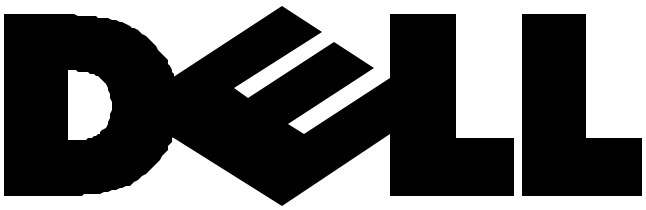


TPC Benchmark™ C
Full Disclosure Report
for
Dell PowerEdge 8450
Using
Microsoft SQL Server 2000 8.0 Enterprise Edition
and
Microsoft Windows 2000 Datacenter Server

First Edition
Submitted for Review
August 4, 2000

First Printing, Aug 4, 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, Aug 4, 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.

Abstract

Overview

This report documents the methodology and results of the TPC Benchmark™ C test conducted on Dell PowerEdge 8450. The tests were run in a client/server configuration using seven PowerEdge 1300's as clients. The operating system used for the benchmark was Microsoft Windows 2000 Datacenter 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 8450	Microsoft Windows 2000 Datacenter Windows 2000 Server SQL Server 2000 Enterprise Edition	$495,610.70	57014.93	$8.70	Jan. 15, 2001

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 8450

Client/Server w/7 PE1300 Front Ends

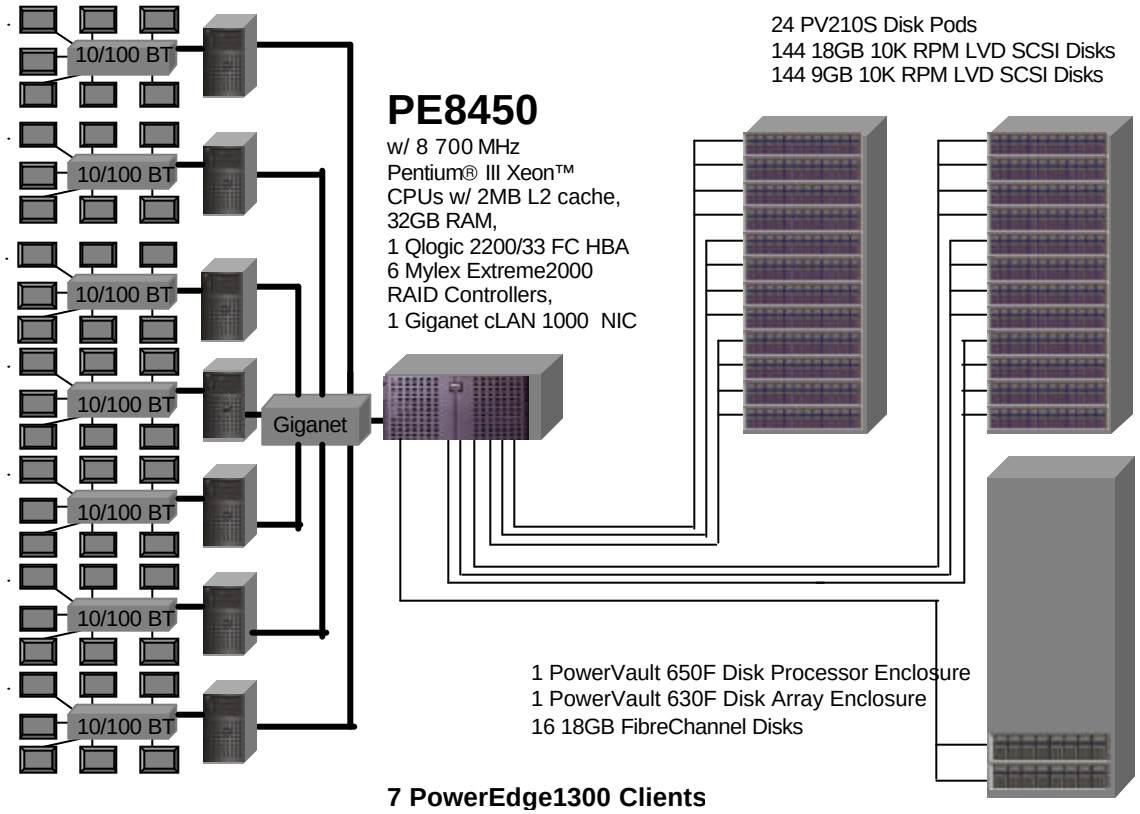
Repricing Date : Sept 27, 2001

TPC-C Rev 5.0 Upgrade

Report Date
Aug. 4, 2000

Total System Cost	TPC-C Throughput	Price/Performance	Availability Date
$495,610.70	**57014.93 tpmC**	**$8.70/ tpmC**	**Jan. 15, 2001**

Processors	Database Manager	OS	Other Software	Number of Users
8 x Pentium® III Xeon™ Processors 700 MHz 2MB L2 Cache	Microsoft SQL Server 2000 Enterprise Edition	Microsoft Windows 2000 Datacenter Server	Windows 2000 Server w/ COM+ Internet Information Server 5.0 Microsoft Visual C++	46,000



System Component	Server		Each Client	
Processors Cache	8	Pentium® III Xeon™ @ 700MHz 2MB	1	Pentium® III w/ 512 KB L2 6 clients @ 600MHz, 1 @ 550
Memory		32768 MB		512 MB
Disk Controllers	6 2	Mylex ExtremeRAID 2000 Adaptec On-Board	1	Adaptec On-Board
Disk Drives	145 144 16	9 GB SCSI 18 GB SCSI 18 GB FC	1	9 GB
Total Storage		3,866GB		9 GB
Other	1 1 1 1	QLogic 2200/33 FC HBA Giganet cLAN 1000 NIC CD-ROM 10/100 BT NIC External DAT	 1 1 1	

Description	Part Number	Third Party Brand	Pricing	Unit Price	Qty	Extended Price	3 yr. Maint. Price
Server Hardware							
Dell PowerEdge 8450 + Windows 2000 DataCenter Server	220-9900		1	99519	1	99,519	49,996
Includes :							
Pentium III Xeon 700 / 2MB L2 - eight pack							
32 GB RAM, 32 x 1GB DIMMS							
1MB Cache Coherency Filter							
9 GB Ultra-2 LVD SCSI 10K RPM Disk							
cLAN 1000 NIC, PCI 32/64-bit							
cLAN Giganet 10m Cable							
Dell M570 15" Monitor							
Qlogic HBA							
DDS4 External TBU	340-7420		1	999	1	999	0
ExtremeRAID 2000 ***		Mylex	3	1849	7	12,943	0
Back-UPS Office 500	519243	APC	1	167	26	4,341	1,176
					Subtotal	117,802	51,172
PowerVault Disk Subsystem							
PV210S,ESEM,PS,Rack mount	220-4099 etc		1	2499	24	59,976	18,336
SCSI Cables	310-0313		1	49	24	1,176	0
9 GB Ultra-2 LVD SCSI 10K RPM Disk *	340-1395		1	249	144	35,856	0
18 GB Ultra-2 LVD SCSI 10K RPM Disk *	340-1395		1	249	144	35,856	0
650F Disk Processor Enclosure w/ 2 SP/ 2 LCC/2 PS/2 Fans	340-0840		1	9999	1	9,999	2,150
512 MB RAID Controller Cache	311-0637		1	1024	2	2,048	0
630F Disk Array Enclosure w/ 2 LCC/2 PS	220-0480		1	3647	1	3,647	1,400
18GB 10K RPM Fibre Channel Hard Drive 10 Pack *	340-2843		1	4590	2	9,180	0
42U Rack	220-0605		1	1294	2	2,588	0
					Subtotal	160,326	21,886
Server Software							
SQL Server 2000 Version 8, Ent. Ed., Per Processor Licensing		Microsoft	2	16541	8	132,328	6,285
					Subtotal	132,328	6,285
Client Hardware							
Dell PowerEdge 1300, 600 MHz Pentium III w/ 512KB L2****	220-2332		1	549	6	3,294	2,988
Dell PowerEdge 1300, 550 MHz Pentium III w/ 512KB L2****	220-2332		1	549	1	549	498
512MB RAM, 2 DIMMs	311-1194		1	490	7	3,430	0
9GB LVD SCSI Disk Drive,	340-1395		1	249	7	1,743	0
Ether Express PRO 100+ ENET Adapter	430-0222	Intel	1	59	7	413	0
cLAN 1000 NIC, PCI 32/64-bit	430-0302	Giganet	1	695	7	4,865	0
cLAN Giganet 2m Cable	310-0497	Giganet	1	99	7	693	0
Dell M570 15" Monitor	320-1502		1	149	7	1,043	0
					Subtotal	16,030	3,486
Client Software							
Windows 2000 Server w/ 25 CAL **		Microsoft	2	738	7	5,166	0
Visual C++ Professional 6.0 Win32 **		Microsoft	2	549	1	549	0
					Subtotal	5,715	0
User Connectivity							
cLAN Giganet Switch	220-4191	Giganet	1	5848	1	5,848	3,600
					Subtotal	5,848	3,600
					Other Discounts	(28,867)	0
					Total	**409182**	**86429**

Notes: * Maintenance included in PowerVault 210S 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 - Netlux 5 - ARK PC 6 -

**** PE1300 substituted with PE1400SC/1 Ghz/P3 256KB L2

Audited by Tom Sawyer, Performance Metrics Inc.

Three-Year Cost of Ownership: 495,610.70

tpmC Rating: 57,014.93

$ / tpmC: 8.70

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

MQTh, computed Maximum Qualified Throughput 57014.93 tpmC

% throughput difference, reported & reproducibility runs 0.01%

Response Times (in seconds)	Average	90th	Max
- Neworder	0.54	1.12	6.12
- Payment	0.49	1.06	5.02
- Order Status	0.51	1.08	6.02
- Delivery (interactive portion)	0.17	0.39	1.48
- Delivery (deferred portion)	0.19	0.25	0.66
- Stock-Level	0.83	1.45	5.79
- Menu	0.17	0.39	1.52

Response time delay added for emulated components Menu 0.1
Resp 0.1

Transaction Mix, in percent of total transactions

- New-Order	44.86 %
- Payment	43.03 %
- Order-Status	4.04 %
- Delivery	4.04 %
- Stock-Level	4.03 %

Keying/Think Times (in seconds),	Min		Average		Max	
- New-Order	18.01	0.0	18.02	12.04	18.28	120.43
- Payment	3.01	0.0	3.02	12.03	3.28	120.45
- Order-Status	2.01	0.0	2.02	10.08	2.23	100.40
- Delivery	2.01	0.0	2.02	5.04	2.27	50.40
- Stock-Level	2.01	0.0	2.02	5.05	2.22	50.41

Test Duration

- Ramp-up time	32 minutes
- Measurement interval	30 minutes
- Number of checkpoints	1
- Checkpoint interval	30 minutes
- Number of transactions (all types) Completed in measurement interval	3,967,075

Table of Contents

Introduction

Document Structure

The contents of this report are determined by the TPC Benchmark C Standard Specification Revision 3.5, written and approved by the Transaction Processing Performance Council (TPC). 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 8450 server driven by seven Dell PowerEdge 1300 clients. The clients and server are networked together via a Giganet cLAN switch. Eleven remote terminal emulator (RTE) systems (PowerEdge 2200's) emulate 46000 users executing the standard TPC-C workload. The RTE's are connected to the seven clients through 10/100 BaseT switches. Each switch connects to one client machine at 100 BaseT and to all eleven RTE machines at 10Mbit/sec, half duplex. Microsoft Windows 2000 Datacenter 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 8450 motherboard is based on the Intel Profusion chipset and can hold up to eight Pentium® III Xeon™ processors (700MHz with 2 MB L2 cache on each). The system has 10 hot-pluggable 64-bit PCI I/O slots (6 at 33 MHz and 4 at 66 MHz). The measured configuration used 32 Gbytes of RAM, which was achieved by using 32 1024 Mbyte DIMMs spread across the two memory boards.

