292 KB     7/21/2000 12:05:02 PM   .
      Microsoft Corporation
msjava.dll  5.0.3310.0  922 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
msjava.dll  5.0.3310.0  922 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
msoss.dll   <File Missing>    Not Available     Not Available     Not
Available   Not Available
msxml.dll   8.0.5226.0  506 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
msxml.dll   8.0.5226.0  506 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
occache.dll 5.0.3103.1000     86 KB 7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
occache.dll 5.0.3103.1000     86 KB 7/21/2000 12:05:02 PM   .
      Microsoft Corporation
ole32.dll   5.0.2195.1607     965 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
ole32.dll   5.0.2195.1607     965 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
oleaut32.dll      2.40.4514.1 600 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
oleaut32.dll      2.40.4514.1 600 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
olepro32.dll      5.0.4514.1  160 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
olepro32.dll      5.0.4514.1  160 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
rsabase.dll 5.0.2195.1391     129 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
```

```
rsabase.dll 5.0.2195.1391     129 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
rsaenh.dll  <File Missing>    Not Available     Not Available     Not
Available   Not Available
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      5.0.2195.0  137 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
schannel.dll      5.0.2195.0  137 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
shdoc401.dll      <File Missing>    Not Available     Not Available
      Not Available     Not Available
shdocvw.dll 5.0.3103.1000     1078 KB     7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
shdocvw.dll 5.0.3103.1000     1078 KB     7/21/2000 12:05:02 PM   .
      Microsoft Corporation
shell32.dll 5.0.3103.1000     2303 KB     7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
shell32.dll 5.0.3103.1000     2303 KB     7/21/2000 12:05:02 PM   .
      Microsoft Corporation
shlwapi.dll 5.0.3103.1000     282 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
shlwapi.dll 5.0.3103.1000     282 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
url.dll     5.0.2920.0  82 KB 12/7/1999 7:00:00 AM    C:\WINNT\system32
      Microsoft Corporation
url.dll     5.0.2920.0  82 KB 12/7/1999 7:00:00 AM    .     Microsoft
Corporation
urlmon.dll  5.0.3103.1000     441 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
urlmon.dll  5.0.3103.1000     441 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
vbscript.dll      5.1.0.5010  428 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
vbscript.dll      5.1.0.5010  428 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
webcheck.dll      5.0.3103.1000     252 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
webcheck.dll      5.0.3103.1000     252 KB      7/21/2000 12:05:02 PM
      .     Microsoft Corporation
win.com     5.0.2134.1  24 KB 12/7/1999 7:00:00 AM    C:\WINNT\system32
      Microsoft Corporation
win.com     5.0.2134.1  24 KB 12/7/1999 7:00:00 AM    .     Microsoft
Corporation
wininet.dll 5.0.3103.1000     457 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
wininet.dll 5.0.3103.1000     457 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
winsock.dll 3.10.0.103  3 KB  12/7/1999 7:00:00 AM    C:\WINNT\system32
      Microsoft Corporation
winsock.dll 3.10.0.103  3 KB  12/7/1999 7:00:00 AM    .     Microsoft
Corporation
```

```
wintrust.dll      5.131.2143.1      162 KB      12/7/1999 7:00:00 AM
      C:\WINNT\system32 Microsoft Corporation
wintrust.dll      5.131.2143.1      162 KB      12/7/1999 7:00:00 AM
      .     Microsoft Corporation
wsock.vxd   <File Missing>    Not Available     Not Available     Not
Available   Not Available
wsock32.dll 5.0.2195.1207     21 KB 7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
wsock32.dll 5.0.2195.1207     21 KB 7/21/2000 12:05:02 PM   .
      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  8675 MB
Available Disk Space    4448 MB
Maximum Cache Size      270 MB
Available Cache Size    271 MB

[List of Objects]

Program File      Status      CodeBase
No cached object information available

[Content]

[ Following are sub-categories of this main category ]

[Summary]
```

```
Item  Value
Content Advisor   Disabled

[Personal Certificates]

Issued To   Issued By   Validity    Signature Algorithm
Administrator     Administrator     9/13/2000 to 8/20/2100  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
```

Appendix C – Tunable Parameters

Client Configuration Parameters

COM+ Settings

TPCC.AllTxns:

- Activation:
  - Enable Object Pooling selected
  - Minimum Pool Size: 37
  - Maximum Pool Size: 37
  - Creation Timeout: 60,000
  - Enable Object Construction
  - Enable Just in Time Activation
- Concurrency:
  - Concurrency Required

TPCC Application Registry Parameters

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\TPCC]
"Path"="c:\\inetpub\\wwwroot\\"
"NumberOfDeliveryThreads"=dword:00000004
"MaxConnections"=dword:00001b58
"MaxPendingDeliveries"=dword:000003e8
"DB_Protocol"="DBLIB"
"TxnMonitor"="COM"
"DbServer"="PE6400_01"
"DbName"="tpcc"
"DbUser"="sa"
"DbPassword"=""
"COM_SinglePool"="YES"
```

Microsoft Internet Information Server Registry Parameters

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo\Parameters]
"ListenBackLog"=dword:00000019
"DispatchEntries"=hex(7):4c,00,44,00,41,00,50,00,53,00,56,00,43,00,00,00,00,00
"PoolThreadLimit"=dword:00000080
"ThreadTimeout"=dword:00015180
"BandwidthLevel"=dword:ffffffff
"DisableMemoryCache"=dword:00000001
"MemoryCacheSize"=dword:00000000
"ObjectCacheTTL"=dword:ffffffff

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo\Performance]
"Library"="infoctrs.dll"
"Open"="OpenINFOPerformanceData"
"Close"="CloseINFOPerformanceData"
"Collect"="CollectINFOPerformanceData"
"Last Counter"=dword:00000842
"Last Help"=dword:00000843
"First Counter"=dword:00000802
"First Help"=dword:00000803
"Library Validation Code"=hex:7e,3e,1e,80,75,1d,c0,01,10,25,00,00,00,00,00,00
```

```
"WbemAdapFileTime"=hex:00,33,eb,ce,35,f3,bf,01
"WbemAdapFileSize"=dword:00002510
"WbemAdapStatus"=dword:00000000
```

World Wide Web Service Registry Parameters

Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC]
"Type"=dword:00000020
"Start"=dword:00000002
"ErrorControl"=dword:00000001
"ImagePath"=hex(2):43,00,3a,00,5c,00,57,00,49,00,4e,00,4e,00,54,00,5c,00,53,00,\
  79,00,73,00,74,00,65,00,6d,00,33,00,32,00,5c,00,69,00,6e,00,65,00,74,00,73,\
  00,72,00,76,00,5c,00,69,00,6e,00,65,00,74,00,69,00,6e,00,66,00,6f,00,2e,00,\
  65,00,78,00,65,00,00,00
"DisplayName"="World Wide Web Publishing Service"
"DependOnService"=hex(7):49,00,49,00,53,00,41,00,44,00,4d,00,49,00,4e,00,00,00,\
  00,00
"DependOnGroup"=hex(7):00,00
"ObjectName"="LocalSystem"
"Description"="Provides Web connectivity and administration through the Internet Information Services snap-in."

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

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

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

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

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

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

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

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\Virtual Roots]

```
"/"="c:\\inetpub\\wwwroot,,205"
"/Scripts"="c:\\inetpub\\scripts,,204"
"/IISHelp"="c:\\winnt\\help\\iishelp,,201"
"/IISAdmin"="C:\\WINNT\\System32\\inetsrv\\iisadmin,,201"
"/IISSamples"="c:\\inetpub\\iissamples,,201"
"/MSADC"="c:\\program files\\common files\\system\\msadc,,205"
"/_vti_bin"="C:\\Program Files\\Common Files\\Microsoft Shared\\Web Server
Extensions\\40\\isapi,,205"
"/Rpc"="C:\\WINNT\\System32\\RpcProxy,,4"
"/Printers"="C:\\WINNT\\web\\printers,,201"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Performance]
"Library"="w3ctrs.dll"
"Open"="OpenW3PerformanceData"
"Close"="CloseW3PerformanceData"
"Collect"="CollectW3PerformanceData"
"Last Counter"=dword:000008e6
"Last Help"=dword:000008e7
"First Counter"=dword:00000844
"First Help"=dword:00000845
"Library Validation Code"=hex:a4,cc,16,83,75,1d,c0,01,10,3d,00,00,00,00,00,00
"WbemAdapFileTime"=hex:00,33,eb,ce,35,f3,bf,01
"WbemAdapFileSize"=dword:00003d10
"WbemAdapStatus"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Security]
"Security"=hex:01,00,14,80,a0,00,00,00,ac,00,00,00,14,00,00,00,30,00,00,00,02,\
  00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00,00,00,00,00,01,00,00,\
  00,00,02,00,70,00,04,00,00,00,00,00,18,00,fd,01,02,00,01,01,00,00,00,00,00,\
  05,12,00,00,00,74,00,6f,00,00,00,1c,00,ff,01,0f,00,01,02,00,00,00,00,00,05,\
  20,00,00,00,20,02,00,00,72,00,73,00,00,00,18,00,8d,01,02,00,01,01,00,00,00,\
  00,00,05,0b,00,00,00,20,02,00,00,00,00,1c,00,fd,01,02,00,01,02,00,00,00,00,\
  00,05,20,00,00,00,23,02,00,00,72,00,73,00,01,01,00,00,00,00,00,05,12,00,00,\
  00,01,01,00,00,00,00,00,05,12,00,00,00