The PowerEdge 8450 has an integrated Symbios Ultra2 LVD SCSI controller that offers a peak transfer rate of 80 MB/s. It was cabled to the internal hard drive backplane, which contained one 9 GB disk drive containing the operating system. In addition, six ExtremeRAID 2000 4 channel RAID controllers were installed in six PCI slots and connected to 24 PowerVault 210S disk pods, which hold 12 disks each. 12 of the pods were filled with 144 9 GB disks and the other 12 were filled with 144 18 GB disks, all containing the database data. Additionally a Qlogic 2200/33 Fibre Channel Host Bus Adapter was used to drive 16 mirrored log drives sitting in one PowerVault 650 Disk Processor Enclosure (containing redundant storage processors) and one PowerVault 630F Disk Array Enclosure. One PCI slot was used for a Giganet cLAN 1000 Network Interface Card.

Each client had a single Pentium® III processor (six 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 Giganet cLAN 1000 Network Interface Card. On each client the Intel Ethernet adapter was connected to the RTE machines through a 10/100 BaseT switch and the cLAN NIC was connected to the Database Server through a Giganet cLAN 5000 switch. The seven clients were driven through six network segments each for a total of 42 network segments. 1096 emulated users were run on each network segment for a total of 46,000 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 Datacenter Server, Windows 2000 Server, and Internet Information Service parameters used in this benchmark.

Appendix D contains the 60 dayspace 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

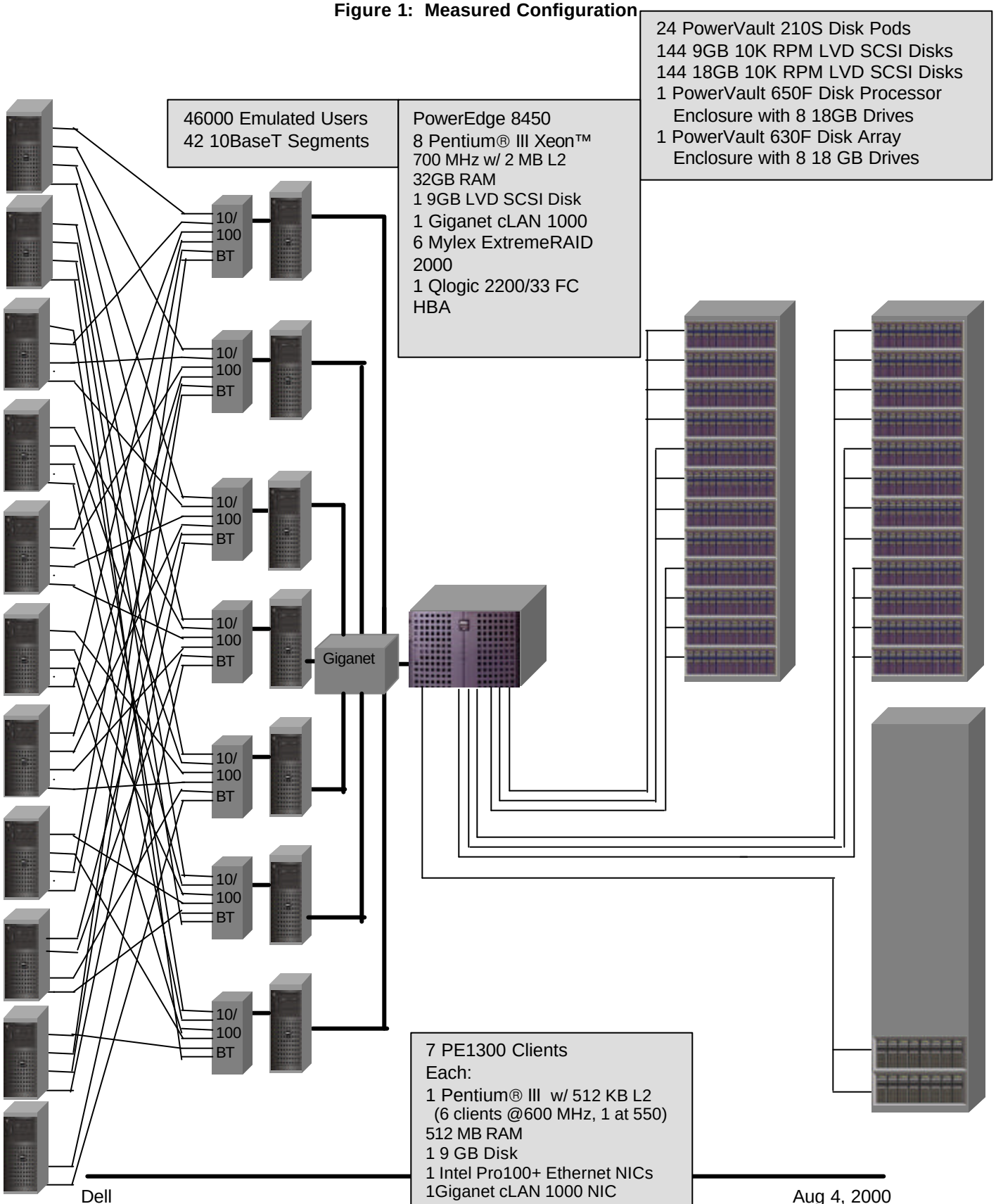
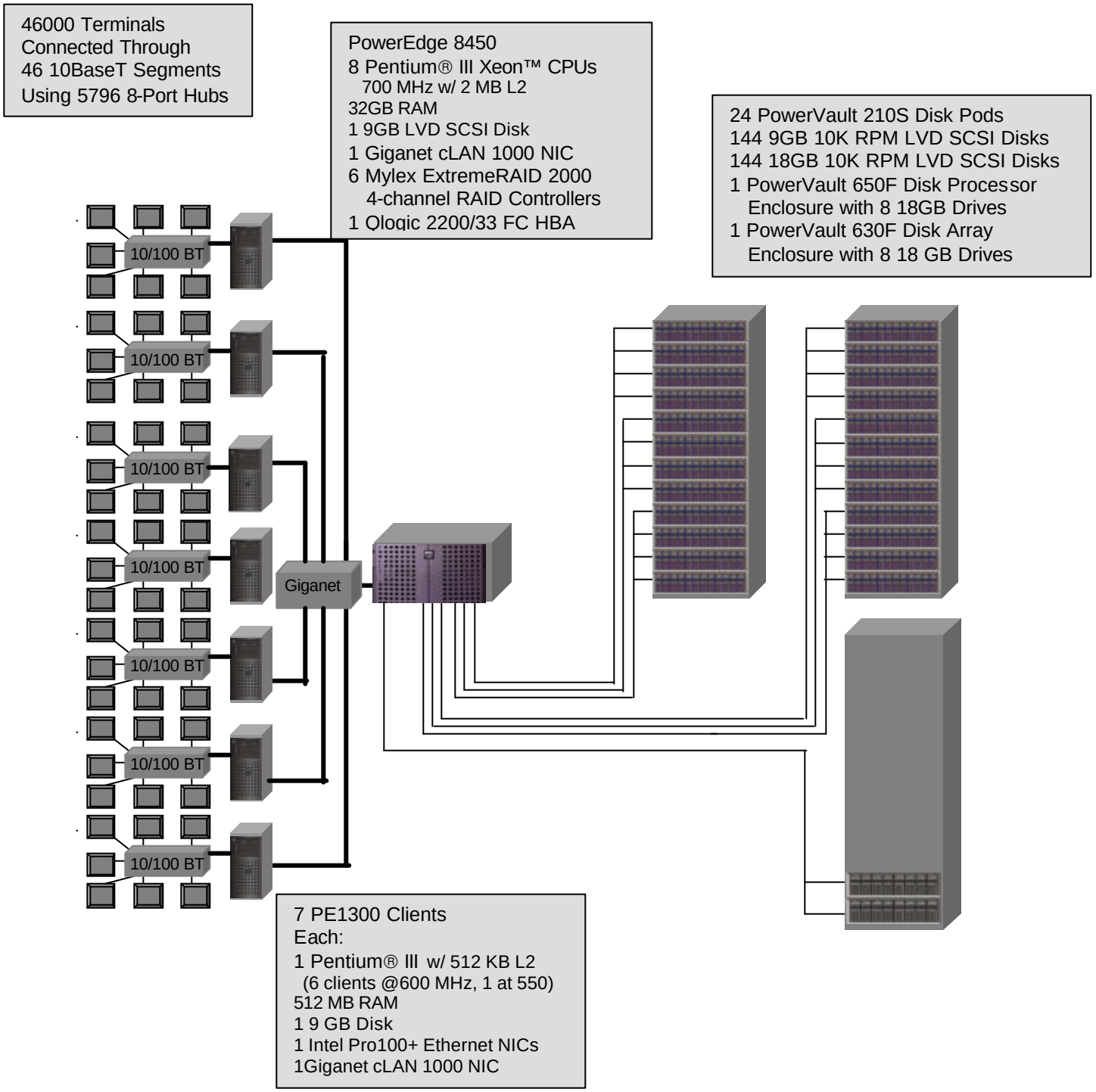


Figure 2: Priced Configuration



Clause 1 -- Logical Database Design Related Items

Table Definitions

Listings must be provided for all table definition statements and all other statements used to set-up the database. (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 305 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	1.00%
	Average Lines Per Order	10.00
Payment	Home Warehouse	85.02%
	Remote Warehouse	14.98%
	Non-Primary Key Access	60.03%
Order Status	Non-Primary Key Access	60.05%
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	44.86%
Payment	43.03%
Order Status	4.04%
Delivery	4.04%
Stock Level	4.03%

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 Log

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 transaction log array was removed with no effect on Windows 2000 and SQL Server.
6. One disk drive in the data array was removed causing SQL Server errors.
7. The RTE was allowed to continue running. Completed transactions enroute from the clients were recorded. Error messages began appearing on the RTE screen.
8. The RTE was stopped.
9. SQL Server was stopped and restarted and a dump of the transaction log was taken.
10. SQL Server was stopped, Windows 2000 was shutdown and the machine powered off.
11. The failed disks were replaced.
12. The machine was powered up, Windows 2000 and SQL Server were started.
13. The TPC-C database was dropped and restored from backup.
14. The transaction log was restored and transactions rolled forward.
15. A new count of D_NEXT_O_ID was taken.
16. This number was compared with the number of new orders reported by the RTE.

Instantaneous Interruption and Loss of Memory

Instantaneous Interruption and Loss of Memory were demonstrated on the full database with 4600 warehouses in a single test. The standard driving mechanism was used to generate the transaction load of 46,000 users for the test. To demonstrate recovery, an instantaneous system interruption was 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. 46,000 users were logged in to the database and ran transactions.
4. The system was run is steady state for 5 minutes
5. The Server was powered off by normal means, causing instantaneous interruption.