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

Appendix C – Tunable Parameters

Microsoft Windows 2000 Server System Information Report for PE1300

```
System Information report written at: 10/15/2000 05:08:36 PM
[System Information]

[ Following are sub-categories of this main category ]

[System Summary]

Item  Value
OS Name     Microsoft Windows 2000 Server
Version     5.0.2195 Service Pack 1 Build 2195
OS Manufacturer   Microsoft Corporation
System Name CLIENT2
System Manufacturer     Dell Computer Corporation
System Model      PowerEdge 1300/600
System Type X86-based PC
Processor   x86 Family 6 Model 7 Stepping 3 GenuineIntel ~600 Mhz
BIOS Version      Phoenix ROM BIOS PLUS Version 1.10 A05
Windows Directory C:\WINNT
System Directory  C:\WINNT\System32
Boot Device \Device\Harddisk0\Partition1
Locale      United States
User Name   CLIENT2\Administrator
Time Zone   Central Daylight Time
Total Physical Memory   523,824 KB
Available Physical Memory     430,272 KB
Total Virtual Memory    1,802,288 KB
Available Virtual Memory      1,647,356 KB
Page File Space   1,278,464 KB
Page File   C:\pagefile.sys

[Hardware Resources]

[ Following are sub-categories of this main category ]

[Conflicts/Sharing]

Resource    Device
No conflicted/shared resources

[DMA]

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

[Forced Hardware]

Device      PNP Device ID
No Forced Hardware

[I/O]
```

```
Address Range     Device      Status
0x0010-0x001F     PCI bus     OK
0x0022-0x003F     PCI bus     OK
0x0044-0x0047     PCI bus     OK
0x004C-0x006F     PCI bus     OK
0x0072-0x007F     PCI bus     OK
0x0090-0x0091     PCI bus     OK
0x0093-0x009F     PCI bus     OK
0x00A2-0x00BF     PCI bus     OK
0x00D0-0x00EF     PCI bus     OK
0x0100-0x0CF7     PCI bus     OK
0x0D00-0xFFFF     PCI bus     OK
0xE000-0xEFFF     Intel 82443BX Pentium(r) II Processor to AGP
Controller  OK
0x03B0-0x03BB     Intel 82443BX Pentium(r) II Processor to AGP
Controller  OK
0x03B0-0x03BB     ATI Technologies Inc. 3D RAGE IIC AGP     OK
0x03C0-0x03DF     Intel 82443BX Pentium(r) II Processor to AGP
Controller  OK
0x03C0-0x03DF     ATI Technologies Inc. 3D RAGE IIC AGP     OK
0xEC00-0xECFF     ATI Technologies Inc. 3D RAGE IIC AGP     OK
0xD000-0xDFFF     DEC 21152 PCI to PCI bridge   OK
0xDC00-0xDCFF     Adaptec AHA-2940U2/U2W PCI SCSI Controller      OK
0x0A79-0x0A79     ISAPNP Read Data Port   OK
0x0279-0x0279     ISAPNP Read Data Port   OK
0x0274-0x0277     ISAPNP Read Data Port   OK
0xFFA0-0xFFAF     Intel(r) 82371AB/EB PCI Bus Master IDE Controller
      OK
0x0170-0x0177     Secondary IDE Channel   OK
0x0376-0x0376     Secondary IDE Channel   OK
0xCCE0-0xCCFF     Intel 82371AB/EB PCI to USB Universal Host Controller
      OK
0xCCC0-0xCCDF     Intel(R) PRO/100+ PCI Adapter OK
0xCCA0-0xCCBF     Intel(R) PRO/100+ PCI Adapter #3    OK
0x0020-0x003F     Programmable interrupt controller   OK
0x00A0-0x00BF     Programmable interrupt controller   OK
0x04D0-0x04D1     Programmable interrupt controller   OK
0x0040-0x005F     System timer      OK
0x0080-0x009F     Direct memory access controller     OK
0x0000-0x001F     Direct memory access controller     OK
0x00C0-0x00DF     Direct memory access controller     OK
0x0060-0x0060     PC/AT Enhanced PS/2 Keyboard (101/102-Key)      OK
0x0064-0x0064     PC/AT Enhanced PS/2 Keyboard (101/102-Key)      OK
0x0378-0x037F     ECP Printer Port (LPT1) OK
0x0778-0x077B     ECP Printer Port (LPT1) OK
0x03F8-0x03FF     Communications Port (COM1)    OK
0x02F8-0x02FF     Communications Port (COM2)    OK
0x03F0-0x03F5     Standard floppy disk controller     OK
0x03F7-0x03F7     Standard floppy disk controller     OK
0x0061-0x0061     System speaker    OK
0x0070-0x007F     System CMOS/real time clock   OK
0x0800-0x083F     System board      OK
0x0850-0x085F     System board      OK
0x0062-0x0063     System board      OK
```

```
0x0065-0x006F     System board      OK
0x00E0-0x00EF     System board      OK
0xAA00-0xAA7F     System board      OK
0x00F0-0x00FF     Numeric data processor  OK

[IRQs]

IRQ Number  Device
44    Adaptec AHA-2940U2/U2W PCI SCSI Controller
15    Secondary IDE Channel
31    Intel 82371AB/EB PCI to USB Universal Host Controller
52    cLAN Host Adapter
56    Intel(R) PRO/100+ PCI Adapter
64    Intel(R) PRO/100+ PCI Adapter #3
1     PC/AT Enhanced PS/2 Keyboard (101/102-Key)
4     Communications Port (COM1)
3     Communications Port (COM2)
6     Standard floppy disk controller
8     System CMOS/real time clock
9     Motherboard resources
13    Numeric data processor
12    Microsoft PS/2 Mouse

[Memory]

Range Device      Status
0xA0000-0xBFFFF   PCI bus     OK
0xA0000-0xBFFFF   Intel 82443BX Pentium(r) II Processor to AGP
Controller  OK
0xA0000-0xBFFFF   ATI Technologies Inc. 3D RAGE IIC AGP     OK
0xCD000-0xEFFFF   PCI bus     OK
0x20000000-0xFEBFFFFF   PCI bus     OK
0xFEC10000-0xFEDFFFFF   PCI bus     OK
0xFEE10000-0xFFF7FFFF   PCI bus     OK
0xFB000000-0xFDFFFFFF   Intel 82443BX Pentium(r) II Processor to AGP
Controller  OK
0xF2000000-0xF2FFFFFF   Intel 82443BX Pentium(r) II Processor to AGP
Controller  OK
0xEC000000-0xEFFFFFFF   Intel 82443BX Pentium(r) II Processor to AGP
Controller  OK
0xFC000000-0xFCFFFFFF   ATI Technologies Inc. 3D RAGE IIC AGP     OK
0xFBFFF000-0xFBFFFFFF   ATI Technologies Inc. 3D RAGE IIC AGP     OK
0xF9000000-0xFAFFFFFF   DEC 21152 PCI to PCI bridge   OK
0xF1000000-0xF1FFFFFF   DEC 21152 PCI to PCI bridge   OK
0xF9FFF000-0xF9FFFFFF   Adaptec AHA-2940U2/U2W PCI SCSI Controller
      OK
0xFE400000-0xFE41FFFF   cLAN Host Adapter OK
0xFE200000-0xFE3FFFFF   cLAN Host Adapter OK
0xF7000000-0xF7FFFFFF   cLAN Host Adapter OK
0xFE420000-0xFE42FFFF   cLAN Host Adapter OK
0xF3001000-0xF3001FFF   Intel(R) PRO/100+ PCI Adapter OK
0xFE100000-0xFE1FFFFF   Intel(R) PRO/100+ PCI Adapter OK
0xF3000000-0xF3000FFF   Intel(R) PRO/100+ PCI Adapter #3    OK
0xFE000000-0xFE0FFFFF   Intel(R) PRO/100+ PCI Adapter #3    OK
```

```
0xFEE00000-0xFEE0FFFF   Advanced programmable interrupt controller
      OK
0xFEC00000-0xFEC0FFFF   Advanced programmable interrupt controller
      OK
0x0000-0x9FFFF    System board      OK
0x100000-0x1FFFDFFF     System board      OK
0xFFE00000-0xFFFFFFFF   System board      OK
0xF0000-0xFFFFF   System board      OK
0xEC000-0xEFFFF   System board      OK

[Components]

[ Following are sub-categories of this main category ]

[Multimedia]

[ Following are sub-categories of this main category ]

[Audio Codecs]

Codec Manufacturer      Description Status      File  Version     Size
      Creation Date
c:\winnt\system32\iac25_32.ax Intel Corporation Indeo® audio software
      OK    C:\WINNT\System32\IAC25_32.AX 2.05.53     195.00 KB
(199,680 bytes)   12/7/1999 6:00:00 AM
c:\winnt\system32\msg723.acm  Microsoft Corporation         OK
      C:\WINNT\System32\MSG723.ACM  4.4.3385    106.77 KB (109,328
bytes)      9/13/2000 11:25:55 AM
c:\winnt\system32\lhacm.acm   Microsoft Corporation         OK
      C:\WINNT\System32\LHACM.ACM   4.4.3385    33.27 KB (34,064 bytes)
      9/13/2000 11:25:55 AM
c:\winnt\system32\tssoft32.acm      DSP GROUP, INC.         OK
      C:\WINNT\System32\TSSOFT32.ACM      1.01  9.27 KB (9,488 bytes)
      12/7/1999 6:00:00 AM
c:\winnt\system32\msg711.acm  Microsoft Corporation         OK
      C:\WINNT\System32\MSG711.ACM  5.00.2134.1 10.27 KB (10,512 bytes)
      12/7/1999 6:00:00 AM
c:\winnt\system32\msadp32.acm Microsoft Corporation         OK
      C:\WINNT\System32\MSADP32.ACM 5.00.2134.1 14.77 KB (15,120 bytes)
      12/7/1999 6:00:00 AM
c:\winnt\system32\imaadp32.acm      Microsoft Corporation         OK
      C:\WINNT\System32\IMAADP32.ACM      5.00.2134.1 16.27 KB (16,656
bytes)      12/7/1999 6:00:00 AM
c:\winnt\system32\msgsm32.acm Microsoft Corporation         OK
      C:\WINNT\System32\MSGSM32.ACM 5.00.2134.1 22.27 KB (22,800 bytes)
      12/7/1999 6:00:00 AM

[Video Codecs]

Codec Manufacturer      Description Status      File  Version     Size
      Creation Date
c:\winnt\system32\ir50_32.dll Intel Corporation Indeo® video 5.10 OK
      C:\WINNT\System32\IR50_32.DLL R.5.10.15.2.55    737.50 KB
(755,200 bytes)   12/7/1999 6:00:00 AM
```

```
c:\winnt\system32\msh261.drv  Microsoft Corporation         OK
      C:\WINNT\System32\MSH261.DRV  4.4.3385    163.77 KB (167,696
bytes)      9/13/2000 11:25:55 AM
c:\winnt\system32\msh263.drv  Microsoft Corporation         OK
      C:\WINNT\System32\MSH263.DRV  4.4.3385    252.27 KB (258,320
bytes)      9/13/2000 11:25:27 AM
c:\winnt\system32\msvidc32.dll      Microsoft Corporation         OK
      C:\WINNT\System32\MSVIDC32.DLL      5.00.2134.1 27.27 KB (27,920
bytes)      12/7/1999 6:00:00 AM
c:\winnt\system32\msrle32.dll Microsoft Corporation         OK
      C:\WINNT\System32\MSRLE32.DLL 5.00.2134.1 10.77 KB (11,024 bytes)
      12/7/1999 6:00:00 AM
c:\winnt\system32\ir32_32.dll Intel(R) Corporation          OK
      C:\WINNT\System32\IR32_32.DLL Not Available     194.50 KB
(199,168 bytes)   12/7/1999 6:00:00 AM
c:\winnt\system32\iccvid.dll  Radius Inc.       OK
      C:\WINNT\System32\ICCVID.DLL  1.10.0.6    108.00 KB (110,592
bytes)      12/7/1999 6:00:00 AM

[CD-ROM]

Item  Value
Drive D:
Description CD-ROM Drive
Media Loaded      True
Media Type  CD-ROM
Name  SAMSUNG CD-ROM SC-140B
Manufacturer      (Standard CD-ROM drives)
Status      OK
Transfer Rate     175.68 kbytes/sec
SCSI Target ID    0
PNP Device ID     IDE\CDROMSAMSUNG_CD-ROM_SC-
140B_____________________D005____\4&13B4AFD&0&0.0.0


[Sound Device]

Item  Value
No sound devices

[Display]

Item  Value
Name  ATI Technologies Inc. 3D RAGE IIC AGP
PNP Device ID
      PCI\VEN_1002&DEV_4757&SUBSYS_00000000&REV_7A\3&225B1D41&0&0008
Adapter Type      ATI 3D RAGE IIC AGP (A21), ATI Technologies Inc.
compatible
Adapter Description     ATI Technologies Inc. 3D RAGE IIC AGP
Adapter RAM 2.00 MB (2,097,152 bytes)
Installed Drivers atiraged.dll
Driver Version    5.00.2174.1
INF File    display.inf (atirage section)
Color Planes      1
Color Table Entries     256
```

```
Resolution  1024 x 768 x 60 hertz
Bits/Pixel  8


[Infrared]

Item  Value
No infrared devices

[Input]

[ Following are sub-categories of this main category ]

[Keyboard]

Item  Value
Description PC/AT Enhanced PS/2 Keyboard (101/102-Key)
Name  Enhanced (101- or 102-key)
Layout      00000409
PNP Device ID     ROOT\*PNP030B\1_0_22_0_32_0
NumberOfFunctionKeys    12


[Pointing Device]

Item  Value
Hardware Type     Microsoft PS/2 Mouse
Number of Buttons 2
Status      OK
PNP Device ID     ROOT\*PNP0F03\1_0_21_0_31_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+ PCI Adapter
Adapter Type      Ethernet 802.3
Product Name      Intel(R) PRO/100+ PCI Adapter
Installed   True
PNP Device ID
      PCI\VEN_8086&DEV_1229&SUBSYS_00098086&REV_05\2&EBB567F&0&70
Last Reset  10/13/2000 11:26:08 AM
Index 0
```

```
Service Name      E100B
IP Address  192.1.20.100
IP Subnet   255.255.255.0
Default IP Gateway      Not Available
DHCP Enabled      False
DHCP Server Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address 00:90:27:5C:D1:98
Service Name      E100B
IRQ Number  56
I/O Port    0xCCC0-0xCCDF
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  10/13/2000 11:26:08 AM
Index 1
Service Name      AsyncMac
IP Address  Not Available
IP Subnet   Not Available
Default IP Gateway      Not Available
DHCP Enabled      False
DHCP Server Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address Not Available
Service Name      Not Available

Name  [00000002] WAN Miniport (L2TP)
Adapter Type      Not Available
Product Name      WAN Miniport (L2TP)
Installed   True
PNP Device ID     ROOT\MS_L2TPMINIPORT\0000
Last Reset  10/13/2000 11:26:08 AM
Index 2
Service Name      Rasl2tp
IP Address  Not Available
IP Subnet   Not Available
Default IP Gateway      Not Available
DHCP Enabled      False
DHCP Server Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address Not Available
Service Name      Rasl2tp
Driver      c:\winnt\system32\drivers\rasl2tp.sys (50800, 5.00.2179.1)

Name  [00000003] WAN Miniport (PPTP)
Adapter Type      Wide Area Network (WAN)
Product Name      WAN Miniport (PPTP)
```

```
Installed   True
PNP Device ID     ROOT\MS_PPTPMINIPORT\0000
Last Reset  10/13/2000 11:26:08 AM
Index 3
Service Name      PptpMiniport
IP Address  Not Available
IP Subnet   Not Available
Default IP Gateway      Not Available
DHCP Enabled      False
DHCP Server Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address 50:50:54:50:30:30
Service Name      PptpMiniport
Driver      c:\winnt\system32\drivers\raspptp.sys (47856, 5.00.2160.1)

Name  [00000004] Direct Parallel
Adapter Type      Not Available
Product Name      Direct Parallel
Installed   True
PNP Device ID     ROOT\MS_PTIMINIPORT\0000
Last Reset  10/13/2000 11:26:08 AM
Index 4
Service Name      Raspti
IP Address  Not Available
IP Subnet   Not Available
Default IP Gateway      Not Available

DHCP Enabled      False
DHCP Server Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address Not Available
Service Name      Raspti
Driver      c:\winnt\system32\drivers\raspti.sys (16880, 5.00.2146.1)

Name  [00000005] WAN Miniport (IP)
Adapter Type      Not Available
Product Name      WAN Miniport (IP)
Installed   True
PNP Device ID     ROOT\MS_NDISWANIP\0000
Last Reset  10/13/2000 11:26:08 AM
Index 5
Service Name      NdisWan
IP Address  Not Available
IP Subnet   Not Available
Default IP Gateway      Not Available
DHCP Enabled      False
DHCP Server Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address Not Available
Service Name      NdisWan
Driver      c:\winnt\system32\drivers\ndiswan.sys (90768, 5.00.2184.1)
```

```
Name  [00000006] cLAN Host Adapter
Adapter Type      Ethernet 802.3
Product Name      cLAN Host Adapter
Installed   True
PNP Device ID
      PCI\VEN_135B&DEV_0001&SUBSYS_00000000&REV_00\2&EBB567F&0&68
Last Reset  10/13/2000 11:26:08 AM
Index 6
Service Name      GNINDIS
IP Address
IP Subnet
Default IP Gateway      Not Available
DHCP Enabled      True
DHCP Server 255.255.255.255
DHCP Lease Expires      1/18/2038 9:14:07 PM
DHCP Lease Obtained     9/27/2000 8:03:01 PM
MAC Address 00:90:FA:00:09:DA
Service Name      GNINDIS
IRQ Number  52
Driver      c:\winnt\system32\drivers\gnindis.sys (22598, 4.1.1)

Name  [00000007] Intel(R) PRO/100+ PCI Adapter
Adapter Type      Not Available
Product Name      Intel(R) PRO/100+ PCI Adapter
Installed   True
PNP Device ID     Not Available
Last Reset  10/13/2000 11:26:08 AM
Index 7
Service Name      E100B
IP Address  192.1.20.100
IP Subnet   255.255.255.0
Default IP Gateway      Not Available
DHCP Enabled      True
DHCP Server
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
MAC Address 00:90:27:5C:D1:98
Service Name      Not Available

Name  [00000008] Intel(R) PRO/100+ PCI Adapter
Adapter Type      Ethernet 802.3
Product Name      Intel(R) PRO/100+ PCI Adapter
Installed   True
PNP Device ID
      PCI\VEN_8086&DEV_1229&SUBSYS_00098086&REV_05\2&EBB567F&0&80
Last Reset  10/13/2000 11:26:08 AM
Index 8
Service Name      E100B
IP Address  192.1.1.2
IP Subnet   255.255.255.0
Default IP Gateway      Not Available
DHCP Enabled      False
DHCP Server Not Available
DHCP Lease Expires      Not Available
DHCP Lease Obtained     Not Available
```

```
MAC Address 00:90:27:5C:D1:D4
Service Name      E100B
IRQ Number  64
I/O Port    0xCCA0-0xCCBF
Driver      c:\winnt\system32\drivers\e100bnt5.sys (85776,
4.02.38.0000)


[Protocol]

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

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

Name  RSVP UDP Service Provider
ConnectionlessService   True
GuaranteesDelivery      False
GuaranteesSequencing    False
MaximumAddressSize      16 bytes
MaximumMessageSize      65467 bytes
MessageOriented   True
MinimumAddressSize      16 bytes
```

```
PseudoStreamOriented    False
SupportsBroadcasting    True
SupportsConnectData     False
SupportsDisconnectData  False
SupportsEncryption      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_{6449A978-B49A-4713-AD9B-
E83FD85CB133}] SEQPACKET 5
ConnectionlessService   False
GuaranteesDelivery      True
GuaranteesSequencing    True
MaximumAddressSize      20 bytes
MaximumMessageSize      64000 bytes
MessageOriented   True
MinimumAddressSize      20 bytes
PseudoStreamOriented    False
SupportsBroadcasting    False
SupportsConnectData     False
SupportsDisconnectData  False
SupportsEncryption      False
SupportsExpeditedData   False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth   False
SupportsMulticasting    False

Name  MSAFD NetBIOS [\Device\NetBT_Tcpip_{6449A978-B49A-4713-AD9B-
E83FD85CB133}] DATAGRAM 5
ConnectionlessService   True
GuaranteesDelivery      False
GuaranteesSequencing    False
MaximumAddressSize      20 bytes
MaximumMessageSize      64000 bytes
MessageOriented   True
```

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

Name  MSAFD NetBIOS [\Device\NetBT_Tcpip_{8BA4A65D-EC53-4A85-B4C2-
02DDD4F7687E}] SEQPACKET 4
ConnectionlessService   False
GuaranteesDelivery      True
GuaranteesSequencing    True
MaximumAddressSize      20 bytes
MaximumMessageSize      64000 bytes
MessageOriented   True
MinimumAddressSize      20 bytes
PseudoStreamOriented    False
SupportsBroadcasting    False
SupportsConnectData     False
SupportsDisconnectData  False
SupportsEncryption      False
SupportsExpeditedData   False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth   False
SupportsMulticasting    False

Name  MSAFD NetBIOS [\Device\NetBT_Tcpip_{8BA4A65D-EC53-4A85-B4C2-
02DDD4F7687E}] DATAGRAM 4
ConnectionlessService   True
GuaranteesDelivery      False
GuaranteesSequencing    False
MaximumAddressSize      20 bytes
MaximumMessageSize      64000 bytes
MessageOriented   True
MinimumAddressSize      20 bytes
PseudoStreamOriented    False
SupportsBroadcasting    True
SupportsConnectData     False
SupportsDisconnectData  False
SupportsEncryption      False
SupportsExpeditedData   False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth   False
SupportsMulticasting    False

Name  MSAFD NetBIOS [\Device\NetBT_Tcpip_{186A986F-C466-4BC3-AAF2-
19EFE8C0B2B8}] SEQPACKET 3
ConnectionlessService   False
GuaranteesDelivery      True
GuaranteesSequencing    True
MaximumAddressSize      20 bytes
```

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

Name  MSAFD NetBIOS [\Device\NetBT_Tcpip_{186A986F-C466-4BC3-AAF2-
19EFE8C0B2B8}] DATAGRAM 3
ConnectionlessService   True
GuaranteesDelivery      False
GuaranteesSequencing    False
MaximumAddressSize      20 bytes
MaximumMessageSize      64000 bytes
MessageOriented   True
MinimumAddressSize      20 bytes
PseudoStreamOriented    False
SupportsBroadcasting    True
SupportsConnectData     False
SupportsDisconnectData  False
SupportsEncryption      False
SupportsExpeditedData   False
SupportsGracefulClosing False
SupportsGuaranteedBandwidth   False
SupportsMulticasting    False

Name  MSAFD NetBIOS [\Device\NetBT_Tcpip_{39F73F3C-0803-4A82-8158-
B8DDBC4C30E4}] 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_{39F73F3C-0803-4A82-8158-
B8DDBC4C30E4}] 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_{D13BBD8A-6510-4ED2-877D-
E3BFE3CC0ED0}] 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_{D13BBD8A-6510-4ED2-877D-
E3BFE3CC0ED0}] 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_{51C52CA2-22FC-4D77-B326-
50B3C60B96A3}] 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_{51C52CA2-22FC-4D77-B326-
50B3C60B96A3}] 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     5.00.2195.1207
Size  21.27 KB (21,776 bytes)


[Ports]

[ Following are sub-categories of this main category ]

[Serial]
```

```
Item  Value
Name  COM1
Status      OK
PNP Device ID     ROOT\*PNP0501\PNPBIOS_1
Maximum Input Buffer Size     Not Available
Maximum Output Buffer Size    Not Available
Settable Baud Rate      Not Available
Settable Data Bits      Not Available
Settable Flow Control   Not Available
Settable Parity   Not Available
Settable Parity Check   Not Available
Settable Stop Bits      Not Available
Settable RLSD     Not Available
Supports RLSD     Not Available
Supports 16 Bit Mode    Not Available
Supports Special Characters   Not Available
Baud Rate   9600
Bits/Byte   8
Stop Bits   1
Parity      None
Busy  -1
Abort Read/Write on Error     Not Available
Binary Mode Enabled     Not Available
Continue XMit on XOff   Not Available
CTS Outflow Control     Not Available
Discard NULL Bytes      Not Available
DSR Outflow Control     Not Available
DSR Sensitivity   Not Available
DTR Flow Control Type   Not Available
EOF Character     Not Available
Error Replace Character Not Available
Error Replacement Enabled     Not Available
Event Character   Not Available
Parity Check Enabled    -1
RTS Flow Control Type   Not Available
XOff Character    19
XOffXMit Threshold      512
XOn Character     17
XOnXMit Threshold 2048
XOnXOff InFlow Control  Not Available
XOnXOff OutFlow Control Not Available
IRQ Number  4
I/O Port    0x03F8-0x03FF
Driver      c:\winnt\system32\drivers\serial.sys (62448, 5.00.2134.1)

Name  COM2
Status      OK
PNP Device ID     ROOT\*PNP0501\PNPBIOS_2
Maximum Input Buffer Size     0
Maximum Output Buffer Size    False
Settable Baud Rate      True
Settable Data Bits      True
Settable Flow Control   True
Settable Parity   True
Settable Parity Check   True
```

```
Settable Stop Bits      True
Settable RLSD     True
Supports RLSD     True
Supports 16 Bit Mode    False
Supports Special Characters   False
Baud Rate   9600
Bits/Byte   8
Stop Bits   1
Parity      None
Busy  0
Abort Read/Write on Error     0
Binary Mode Enabled     -1
Continue XMit on XOff   0
CTS Outflow Control     0
Discard NULL Bytes      0
DSR Outflow Control     0
DSR Sensitivity   0
DTR Flow Control Type   Enable
EOF Character     0
Error Replace Character 0
Error Replacement Enabled     0
Event Character   0
Parity Check Enabled    0
RTS Flow Control Type   Enable
XOff Character    19
XOffXMit Threshold      512
XOn Character     17
XOnXMit Threshold 2048
XOnXOff InFlow Control  0
XOnXOff OutFlow Control 0
IRQ Number  3
I/O Port    0x02F8-0x02FF
Driver      c:\winnt\system32\drivers\serial.sys (62448, 5.00.2134.1)


[Parallel]

Item  Value
Name  LPT1
PNP Device ID     ROOT\*PNP0401\PNPBIOS_3


[Storage]

[ Following are sub-categories of this main category ]

[Drives]

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

Drive C:
Description Local Fixed Disk
Compressed  False
```

```
File System NTFS
Size  4.24 GB (4,556,771,328 bytes)
Free Space  1.44 GB (1,543,471,104 bytes)
Volume Name
Volume Serial Number    A03ABF83
Partition   Disk #0, Partition #0
Partition Size    4.24 GB (4,556,772,864 bytes)
Starting Offset   32256 bytes
Drive Description Disk drive
Drive Manufacturer      (Standard disk drives)
Drive Model QUANTUM VIKING II 4.5WLS 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      1
Drive SectorsPerTrack   63
Drive Size  4556805120 bytes
Drive TotalCylinders    554
Drive TotalSectors      8900010
Drive TotalTracks 141270
Drive TracksPerCylinder 255


[SCSI]

Item  Value
Name  Adaptec AHA-2940U2/U2W PCI SCSI Controller
Caption     Adaptec AHA-2940U2/U2W PCI SCSI Controller
Driver      aic78u2
Status      OK
PNP Device ID
      PCI\VEN_9005&DEV_001F&SUBSYS_000F9005&REV_01\3&3034C9FE&0&5810
Device ID
      PCI\VEN_9005&DEV_001F&SUBSYS_000F9005&REV_01\3&3034C9FE&0&5810
Device Map  Not Available
Index Not Available
Max Number Controlled   Not Available
IRQ Number  44
I/O Port    0xDC00-0xDCFF
Driver      c:\winnt\system32\drivers\aic78u2.sys (65168, v3.00a)


[Printing]

Name  Port Name   Server Name
No printing information

[Problem Devices]

Device      PNP Device ID     Error Code
No Problem Devices
```

```
[USB]

Device      PNP Device ID
Intel 82371AB/EB PCI to USB Universal Host Controller
      PCI\VEN_8086&DEV_7112&SUBSYS_00000000&REV_01\2&EBB567F&0&3A
USB Root Hub      USB\ROOT_HUB\3&32C8BD93&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  ACPI  Not Available     Kernel Driver     False Disabled
      Stopped     OK    Normal      False False
acpiec      ACPIEC      Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
adpu160m    adpu160m    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
afd   AFD Networking Support Environment
      c:\winnt\system32\drivers\afd.sys   Kernel Driver     True  Auto
      Running     OK    Normal      False True
agp440      Intel AGP Bus Filter
      c:\winnt\system32\drivers\agp440.sys      Kernel Driver     True
      Boot  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     c:\winnt\system32\drivers\aic78u2.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
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
atirage     atirage     c:\winnt\system32\drivers\atiragem.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     False Disabled    Stopped     OK    Normal
      False False
dmio  Logical Disk Manager Driver   c:\winnt\system32\drivers\dmio.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
```

```
dmload      dmload      c:\winnt\system32\drivers\dmload.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
e100b Intel PRO Adapter Driver
      c:\winnt\system32\drivers\e100bnt5.sys    Kernel Driver     True
      Manual      Running     OK    Normal      False True
efs   EFS   c:\winnt\system32\drivers\efs.sys   File System Driver
      True  Disabled    Running     OK    Normal      False True
fastfat     Fastfat     c:\winnt\system32\drivers\fastfat.sys     File
System Driver     True  Disabled    Running     OK    Normal      False
      True
fd16_700    Fd16_700    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
fdc   Floppy Disk Controller Driver c:\winnt\system32\drivers\fdc.sys
      Kernel Driver     True  Manual      Running     OK    Normal
      False True
fireport    fireport    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
flashpnt    flashpnt    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
flpydisk    Floppy Disk Driver
      c:\winnt\system32\drivers\flpydisk.sys    Kernel Driver     True
      Manual      Running     OK    Normal      False True
ftdisk      Volume Manager Driver
      c:\winnt\system32\drivers\ftdisk.sys      Kernel Driver     True
      Boot  Running     OK    Normal      False True
gnindis     cLAN NDIS Driver  c:\winnt\system32\drivers\gnindis.sys
      Kernel Driver     True  Auto  Running     OK    Normal      False
      True
gnivia      cLAN VIA Driver   c:\winnt\system32\drivers\gnivia.sys
      Kernel Driver     True  Auto  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      False Manual      Stopped     OK    Normal      False False
```

```
ipsraidn    ipsraidn    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
isapnp      PnP ISA/EISA Bus Driver
      c:\winnt\system32\drivers\isapnp.sys      Kernel Driver     True
      Boot  Running     OK    Critical    False True
kbdclass    Keyboard Class Driver
      c:\winnt\system32\drivers\kbdclass.sys    Kernel Driver     True
      System      Running     OK    Normal      False True
ksecdd      KSecDD      c:\winnt\system32\drivers\ksecdd.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
lbrtfdc     lbrtfdc     Not Available     Kernel Driver     False
      System      Stopped     OK    Ignore      False False
lp6nds35    lp6nds35    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
mnmdd mnmdd c:\winnt\system32\drivers\mnmdd.sys Kernel Driver     True
      System      Running     OK    Ignore      False True
modem Modem c:\winnt\system32\drivers\modem.sys Kernel Driver     False
      Manual      Stopped     OK    Ignore      False False
mouclass    Mouse Class Driver
      c:\winnt\system32\drivers\mouclass.sys    Kernel Driver     True
      System      Running     OK    Normal      False True
mountmgr    MountMgr    c:\winnt\system32\drivers\mountmgr.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
mraid35x    mraid35x    Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
mrxsmb      MRXSMB      c:\winnt\system32\drivers\mrxsmb.sys      File
System Driver     True  System      Running     OK    Normal      False
      True
msfs  Msfs  c:\winnt\system32\drivers\msfs.sys  File System Driver
      True  System      Running     OK    Normal      False True
mskssrv     Microsoft Streaming Service Proxy
      c:\winnt\system32\drivers\mskssrv.sys     Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
mspclock    Microsoft Streaming Clock Proxy
      c:\winnt\system32\drivers\mspclock.sys    Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
mspqm Microsoft Streaming Quality Manager Proxy
      c:\winnt\system32\drivers\mspqm.sys Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
mup   Mup   c:\winnt\system32\drivers\mup.sys   File System Driver
      True  Boot  Running     OK    Normal      False True
ncrc710     Ncrc710     Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
ndis  NDIS System Driver      c:\winnt\system32\drivers\ndis.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
ndistapi    Remote Access NDIS TAPI Driver
      c:\winnt\system32\drivers\ndistapi.sys    Kernel Driver     True
      Manual      Running     OK    Normal      False True
ndiswan     Remote Access NDIS WAN Driver
      c:\winnt\system32\drivers\ndiswan.sys     Kernel Driver     True
      Manual      Running     OK    Normal      False True
```

```
ndproxy     NDIS Proxy  c:\winnt\system32\drivers\ndproxy.sys
      Kernel Driver     True  Manual      Running     OK    Normal
      False True
netbios     NetBIOS Interface c:\winnt\system32\drivers\netbios.sys
      File System Driver      True  System      Running     OK
      Normal      False True
netbt NetBios over Tcpip      c:\winnt\system32\drivers\netbt.sys
      Kernel Driver     True  System      Running     OK    Normal
      False True
netdetect   NetDetect   c:\winnt\system32\drivers\netdtect.sys
      Kernel Driver     False Manual      Stopped     OK    Normal
      False False
npfs  Npfs  c:\winnt\system32\drivers\npfs.sys  File System Driver
      True  System      Running     OK    Normal      False True
ntfs  Ntfs  c:\winnt\system32\drivers\ntfs.sys  File System Driver
      True  Disabled    Running     OK    Normal      False True
null  Null  c:\winnt\system32\drivers\null.sys  Kernel Driver     True
      System      Running     OK    Normal      False True
nwlnkflt    IPX Traffic Filter Driver
      c:\winnt\system32\drivers\nwlnkflt.sys    Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
nwlnkfwd    IPX Traffic Forwarder Driver
      c:\winnt\system32\drivers\nwlnkfwd.sys    Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
parallel    Parallel class driver
      c:\winnt\system32\drivers\parallel.sys    Kernel Driver     True
      Manual      Running     OK    Normal      False True
parport     Parallel port driver
      c:\winnt\system32\drivers\parport.sys     Kernel Driver     True
      System      Running     OK    Ignore      False True
partmgr     PartMgr     c:\winnt\system32\drivers\partmgr.sys
      Kernel Driver     True  Boot  Running     OK    Normal      False
      True
parvdm      ParVdm      c:\winnt\system32\drivers\parvdm.sys
      Kernel Driver     True  Auto  Running     OK    Ignore      False
      True
pci   PCI Bus Driver    c:\winnt\system32\drivers\pci.sys   Kernel
Driver      True  Boot  Running     OK    Critical    False True
pcidump     PCIDump     Not Available     Kernel Driver     False
      System      Stopped     OK    Ignore      False False
pciide      PCIIde      Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
pcmcia      Pcmcia      c:\winnt\system32\drivers\pcmcia.sys
      Kernel Driver     False Disabled    Stopped     OK    Normal
      False False
pdcomp      PDCOMP      Not Available     Kernel Driver     False
      Manual      Stopped     OK    Ignore      False False
pdframe     PDFRAME     Not Available     Kernel Driver     False
      Manual      Stopped     OK    Ignore      False False
pdreli      PDRELI      Not Available     Kernel Driver     False
      Manual      Stopped     OK    Ignore      False False
pdrframe    PDRFRAME    Not Available     Kernel Driver     False
      Manual      Stopped     OK    Ignore      False False
```

```
pptpminiport      WAN Miniport (PPTP)
      c:\winnt\system32\drivers\raspptp.sys     Kernel Driver     True
      Manual      Running     OK    Normal      False True
ptilink     Direct Parallel Link Driver
      c:\winnt\system32\drivers\ptilink.sys     Kernel Driver     True
      Manual      Running     OK    Normal      False True
ql1080      ql1080      Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
ql10wnt     Ql10wnt     Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
ql1240      ql1240      Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
ql2100      ql2100      Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
rasacd      Remote Access Auto Connection Driver
      c:\winnt\system32\drivers\rasacd.sys      Kernel Driver     True
      System      Running     OK    Normal      False True
rasl2tp     WAN Miniport (L2TP)
      c:\winnt\system32\drivers\rasl2tp.sys     Kernel Driver     True
      Manual      Running     OK    Normal      False True
raspti      Direct Parallel   c:\winnt\system32\drivers\raspti.sys
      Kernel Driver     True  Manual      Running     OK    Normal
      False True
rca   Microsoft Streaming Network Raw Channel Access
      c:\winnt\system32\drivers\rca.sys   Kernel Driver     False
      Manual      Stopped     OK    Normal      False False
rdbss Rdbss c:\winnt\system32\drivers\rdbss.sys File System Driver
      True  System      Running     OK    Normal      False True
rdpwd RDPWD c:\winnt\system32\drivers\rdpwd.sys Kernel Driver     False
      Manual      Stopped     OK    Ignore      False False
redbook     Digital CD Audio Playback Filter Driver
      c:\winnt\system32\drivers\redbook.sys     Kernel Driver     False
      System      Stopped     OK    Normal      False False
serenum     Serenum Filter Driver
      c:\winnt\system32\drivers\serenum.sys     Kernel Driver     True
      Manual      Running     OK    Normal      False True
serial      Serial port driver
      c:\winnt\system32\drivers\serial.sys      Kernel Driver     True
      System      Running     OK    Ignore      False True
sfloppy     Sfloppy     c:\winnt\system32\drivers\sfloppy.sys
      Kernel Driver     False System      Stopped     OK    Ignore
      False False
sglfb sglfb Not Available     Kernel Driver     False System
      Stopped     OK    Normal      False False
simbad      Simbad      Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
sparrow     Sparrow     Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
spud  Special Purpose Utility Driver
      c:\winnt\system32\drivers\spud.sys  Kernel Driver     True
      Manual      Running     OK    Normal      False True
srv   Srv   c:\winnt\system32\drivers\srv.sys   File System Driver
      True  Manual      Running     OK    Normal      False True
```

```
swenum      Software Bus Driver
      c:\winnt\system32\drivers\swenum.sys      Kernel Driver     True
      Manual      Running     OK    Normal      False True
symc810     symc810     Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
symc8xx     symc8xx     Not Available     Kernel Driver     False
      Disabled    Stopped     OK    Normal      False False
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
usbhub      Microsoft USB Standard Hub Driver
      c:\winnt\system32\drivers\usbhub.sys      Kernel Driver     True
      Manual      Running     OK    Normal      False True
vgasave     VgaSave     c:\winnt\system32\drivers\vga.sys   Kernel
Driver      True  System      Running     OK    Ignore      False True
wanarp      Remote Access IP ARP Driver
      c:\winnt\system32\drivers\wanarp.sys      Kernel Driver     True
      Manual      Running     OK    Normal      False True
wdica WDICA Not Available     Kernel Driver     False Manual
      Stopped     OK    Ignore      False False

[Environment Variables]
```

```
Variable    Value User Name
ComSpec     %SystemRoot%\system32\cmd.exe <SYSTEM>
HOME  C:/   <SYSTEM>
NUMBER_OF_PROCESSORS    1     <SYSTEM>
OS    Windows_NT  <SYSTEM>
Os2LibPath  %SystemRoot%\system32\os2\dll;      <SYSTEM>
Path
      C:\MKS\mksnt;C:\WINNT\system32;C:\WINNT;C:\WINNT\System32\Wbem;C:
\Program Files\Microsoft SQL
Server\80\Tools\BINN;C:\SQL_2K_ENT\x86\binn;.;  <SYSTEM>
PATHEXT     .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH
      <SYSTEM>
PROCESSOR_ARCHITECTURE  x86   <SYSTEM>
PROCESSOR_IDENTIFIER    x86 Family 6 Model 7 Stepping 3, GenuineIntel
      <SYSTEM>
PROCESSOR_LEVEL   6     <SYSTEM>
PROCESSOR_REVISION      0703  <SYSTEM>
ROOTDIR     C:/MKS      <SYSTEM>
SHELL C:/MKS/mksnt/sh.exe     <SYSTEM>
TEMP  %SystemRoot%\TEMP <SYSTEM>
TMP   %SystemRoot%\TEMP <SYSTEM>
TMPDIR      C:/WINNT/TEMP     <SYSTEM>
windir      %SystemRoot%      <SYSTEM>
TEMP  %USERPROFILE%\Local Settings\Temp   CLIENT2\Administrator
TMP   %USERPROFILE%\Local Settings\Temp   CLIENT2\Administrator

[Jobs]

[ Following are sub-categories of this main category ]

[Print]

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

[Network Connections]

Local Name  Remote Name Type  Status      User Name
No network connections information

[Running Tasks]

Name  Path  Process ID  Priority    Min Working Set   Max Working Set
      Start Time  Version     Size  File Date
system idle process     Not Available     0     0     Not Available
      Not Available     Not Available     Unknown     Unknown
      Unknown
system      Not Available     8     8     0     1413120     Not
Available   Unknown     Unknown     Unknown
```

```
smss.exe    c:\winnt\system32\smss.exe    156   11    204800
      1413120     10/13/2000 4:26:26 PM   5.00.2195.31      44.27 KB
(45,328 bytes)    12/7/1999 6:00:00 AM
csrss.exe   Not Available     184   13    Not Available     Not
Available   10/13/2000 4:26:30 PM   Unknown     Unknown     Unknown
winlogon.exe      c:\winnt\system32\winlogon.exe      180   13
      204800      1413120     10/13/2000 4:26:31 PM   5.00.2195.1600
      172.77 KB (176,912 bytes)     12/7/1999 6:00:00 AM
services.exe      c:\winnt\system32\services.exe      232   9
      204800      1413120     10/13/2000 4:26:33 PM   5.00.2134.1 86.77
KB (88,848 bytes) 12/7/1999 6:00:00 AM
lsass.exe   c:\winnt\system32\lsass.exe   244   13    204800
      1413120     10/13/2000 4:26:33 PM   5.00.2195.1620    32.77 KB
(33,552 bytes)    12/7/1999 6:00:00 AM
gnconmgr.exe      c:\winnt\system32\gnconmgr.exe      372   8
      204800      1413120     10/13/2000 4:26:38 PM   4.1.1 128.05 KB
(131,119 bytes)   9/13/2000 3:45:58 PM
svchost.exe c:\winnt\system32\svchost.exe 420   8     204800
      1413120     10/13/2000 4:26:39 PM   5.00.2134.1 7.77 KB (7,952
bytes)      12/7/1999 6:00:00 AM
msdtc.exe   c:\winnt\system32\msdtc.exe   448   8     204800
      1413120     10/13/2000 4:26:40 PM   1999.9.3421.3     6.77 KB
(6,928 bytes)     9/13/2000 6:25:55 AM
svchost.exe c:\winnt\system32\svchost.exe 552   8     204800
      1413120     10/13/2000 4:26:42 PM   5.00.2134.1 7.77 KB (7,952
bytes)      12/7/1999 6:00:00 AM
regsvc.exe  c:\winnt\system32\regsvc.exe  580   8     204800
      1413120     10/13/2000 4:26:42 PM   5.00.2195.31      65.27 KB
(66,832 bytes)    9/15/2000 3:01:52 PM
mstask.exe  c:\winnt\system32\mstask.exe  596   8     204800
      1413120     10/13/2000 4:26:43 PM   4.71.2137.1 115.27 KB
(118,032 bytes)   9/13/2000 11:25:44 AM
tcpsvcs.exe c:\winnt\system32\tcpsvcs.exe 648   8     204800
      1413120     10/13/2000 4:26:45 PM   5.00.2134.1 24.77 KB (25,360
bytes)      12/7/1999 6:00:00 AM
winmgmt.exe c:\winnt\system32\wbem\winmgmt.exe  672   8     204800
      1413120     10/13/2000 4:26:45 PM   1.50.1085.0009    192.08 KB
(196,685 bytes)   9/15/2000 3:02:35 PM
inetinfo.exe      c:\winnt\system32\inetsrv\inetinfo.exe    740   8
      204800      1413120     10/13/2000 4:26:52 PM   5.00.0984   14.27
KB (14,608 bytes) 9/15/2000 3:03:43 PM
explorer.exe      c:\winnt\explorer.exe   824   8     204800
      1413120     10/13/2000 4:26:55 PM   5.00.3103.1000    237.27 KB
(242,960 bytes)   9/15/2000 3:02:27 PM
svchost.exe c:\winnt\system32\svchost.exe 828   8     204800
      1413120     10/13/2000 4:29:41 PM   5.00.2134.1 7.77 KB (7,952
bytes)      12/7/1999 6:00:00 AM
mmc.exe     c:\winnt\system32\mmc.exe     736   8     204800
      1413120     10/15/2000 5:06:42 PM   5.00.2153.1 589.27 KB
(603,408 bytes)   12/7/1999 6:00:00 AM
rsvp.exe    c:\winnt\system32\rsvp.exe    1120  8     204800
      1413120     10/15/2000 5:08:07 PM   5.00.2167.1 172.77 KB
(176,912 bytes)   12/7/1999 6:00:00 AM

[Loaded Modules]
```

```
Name  Version     Size  File Date   Manufacturer      Path
traffic.dll 5.00.2139.1 30.77 KB (31,504 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\traffic.dll
rsvp.exe    5.00.2167.1 172.77 KB (176,912 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\rsvp.exe
wbemprox.dll      1.50.1085.0015    40.08 KB (41,040 bytes) 9/15/2000
3:02:35 PM  Microsoft Corporation   c:\winnt\system32\wbem\wbemprox.dll
mlang.dll   5.00.3103.1000    510.77 KB (523,024 bytes)     9/15/2000
3:02:09 PM  Microsoft Corporation   c:\winnt\system32\mlang.dll
rassapi.dll 5.00.2188.1 14.27 KB (14,608 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\rassapi.dll
adsnt.dll   5.00.2195.1600    194.27 KB (198,928 bytes)     9/15/2000
3:02:22 PM  Microsoft Corporation   c:\winnt\system32\adsnt.dll
dbghelp.dll 5.00.2195.1 159.27 KB (163,088 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\dbghelp.dll
localsec.dll      5.00.2195.1340    227.27 KB (232,720 bytes)
      9/15/2000 3:02:09 PM    Microsoft Corporation
      c:\winnt\system32\localsec.dll
devmgr.dll  5.00.2166.1 215.77 KB (220,944 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\devmgr.dll
filemgmt.dll      5.00.2134.1 287.27 KB (294,160 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\filemgmt.dll
pdh.dll     5.00.2195.1600    143.27 KB (146,704 bytes)     9/15/2000
3:01:55 PM  Microsoft Corporation   c:\winnt\system32\pdh.dll
smlogcfg.dll      5.00.2163.1 273.27 KB (279,824 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\smlogcfg.dll
cabinet.dll 5.00.2147.1 54.77 KB (56,080 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\cabinet.dll
msinfo32.dll      5.00.2177.1 312.27 KB (319,760 bytes)     9/13/2000
11:25:52 AM Microsoft Corporation   c:\program files\common
files\microsoft shared\msinfo\msinfo32.dll
riched20.dll      5.30.23.1203      421.27 KB (431,376 bytes)
      9/15/2000 3:01:52 PM    Microsoft Corporation
      c:\winnt\system32\riched20.dll
riched32.dll      5.00.2134.1 3.77 KB (3,856 bytes)   12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\riched32.dll
els.dll     5.00.2175.1 151.27 KB (154,896 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\els.dll
ntmsmgr.dll 1,0,0,1     427.77 KB (438,032 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation and HighGround Systems, Inc.
      c:\winnt\system32\ntmsmgr.dll
mmfutil.dll 1.50.1085.0000    32.06 KB (32,829 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\mmfutil.dll
logdrive.dll      1.50.1085.0000    200.06 KB (204,863 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\logdrive.dll
dfrgres.dll 5.00.2150.1 27.50 KB (28,160 bytes) 12/7/1999 6:00:00 AM
      Executive Software International, Inc.
      c:\winnt\system32\dfrgres.dll
dfrgsnap.dll      5.00.2195.31      41.77 KB (42,768 bytes) 9/15/2000
3:02:17 PM  Executive Software International, Inc.
      c:\winnt\system32\dfrgsnap.dll
```