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. The server was powered on again and rebooted.
9. SQL Server was restarted and automatically recovered.
10. A new count of D_NEXT_O_ID was taken.
11. 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 4700 warehouses. The performance run used 4600 warehouses and this is verified by runcheck

Table 3: Table Cardinality

Table	Cardinality as Benchmarked
Warehouse	4,700
District	47,000
Customer	141,000,000
History	141,000,000
NewOrder	42,300,000
Orders	141,000,000
OrderLine	1,409,999,206
Item	100,000
Stock	470,000,000
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 305 disks: 144 9GB for data, 144 18GB for data, 16 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 1, 2, 3, 4, 5 and 6 were configured with 48 disk drives per logical drive. Disks 4, 5 and 6 (controllers 4,5 and 6) contained 18GB drives. QLogic 2200/33 Fibre Channel Host Bus Adapter (in PCI slot 10) was configured with 16-mirrored 18GB disk 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 8663MB**	On-Board Controller # **1**					
Partition	On-Board		Channels			
1	Internal	SCSI ID	0			
C: OS NTFS 8663 MB		0	A0-1			
		1				
		2				
		3				

W2K Disk Administration			MYLEX EX2000P Configuration					
Disk **1 402810MB**			Controller # **1**					
Partition			Slot# **1**		Channels			
1	2	3		SCSI ID	A	B	C	D
E: CS1 Unknown 46080MB	**F: MS1 Unknown 25600MB**	**X: Backup1 NTFS 331130MB**		0	A1-1	A1-13	A2-9	A3-5
				1	A1-2	A1-14	A2-10	A3-6
				2	A1-3	A1-15	A2-11	A3-7
				3	A1-4	A1-16	A2-12	A3-8
				4	A1-5	A2-1	A2-13	A3-9
				5	A1-6	A2-2	A2-14	A3-10
				8	A1-7	A2-3	A2-15	A3-11
				9	A1-8	A2-4	A2-16	A3-12
				10	A1-9	A2-5	A3-1	A3-13
				11	A1-10	A2-6	A3-2	A3-14
				12	A1-11	A2-7	A3-3	A3-15
				13	A1-12	A2-8	A3-4	A3-16

W2K Disk Administration			MYLEX EX2000P Configuration					
Disk **2 402810MB**			Controller # **2**					
Partition			Slot# **2**		Channels			
1	2	3		SCSI ID	A	B	C	D
G:	**H:**	**Y:**		0	A1-1	A1-13	A2-9	A3-5
CS2	**MS2**	**Backup2**		1	A1-2	A1-14	A2-10	A3-6
Unknown	**Unknown**	**NTFS**		2	A1-3	A1-15	A2-11	A3-7
46080MB	**25600MB**	**331130MB**		3	A1-4	A1-16	A2-12	A3-8
				4	A1-5	A2-1	A2-13	A3-9
				5	A1-6	A2-2	A2-14	A3-10
				8	A1-7	A2-3	A2-15	A3-11
				9	A1-8	A2-4	A2-16	A3-12
				10	A1-9	A2-5	A3-1	A3-13
				11	A1-10	A2-6	A3-2	A3-14
				12	A1-11	A2-7	A3-3	A3-15
				13	A1-12	A2-8	A3-4	A3-16

W2K Disk Administration			Mylex EX2000P Configuration					
Disk **3 402810MB**			Controller # **3**					
Partition			Slot# **3**		Channels			
1	2	3		SCSI ID	A	B	C	D
I:	**J:**	**U:**		0	A1-1	A1-13	A2-9	A0-5
CS3	**MS3**	**Backup3**		1	A1-2	A1-14	A2-10	A0-6
Unknown	**Unknown**	**NTFS**		2	A1-3	A1-15	A2-11	A1-7
46080MB	**25600MB**	**331130MB**		3	A1-4	A1-16	A2-12	A1-8
				4	A1-5	A2-1	A2-13	A2-9
				5	A1-6	A2-2	A2-14	A2-10
				8	A1-7	A2-3	A2-15	A3-11
				9	A1-8	A2-4	A2-16	A3-12
				10	A1-9	A2-5	A4-1	A4-13
				11	A1-10	A2-6	A4-2	A4-14
				12	A1-11	A2-7	A5-3	A5-15
				13	A1-12	A2-8	A5-4	A5-16

W2K Disk Administration			Mylex EX2000P Configuration					
Disk **4 823674MB**			Controller # **4**					
Partition			Slot# **4**		Channels			
1	2	3		SCSI ID	A	B	C	D
K:	**L:**	**V:**		0	A1-1	A1-13	A2-9	A0-5
CS4	**MS4**	**Backup4**		1	A1-2	A1-14	A2-10	A0-6
Unknown	**Unknown**	**NTFS**		2	A1-3	A1-15	A2-11	A1-7
46080MB	**25600MB**	**751995MB**		3	A1-4	A1-16	A2-12	A1-8
				4	A1-5	A2-1	A2-13	A2-9
				5	A1-6	A2-2	A2-14	A2-10
				8	A1-7	A2-3	A2-15	A3-11
				9	A1-8	A2-4	A2-16	A3-12
				10	A1-9	A2-5	A4-1	A4-13
				11	A1-10	A2-6	A4-2	A4-14
				12	A1-11	A2-7	A5-3	A5-15
				13	A1-12	A2-8	A5-4	A5-16

W2K Disk Administration			Mylex EX2000P Configuration					
Disk **5 823674MB**			Controller # **5**					
Partition			Slot# **5**		Channels			
1	2	3		SCSI ID	A	B	C	D
M:	**N:**	**R:**		0	A1-1	A1-13	A2-9	A0-5
CS5	**MS5**	**Backup5**		1	A1-2	A1-14	A2-10	A0-6
Unknown	**Unknown**	**NTFS**		2	A1-3	A1-15	A2-11	A1-7
46080MB	**25600MB**	**751995MB**		3	A1-4	A1-16	A2-12	A1-8
				4	A1-5	A2-1	A2-13	A2-9
				5	A1-6	A2-2	A2-14	A2-10
				8	A1-7	A2-3	A2-15	A3-11
				9	A1-8	A2-4	A2-16	A3-12
				10	A1-9	A2-5	A4-1	A4-13
				11	A1-10	A2-6	A4-2	A4-14
				12	A1-11	A2-7	A5-3	A5-15
				13	A1-12	A2-8	A5-4	A5-16

W2K Disk Administration			Mylex EX2000P Configuration					
Disk **6 823674MB**			Controller # **6**					
Partition			Slot# **6**		Channels			
1	2	3		SCSI ID	A	B	C	D
O:	**P:**	**W:**		0	A1-1	A1-13	A2-9	A0-5
CS5	**MS5**	**Page File**		1	A1-2	A1-14	A2-10	A0-6
Unknown	**Unknown**	**NTFS**		2	A1-3	A1-15	A2-11	A1-7
46080MB	**25600MB**	**751995MB**		3	A1-4	A1-16	A2-12	A1-8
				4	A1-5	A2-1	A2-13	A2-9
				5	A1-6	A2-2	A2-14	A2-10
				8	A1-7	A2-3	A2-15	A3-11
				9	A1-8	A2-4	A2-16	A3-12
				10	A1-9	A2-5	A4-1	A4-13
				11	A1-10	A2-6	A4-2	A4-14
				12	A1-11	A2-7	A5-3	A5-15
				13	A1-12	A2-8	A5-4	A5-16

W2K Disk Administration		Qlogic 2200 Configuration					
Disk **7 135485MB**		Controller # **7**					
Partition		Slot# **7**					
1	2		LUN ID	SP A		SP B	
				Data Array Enclosures			
S:				1	2	1	2
LOG			0	A1-1	A1-2		
Unknown	**Freespace 21821MB**		1	A2-1	A2-2		
113664MB			2	A3-1	A3-2		
			3	A4-1	A4-2		
			4	A5-1	A5-2		
			5	A6-1	A62		
			6	A7-1	A7-2		
			7	A8-1	A8-2		
			8				
			9				

***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 daySpace Calculation

Details of the 60 dayspace 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 261.69 GB (including mirror) to sustain the log for 8 hours. Space available on the transaction log volume was 268.13 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 are 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	57014.93
Price per TpmC	$8.70

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	0.54	1.12	6.12
Payment	0.49	1.06	5.02
Order Status	0.51	1.08	6.02
Interactive Delivery	0.17	0.39	1.48
Deferred Delivery	0.19	0.25	0.66
Stock Level	0.83	1.45	5.79
Menu	0.17	0.39	1.52

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	18.28
Payment	3.01	3.02	3.28
Order Status	2.01	2.02	2.23
Delivery	2.01	2.02	2.23
Stock Level	2.01	2.02	2.23

Table 8: Transaction Think Times

Transaction	Minimum	Average	Maximum
New Order	0.00	12.04	120.43
Payment	0.00	12.03	120.45
Order Status	0.00	10.08	100.40
Delivery	0.00	5.04	50.40
Stock Level	0.00	5.05	50.41