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dmdskres.dll      2191.1.296.2      119.00 KB (121,856 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corp., VERITAS Software
      c:\winnt\system32\dmdskres.dll
dmutil.dll  2195.23.297.2     42.27 KB (43,280 bytes) 9/15/2000 3:02:16
PM    VERITAS Software Corp.  c:\winnt\system32\dmutil.dll
ntmsapi.dll 5.00.1948.1 50.27 KB (51,472 bytes) 9/15/2000 3:01:59 PM
      Microsoft Corporation   c:\winnt\system32\ntmsapi.dll
dmdskmgr.dll      2195.1600.297.3   160.27 KB (164,112 bytes)
      9/15/2000 3:02:16 PM    Microsoft Corp., VERITAS Software
      c:\winnt\system32\dmdskmgr.dll
mycomput.dll      5.00.2134.1 107.77 KB (110,352 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\mycomput.dll
mmcndmgr.dll      5.00.2178.1 815.27 KB (834,832 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\mmcndmgr.dll
mfc42u.dll  6.00.8665.0 972.05 KB (995,384 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\mfc42u.dll
mmc.exe     5.00.2153.1 589.27 KB (603,408 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\mmc.exe
tapisrv.dll 5.00.2186.1 168.77 KB (172,816 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\tapisrv.dll
wininet.dll 5.00.3103.1000    456.77 KB (467,728 bytes)     9/15/2000
3:01:46 PM  Microsoft Corporation   c:\winnt\system32\wininet.dll
shdoclc.dll 5.00.3103.1000    324.50 KB (332,288 bytes)     9/15/2000
3:01:50 PM  Microsoft Corporation   c:\winnt\system32\shdoclc.dll
faxshell.dll      5.00.2134.1 8.27 KB (8,464 bytes)   12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\faxshell.dll
msacm32.dll 5.00.2134.1 65.27 KB (66,832 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\msacm32.dll
avifil32.dll      5.00.2134.1 76.27 KB (78,096 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\avifil32.dll
msvfw32.dll 5.00.2134.1 113.77 KB (116,496 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\msvfw32.dll
docprop2.dll      5.00.2178.1 297.77 KB (304,912 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\docprop2.dll
mydocs.dll  5.00.2920.0000    55.77 KB (57,104 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\mydocs.dll
msi.dll     1.11.1314.0 1.72 MB (1,798,928 bytes)     9/15/2000 3:02:05
PM    Microsoft Corporation   c:\winnt\system32\msi.dll
urlmon.dll  5.00.3103.1000    440.77 KB (451,344 bytes)     9/15/2000
3:01:47 PM  Microsoft Corporation   c:\winnt\system32\urlmon.dll
ntshrui.dll 5.00.2134.1 46.77 KB (47,888 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\ntshrui.dll
linkinfo.dll      5.00.2134.1 15.77 KB (16,144 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\linkinfo.dll
browselc.dll      5.00.3103.1000    34.50 KB (35,328 bytes) 9/15/2000
3:02:21 PM  Microsoft Corporation   c:\winnt\system32\browselc.dll
powrprof.dll      5.00.3103.1000    13.27 KB (13,584 bytes) 9/15/2000
3:01:54 PM  Microsoft Corporation   c:\winnt\system32\powrprof.dll
batmeter.dll      5.00.2920.0000    20.27 KB (20,752 bytes) 9/15/2000
3:02:21 PM  Microsoft Corporation   c:\winnt\system32\batmeter.dll
stobject.dll      5.00.2195.1387    79.27 KB (81,168 bytes) 9/15/2000
3:01:48 PM  Microsoft Corporation   c:\winnt\system32\stobject.dll
webcheck.dll      5.00.3103.1000    251.77 KB (257,808 bytes)
      9/15/2000 3:01:47 PM    Microsoft Corporation
      c:\winnt\system32\webcheck.dll
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browseui.dll      5.00.3103.1000    788.77 KB (807,696 bytes)
      9/15/2000 3:02:21 PM    Microsoft Corporation
      c:\winnt\system32\browseui.dll
shdocvw.dll 5.00.3103.1000    1.05 MB (1,104,144 bytes)     9/15/2000
3:01:49 PM  Microsoft Corporation   c:\winnt\system32\shdocvw.dll
explorer.exe      5.00.3103.1000    237.27 KB (242,960 bytes)
      9/15/2000 3:02:27 PM    Microsoft Corporation
      c:\winnt\explorer.exe
iislog.dll  5.00.0984   75.77 KB (77,584 bytes) 9/15/2000 3:03:44 PM
      Microsoft Corporation   c:\winnt\system32\inetsrv\iislog.dll
httpext.dll 0.9.3940.2  418.27 KB (428,304 bytes)     9/15/2000 3:03:44
PM    Microsoft Corporation   c:\winnt\system32\inetsrv\httpext.dll
rpcproxy.dll      5.00.2176.1 16.27 KB (16,656 bytes) 9/13/2000 6:25:47
AM    Microsoft Corporation   c:\winnt\system32\rpcproxy\rpcproxy.dll
fpexedll.dll      4.0.2.4022  20.06 KB (20,541 bytes) 9/15/2000 3:03:36
PM    Microsoft Corporation   c:\program files\common files\microsoft
shared\web server extensions\40\bin\fpexedll.dll
md5filt.dll 5.00.0984   32.77 KB (33,552 bytes) 9/15/2000 3:03:43 PM
      Microsoft Corporation   c:\winnt\system32\inetsrv\md5filt.dll
gzip.dll    5.00.0984   30.27 KB (30,992 bytes) 9/15/2000 3:03:44 PM
      Microsoft Corporation   c:\winnt\system32\inetsrv\gzip.dll
compfilt.dll      5.00.0984   22.27 KB (22,800 bytes) 9/15/2000 3:03:45
PM    Microsoft Corporation   c:\winnt\system32\inetsrv\compfilt.dll
sspifilt.dll      5.00.0984   43.27 KB (44,304 bytes) 9/15/2000 3:03:42
PM    Microsoft Corporation   c:\winnt\system32\inetsrv\sspifilt.dll
iscomlog.dll      5.00.0984   24.77 KB (25,360 bytes) 9/15/2000 3:03:43
PM    Microsoft Corporation   c:\winnt\system32\inetsrv\iscomlog.dll
lonsint.dll 5.00.0984   11.77 KB (12,048 bytes) 9/15/2000 3:03:43 PM
      Microsoft Corporation   c:\winnt\system32\inetsrv\lonsint.dll
inetsloc.dll      5.00.0984   20.27 KB (20,752 bytes) 9/15/2000 3:02:11
PM    Microsoft Corporation   c:\winnt\system32\inetsloc.dll
iisfecnv.dll      5.00.0984   7.27 KB (7,440 bytes)   9/13/2000 6:26:47
AM    Microsoft Corporation   c:\winnt\system32\inetsrv\iisfecnv.dll
isatq.dll   5.00.0984   60.27 KB (61,712 bytes) 9/15/2000 3:03:43 PM
      Microsoft Corporation   c:\winnt\system32\inetsrv\isatq.dll
infocomm.dll      5.00.0984   229.77 KB (235,280 bytes)     9/15/2000
3:03:43 PM  Microsoft Corporation
      c:\winnt\system32\inetsrv\infocomm.dll
w3svc.dll   5.00.0984   342.77 KB (350,992 bytes)     9/15/2000 3:03:42
PM    Microsoft Corporation   c:\winnt\system32\inetsrv\w3svc.dll
security.dll      5.00.2154.1 5.77 KB (5,904 bytes)   12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\security.dll
svcext.dll  5.00.0984   39.77 KB (40,720 bytes) 9/15/2000 3:03:42 PM
      Microsoft Corporation   c:\winnt\system32\inetsrv\svcext.dll
admexs.dll  5.00.0984   27.77 KB (28,432 bytes) 9/15/2000 3:03:45 PM
      Microsoft Corporation   c:\winnt\system32\inetsrv\admexs.dll
wamreg.dll  5.00.0984   45.77 KB (46,864 bytes) 9/15/2000 3:03:41 PM
      Microsoft Corporation   c:\winnt\system32\inetsrv\wamreg.dll
metadata.dll      5.00.0984   68.27 KB (69,904 bytes) 9/15/2000 3:03:42
PM    Microsoft Corporation   c:\winnt\system32\inetsrv\metadata.dll
iismap.dll  5.00.0984   55.77 KB (57,104 bytes) 9/15/2000 3:02:12 PM
      Microsoft Corporation   c:\winnt\system32\iismap.dll
nsepm.dll   5.00.0984   43.27 KB (44,304 bytes) 9/15/2000 3:03:42 PM
      Microsoft Corporation   c:\winnt\system32\inetsrv\nsepm.dll
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admwprox.dll      5.00.0984   31.77 KB (32,528 bytes) 9/13/2000 6:26:48
AM    Microsoft Corporation   c:\winnt\system32\admwprox.dll
coadmin.dll 5.00.0984   39.27 KB (40,208 bytes) 9/15/2000 3:03:45 PM
      Microsoft Corporation   c:\winnt\system32\inetsrv\coadmin.dll
iisadmin.dll      5.00.0984   15.27 KB (15,632 bytes) 9/15/2000 3:03:44
PM    Microsoft Corporation   c:\winnt\system32\inetsrv\iisadmin.dll
rpcref.dll  5.00.0984   4.27 KB (4,368 bytes)   9/15/2000 3:03:42 PM
      Microsoft Corporation   c:\winnt\system32\inetsrv\rpcref.dll
iisrtl.dll  5.00.0984   120.27 KB (123,152 bytes)     9/15/2000 3:02:12
PM    Microsoft Corporation   c:\winnt\system32\iisrtl.dll
inetinfo.exe      5.00.0984   14.27 KB (14,608 bytes) 9/15/2000 3:03:43
PM    Microsoft Corporation   c:\winnt\system32\inetsrv\inetinfo.exe
netui1.dll  5.00.2134.1 210.27 KB (215,312 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\netui1.dll
netui0.dll  5.00.2134.1 70.27 KB (71,952 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\netui0.dll
ntlanman.dll      5.00.2157.1 35.27 KB (36,112 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\ntlanman.dll
wshnetbs.dll      5.00.2134.1 7.77 KB (7,952 bytes)   12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\wshnetbs.dll
rapilib.dll 5.00.2167.1 25.27 KB (25,872 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\rapilib.dll
rsvpsp.dll  5.00.2167.1 74.77 KB (76,560 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\rsvpsp.dll
ntmarta.dll 5.00.2158.1 98.77 KB (101,136 bytes)      12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\ntmarta.dll
provthrd.dll      1.50.1085.0000    68.07 KB (69,708 bytes) 9/13/2000
11:25:43 AM Microsoft Corporation   c:\winnt\system32\wbem\provthrd.dll
ntevt.dll   1.50.1085.0000    192.06 KB (196,669 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\wbem\ntevt.dll
perfos.dll  5.00.2155.1 21.27 KB (21,776 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\perfos.dll
psapi.dll   5.00.2134.1 28.27 KB (28,944 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\psapi.dll
framedyn.dll      1.50.1085.0000    164.05 KB (167,992 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\wbem\framedyn.dll
cimwin32.dll      1.50.1085.0016    1.02 MB (1,073,232 bytes)
      9/15/2000 3:02:37 PM    Microsoft Corporation
      c:\winnt\system32\wbem\cimwin32.dll
wbemsvc.dll 1.50.1085.0007    40.07 KB (41,036 bytes) 9/15/2000 3:02:35
PM    Microsoft Corporation   c:\winnt\system32\wbem\wbemsvc.dll
wbemess.dll 1.50.1085.0007    364.07 KB (372,804 bytes)     9/15/2000
3:02:35 PM  Microsoft Corporation   c:\winnt\system32\wbem\wbemess.dll
fastprox.dll      1.50.1085.0007    144.08 KB (147,536 bytes)
      9/15/2000 3:02:36 PM    Microsoft Corporation
      c:\winnt\system32\wbem\fastprox.dll
wbemcore.dll      1.50.1085.0008    628.07 KB (643,140 bytes)
      9/15/2000 3:02:35 PM    Microsoft Corporation
      c:\winnt\system32\wbem\wbemcore.dll
wbemcomn.dll      1.50.1085.0007    692.07 KB (708,675 bytes)
      9/15/2000 3:02:36 PM    Microsoft Corporation
      c:\winnt\system32\wbem\wbemcomn.dll
winmgmt.exe 1.50.1085.0009    192.08 KB (196,685 bytes)     9/15/2000
3:02:35 PM  Microsoft Corporation   c:\winnt\system32\wbem\winmgmt.exe
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simptcp.dll 5.00.2134.1 19.27 KB (19,728 bytes) 9/13/2000 6:25:46 AM
      Microsoft Corporation   c:\winnt\system32\simptcp.dll
tcpsvcs.exe 5.00.2134.1 24.77 KB (25,360 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\tcpsvcs.exe
msidle.dll  5.00.2920.0000    6.27 KB (6,416 bytes)   12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\msidle.dll
mstask.exe  4.71.2137.1 115.27 KB (118,032 bytes)     9/13/2000
11:25:44 AM Microsoft Corporation   c:\winnt\system32\mstask.exe
regsvc.exe  5.00.2195.31      65.27 KB (66,832 bytes) 9/15/2000 3:01:52
PM    Microsoft Corporation   c:\winnt\system32\regsvc.exe
wmi.dll     5.00.2191.1 6.27 KB (6,416 bytes)   12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\wmi.dll
netshell.dll      5.00.2195.1600    456.77 KB (467,728 bytes)
      9/15/2000 3:02:00 PM    Microsoft Corporation
      c:\winnt\system32\netshell.dll
netman.dll  5.00.2195.1600    89.27 KB (91,408 bytes) 9/15/2000 3:02:00
PM    Microsoft Corporation   c:\winnt\system32\netman.dll
rasdlg.dll  5.00.2194.1 514.27 KB (526,608 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\rasdlg.dll
netcfgx.dll 5.00.2195.1618    533.77 KB (546,576 bytes)     9/15/2000
3:02:01 PM  Microsoft Corporation   c:\winnt\system32\netcfgx.dll
rasmans.dll 5.00.2195.27      146.77 KB (150,288 bytes)     9/15/2000
3:01:53 PM  Microsoft Corporation   c:\winnt\system32\rasmans.dll
iashlpr.dll 5.00.2184.1 33.27 KB (34,064 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\iashlpr.dll
iasacct.dll 5.00.2134.1 28.27 KB (28,944 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\iasacct.dll
iasuserr.dll      5.00.2134.1 25.77 KB (26,384 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\iasuserr.dll
iasnap.dll  5.00.2134.1 58.77 KB (60,176 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\iasnap.dll
iaspipe.dll 5.00.2134.1 41.77 KB (42,768 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\iaspipe.dll
expsrv.dll  6.0.8540    370.27 KB (379,152 bytes)     9/15/2000 3:02:14
PM    Microsoft Corporation   c:\winnt\system32\expsrv.dll
vbajet32.dll      6.1.8268    30.27 KB (30,992 bytes) 9/15/2000 3:01:47
PM    Microsoft Corporation   c:\winnt\system32\vbajet32.dll
msjtes40.dll      4.00.3714.5 236.27 KB (241,936 bytes)     9/15/2000
3:02:03 PM  Microsoft Corporation   c:\winnt\system32\msjtes40.dll
oledb32r.dll      2.60.6526.0 68.27 KB (69,904 bytes) 9/13/2000 4:44:24
PM    Microsoft Corporation   c:\program files\common files\system\ole
db\oledb32r.dll
comdlg32.dll      5.00.3103.1000    236.77 KB (242,448 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\comdlg32.dll
msdart.dll  2.60.6526.0 144.27 KB (147,728 bytes)     9/13/2000 4:44:23
PM    Microsoft Corporation   c:\winnt\system32\msdart.dll
oledb32.dll 2.60.6526.0 448.27 KB (459,024 bytes)     9/13/2000 4:44:24
PM    Microsoft Corporation   c:\program files\common files\system\ole
db\oledb32.dll
msjint40.dll      4.00.2927.2 148.27 KB (151,824 bytes)     9/15/2000
3:02:03 PM  Microsoft Corporation   c:\winnt\system32\msjint40.dll
msjter40.dll      4.00.2927.2 52.27 KB (53,520 bytes) 9/15/2000 3:02:03
PM    Microsoft Corporation   c:\winnt\system32\msjter40.dll
```

```
mswstr10.dll      4.00.3829.2 600.27 KB (614,672 bytes)     9/15/2000
3:02:01 PM  Microsoft Corporation   c:\winnt\system32\mswstr10.dll
msjet40.dll 4.00.3714.7 1.43 MB (1,499,408 bytes)     9/15/2000 3:02:04
PM    Microsoft Corporation   c:\winnt\system32\msjet40.dll
msjetoledb40.dll  4.00.3714.0 340.27 KB (348,432 bytes)     9/15/2000
3:02:03 PM  Microsoft Corporation   c:\winnt\system32\msjetoledb40.dll
iasrad.dll  5.00.2139.1 94.27 KB (96,528 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\iasrad.dll
iassam.dll  5.00.2160.1 96.27 KB (98,576 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\iassam.dll
iasads.dll  5.00.2134.1 73.77 KB (75,536 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\iasads.dll
sens.dll    5.00.2163.1 36.77 KB (37,648 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\sens.dll
iaspolcy.dll      5.00.2134.1 25.27 KB (25,872 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\iaspolcy.dll
iassvcs.dll 5.00.2160.1 58.77 KB (60,176 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\iassvcs.dll
iassdo.dll  5.00.2195.1163    262.27 KB (268,560 bytes)     9/15/2000
3:02:13 PM  Microsoft Corporation   c:\winnt\system32\iassdo.dll
ias.dll     5.00.2134.1 7.27 KB (7,440 bytes)   12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\ias.dll
es.dll      1999.9.3422.21    231.77 KB (237,328 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\es.dll
mtxoci.dll  1999.9.3421.3     109.27 KB (111,888 bytes)     9/13/2000
6:25:57 AM  Microsoft Corporation   c:\winnt\system32\mtxoci.dll
resutils.dll      5.00.2195.1613    39.77 KB (40,720 bytes) 9/15/2000
3:01:52 PM  Microsoft Corporation   c:\winnt\system32\resutils.dll
clusapi.dll 5.00.2195.1613    54.27 KB (55,568 bytes) 9/15/2000 3:02:19
PM    Microsoft Corporation   c:\winnt\system32\clusapi.dll
msvcp50.dll 5.00.7051   552.50 KB (565,760 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\msvcp50.dll
xolehlp.dll 1999.9.3421.3     17.27 KB (17,680 bytes) 9/13/2000 6:25:55
AM    Microsoft Corporation   c:\winnt\system32\xolehlp.dll
msdtclog.dll      1999.9.3421.3     89.77 KB (91,920 bytes) 9/13/2000
6:25:55 AM  Microsoft Corporation   c:\winnt\system32\msdtclog.dll
mtxclu.dll  1999.9.3421.3     50.27 KB (51,472 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\mtxclu.dll
msdtcprx.dll      2000.2.3449.0     625.77 KB (640,784 bytes)
      9/15/2000 3:02:08 PM    Microsoft Corporation
      c:\winnt\system32\msdtcprx.dll
txfaux.dll  1999.9.3422.24    341.27 KB (349,456 bytes)     9/13/2000
6:25:55 AM  Microsoft Corporation   c:\winnt\system32\txfaux.dll
msdtctm.dll 2000.2.3449.0     1.07 MB (1,120,528 bytes)     9/15/2000
3:02:07 PM  Microsoft Corporation   c:\winnt\system32\msdtctm.dll
msdtc.exe   1999.9.3421.3     6.77 KB (6,928 bytes)   9/13/2000 6:25:55
AM    Microsoft Corporation   c:\winnt\system32\msdtc.exe
rasadhlp.dll      5.00.2168.1 7.27 KB (7,440 bytes)   12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\rasadhlp.dll
winrnr.dll  5.00.2160.1 18.77 KB (19,216 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\winrnr.dll
rnr20.dll   5.00.2195.1207    35.77 KB (36,624 bytes) 9/15/2000 3:01:52
PM    Microsoft Corporation   c:\winnt\system32\rnr20.dll
wshtcpip.dll      5.00.2134.1 17.27 KB (17,680 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\wshtcpip.dll
```

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dhcpcsvc.dll      5.00.2153.1 88.77 KB (90,896 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\dhcpcsvc.dll
tapi32.dll  5.00.2182.1 123.27 KB (126,224 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\tapi32.dll
rasman.dll  5.00.2188.1 54.77 KB (56,080 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\rasman.dll
rasapi32.dll      5.00.2188.1 189.77 KB (194,320 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\rasapi32.dll
iphlpapi.dll      5.00.2173.2 67.77 KB (69,392 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\iphlpapi.dll
msafd.dll   5.00.2195.1614    102.77 KB (105,232 bytes)     9/15/2000
3:02:08 PM  Microsoft Corporation   c:\winnt\system32\msafd.dll
rpcss.dll   5.00.2195.1600    229.27 KB (234,768 bytes)     9/15/2000
3:01:51 PM  Microsoft Corporation   c:\winnt\system32\rpcss.dll
svchost.exe 5.00.2134.1 7.77 KB (7,952 bytes)   12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\svchost.exe
vipl.dll    4.1.1 80.00 KB (81,920 bytes) 9/14/2000 5:08:42 PM
      Giganet Incorporated    c:\winnt\system32\vipl.dll
gnconmgr.exe      4.1.1 128.05 KB (131,119 bytes)     9/13/2000 3:45:58
PM    Giganet Incorporated    c:\winnt\system32\gnconmgr.exe
scecli.dll  5.00.2191.1 105.27 KB (107,792 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\scecli.dll
atl.dll     3.00.8449   57.56 KB (58,938 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\atl.dll
certcli.dll 5.00.2175.1 132.27 KB (135,440 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\certcli.dll
mswsock.dll 5.00.2195.1207    62.77 KB (64,272 bytes) 9/15/2000 3:02:01
PM    Microsoft Corporation   c:\winnt\system32\mswsock.dll
ntdsatq.dll 5.00.2195.1284    31.27 KB (32,016 bytes) 9/15/2000 3:02:00
PM    Microsoft Corporation   c:\winnt\system32\ntdsatq.dll
ntdsa.dll   5.00.2195.1600    987.27 KB (1,010,960 bytes)   9/15/2000
3:02:00 PM  Microsoft Corporation   c:\winnt\system32\ntdsa.dll
kdcsvc.dll  5.00.2195.1284    133.77 KB (136,976 bytes)     9/15/2000
3:02:09 PM  Microsoft Corporation   c:\winnt\system32\kdcsvc.dll
sfmapi.dll  5.00.2134.1 38.77 KB (39,696 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\sfmapi.dll
rtutils.dll 5.00.2168.1 43.77 KB (44,816 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\rtutils.dll
adsldpc.dll 5.00.2195.1600    125.77 KB (128,784 bytes)     9/15/2000
3:02:22 PM  Microsoft Corporation   c:\winnt\system32\adsldpc.dll
activeds.dll      5.00.2172.1 172.77 KB (176,912 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\activeds.dll
mprapi.dll  5.00.2181.1 79.27 KB (81,168 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\mprapi.dll
rassfm.dll  5.00.2195.1179    21.27 KB (21,776 bytes) 9/15/2000 3:01:52
PM    Microsoft Corporation   c:\winnt\system32\rassfm.dll
mpr.dll     5.00.2195.1340    53.27 KB (54,544 bytes) 9/15/2000 3:02:09
PM    Microsoft Corporation   c:\winnt\system32\mpr.dll
schannel.dll      5.00.2195.1163    137.27 KB (140,560 bytes)
      7/21/2000 12:05:02 PM   Microsoft Corporation
      c:\winnt\system32\schannel.dll
netlogon.dll      5.00.2195.1600    348.27 KB (356,624 bytes)
      9/15/2000 3:02:00 PM    Microsoft Corporation
      c:\winnt\system32\netlogon.dll
```