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

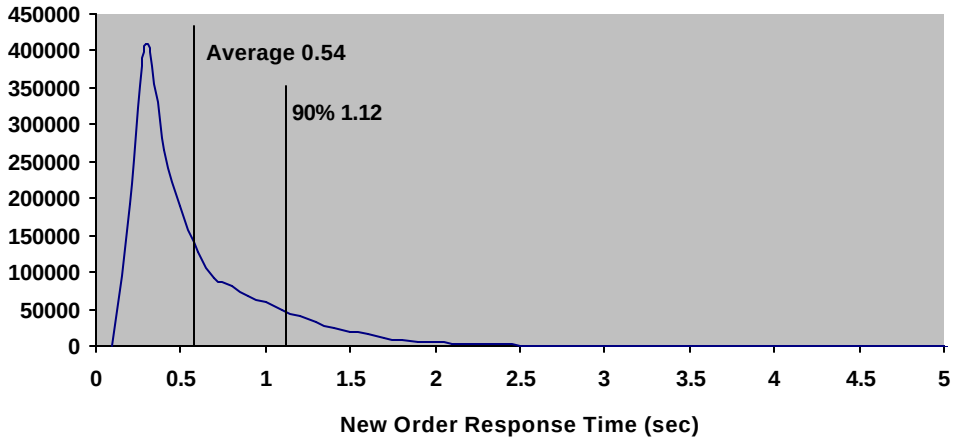


Figure 4: Payment Response Time Distribution

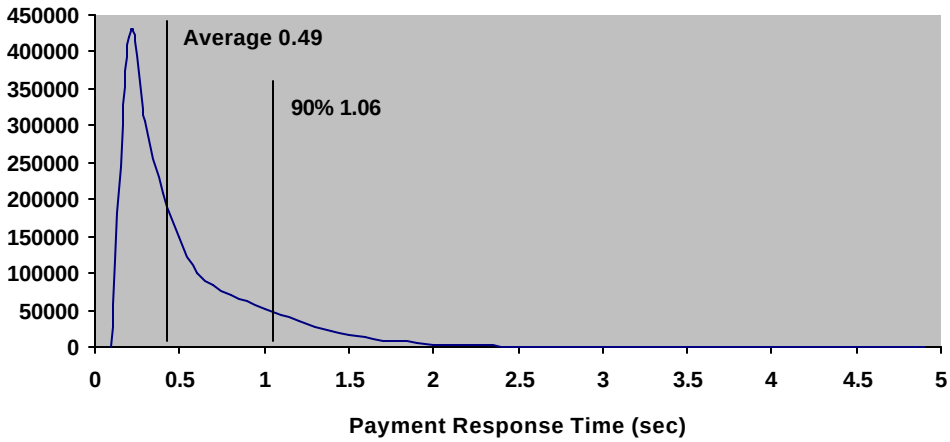


Figure 5: Order Status Response Time Distribution

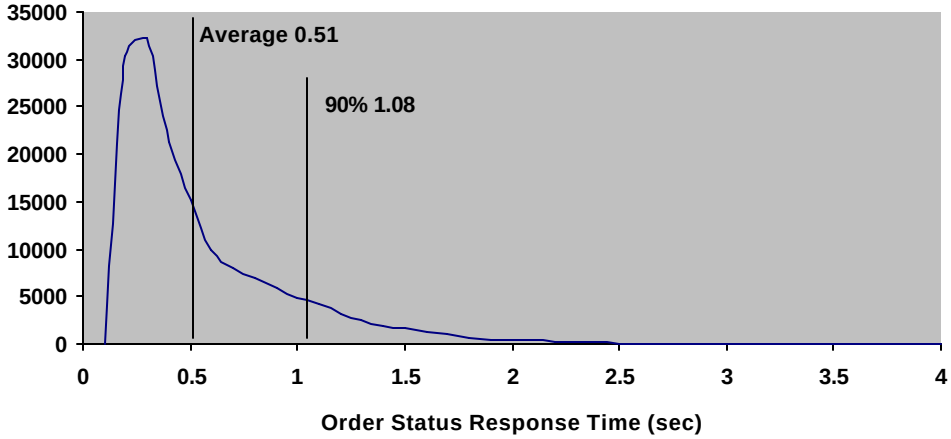


Figure 6: Delivery Response Time Distribution

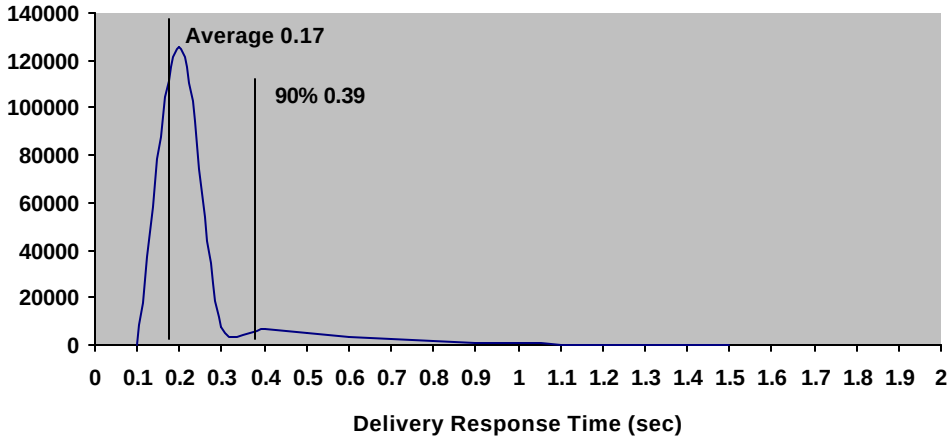
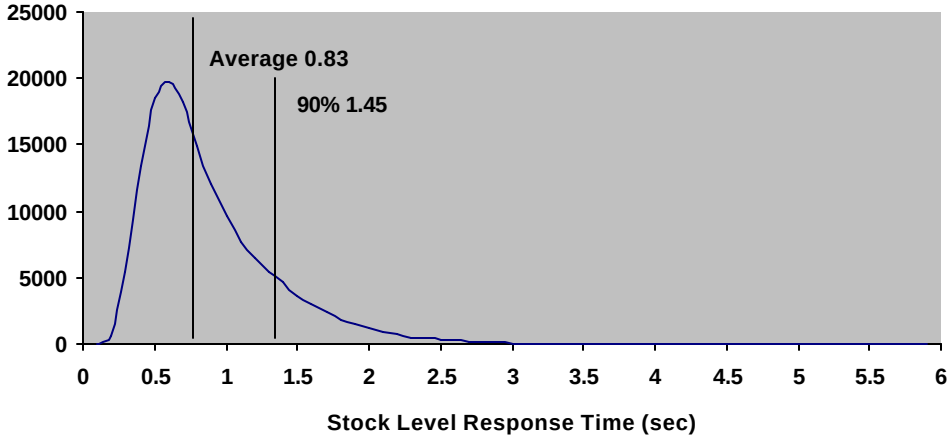


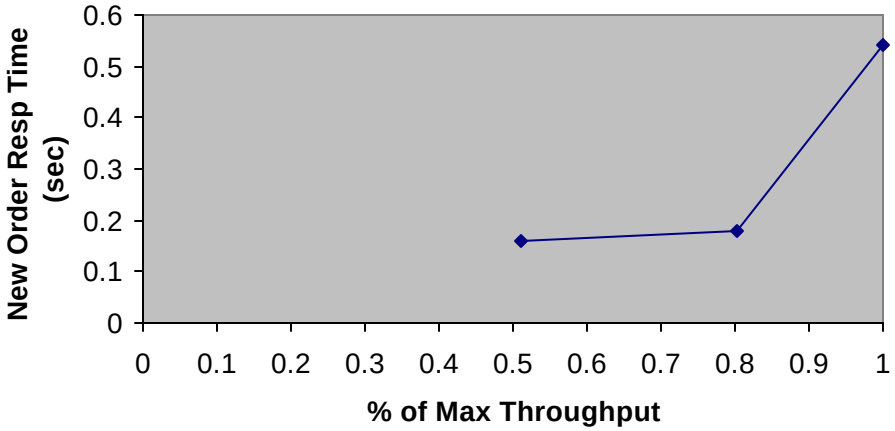
Figure 7: Stock Level Response Time Distribution



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)

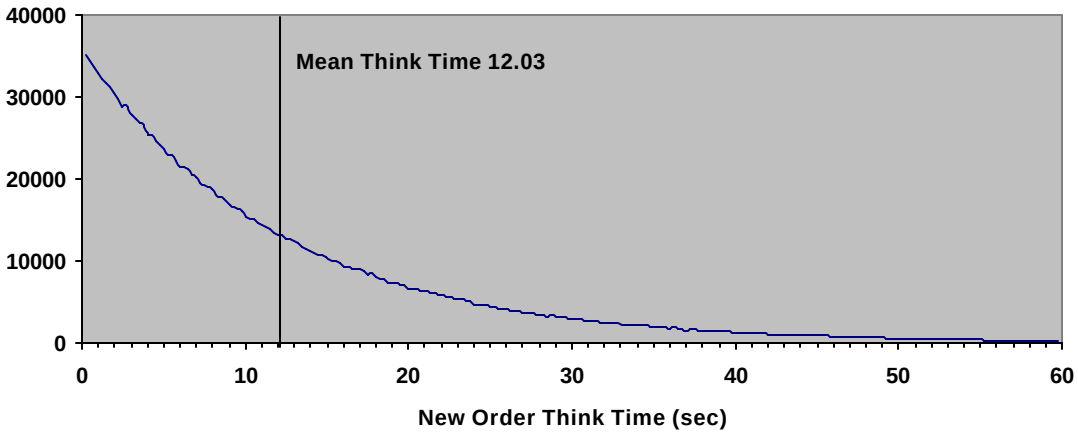
Figure 8: New Order Response Time vs. Throughput



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)

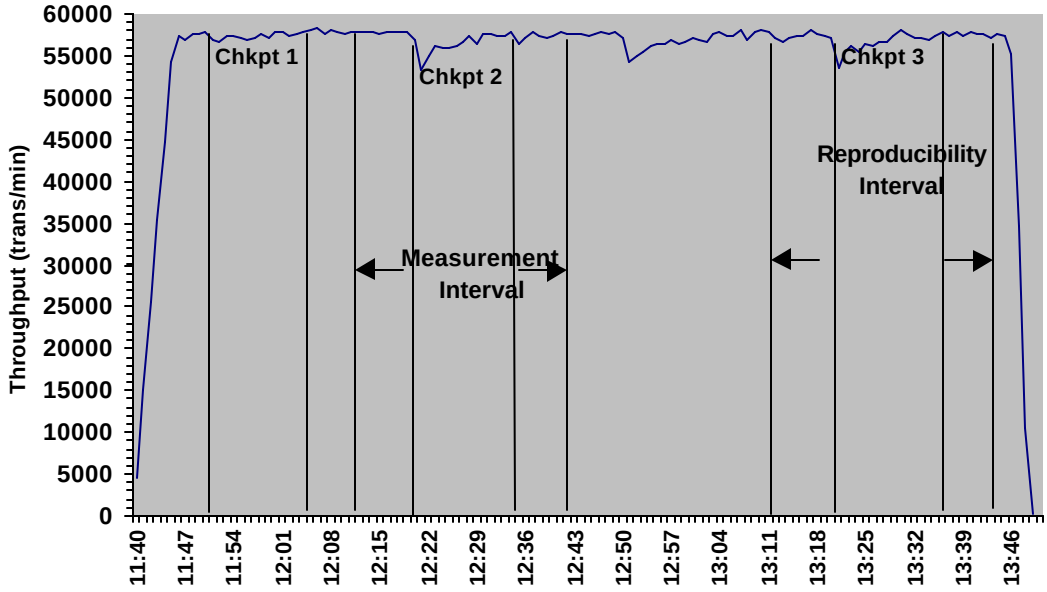
Figure 9: New Order Think Time Distribution



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 56* 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 10.

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 46,000 over 8 minutes. We allowed the database to warm up and to reach a steady state for an additional 25 minutes, including one checkpoint. The steady state was sustained for a 30-minute performance interval, including checkpoint, followed 31 minutes later by a 30-minute reproducibility interval. 3 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 0.01% 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, which 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	44.86%
Payment	43.03%
Order Status	4.04%
Delivery	4.04%
Stock Level	4.03%

Other Metrics

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

Table 10: Transaction Statistics

Transaction	Function	Value
New Order	Home Warehouse Items	99.00%
	Remote Warehouse Items	1.00%
	Rolled Back Transactions	1.00%
	Average Lines Per Order	10.00
Payment	Home Warehouse	85.02%
	Remote Warehouse	14.98%
	Non-Primary Key Access	60.03%
Order Status	Non-Primary Key Access	60.05%
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 504 sec after the start of the measurement interval. The checkpoint in the measurement interval lasted 840 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.
- Giganet (1.25 Gbit/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: Jan 15, 2001
Software Availability Date: Jan 15, 2001

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: 57,014.93 tpmC
Price Performance Metric: $8.70/tpmC

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:

- 7 Microsoft Windows 2000 Server Licenses
- 1 Microsoft Windows 2000 Datacenter Server License
- 1 Microsoft SQL Server 2000 Enterprise Edition License.
- 1 Microsoft Visual C++ 32 bit Edition
- 5Year 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)

Tom Sawyer of Performance Metrics has audited this TPC-C benchmark.

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 28, 2001

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

In my opinion, the data provided for the PowerEdge 8450/ result of August 4, 2001 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.
- 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. The price is the 1400 price which is higher than the last published 1300 price.

Sincerely,

Tom Sawyer

Auditor

Auditor's Letter of Attestation

July 7, 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 8450 Server
Database Manager: Microsoft SQL Server 2000 Enterprise Edition (Version 8.0)
Operating System:
Server: Microsoft Windows 2000 Datacenter Server
Clients: Microsoft Windows 2000 Server
Transaction Manager: Microsoft COM+

Server: Dell PowerEdge 8450 Server				
CPU's	Memory	Disks	90% Response	TpmC
8 Pentium III Xeon @ 700 MHz	Main: 32 GB Cache: 2MB	145 @ 9 GB 144 @ 18 GB	**1.12 sec**	**57,014.93**
7 Clients: Dell PowerEdge 1300 (each)				
1 Pentium III @600MHz	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 4,700 warehouses. The measurement used 4,600 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 data-loss 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 – the measured system had sufficient space.
- 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:

One client machine used a Pentium III @ 550MHz.

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( 0xfffffff0c ),    /* Offset= -244 (470) */
/* 716 */
                              0x1b,               /* FC_CARRAY */
                              0x0,                /* 0 */
/* 718 */ NdrFcShort( 0x1 ), /* 1 */
/* 720 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                              0x0,                /*  */
/* 722 */ NdrFcShort( 0x0 ), /* 0 */
/* 724 */ 0x1,                /* FC_BYTE */
                              0x5b,               /* FC_END */
/* 726 */
                              0x16,               /* FC_PSTRUCT */
                              0x3,                /* 3 */
/* 728 */ NdrFcShort( 0x8 ), /* 8 */
/* 730 */
                              0x4b,               /* FC_PP */
                              0x5c,               /* FC_PAD */
/* 732 */
                              0x46,               /* FC_NO_REPEAT */
                              0x5c,               /* FC_PAD */
/* 734 */ NdrFcShort( 0x4 ), /* 4 */
/* 736 */ NdrFcShort( 0x4 ), /* 4 */
/* 738 */ 0x12, 0x0,         /* FC_UP */
/* 740 */ NdrFcShort( 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( 0xffffffdc ),    /* Offset= -36 (424) */
/* 462 */
                            0x21,             /* FC_BOGUS_ARRAY */
                            0x3,              /* 3 */
/* 464 */ NdrFcShort( 0x0 ), /* 0 */
/* 466 */ 0x19,              /* Corr desc:  field pointer, FC_ULONG */
                            0x0,              /*  */
/* 468 */ NdrFcShort( 0x0 ), /* 0 */
/* 470 */ NdrFcShort( 0x1 ), /* Corr flags:  early, */
/* 472 */ NdrFcLong( 0xffffffff ),     /* -1 */
/* 476 */ NdrFcShort( 0x0 ), /* Corr flags:  */
/* 478 */ 0x4c,              /* FC_EMBEDDED_COMPLEX */
                            0x0,              /* 0 */
/* 480 */ NdrFcShort( 0xffffff58 ),    /* Offset= -168 (312) */
/* 482 */ 0x5c,              /* FC_PAD */
                            0x5b,             /* FC_END */
/* 484 */
                            0x1a,             /* FC_BOGUS_STRUCT */
                            0x3,              /* 3 */
/* 486 */ NdrFcShort( 0x10 ),/* 16 */
/* 488 */ NdrFcShort( 0x0 ), /* 0 */
/* 490 */ NdrFcShort( 0x6 ), /* Offset= 6 (496) */
/* 492 */ 0x8,               /* FC_LONG */
                            0x39,             /* FC_ALIGNM8 */
/* 494 */ 0x36,              /* FC_POINTER */
                            0x5b,             /* FC_END */
/* 496 */
                            0x11, 0x0,        /* FC_RP */
/* 498 */ NdrFcShort( 0xffffffdc ),    /* Offset= -36 (462) */
/* 500 */
                            0x21,             /* FC_BOGUS_ARRAY */
                            0x3,              /* 3 */
/* 502 */ NdrFcShort( 0x0 ), /* 0 */
/* 504 */ 0x19,              /* Corr desc:  field pointer, FC_ULONG */
                            0x0,              /*  */
/* 506 */ NdrFcShort( 0x0 ), /* 0 */
/* 508 */ NdrFcShort( 0x1 ), /* Corr flags:  early, */
/* 510 */ NdrFcLong( 0xffffffff ),     /* -1 */
/* 514 */ NdrFcShort( 0x0 ), /* Corr flags:  */
/* 516 */ 0x4c,              /* FC_EMBEDDED_COMPLEX */
                            0x0,              /* 0 */
/* 518 */ NdrFcShort( 0xffffff44 ),    /* Offset= -188 (330) */
/* 520 */ 0x5c,              /* FC_PAD */
                            0x5b,             /* FC_END */
/* 522 */
                            0x1a,             /* FC_BOGUS_STRUCT */
                            0x3,              /* 3 */
/* 524 */ NdrFcShort( 0x10 ),/* 16 */
/* 526 */ NdrFcShort( 0x0 ), /* 0 */
/* 528 */ NdrFcShort( 0x6 ), /* Offset= 6 (534) */
/* 530 */ 0x8,               /* FC_LONG */
                            0x39,             /* FC_ALIGNM8 */
/* 532 */ 0x36,              /* FC_POINTER */
                            0x5b,             /* FC_END */
/* 534 */
                            0x11, 0x0,        /* FC_RP */
/* 536 */ NdrFcShort( 0xffffffdc ),    /* Offset= -36 (500) */
/* 538 */
                            0x21,             /* FC_BOGUS_ARRAY */
```

```
                            0x3,                /* 3 */
/* 540 */ NdrFcShort( 0x0 ), /* 0 */
/* 542 */ 0x19,              /* Corr desc:  field pointer, FC_ULONG */
                            0x0,                /*  */
/* 544 */ NdrFcShort( 0x0 ), /* 0 */
/* 546 */ NdrFcShort( 0x1 ), /* Corr flags:  early, */
/* 548 */ NdrFcLong( 0xffffffff ),     /* -1 */
/* 552 */ NdrFcShort( 0x0 ), /* Corr flags:  */
/* 554 */
                            0x12, 0x0,          /* FC_UP */
/* 556 */ NdrFcShort( 0x176 ),         /* Offset= 374 (930) */
/* 558 */ 0x5c,              /* FC_PAD */
                            0x5b,               /* FC_END */
/* 560 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x3,                /* 3 */
/* 562 */ NdrFcShort( 0x10 ),/* 16 */
/* 564 */ NdrFcShort( 0x0 ), /* 0 */
/* 566 */ NdrFcShort( 0x6 ), /* Offset= 6 (572) */
/* 568 */ 0x8,               /* FC_LONG */
                            0x39,               /* FC_ALIGNM8 */
/* 570 */ 0x36,              /* FC_POINTER */
                            0x5b,               /* FC_END */
/* 572 */
                            0x11, 0x0,          /* FC_RP */
/* 574 */ NdrFcShort( 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 V3 Benchmark Kit Ver. 4.21                                  *
@ECHO *                                                                              *
@ECHO ********************************************************************************

@if '%1'=='' goto usage
@if '%2'=='' goto usage
@if '%3'=='' goto usage
@if not '%4'=='' if not '%4' == 'normal' if not '%4' == 'scale_down' 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

:Verify_Installation
@isql -Usa -P -S%1 -b -iscripts\utility\verify_msg.sql                        >nul
@isql -Usa -P -S%1 -b -iscripts\utility\verify_sort.sql                       >nul
@isql -Usa -P -S%1 -b -Q"ms_verify_sort"                                      >nul
@if errorlevel 1 goto BAD_SORT

:builddb
@@if exist logs\db.log del logs\db.log                                        >nul
@ECHO Removing any existing TPCC database and backup devices...
@isql -Usa -P -S%1 -e < scripts\%2.war\database\removedb.sql                  >
logs\db.log
@ECHO Creating Backup Device(s)...
@isql -Usa -P -S%1 -e < scripts\%2.war\database\backupdev.sql                 >>
logs\db.log
@if errorlevel 1 goto CREATE_ERROR
@ECHO Building database files and database...
@isql -Usa -P -S%1 -b -e < scripts\%2.war\database\createdb.sql               >>
logs\db.log
@if errorlevel 1 goto CREATE_ERROR
@ECHO Database build complete.
@if  '%3'=='full' goto objects
goto end

:objects
@if exist logs\objects.log del logs\objects.log                               >nul
@ECHO Creating TPC-C database tables...
@isql -Usa -P -S%1 -b -e < scripts\%2.war\ddl\tables.sql           >  logs\objects.log
@if errorlevel 1 goto TABLES_ERROR
@ECHO Creating database objects...
@isql -Usa -P -S%1 -b -e < scripts\dml\neword.sql                  >> logs\objects.log
@if errorlevel 1 goto NEWORDER_ERROR
@isql -Usa -P -S%1 -b -e < scripts\dml\payment.sql                            >>
logs\objects.log
@if errorlevel 1 goto PAYMENT_ERROR
@isql -Usa -P -S%1 -b -e < scripts\dml\ordstat.sql                            >>
logs\objects.log
@if errorlevel 1 goto ORDERSTATUS_ERROR
@isql -Usa -P -S%1 -b -e < scripts\dml\delivery.sql                           >>
logs\objects.log
@if errorlevel 1 goto DELIVERY_ERROR
@isql -Usa -P -S%1 -b -e < scripts\dml\stocklev.sql                           >>
logs\objects.log
@if errorlevel 1 goto STOCKLEVEL_ERROR
@isql -Usa -P -S%1 -e < scripts\dml\version.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 Setting database options before load...
@isql -Usa -P -S%1 -b -e < scripts\utility\dbopt1.sql                         >>
logs\bulkload.log
@if errorlevel 1 goto DBOPT1_ERROR
@ECHO Beginning data load and index creation...
@if '%4'==''      loader\bin\tpccldr -S%1 -W%2 -flogs\bulkload.log -dscripts\%2.war\ddl -
c0
@if errorlevel 1 goto END
@if '%4'=='normal' loader\bin\tpccldr -S%1 -W%2 -flogs\bulkload.log -dscripts\%2.war\ddl
-c0
@if errorlevel 1 goto END
@if '%4'=='scale_down' loader\bin\tpccldr -S%1 -W%2 -flogs\bulkload.log -
dscripts\%2.war\ddl -c1
@if errorlevel 1 goto END
goto bulkloaddone
:bulkloaddone
@ECHO Setting database options after load...
@isql -Usa -P -S%1 -b -e < scripts\utility\dbopt2.sql                         >>
logs\bulkload.log
@if errorlevel 1 goto DBOPT2_ERROR
@ECHO Data load and index creation complete.

@ECHO.
@ECHO Calculating initial database space usage...
@cd..\acid\space
```

```
@call space.cmd %1
@cd..\..\setup

@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 -b -e < scripts\%2.war\database\backup.sql                >
logs\backup.log
@if errorlevel 1 goto BACKUP_ERROR
@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 -b -e < scripts\utility\verifytpccload.sql      >
logs\verifyload.log
@if errorlevel 1 goto VERIFY_ERROR
@ECHO Check logs\verifyload.log to verify database load.