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msv1_0.dll  5.00.2195.1620    92.77 KB (94,992 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\msv1_0.dll
kerberos.dll      5.00.2195.1378    197.77 KB (202,512 bytes)
      9/15/2000 3:02:09 PM    Microsoft Corporation
      c:\winnt\system32\kerberos.dll
msprivs.dll 5.00.2154.1 41.50 KB (42,496 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\msprivs.dll
samsrv.dll  5.00.2195.1609    343.27 KB (351,504 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\samsrv.dll
lsasrv.dll  5.00.2195.1620    475.27 KB (486,672 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\lsasrv.dll
lsass.exe   5.00.2195.1620    32.77 KB (33,552 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\lsass.exe
esent.dll   6.0.3940.4  1.08 MB (1,135,888 bytes)     9/15/2000 3:02:15
PM    Microsoft Corporation   c:\winnt\system32\esent.dll
ntlsapi.dll 5.00.2134.1 6.77 KB (6,928 bytes)   12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\ntlsapi.dll
wmicore.dll 5.00.2178.1 70.77 KB (72,464 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\wmicore.dll
xactsrv.dll 5.00.2134.1 90.27 KB (92,432 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\xactsrv.dll
browser.dll 5.00.2142.1 48.27 KB (49,424 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\browser.dll
seclogon.dll      5.00.2135.1 15.77 KB (16,144 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\seclogon.dll
psbase.dll  5.00.2195.1600    111.77 KB (114,448 bytes)     9/15/2000
3:01:54 PM  Microsoft Corporation   c:\winnt\system32\psbase.dll
cryptsvc.dll      5.00.2181.1 61.77 KB (63,248 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\cryptsvc.dll
cryptdll.dll      5.00.2135.1 41.27 KB (42,256 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\cryptdll.dll
wkssvc.dll  5.00.2195.1175    95.27 KB (97,552 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\wkssvc.dll
srvsvc.dll  5.00.2178.1 79.27 KB (81,168 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\srvsvc.dll
cfgmgr32.dll      5.00.2134.1 16.77 KB (17,168 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\cfgmgr32.dll
dmserver.dll      2195.23.297.2     11.77 KB (12,048 bytes) 9/15/2000
3:02:16 PM  VERITAS Software Corp.  c:\winnt\system32\dmserver.dll
winsta.dll  5.00.2195.32      36.27 KB (37,136 bytes) 9/15/2000 3:01:46
PM    Microsoft Corporation   c:\winnt\system32\winsta.dll
icmp.dll    5.00.2134.1 7.27 KB (7,440 bytes)   12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\icmp.dll
lmhsvc.dll  5.00.2134.1 9.27 KB (9,488 bytes)   12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\lmhsvc.dll
eventlog.dll      5.00.2178.1 43.77 KB (44,816 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\eventlog.dll
ntdsapi.dll 5.00.2160.1 56.27 KB (57,616 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\ntdsapi.dll
scesrv.dll  5.00.2188.1 225.77 KB (231,184 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\scesrv.dll
umpnpmgr.dll      5.00.2182.1 86.27 KB (88,336 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\umpnpmgr.dll
services.exe      5.00.2134.1 86.77 KB (88,848 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\services.exe
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clbcatq.dll 2000.2.3449.0     496.27 KB (508,176 bytes)     9/15/2000
3:02:20 PM  Microsoft Corporation   c:\winnt\system32\clbcatq.dll
oleaut32.dll      2.40.4514   600.27 KB (614,672 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\oleaut32.dll
cscui.dll   5.00.2195.1387    227.27 KB (232,720 bytes)     9/15/2000
3:02:18 PM  Microsoft Corporation   c:\winnt\system32\cscui.dll
winspool.drv      5.00.2195.1340    109.77 KB (112,400 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\winspool.drv
winscard.dll      5.00.2134.1 77.27 KB (79,120 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\winscard.dll
wlnotify.dll      5.00.2195.1163    53.27 KB (54,544 bytes) 9/15/2000
3:01:46 PM  Microsoft Corporation   c:\winnt\system32\wlnotify.dll
cscdll.dll  5.00.2195.1600    98.27 KB (100,624 bytes)      9/15/2000
3:02:18 PM  Microsoft Corporation   c:\winnt\system32\cscdll.dll
lz32.dll    5.00.2134.1 9.77 KB (10,000 bytes)  12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\lz32.dll
version.dll 5.00.2134.1 15.77 KB (16,144 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\version.dll
rsabase.dll 5.00.2195.1391    129.27 KB (132,368 bytes)     7/21/2000
12:05:02 PM Microsoft Corporation   c:\winnt\system32\rsabase.dll
mscat32.dll 5.131.2134.1      7.77 KB (7,952 bytes)   12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\mscat32.dll
ole32.dll   5.00.2195.1607    965.27 KB (988,432 bytes)     9/15/2000
3:01:56 PM  Microsoft Corporation   c:\winnt\system32\ole32.dll
imagehlp.dll      5.00.2195.1 125.27 KB (128,272 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\imagehlp.dll
msasn1.dll  5.00.2134.1 51.27 KB (52,496 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\msasn1.dll
crypt32.dll 5.131.2195.1340   464.77 KB (475,920 bytes)     9/15/2000
3:02:18 PM  Microsoft Corporation   c:\winnt\system32\crypt32.dll
wintrust.dll      5.131.2143.1      162.27 KB (166,160 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\wintrust.dll
setupapi.dll      5.00.2195.1608    552.77 KB (566,032 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\setupapi.dll
winmm.dll   5.00.2161.1 184.77 KB (189,200 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\winmm.dll
comctl32.dll      5.81  537.77 KB (550,672 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\comctl32.dll
shlwapi.dll 5.00.3103.1000    282.27 KB (289,040 bytes)     9/15/2000
3:01:49 PM  Microsoft Corporation   c:\winnt\system32\shlwapi.dll
shell32.dll 5.00.3103.1000    2.25 MB (2,358,032 bytes)     9/15/2000
3:01:49 PM  Microsoft Corporation   c:\winnt\system32\shell32.dll
msgina.dll  5.00.2195.1600    323.27 KB (331,024 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\msgina.dll
wsock32.dll 5.00.2195.1207    21.27 KB (21,776 bytes) 9/15/2000 3:01:46
PM    Microsoft Corporation   c:\winnt\system32\wsock32.dll
dnsapi.dll  5.00.2195.1600    127.77 KB (130,832 bytes)     9/15/2000
3:02:16 PM  Microsoft Corporation   c:\winnt\system32\dnsapi.dll
wldap32.dll 5.00.2195.1175    155.27 KB (158,992 bytes)     9/15/2000
3:01:46 PM  Microsoft Corporation   c:\winnt\system32\wldap32.dll
ws2help.dll 5.00.2134.1 17.77 KB (18,192 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\ws2help.dll
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ws2_32.dll  5.00.2195.1340    68.77 KB (70,416 bytes) 9/15/2000 3:01:46
PM    Microsoft Corporation   c:\winnt\system32\ws2_32.dll
samlib.dll  5.00.2160.1 46.27 KB (47,376 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\samlib.dll
netrap.dll  5.00.2134.1 11.27 KB (11,536 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\netrap.dll
netapi32.dll      5.00.2195.1600    303.27 KB (310,544 bytes)
      9/15/2000 3:02:01 PM    Microsoft Corporation
      c:\winnt\system32\netapi32.dll
profmap.dll 5.00.2181.1 29.27 KB (29,968 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\profmap.dll
secur32.dll 5.00.2195.1600    47.27 KB (48,400 bytes) 9/15/2000 3:01:50
PM    Microsoft Corporation   c:\winnt\system32\secur32.dll
sfc.dll     5.00.2195.1618    90.05 KB (92,216 bytes) 9/15/2000 3:01:50
PM    Microsoft Corporation   c:\winnt\system32\sfc.dll
nddeapi.dll 5.00.2137.1 15.27 KB (15,632 bytes) 12/7/1999 6:00:00 AM
      Microsoft Corporation   c:\winnt\system32\nddeapi.dll
userenv.dll 5.00.2195.1600    359.27 KB (367,888 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\userenv.dll
user32.dll  5.00.2195.1600    392.77 KB (402,192 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\user32.dll
gdi32.dll   5.00.2195.1340    228.77 KB (234,256 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\gdi32.dll
rpcrt4.dll  5.00.2195.1615    436.27 KB (446,736 bytes)     9/15/2000
3:01:51 PM  Microsoft Corporation   c:\winnt\system32\rpcrt4.dll
advapi32.dll      5.00.2195.1600    349.27 KB (357,648 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\advapi32.dll
kernel32.dll      5.00.2195.1600    713.27 KB (730,384 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\kernel32.dll
msvcrt.dll  6.10.8637.0 288.09 KB (295,000 bytes)     12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\msvcrt.dll
winlogon.exe      5.00.2195.1600    172.77 KB (176,912 bytes)
      12/7/1999 6:00:00 AM    Microsoft Corporation
      c:\winnt\system32\winlogon.exe
sfcfiles.dll      5.00.2195.1 973.27 KB (996,624 bytes)     12/7/1999
6:00:00 AM  Microsoft Corporation   c:\winnt\system32\sfcfiles.dll
ntdll.dll   5.00.2195.1600    475.27 KB (486,672 bytes)     7/21/2000
12:05:02 PM Microsoft Corporation   c:\winnt\system32\ntdll.dll
smss.exe    5.00.2195.31      44.27 KB (45,328 bytes) 12/7/1999 6:00:00
AM    Microsoft Corporation   c:\winnt\system32\smss.exe