:complete
@ECHO ********************************************************************************
@ECHO *                                                                              *
@ECHO *  Full TPC-C V3 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 *      DBTYPE  = normal or scale_down                                     *
@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                                            *
@ECHO *                                                                         *
@ECHO *  NOTE 1: 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 *  NOTE 2: The TPC-C setup program supports both Intel and Alpha          *
@ECHO *  systems.  It queries the %PROCESSOR_ARCHITECTURE% environment          *
@ECHO *  variable and runs the appropriate executables.                         *
@ECHO *                                                                         *
@ECHO ***************************************************************************
@goto end


:CREATE_ERROR
@echo.
@echo BUILD ABORTED!
@echo.
@echo There was an error in the database/backup device creation.
@echo.
@echo Check your CREATEDB.SQL, BACKUPDEV.SQL, LOGS\DB.LOG, and the
@echo SQL Server errorlog (MSSQL7\LOG\ERRORLOG) for details.
@echo.
@goto END

:TABLES_ERROR
@echo.
@echo BUILD ABORTED!
@echo.
@echo There was an error in the table creation.
@echo.
@echo Verify that the FileGroup names specified in CREATEDB.SQL
@echo match those specified in SCRIPTS\DDL\TABLES.SQL.
@echo.
@goto END

:NEWORDER_ERROR
@echo.
@echo BUILD ABORTED!
@echo.
@echo There was an error in the creation of the New Order stored procedure.
@echo.
@echo Check your LOGS\OBJECTS.LOG, SCRIPTS\DML\NEWORD.SQL and the
@echo SQL Server errorlog (MSSQL7\LOG\ERRORLOG) for details.
@echo.
@goto END

:PAYMENT_ERROR
@echo.
@echo BUILD ABORTED!
@echo.
@echo There was an error in the creation of the Payment stored procedure.
@echo.
@echo Check your LOGS\OBJECTS.LOG, SCRIPTS\DML\PAYMENT.SQL and the
@echo SQL Server errorlog (MSSQL7\LOG\ERRORLOG) for details.
@echo.
@goto END

:ORDERSTATUS_ERROR
@echo.
@echo BUILD ABORTED!
@echo.
@echo There was an error in the creation of the Order Status stored procedure.
```

```
@echo.
@echo Check your LOGS\OBJECTS.LOG, SCRIPTS\DML\ORDSTAT.SQL and the
@echo SQL Server errorlog (MSSQL7\LOG\ERRORLOG) for details.
@echo.
@goto END

:DELIVERY_ERROR
@echo.
@echo BUILD ABORTED!
@echo.
@echo There was an error in the creation of the Delivery stored procedure.
@echo.
@echo Check your LOGS\OBJECTS.LOG, SCRIPTS\DML\DELIVERY.SQL and the
@echo SQL Server errorlog (MSSQL7\LOG\ERRORLOG) for details.
@echo.
@goto END

:STOCKLEVEL_ERROR
@echo.
@echo BUILD ABORTED!
@echo.
@echo There was an error in the creation of the Stock Level stored procedure.
@echo.
@echo Check your LOGS\OBJECTS.LOG, SCRIPTS\DML\STOCKLEV.SQL and the
@echo SQL Server errorlog (MSSQL7\LOG\ERRORLOG) for details.
@echo.
@goto END

:DBOPT1_ERROR
@echo.
@echo BUILD ABORTED!
@echo.
@echo There was an error setting the database options before load.
@echo.
@echo Check your LOGS\OBJECTS.LOG and the SQL Server errorlog
@echo (MSSQL7\LOG\ERRORLOG) for details.
@echo.
@goto END

:DBOPT2_ERROR
@echo.
@echo BUILD ABORTED!
@echo.
@echo There was an error setting the database options after load.
@echo.
@echo Check your LOGS\OBJECTS.LOG and the SQL Server errorlog
@echo (MSSQL7\LOG\ERRORLOG) for details.
@echo.
@goto END

:BACKUP_ERROR
@echo.
@echo BUILD ABORTED!
@echo.
@echo There was an error backing up the database after load.
@echo.
@echo Check your LOGS\BACKUP.LOG and the SQL Server errorlog
@echo (MSSQL7\LOG\ERRORLOG) for details.
@echo.
@goto END

:VERIFY_ERROR
@echo.
@echo BUILD ABORTED!
@echo.
@echo There was an error performing TPC-C database verification.
@echo.
@echo Check your LOGS\VERIFYLOAD.LOG and the SQL Server errorlog
@echo (MSSQL7\LOG\ERRORLOG) for details.
@echo.
@goto END

:BAD_SORT
@echo.
@echo BUILD ABORTED!
@echo.
@echo Incorrect SQL Server Sort Order.  For performance and compatibility
@echo issues, you must run SQL Server with the Binary Sort Order.
@echo.
@echo For SQL Server 7.0, please re-install and specify the Binary Sort Order.
@echo.
@echo For SQL Server 8.0, please re-install and specify Latin1_General with the Binary
Option.
@echo.
@goto END
: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                = 25008MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL70_misc2,
          FILENAME  = "H:",
          SIZE                = 25008MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL70_misc3,
          FILENAME  = "J:",
          SIZE                = 25008MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL70_misc4,
          FILENAME  = "L:",
          SIZE                = 25008MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL70_misc5,
          FILENAME  = "N:",
          SIZE                = 25008MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL70_misc6,
          FILENAME  = "P:",
          SIZE                = 25008MB,
          FILEGROWTH          = 0),
FILEGROUP MSSQL70_cs_fg
(         NAME                = MSSQL70_cs1,
          FILENAME  = "E:",
          SIZE                = 45264MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL70_cs2,
          FILENAME  = "G:",
          SIZE                = 45264MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL70_cs3,
          FILENAME  = "I:",
          SIZE                = 45264MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL70_cs4,
          FILENAME  = "K:",
          SIZE                = 45264MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL70_cs5,
          FILENAME  = "M:",
          SIZE                = 45264MB,
          FILEGROWTH          = 0),
(         NAME                = MSSQL70_cs6,
          FILENAME  = "O:",
          SIZE                = 45264MB,
          FILEGROWTH          = 0)
LOG ON
(         NAME                =MSSQL70_tpccv3_log,
          FILENAME  ="S:",
          SIZE                =112640MB,
          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,tpccback5 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,tpccback5 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 Datacenter 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 Datacenter 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: 6.00-00 bld 12
- 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"

Qlogic Device Driver

- Qlogic W2K driver : 7.04.02 (ql2200.sys)