[Services]

Display Name      Name  State Start Mode  Service Type      Path  Error
Control     Start Name  Tag ID
Alerter     Alerter     Stopped     Manual      Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
Application Management  AppMgmt     Stopped     Manual      Share
Process     c:\winnt\system32\services.exe      Normal      LocalSystem
      0
Computer Browser  Browser     Running     Auto  Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
```

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Indexing Service  cisvc Stopped     Manual      Share Process
      c:\winnt\system32\cisvc.exe   Normal      LocalSystem 0
ClipBook    ClipSrv     Stopped     Manual      Own Process
      c:\winnt\system32\clipsrv.exe Normal      LocalSystem 0
Distributed File System Dfs   Stopped     Manual      Own Process
      c:\winnt\system32\dfssvc.exe  Normal      LocalSystem 0
DHCP Client Dhcp  Stopped     Manual      Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
Logical Disk Manager Administrative Service     dmadmin     Stopped
      Manual      Share Process     c:\winnt\system32\dmadmin.exe /com
      Normal      LocalSystem 0
Logical Disk Manager    dmserver    Running     Auto  Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
DNS Client  Dnscache    Stopped     Manual      Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
Event Log   Eventlog    Running     Auto  Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
COM+ Event System EventSystem Running     Manual      Share Process
      c:\winnt\system32\svchost.exe -k netsvcs  Normal      LocalSystem
      0
Fax Service Fax   Stopped     Manual      Own Process
      c:\winnt\system32\faxsvc.exe  Normal      LocalSystem 0
cLAN Connection Manager GniConMgr   Running     Auto  Own Process
      c:\winnt\system32\gnconmgr.exe      Normal      LocalSystem 0
Internet Authentication Service     IAS   Running     Auto  Share
Process     c:\winnt\system32\svchost.exe -k netsvcs  Normal
      LocalSystem 0
IIS Admin Service IISADMIN    Running     Auto  Share Process
      c:\winnt\system32\inetsrv\inetinfo.exe    Normal      LocalSystem
      0
Intersite Messaging     IsmServ     Stopped     Disabled    Own Process
      c:\winnt\system32\ismserv.exe Normal      LocalSystem 0
Kerberos Key Distribution Center    kdc   Stopped     Disabled    Share
Process     c:\winnt\system32\lsass.exe   Normal      LocalSystem 0
Server      lanmanserver      Running     Auto  Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
Workstation lanmanworkstation Running     Auto  Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
License Logging Service LicenseService    Stopped     Manual      Own
Process     c:\winnt\system32\llssrv.exe  Normal      LocalSystem 0
TCP/IP NetBIOS Helper Service LmHosts     Running     Auto  Share
Process     c:\winnt\system32\services.exe      Normal      LocalSystem
      0
Messenger   Messenger   Stopped     Manual      Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
NetMeeting Remote Desktop Sharing   mnmsrvc     Stopped     Manual
      Own Process c:\winnt\system32\mnmsrvc.exe Normal      LocalSystem
      0
Distributed Transaction Coordinator MSDTC Running     Auto  Own Process
      c:\winnt\system32\msdtc.exe   Normal      LocalSystem 0
Windows Installer MSIServer   Stopped     Manual      Share Process
      c:\winnt\system32\msiexec.exe /v    Normal      LocalSystem 0
Network DDE NetDDE      Stopped     Manual      Share Process
      c:\winnt\system32\netdde.exe  Normal      LocalSystem 0
```

```
Network DDE DSDM  NetDDEdsdm  Stopped     Manual      Share Process
      c:\winnt\system32\netdde.exe  Normal      LocalSystem 0
Net Logon   Netlogon    Stopped     Manual      Share Process
      c:\winnt\system32\lsass.exe   Normal      LocalSystem 0
Network Connections     Netman      Running     Manual      Share
Process     c:\winnt\system32\svchost.exe -k netsvcs  Normal
      LocalSystem 0
File Replication  NtFrs Stopped     Manual      Own Process
      c:\winnt\system32\ntfrs.exe   Ignore      LocalSystem 0
NT LM Security Support Provider     NtLmSsp     Stopped     Manual
      Share Process     c:\winnt\system32\lsass.exe   Normal
      LocalSystem 0
Removable Storage NtmsSvc     Stopped     Manual      Share Process
      c:\winnt\system32\svchost.exe -k netsvcs  Normal      LocalSystem
      0
Plug and Play     PlugPlay    Running     Auto  Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
IPSEC Policy Agent      PolicyAgent Stopped     Manual      Share
Process     c:\winnt\system32\lsass.exe   Normal      LocalSystem 0
Protected Storage ProtectedStorage  Running     Auto  Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
Remote Access Auto Connection Manager     RasAuto     Stopped
      Manual      Share Process     c:\winnt\system32\svchost.exe -k
netsvcs     Normal      LocalSystem 0
Remote Access Connection Manager    RasMan      Stopped     Manual
      Share Process     c:\winnt\system32\svchost.exe -k netsvcs
      Normal      LocalSystem 0
Routing and Remote Access     RemoteAccess      Stopped     Disabled
      Share Process     c:\winnt\system32\svchost.exe -k netsvcs
      Normal      LocalSystem 0
Remote Registry Service RemoteRegistry    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
```

```
Simple TCP/IP Services  SimpTcp     Running     Auto  Share Process
      c:\winnt\system32\tcpsvcs.exe Normal      LocalSystem 0
Print Spooler     Spooler     Stopped     Manual      Own Process
      c:\winnt\system32\spoolsv.exe Normal      LocalSystem 0
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      Stopped     Manual
      Share Process     c:\winnt\system32\services.exe      Normal
      LocalSystem 0
Uninterruptible Power Supply  UPS   Stopped     Manual      Own Process
      c:\winnt\system32\ups.exe     Normal      LocalSystem 0
Utility Manager   UtilMan     Stopped     Manual      Own Process
      c:\winnt\system32\utilman.exe Normal      LocalSystem 0
Windows Time      W32Time     Stopped     Manual      Share Process
      c:\winnt\system32\services.exe      Normal      LocalSystem 0
World Wide Web Publishing Service   W3SVC Running     Auto  Share
Process     c:\winnt\system32\inetsrv\inetinfo.exe    Normal
      LocalSystem 0
Windows Management Instrumentation  WinMgmt     Running     Auto  Own
Process     c:\winnt\system32\wbem\winmgmt.exe  Ignore      LocalSystem
      0
Windows Management Instrumentation Driver Extensions  Wmi   Running
      Manual      Share Process     c:\winnt\system32\services.exe
      Normal      LocalSystem 0

[Program Groups]

Group Name  Name  User Name
Accessories Default User:Accessories      Default User
Accessories\Accessibility     Default User:Accessories\Accessibility
      Default User
Accessories\Entertainment     Default User:Accessories\Entertainment
      Default User
Accessories\System Tools      Default User:Accessories\System Tools
      Default User
Startup     Default User:Startup    Default User
Accessories All Users:Accessories   All Users
Accessories\Accessibility     All Users:Accessories\Accessibility All
Users
Accessories\Communications    All Users:Accessories\Communications
      All Users
Accessories\Entertainment     All Users:Accessories\Entertainment All
Users
Accessories\Games All Users:Accessories\Games   All Users
```

```
Accessories\System Tools      All Users:Accessories\System Tools  All
Users
Administrative Tools    All Users:Administrative Tools      All Users
GigaNet     All Users:GigaNet All Users
Microsoft SQL Server    All Users:Microsoft SQL Server      All Users
MKS Toolkit All Users:MKS Toolkit   All Users
Startup     All Users:Startup All Users
Accessories CLIENT2\Administrator:Accessories   CLIENT2\Administrator
Accessories\Accessibility
      CLIENT2\Administrator:Accessories\Accessibility
      CLIENT2\Administrator
Accessories\Entertainment
      CLIENT2\Administrator:Accessories\Entertainment
      CLIENT2\Administrator
Accessories\System Tools      CLIENT2\Administrator:Accessories\System
Tools CLIENT2\Administrator
Administrative Tools    CLIENT2\Administrator:Administrative Tools
      CLIENT2\Administrator
Startup     CLIENT2\Administrator:Startup CLIENT2\Administrator

[Startup Programs]

Program     Command     User Name   Location
No startup program information

[OLE Registration]

Object      Local Server
Sound (OLE2)      sndrec32.exe
Media Clip  mplay32.exe
Video Clip  mplay32.exe /avi
MIDI Sequence     mplay32.exe /mid
Sound Not Available
Media Clip  Not Available
Image Document    "C:\Program Files\Windows
NT\Accessories\ImageVue\KodakImg.exe"
WordPad Document  "%ProgramFiles%\Windows NT\Accessories\WORDPAD.EXE"
Windows Media Services DRM Storage object Not Available
Bitmap Image      mspaint.exe

[Internet Explorer 5]

[ Following are sub-categories of this main category ]

[Summary]

Item  Value
Version     5.00.3103.1000
Build 53103.1000
Product ID  51876-OEM-0000007-00000
Application Path  C:\Program Files\Internet Explorer
Language    English (United States)
Active Printer    Not Available

Cipher Strength   56-bit
```

```
Content Advisor   Disabled
IEAK Install      No

[File Versions]

File  Version     Size  Date  Path  Company
advapi32.dll      5.0.2195.1600     349 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
advapi32.dll      5.0.2195.1600     349 KB      7/21/2000 12:05:02 PM
      .     Microsoft Corporation
advpack.dll 5.0.3103.1000     87 KB 7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
advpack.dll 5.0.3103.1000     87 KB 7/21/2000 12:05:02 PM   .
      Microsoft Corporation
browselc.dll      5.0.3103.1000     35 KB 7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
browselc.dll      5.0.3103.1000     35 KB 7/21/2000 12:05:02 PM   .
      Microsoft Corporation
browseui.dll      5.0.3103.1000     789 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
browseui.dll      5.0.3103.1000     789 KB      7/21/2000 12:05:02 PM
      .     Microsoft Corporation
ckcnv.exe   5.0.2189.1  9 KB  12/7/1999 7:00:00 AM    C:\WINNT\system32
      Microsoft Corporation
ckcnv.exe   5.0.2189.1  9 KB  12/7/1999 7:00:00 AM    .     Microsoft
Corporation
comctl32.dll      5.81.3103.1000    538 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
comctl32.dll      5.81.3103.1000    538 KB      7/21/2000 12:05:02 PM
      .     Microsoft Corporation
crypt32.dll 5.131.2195.1340   465 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
crypt32.dll 5.131.2195.1340   465 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
enhsig.dll  <File Missing>    Not Available     Not Available     Not
Available   Not Available
iemigrat.dll      <File Missing>    Not Available     Not Available
      Not Available     Not Available
iesetup.dll 5.0.3103.1000     57 KB 7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
iesetup.dll 5.0.3103.1000     57 KB 7/21/2000 12:05:02 PM   .
      Microsoft Corporation
iexplore.exe      5.0.2920.0  59 KB 12/7/1999 7:00:00 AM    C:\Program
Files\Internet Explorer Microsoft Corporation
imagehlp.dll      5.0.2195.1  125 KB      12/7/1999 7:00:00 AM
      C:\WINNT\system32 Microsoft Corporation
imagehlp.dll      5.0.2195.1  125 KB      12/7/1999 7:00:00 AM    .
      Microsoft Corporation
imghelp.dll <File Missing>    Not Available     Not Available     Not
Available   Not Available
inseng.dll  5.0.3103.1000     72 KB 7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
inseng.dll  5.0.3103.1000     72 KB 7/21/2000 12:05:02 PM   .
      Microsoft Corporation
```

```
jobexec.dll 5.0.0.1     47 KB 12/7/1999 7:00:00 AM    C:\WINNT\system32
      Microsoft Corporation
jobexec.dll 5.0.0.1     47 KB 12/7/1999 7:00:00 AM    .     Microsoft
Corporation
jscript.dll 5.1.0.5010  476 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
jscript.dll 5.1.0.5010  476 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
jsproxy.dll 5.0.2920.0  13 KB 12/7/1999 7:00:00 AM    C:\WINNT\system32
      Microsoft Corporation
jsproxy.dll 5.0.2920.0  13 KB 12/7/1999 7:00:00 AM    .     Microsoft
Corporation
msaahtml.dll      <File Missing>    Not Available     Not Available
      Not Available     Not Available
mshtml.dll  5.0.3103.1000     2292 KB     7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
mshtml.dll  5.0.3103.1000     2292 KB     7/21/2000 12:05:02 PM   .
      Microsoft Corporation
msjava.dll  5.0.3310.0  922 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
msjava.dll  5.0.3310.0  922 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
msoss.dll   <File Missing>    Not Available     Not Available     Not
Available   Not Available
msxml.dll   8.0.5226.0  506 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
msxml.dll   8.0.5226.0  506 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
occache.dll 5.0.3103.1000     86 KB 7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
occache.dll 5.0.3103.1000     86 KB 7/21/2000 12:05:02 PM   .
      Microsoft Corporation
ole32.dll   5.0.2195.1607     965 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
ole32.dll   5.0.2195.1607     965 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
oleaut32.dll      2.40.4514.1 600 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
oleaut32.dll      2.40.4514.1 600 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
olepro32.dll      5.0.4514.1  160 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
olepro32.dll      5.0.4514.1  160 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
rsabase.dll 5.0.2195.1391     129 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
rsabase.dll 5.0.2195.1391     129 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
rsaenh.dll  <File Missing>    Not Available     Not Available     Not
Available   Not Available
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      5.0.2195.0  137 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
schannel.dll      5.0.2195.0  137 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
shdoc401.dll      <File Missing>    Not Available     Not Available
      Not Available     Not Available
shdocvw.dll 5.0.3103.1000     1078 KB     7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
shdocvw.dll 5.0.3103.1000     1078 KB     7/21/2000 12:05:02 PM   .
      Microsoft Corporation
shell32.dll 5.0.3103.1000     2303 KB     7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
shell32.dll 5.0.3103.1000     2303 KB     7/21/2000 12:05:02 PM   .
      Microsoft Corporation
shlwapi.dll 5.0.3103.1000     282 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
shlwapi.dll 5.0.3103.1000     282 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
url.dll     5.0.2920.0  82 KB 12/7/1999 7:00:00 AM    C:\WINNT\system32
      Microsoft Corporation
url.dll     5.0.2920.0  82 KB 12/7/1999 7:00:00 AM    .     Microsoft
Corporation
urlmon.dll  5.0.3103.1000     441 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
urlmon.dll  5.0.3103.1000     441 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
vbscript.dll      5.1.0.5010  428 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
vbscript.dll      5.1.0.5010  428 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
webcheck.dll      5.0.3103.1000     252 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
webcheck.dll      5.0.3103.1000     252 KB      7/21/2000 12:05:02 PM
      .     Microsoft Corporation
win.com     5.0.2134.1  24 KB 12/7/1999 7:00:00 AM    C:\WINNT\system32
      Microsoft Corporation
win.com     5.0.2134.1  24 KB 12/7/1999 7:00:00 AM    .     Microsoft
Corporation
wininet.dll 5.0.3103.1000     457 KB      7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
wininet.dll 5.0.3103.1000     457 KB      7/21/2000 12:05:02 PM   .
      Microsoft Corporation
winsock.dll 3.10.0.103  3 KB  12/7/1999 7:00:00 AM    C:\WINNT\system32
      Microsoft Corporation
winsock.dll 3.10.0.103  3 KB  12/7/1999 7:00:00 AM    .     Microsoft
Corporation
wintrust.dll      5.131.2143.1      162 KB      12/7/1999 7:00:00 AM
      C:\WINNT\system32 Microsoft Corporation
wintrust.dll      5.131.2143.1      162 KB      12/7/1999 7:00:00 AM
      .     Microsoft Corporation
wsock.vxd   <File Missing>    Not Available     Not Available     Not
Available   Not Available
wsock32.dll 5.0.2195.1207     21 KB 7/21/2000 12:05:02 PM
      C:\WINNT\system32 Microsoft Corporation
```

```
wsock32.dll 5.0.2195.1207     21 KB 7/21/2000 12:05:02 PM   .
      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  4345 MB
Available Disk Space    1471 MB
Maximum Cache Size      135 MB
Available Cache Size    136 MB

[List of Objects]

Program File      Status      CodeBase
No cached object information available

[Content]

[ Following are sub-categories of this main category ]

[Summary]

Item  Value
Content Advisor   Disabled

[Personal Certificates]

Issued To   Issued By   Validity    Signature Algorithm
Administrator     Administrator     9/13/2000 to 8/20/2100  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
```

Appendix C – Tunable Parameters

RTE Input Parameters

BenchCraft Configuration File

Profile: 2432_32_4_01
File Path: C:\benchcrf\2432_32_4_01.pro
Version: 1.0.1

Number of Engines: 8
Name: DRIVER2A
Description: RTE2A
Directory: c:\tpcclog\rte2a.log
Machine: RTE2A
Parameter Set: PARAM2
Index: 0
Seed: 98176
Configured Users: 3040
Pipe Name: DRIVER43501360
Connect Rate: 2000
Start Rate: 0
CLIENT_NURAND: 208
CPU: 0

Name: DRIVER2B
Description: RTE2B
Directory: c:\tpcclog\rte2b.log
Machine: RTE2B
Parameter Set: PARAM2
Index: 100000000
Seed: 98176
Configured Users: 3040
Pipe Name: DRIVER40641161
Connect Rate: 2000
Start Rate: 0
CLIENT_NURAND: 208
CPU: 0

Name: DRIVER3A
Description: RTE3A
Directory: c:\tpcclog\rte3a.log
Machine: RTE3A
Parameter Set: PARAM2
Index: 200000000
Seed: 98176
Configured Users: 3040
Pipe Name: DRIVER371721555
Connect Rate: 2000
Start Rate: 0
CLIENT_NURAND: 208
CPU: 0

Name: DRIVER3B
Description: RTE3B
Directory: c:\tpcclog\rte3b.log
Machine: RTE3B
Parameter Set: PARAM2
Index: 300000000
Seed: 98176
Configured Users: 3040
Pipe Name: DRIVER341837462
Connect Rate: 2000
Start Rate: 0
CLIENT_NURAND: 208
CPU: 0

Name: DRIVER4A
Description: RTE4A
Directory: c:\tpcclog\rte4a.log
Machine: RTE4A
Parameter Set: PARAM2
Index: 400000000
Seed: 98176
Configured Users: 3040
Pipe Name: DRIVER311984373
Connect Rate: 2000
Start Rate: 0
CLIENT_NURAND: 208
CPU: 0

Name: DRIVER4B
Description: RTE4B
Directory: c:\tpcclog\rte4b.log
Machine: RTE4B
Parameter Set: PARAM2
Index: 500000000
Seed: 98176
Configured Users: 3040
Pipe Name: DRIVER282107740
Connect Rate: 2000
Start Rate: 0
CLIENT_NURAND: 208
CPU: 0

Name: DRIVER5A
Description: RTE5A
Directory: c:\tpcclog\rte5a.log
Machine: RTE5A
Parameter Set: PARAM2
Index: 600000000
Seed: 98176
Configured Users: 3040
Pipe Name: DRIVER252204459
Connect Rate: 2000
Start Rate: 0
CLIENT_NURAND: 208
CPU: 0

Name: DRIVER5B
Description: RTE5B
Directory: c:\tpcclog\rte5b.log
Machine: RTE5B
Parameter Set: PARAM2
Index: 700000000
Seed: 98176
Configured Users: 3040
Pipe Name: DRIVER222420160
Connect Rate: 2000
Start Rate: 0
CLIENT_NURAND: 208
CPU: 0

Number of User groups: 32

Driver Engine: DRIVER2A
IIS Server: CLIENT2_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 1 - 76
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER2A
IIS Server: CLIENT3_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 77 - 152
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER2A
IIS Server: CLIENT4_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 153 - 228
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER2A
IIS Server: CLIENT5_1

SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 229 - 304
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER2B
IIS Server: CLIENT2_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 305 - 380
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER2B
IIS Server: CLIENT3_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 381 - 456
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER2B
IIS Server: CLIENT4_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 457 - 532
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER2B
IIS Server: CLIENT5_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 533 - 608
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760

District id: 1
Scale Down: No

Driver Engine: DRIVER3A
IIS Server: CLIENT2_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 609 - 684
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER3A
IIS Server: CLIENT3_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 685 - 760
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER3A
IIS Server: CLIENT4_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 761 - 836
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER3A
IIS Server: CLIENT5_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 837 - 912
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER3B
IIS Server: CLIENT2_1
SQL Server: PE6400_01
User: sa

Protocol: Html
w_id Range: 913 - 988
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER3B
IIS Server: CLIENT3_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 989 - 1064
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER3B
IIS Server: CLIENT4_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 1065 - 1140
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER3B
IIS Server: CLIENT5_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 1141 - 1216
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER4A
IIS Server: client2_1
SQL Server: pe6400_01
User: sa
Protocol: Html
w_id Range: 1217 - 1292
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER4A
IIS Server: client3_1
SQL Server: pe6400_01
User: sa
Protocol: Html
w_id Range: 1293 - 1368
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER4A
IIS Server: client4_1
SQL Server: pe6400_01
User: sa
Protocol: Html
w_id Range: 1369 - 1444
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER4A
IIS Server: client5_1
SQL Server: pe6400_01
User: sa
Protocol: Html
w_id Range: 1445 - 1520
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER4B
IIS Server: CLIENT2_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 1521 - 1596
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER4B
IIS Server: client3_1
SQL Server: pe6400_01
User: sa
Protocol: Html
w_id Range: 1597 - 1672

w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER4B
IIS Server: CLIENT4_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 1673 - 1748
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER4B
IIS Server: CLIENT5_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 1749 - 1824
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER5A
IIS Server: CLIENT2_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 1825 - 1900
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER5A
IIS Server: CLIENT3_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 1901 - 1976
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER5A

IIS Server: CLIENT4_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 1977 - 2052
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER5A
IIS Server: CLIENT5_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 2053 - 2128
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER5B
IIS Server: CLIENT2_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 2129 - 2204
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER5B
IIS Server: CLIENT3_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 2205 - 2280
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER5B
IIS Server: CLIENT4_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 2281 - 2356
w_id Max Warehouse: 2432
Scale: Normal

Appendix C – Tunable Parameters

User Count: 760
District id: 1
Scale Down: No

Driver Engine: DRIVER5B
IIS Server: CLIENT5_1
SQL Server: PE6400_01
User: sa
Protocol: Html
w_id Range: 2357 - 2432
w_id Max Warehouse: 2432
Scale: Normal
User Count: 760
District id: 1
Scale Down: No

Number of Parameter Sets: 6

80 run

New Parameter Set

	Txn Weight	Think Time	Key Time	RT Delay	RT Fence	Menu Delay	
New Order	44.86		18.00	18.02	0.10	5.00	0.10
Payment	43.05		18.00	3.02	0.10	5.00	0.10
Delivery	4.03		13.00	2.02	0.10	5.00	0.10
Stock Level	4.03		13.00	2.02	0.10	20.00	0.10
Order Status	4.03		8.00	2.02	0.10	5.00	0.10

50 run2

New Parameter Set

	Txn Weight	Think Time	Key Time	RT Delay	RT Fence	Menu Delay	
New Order	44.86		32.00	18.02	0.10	5.00	0.10
Payment	43.05		32.00	3.02	0.10	5.00	0.10
Delivery	4.03		17.00	2.02	0.10	5.00	0.10
Stock Level	4.03		17.00	2.02	0.10	20.00	0.10
Order Status	4.03		27.00	2.02	0.10	5.00	0.10

PARAM3

New Parameter Set

	Txn Weight	Think Time	Key Time	RT Delay	RT Fence	Menu Delay	
New Order	44.86		12.04	18.02	0.10	5.00	0.10
Payment	43.05		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

PARAM2

Slightly tweaked parameter set

	Txn Weight	Think Time	Key Time	RT Delay	RT Fence	Menu Delay	
New Order	44.84		12.04	18.02	0.10	5.00	0.10
Payment	43.04		12.04	3.02	0.10	5.00	0.10

Delivery	4.04	5.04	2.02	0.10	5.00	0.10
Stock Level	4.04	5.04	2.02	0.10	20.00	0.10
Order Status	4.04	10.04	2.02	0.10	5.00	0.10

~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	

50 run
New Parameter Set

	Txn Weight	Think Time	Key Time	RT Delay	RT Fence	Menu Delay	
New Order	44.86	30.00	18.02	0.10	5.00	0.10	
Payment	43.05	30.00	3.02	0.10	5.00	0.10	
Delivery	4.03	15.00	2.02	0.10	5.00	0.10	
Stock Level	4.03	15.00	2.02	0.10	20.00	0.10	
Order Status	4.03	25.00	2.02	0.10	5.00	0.10	

Appendix D – Disk Storage

60 Day Space

TPC-C 60 Day Space Requirements						
Warehouses	**2,450**				**TpmC**	**30250**
Table	**Rows**	**Data KB**	**Index KB**	**Extra 5% KB**	**8hr Space**	**Total Space KB**
Warehouse	2,450	264	32	15		311
District	24,500	2,728	32	138		2898
Customer	73,500,000	53,454,552	3,187,504	2,832,103		59474159
History	73,500,000	4,333,344	80		856,072	4333424
NewOrder	22,050,000	348,624	824			349448
Orders	73,500,000	2,252,880	1,024,480		647,446	3277360
OrderLine	600,000,886	45,937,448	97,256		9,094,203	46034704
Item	100,000	9,528	48	479		10055
Stock	245,000,000	78,400,008	146,568	3,927,329		82473905
Total		184,739,376	4,456,824	6,760,063	10,597,721	195,956,263
MB					10,349.34	
	MB					
Dynamic Space	51,293	Sum of Data for Order, Orderline and History				
Static Space	140,071	Sum of Data+Index+5%-Dynamic Space				
Free Space	na	Total Allocated Spac - (Dynamic + Static Space)				
Daily Growth	10,133	(Dynamic Space/(W*62.5))*tpmc				
Daily Spread	-	(Free Space -1.5*Daily Growth) Zero Assumed				
60 Day Space MB	748,046		18 GB Drive	16.756	GB	603
60 Day Space GB	**730.51**	**GB**	9 GB Drive	8.470	GB	35.9871091
			36 GB Drive	33.512	GB	
Log Size	43,603	MB				
KB Per New Order	5.2349	KB				
8 hr log MB	74,229	MB				
8 hr log GB	**72.4891**	**GB**				
Space Usage	**GB Needed**	**Disks Measured**	**GB Priced**		Disks Needed	
60 Day Space DB	730.51	108	1,809.65	18GB		
		0	0.00	9GB		
		0	0.00	36GB		
Total DB		**108.00**	**1,809.65**	**GB**		
8-hr log + mirror	144.98	10	167.56	GB	10.00	
OS, Swap	3	1	8.470	GB		

Total Storage	**878.49**	**GB**	**1,985.68**	**GB**		
Log Space OK						
Total Space OK		-130.71857	-66.07701			
		9GB	18GB			

Appendix E - Price Quotations

Mylex ExtremeRAID 2000 Quotation

To: Nicholas Wakou - Dell	**From: Bruce Foster** **Phone: 510/608-2328** **Fax: 510/745-8016** **Email: bfoster1@ibm.us.com**
Company: Dell Computer – Enterprise Performance Group	**Date: 08/13/01**
RE: Mylex ExtremeRAID 2000 Price quote	**Total Pages: 1**

Dear Mr. Wakou,

Mylex is pleased to submit the following quotation for ExtremeRAID 2000 controller:

==========

Mylex P/n/ Description Reseller Suggested price

EXtremeRAID 2000, PCI RAID Ultra 160/mSCSI 4 Channel RAID controller:

E2000-4-32NB **[4 external +2 internal chnl, 32MB cache, no BBU]** $1842

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Notes: Above price is based on FOB, ex-factory, Fremont, California and firm for 90 days.

Lead time: 45 days ARO

Product is covered by a 5 year warranty.

Failed product will be repaired or replaced within 7 days.

Bruce Foster - Director, Strategic Sales

Cc: Steve Page – Director PCI Marketing

34551 Ardenwood Blvd.
Fremont, CA 94555-3607
Tel: 510.796-6100
Sales Fax: 510.745-8016
www.mylex.com

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

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

Microsoft

September 19, 2001

Dell Computer
Corporation
Nicholas Wakou
RR5
One DellWay
Round Rock, TX 787682

Nicholas:

Here is the information you requested regarding pricing for several Microsoft products to be used in conjunction with your TPC-C V5.0 benchmark testing.

All pricing shown is in US Dollars ($).

Part Number	Description	Unit Price	Quantity	Price
810-00846	**SQL Server 2000 Enterprise Edition** *Per processor licensing* *Discount schedule: Open Program Level C*	$ 16,541	4	$ 66,164
C11-00821	**Windows 2000 Server** *Server license only - No CALs* *Discount schedule: Open Program - No Level*	$ 738	1	$ 738
C10-00475	**Windows 2000 Advanced Server** *Server license only - No CALs* *Discount schedule: Open Program - No Level*	$ 2,399	1	$ 2,399
048-00317	**Visual C++ Professional 6.0 Win32**	$ 549	1	$ 549
	3-year maintenance for above software	$ 2,095	1	$ 6,285

All products are currently orderable through Microsoft's normal distribution channels.

This quote is valid for the next 90 days.

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

Reference ID: Pelty0119090295
Please include this Reference ID in any correspondence regarding this price quote.