Microsoft SQL Server 2000 Configuration Parameters

name	minimum	maximum	config_value	run_value
affinity mask	0	2147483647	255	255
allow updates	0	1	1	1
awe enabled	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	31000	31000
max text repl size (B)	0	2147483647	65536	65536
max worker threads	10	1024	199	199
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	56	56
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 Datacenter Server System Information Report For PE8450

```
System Information report written at: 06/28/2000 07:44:24 PM
[System Information]

[ Following are sub-categories of this main category ]

[System Summary]

Item   Value
OS NameMicrosoft Windows 2000 Datacenter Server
Version5.0.2195 Service Pack 1, RC 1.45 Build 2195
OS Manufacturer      Microsoft Corporation
System Name   PE8450_01
System Manufacturer  Dell Computer Corporation
System Model  Dell PowerEdge 8450
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
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  OCPRF100- PhoenixBIOS 4.0 Release 6.0
Windows Directory    C:\WINNT
System Directory     C:\WINNT\System32
Boot Device   \Device\Harddisk0\Partition1
Locale United States
User Name     PE8450_01\Administrator
Time Zone     Central Daylight Time
Total Physical Memory32,505,148 KB
Available Physical Memory  32,089,340 KB
Total Virtual Memory 66,736,868 KB
Available Virtual Memory    66,249,868 KB
Page File Space      34,231,720 KB
Page File     C:\pagefile.sys

[Hardware Resources]

[ Following are sub-categories of this main category ]

[Conflicts/Sharing]

Resource      Device
IRQ 10 Compaq PCI Hotplug Controller
IRQ 10 Compaq PCI Hotplug Controller
IRQ 10 Compaq PCI Hotplug Controller
IRQ 10 Compaq PCI Hotplug Controller

[DMA]

ChannelDevice Status
4      Direct memory access controller   OK
2      Standard floppy disk controller   OK

[Forced Hardware]

Device PNP Device ID
No Forced Hardware

[I/O]

Address Range Device Status
0x0000-0x0CF7 PCI busOK
```

```
0x0000-0x0CF7 Direct memory access controller   OK
0x0000-0x0CF7 PCI busOK
0x0D00-0x3000 PCI busOK
0x9000-0xFFFF PCI busOK
0x2000-0x2FFF DEC 21154 PCI to PCI bridge OK
0x2000-0x2FFF Mylex eXtremeRAID 2000 Disk Array ControllerOK
0x1000-0x10FF Symbios Logic 896, 22910 PCI SCSI AdapterOK
0x1400-0x14FF Symbios Logic 896, 22910 PCI SCSI AdapterOK
0x03B0-0x03BB Cirrus Logic 5446 Compatible Graphics Adapter   OK
0x03C0-0x03DF Cirrus Logic 5446 Compatible Graphics Adapter   OK
0x0A79-0x0A79 ISAPNP Read Data PortOK
0x0279-0x0279 ISAPNP Read Data PortOK
0x0274-0x0277 ISAPNP Read Data PortOK
0x00B3-0x00B3 Motherboard resourcesOK
0x0C10-0x0C3F Motherboard resourcesOK
0x0CA8-0x0CAF Motherboard resourcesOK
0x0CC0-0x0CCF Motherboard resourcesOK
0x0010-0x001F Direct memory access controller   OK
0x0080-0x009F Direct memory access controller   OK
0x00C0-0x00DF Direct memory access controller   OK
0x0070-0x0077 System CMOS/real time clock OK
0x0020-0x0021 Programmable interrupt controller  OK
0x0024-0x0025 Programmable interrupt controller  OK
0x0028-0x0029 Programmable interrupt controller  OK
0x002C-0x002D Programmable interrupt controller  OK
0x0030-0x0031 Programmable interrupt controller  OK
0x0034-0x0035 Programmable interrupt controller  OK
0x0038-0x0039 Programmable interrupt controller  OK
0x003C-0x003D Programmable interrupt controller  OK
0x00A0-0x00A1 Programmable interrupt controller  OK
0x00A4-0x00A5 Programmable interrupt controller  OK
0x00A8-0x00A9 Programmable interrupt controller  OK
0x00AC-0x00AD Programmable interrupt controller  OK
0x00B0-0x00B1 Programmable interrupt controller  OK
0x00B4-0x00B5 Programmable interrupt controller  OK
0x00B8-0x00B9 Programmable interrupt controller  OK
0x00BC-0x00BD Programmable interrupt controller  OK
0x04D0-0x04D1 Programmable interrupt controller  OK
0x00F0-0x00FF Numeric data processorOK
0x0040-0x0043 System timer  OK
0x0050-0x0053 System timer  OK
0x0061-0x0061 System speakerOK
0x0060-0x0060 Standard 101/102-Key or Microsoft Natural PS/2 KeyboardOK
0x0064-0x0064 Standard 101/102-Key or Microsoft Natural PS/2 KeyboardOK
0x03F2-0x03F5 Standard floppy disk controller   OK
0x03F7-0x03F7 Standard floppy disk controller   OK
0x03F8-0x03FF Communications Port (COM1)  OK
0x02F8-0x02FF Communications Port (COM2)  OK
0x1820-0x182F Intel(r) 82371AB/EB PCI Bus Master IDE ControllerOK
0x01F0-0x01F7 Primary IDE Channel  OK
0x03F6-0x03F6 Primary IDE Channel  OK
0x1800-0x181F Intel 82371AB/EB PCI to USB Universal Host Controller  OK
0x3000-0x4FFF PCI busOK
0x3000-0x4FFF DEC 21154 PCI to PCI bridge OK
0x3000-0x4FFF Mylex eXtremeRAID 2000 Disk Array ControllerOK
0x4000-0x4FFF DEC 21154 PCI to PCI bridge OK
0x4000-0x4FFF Mylex eXtremeRAID 2000 Disk Array ControllerOK
0x5000-0x6FFF PCI busOK
0x5000-0x6FFF DEC 21154 PCI to PCI bridge OK
0x5000-0x6FFF Mylex eXtremeRAID 2000 Disk Array ControllerOK
0x6000-0x6FFF DEC 21154 PCI to PCI bridge OK
0x6000-0x6FFF Mylex eXtremeRAID 2000 Disk Array ControllerOK
0x7000-0x8FFF PCI busOK
0x7000-0x8FFF QLogic QLA2200 PCI Fibre Channel Adapter OK
0x8000-0x8FFF DEC 21154 PCI to PCI bridge OK
0x8000-0x8FFF Mylex eXtremeRAID 2000 Disk Array ControllerOK

[IRQs]

IRQ Number    Device
```

```
9       Microsoft ACPI-Compliant System
10      Compaq PCI Hotplug Controller
10      Compaq PCI Hotplug Controller
10      Compaq PCI Hotplug Controller
10      Compaq PCI Hotplug Controller
61      Mylex eXtremeRAID 2000 Disk Array Controller
54      cLAN Host Adapter
58      Symbios Logic 896, 22910 PCI SCSI Adapter
18      Symbios Logic 896, 22910 PCI SCSI Adapter
8       System CMOS/real time clock
13      Numeric data processor
1       Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
12      Microsoft PS/2 Mouse
6       Standard floppy disk controller
4       Communications Port (COM1)
3       Communications Port (COM2)
14      Primary IDE Channel
49      Intel 82371AB/EB PCI to USB Universal Host Controller
50      Mylex eXtremeRAID 2000 Disk Array Controller
36      Mylex eXtremeRAID 2000 Disk Array Controller
32      Mylex eXtremeRAID 2000 Disk Array Controller
28      Mylex eXtremeRAID 2000 Disk Array Controller
24      Mylex eXtremeRAID 2000 Disk Array Controller
20      QLogic QLA2200 PCI Fibre Channel Adapter

[Memory]

Range  Device Status
0xA0000-0xBFFFF      PCI busOK
0xA0000-0xBFFFF      Cirrus Logic 5446 Compatible Graphics Adapter   OK
0xC8000-0xDFFFF      PCI busOK
0xE0000-0xFFFFF      PCI busOK
0xC0000000-0xE3FFFFFFPCI busOK
0xFFF00000-0xFFFFFFFFPCI busOK
0xDC015000-0xDC0150FFCompaq PCI Hotplug ControllerOK
0xDE000000-0xDFFFFFFFDEC 21154 PCI to PCI bridge OK
0xDE000000-0xDFFFFFFFMylex eXtremeRAID 2000 Disk Array ControllerOK
0xE2000000-0xE3FFFFFFDEC 21154 PCI to PCI bridge OK
0xE2000000-0xE3FFFFFFMylex eXtremeRAID 2000 Disk Array ControllerOK
0xDC020000-0xDC03FFFFcLAN Host Adapter    OK
0xDC200000-0xDC3FFFFFcLAN Host Adapter    OK
0xDD000000-0xDDFFFFFFcLAN Host Adapter    OK
0xDC000000-0xDC00FFFFcLAN Host Adapter    OK
0xDC015400-0xDC0157FFSymbios Logic 896, 22910 PCI SCSI AdapterOK
0xDC010000-0xDC011FFFSymbios Logic 896, 22910 PCI SCSI AdapterOK
0xDC015800-0xDC015BFFSymbios Logic 896, 22910 PCI SCSI AdapterOK
0xDC012000-0xDC013FFFSymbios Logic 896, 22910 PCI SCSI AdapterOK
0xE0000000-0xE1FFFFFFCirrus Logic 5446 Compatible Graphics Adapter   OK
0xDC014000-0xDC014FFFCirrus Logic 5446 Compatible Graphics Adapter   OK
0xE4000000-0xEDFFFFFFPCI busOK
0xE4000000-0xEDFFFFFFCompaq PCI Hotplug ControllerOK
0xE6000000-0xE7FFFFFFDEC 21154 PCI to PCI bridge OK
0xE6000000-0xE7FFFFFFMylex eXtremeRAID 2000 Disk Array ControllerOK
0xEA000000-0xEBFFFFFFDEC 21154 PCI to PCI bridge OK
0xEA000000-0xEBFFFFFFMylex eXtremeRAID 2000 Disk Array ControllerOK
0xE8000000-0xE9FFFFFFDEC 21154 PCI to PCI bridge OK
0xE8000000-0xE9FFFFFFMylex eXtremeRAID 2000 Disk Array ControllerOK
0xEC000000-0xEDFFFFFFDEC 21154 PCI to PCI bridge OK
0xEC000000-0xEDFFFFFFMylex eXtremeRAID 2000 Disk Array ControllerOK
0xEE000000-0xF7FFFFFFPCI busOK
0xEE000000-0xF7FFFFFFCompaq PCI Hotplug ControllerOK
0xF0000000-0xF1FFFFFFDEC 21154 PCI to PCI bridge OK
0xF0000000-0xF1FFFFFFMylex eXtremeRAID 2000 Disk Array ControllerOK
0xF4000000-0xF5FFFFFFDEC 21154 PCI to PCI bridge OK
0xF4000000-0xF5FFFFFFMylex eXtremeRAID 2000 Disk Array ControllerOK
0xF2000000-0xF3FFFFFFDEC 21154 PCI to PCI bridge OK
0xF2000000-0xF3FFFFFFMylex eXtremeRAID 2000 Disk Array ControllerOK
0xF6000000-0xF7FFFFFFDEC 21154 PCI to PCI bridge OK
0xF6000000-0xF7FFFFFFMylex eXtremeRAID 2000 Disk Array ControllerOK
0xE8000000-0xEDFFFFFFPCI busOK
```

```
0xF8000000-0xFDFFFFFFQLogic QLA2200 PCI Fibre Channel Adapter OK
0xF8001000-0xF80010FFCompaq PCI Hotplug ControllerOK
0xFA000000-0xFBFFFFFFDEC 21154 PCI to PCI bridge OK
0xFA000000-0xFBFFFFFFMylex eXtremeRAID 2000 Disk Array ControllerOK
0xFC000000-0xFDFFFFFFDEC 21154 PCI to PCI bridge OK
0xFC000000-0xFDFFFFFFMylex eXtremeRAID 2000 Disk Array ControllerOK

[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   VersionSize   Creation Date
c:\winnt\system32\msg723.acmMicrosoft Corporation       OK
       C:\WINNT\System32\MSG723.ACM4.4.3385      106.77 KB (109,328 bytes)
       6/15/2000 7:22:41 PM
c:\winnt\system32\tssoft32.acm    DSP GROUP, INC.             OK
       C:\WINNT\System32\TSSOFT32.ACM    1.01   9.27 KB (9,488 bytes)3/15/2000
6:00:00 PM
c:\winnt\system32\msgsm32.acmMicrosoft Corporation       OK
       C:\WINNT\System32\MSGSM32.ACM5.00.2134.1   22.27 KB (22,800 bytes)
       3/15/2000 6:00:00 PM
c:\winnt\system32\msadp32.acmMicrosoft Corporation       OK
       C:\WINNT\System32\MSADP32.ACM5.00.2134.1   14.77 KB (15,120 bytes)
       3/15/2000 6:00:00 PM
c:\winnt\system32\iac25_32.axIntel Corporation    Indeo® audio softwareOK
       C:\WINNT\System32\IAC25_32.AX2.05.53195.00 KB (199,680 bytes)  3/15/2000
6:00:00 PM
c:\winnt\system32\imaadp32.acm    Microsoft Corporation       OK
       C:\WINNT\System32\IMAADP32.ACM    5.00.2134.1   16.27 KB (16,656 bytes)
       3/15/2000 6:00:00 PM
c:\winnt\system32\lhacm.acm Microsoft Corporation       OK
       C:\WINNT\System32\LHACM.ACM 4.4.3385      33.27 KB (34,064 bytes)
       6/15/2000 7:22:41 PM
c:\winnt\system32\msg711.acmMicrosoft Corporation       OK
       C:\WINNT\System32\MSG711.ACM5.00.2134.1   10.27 KB (10,512 bytes)
       3/15/2000 6:00:00 PM

[Video Codecs]

Codec  Manufacturer  Description   Status File   VersionSize   Creation Date
c:\winnt\system32\ir50_32.dllIntel Corporation    Indeo® video 5.10    OK
       C:\WINNT\System32\IR50_32.DLLR.5.10.15.2.55737.50 KB (755,200 bytes)
       3/15/2000 6:00:00 PM
c:\winnt\system32\msh261.drvMicrosoft Corporation       OK
       C:\WINNT\System32\MSH261.DRV4.4.3385      163.77 KB (167,696 bytes)
       6/15/2000 7:22:41 PM
c:\winnt\system32\msh263.drvMicrosoft Corporation       OK
       C:\WINNT\System32\MSH263.DRV4.4.3385      252.27 KB (258,320 bytes)
       6/15/2000 7:22:07 PM
c:\winnt\system32\msrle32.dllMicrosoft Corporation       OK
       C:\WINNT\System32\MSRLE32.DLL5.00.2134.1   10.77 KB (11,024 bytes)
       3/15/2000 6:00:00 PM
c:\winnt\system32\iccvid.dllRadius Inc.          OK     C:\WINNT\System32\ICCVID.DLL
       1.10.0.6      108.00 KB (110,592 bytes)   3/15/2000 6:00:00 PM
c:\winnt\system32\ir32_32.dllIntel(R) Corporation       OK
       C:\WINNT\System32\IR32_32.DLLNot Available 194.50 KB (199,168 bytes)
       3/15/2000 6:00:00 PM
c:\winnt\system32\msvidc32.dll    Microsoft Corporation       OK
       C:\WINNT\System32\MSVIDC32.DLL    5.00.2134.1   27.27 KB (27,920 bytes)
       3/15/2000 6:00:00 PM

[CD-ROM]

Item   Value
```

```
Drive  Z:
Description   CD-ROM Drive
Media Loaded  False
Media Type    CD-ROM
Name   SONY CD-ROM CDU701
Manufacturer  (Standard CD-ROM drives)
Status OK
Transfer Rate Not Available
SCSI Target ID0
PNP Device ID IDE\CDROMSONY_CD-ROM_CDU701_____________________1.0R____\5&201331&0&0.0.0


[Sound Device]

Item   Value
No sound devices

[Display]

Item   Value
Name   Cirrus Logic 5446 Compatible Graphics Adapter
PNP Device ID PCI\VEN_1013&DEV_00B8&SUBSYS_00B81013&REV_45\3&267A616A&0&60
Adapter Type  Cirrus Logic 5446BE, Cirrus Logic compatible
Adapter Description  Cirrus Logic 5446 Compatible Graphics Adapter
Adapter RAM   2.00 MB (2,097,152 bytes)
Installed Drivers    vga.sys,cirrus.sys,vga256.dll,vga64k.dll
Driver Version5.00.2146.1
INF File      display.inf (cirrus 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&43B47AD&0
NumberOfFunctionKeys 12


[Pointing Device]

Item   Value
Hardware Type Microsoft PS/2 Mouse
Number of Buttons    2
Status OK
PNP Device ID ACPI\PNP0F03\4&43B47AD&0
Power Management Supported  False
Double Click Threshold6
Handedness    Right Handed Operation


[Modem]

Item   Value
No modems
```

```
[Network]

[ Following are sub-categories of this main category ]

[Adapter]

Item   Value
Name   [00000000] Intel(R) PRO/100+ Server Adapter (PILA8470B)
Adapter Type  Not Available
Product Name  Intel(R) PRO/100+ Server Adapter (PILA8470B)
Installed     True
PNP Device ID Not Available
Last Reset    6/28/2000 11:29:12 AM
Index  0
Service Name  E100B
IP Address
IP Subnet
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:FA:00:10:12
Service Name  Not Available

Name   [00000001] RAS Async Adapter
Adapter Type  Not Available
Product Name  RAS Async Adapter
Installed     True
PNP Device ID Not Available
Last Reset    6/28/2000 11:29:12 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    6/28/2000 11:29:12 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 (50288, 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    6/28/2000 11:29:12 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 (47216, 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    6/28/2000 11:29:12 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    6/28/2000 11:29:12 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 (89680, 5.00.2184.1)

Name   [00000007] 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\3&267A616A&0&28
Last Reset    6/28/2000 11:29:12 AM
Index  7
Service Name  GNINDIS
IP Address
IP Subnet
Default IP Gateway   Not Available
DHCP Enabled  True
DHCP Server   255.255.255.255
DHCP Lease Expires   6/21/2000 7:13:17 PM
DHCP Lease Obtained  6/21/2000 6:13:17 PM
MAC Address   00:90:FA:00:10:12
Service Name  GNINDIS
IRQ Number    54
Driver c:\winnt\system32\drivers\gnindis.sys (21670, 4.00.01)
```

```
[Protocol]

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

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

Name   RSVP UDP Service Provider
ConnectionlessServiceTrue
GuaranteesDelivery   False
GuaranteesSequencing False
MaximumAddressSize   16 bytes
MaximumMessageSize   65467 bytes
MessageOriented      True
MinimumAddressSize   16 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   True
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidth False
SupportsMulticasting True

Name   RSVP TCP Service Provider
ConnectionlessServiceFalse
GuaranteesDelivery   True
GuaranteesSequencing True
MaximumAddressSize   16 bytes
MaximumMessageSize   0 bytes
MessageOriented      False
MinimumAddressSize   16 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   True
```

```
SupportsExpeditedDataTrue
SupportsGracefulClosing    True
SupportsGuaranteedBandwidthFalse
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{A32854FF-65ED-4588-B87D-047AAD3211DF}]
SEQPACKET 4
ConnectionlessServiceFalse
GuaranteesDelivery   True
GuaranteesSequencing True
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidthFalse
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{A32854FF-65ED-4588-B87D-047AAD3211DF}]
DATAGRAM 4
ConnectionlessServiceTrue
GuaranteesDelivery   False
GuaranteesSequencing False
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidthFalse
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{B559D6F3-623E-4977-9991-BCDEE82754C8}]
SEQPACKET 0
ConnectionlessServiceFalse
GuaranteesDelivery   True
GuaranteesSequencing True
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidthFalse
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{B559D6F3-623E-4977-9991-BCDEE82754C8}]
DATAGRAM 0
ConnectionlessServiceTrue
GuaranteesDelivery   False
GuaranteesSequencing False
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
```

```
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{7F2862C4-71D1-4A09-8D3E-1FE5E00C735B}]
SEQPACKET 1
ConnectionlessServiceFalse
GuaranteesDelivery   True
GuaranteesSequencing True
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{7F2862C4-71D1-4A09-8D3E-1FE5E00C735B}]
DATAGRAM 1
ConnectionlessServiceTrue
GuaranteesDelivery   False
GuaranteesSequencing False
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{89C4FE1B-BCDD-452A-839B-C571CC7595F0}]
SEQPACKET 2
ConnectionlessServiceFalse
GuaranteesDelivery   True
GuaranteesSequencing True
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{89C4FE1B-BCDD-452A-839B-C571CC7595F0}]
DATAGRAM 2
```

```
ConnectionlessServiceTrue
GuaranteesDelivery   False
GuaranteesSequencing False
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidth False
SupportsMulticasting False


[WinSock]

Item   Value
File   c:\winnt\system32\winsock.dll
Version3.10
Size   2.80 KB (2,864 bytes)

File   c:\winnt\system32\wsock32.dll
Version5.00.2195.1207
Size   21.77 KB (22,288 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 ControlTrue
Settable Parity      True
Settable Parity CheckTrue
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 XOff0
CTS Outflow Control  0
Discard NULL Bytes   0
DSR Outflow Control  0
DSR Sensitivity      0
DTR Flow Control TypeEnable
EOF Character 0
Error Replace Character    0
Error Replacement Enabled  0
Event Character      0
Parity Check Enabled 0
```

```
RTS Flow Control TypeEnable
XOff Character19
XOffXMit Threshold   512
XOn Character 17
XOnXMit Threshold    2048
XOnXOff InFlow Control0
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 ControlTrue
Settable Parity      True
Settable Parity CheckTrue
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 XOff0
CTS Outflow Control  0
Discard NULL Bytes   0
DSR Outflow Control  0
DSR Sensitivity      0
DTR Flow Control TypeEnable
EOF Character 0
Error Replace Character     0
Error Replacement Enabled   0
Event Character      0
Parity Check Enabled 0
RTS Flow Control TypeEnable
XOff Character19
XOffXMit Threshold   512
XOn Character 17
XOnXMit Threshold    2048
XOnXOff InFlow Control0
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
No parallel port information

[Storage]

[ Following are sub-categories of this main category ]

[Drives]

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

```
Drive  C:
Description   Local Fixed Disk
Compressed    False
File System   NTFS
Size   8.46 GB (9,088,901,120 bytes)
Free Space    4.56 GB (4,893,904,896 bytes)
Volume Name
Volume Serial Number 08A5E3E1
Partition     Disk #0, Partition #0
Partition Size8.46 GB (9,088,902,144 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 SCSILogicalUnit0
Drive SCSIPort1
Drive SCSITargetId   0
Drive SectorsPerTrack63
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 #1, Partition #0
Partition Size45.00 GB (48,315,262,464 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     3
Drive SCSIBus 4
Drive SCSILogicalUnit0
Drive SCSIPort3
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    422376353280 bytes
Drive TotalCylinders 51351
Drive TotalSectors   824953815
Drive TotalTracks    13094505
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 #1, Partition #1
Partition Size25.00 GB (26,847,313,920 bytes)
Starting Offset      Not Available
```

```
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     3
Drive SCSIBus 4
Drive SCSILogicalUnit0
Drive SCSIPort3
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    422376353280 bytes
Drive TotalCylinders 51351
Drive TotalSectors   824953815
Drive TotalTracks    13094505
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 #2, Partition #0
Partition Size45.00 GB (48,315,262,464 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 SCSILogicalUnit0
Drive SCSIPort4
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    422376353280 bytes
Drive TotalCylinders 51351
Drive TotalSectors   824953815
Drive TotalTracks    13094505
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 #2, Partition #1
Partition Size25.00 GB (26,847,313,920 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 SCSILogicalUnit0
Drive SCSIPort4
Drive SCSITargetId   0
Drive SectorsPerTrack63
```

```
Drive Size    422376353280 bytes
Drive TotalCylinders 51351
Drive TotalSectors   824953815
Drive TotalTracks    13094505
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 #3, Partition #0
Partition Size45.00 GB (48,315,262,464 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 SCSILogicalUnit0
Drive SCSIPort5
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    422376353280 bytes
Drive TotalCylinders 51351
Drive TotalSectors   824953815
Drive TotalTracks    13094505
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 #3, Partition #1
Partition Size25.00 GB (26,847,313,920 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 SCSILogicalUnit0
Drive SCSIPort5
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    422376353280 bytes
Drive TotalCylinders 51351
Drive TotalSectors   824953815
Drive TotalTracks    13094505
Drive TracksPerCylinder     255

Drive  K:
Description   Local Fixed Disk
Compressed    Not Available
File System   Not Available
Size   Not Available
Free Space    Not Available
```

```
Volume Name   Not Available
Volume Serial Number Not Available
Partition     Disk #4, Partition #0
Partition Size45.00 GB (48,315,262,464 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 SCSILogicalUnit0
Drive SCSIPort6
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    863687301120 bytes
Drive TotalCylinders 105004
Drive TotalSectors   1686889260
Drive TotalTracks    26776020
Drive TracksPerCylinder    255

Drive  L:
Description   Local Fixed Disk
Compressed    Not Available
File System   Not Available
Size   Not Available
Free Space    Not Available
Volume Name   Not Available
Volume Serial Number Not Available
Partition     Disk #4, Partition #1
Partition Size25.00 GB (26,847,313,920 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 SCSILogicalUnit0
Drive SCSIPort6
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    863687301120 bytes
Drive TotalCylinders 105004
Drive TotalSectors   1686889260
Drive TotalTracks    26776020
Drive TracksPerCylinder    255

Drive  M:
Description   Local Fixed Disk
Compressed    Not Available
File System   Not Available
Size   Not Available
Free Space    Not Available
Volume Name   Not Available
Volume Serial Number Not Available
Partition     Disk #5, Partition #0
Partition Size45.00 GB (48,315,262,464 bytes)
Starting Offset      32256 bytes
Drive Description    \\.\PHYSICALDRIVE5
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 SCSILogicalUnit0
Drive SCSIPort7
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    863687301120 bytes
Drive TotalCylinders 105004
Drive TotalSectors   1686889260
Drive TotalTracks    26776020
Drive TracksPerCylinder     255

Drive  N:
Description   Local Fixed Disk
Compressed    Not Available
File System   Not Available
Size   Not Available
Free Space    Not Available
Volume Name   Not Available
Volume Serial Number Not Available
Partition     Disk #5, Partition #1
Partition Size25.00 GB (26,847,313,920 bytes)
Starting Offset      Not Available
Drive Description    \\.\PHYSICALDRIVE5
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 SCSILogicalUnit0
Drive SCSIPort7
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    863687301120 bytes
Drive TotalCylinders 105004
Drive TotalSectors   1686889260
Drive TotalTracks    26776020
Drive TracksPerCylinder     255

Drive  O:
Description   Local Fixed Disk
Compressed    Not Available
File System   Not Available
Size   Not Available
Free Space    Not Available
Volume Name   Not Available
Volume Serial Number Not Available
Partition     Disk #6, Partition #0
Partition Size45.00 GB (48,315,262,464 bytes)
Starting Offset      32256 bytes
Drive Description    \\.\PHYSICALDRIVE6
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 SCSILogicalUnit0
Drive SCSIPort8
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    863687301120 bytes
Drive TotalCylinders 105004
Drive TotalSectors   1686889260
Drive TotalTracks    26776020
Drive TracksPerCylinder     255

Drive  P:
```

```
Description   Local Fixed Disk
Compressed    Not Available
File System   Not Available
Size   Not Available
Free Space    Not Available
Volume Name   Not Available
Volume Serial Number Not Available
Partition     Disk #6, Partition #1
Partition Size25.00 GB (26,847,313,920 bytes)
Starting Offset      Not Available
Drive Description    \\.\PHYSICALDRIVE6
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 SCSILogicalUnit0
Drive SCSIPort8
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    863687301120 bytes
Drive TotalCylinders 105004
Drive TotalSectors   1686889260
Drive TotalTracks    26776020
Drive TracksPerCylinder    255

Drive  R:
Description   Local Fixed Disk
Compressed    False
File System   NTFS
Size   734.37 GB (788,524,630,016 bytes)
Free Space    665.09 GB (714,133,995,520 bytes)
Volume Name
Volume Serial Number 74241FC0
Partition     Disk #5, Partition #2
Partition Size734.37 GB (788,524,692,480 bytes)
Starting Offset      Not Available
Drive Description    \\.\PHYSICALDRIVE5
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 SCSILogicalUnit0
Drive SCSIPort7
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    863687301120 bytes
Drive TotalCylinders 105004
Drive TotalSectors   1686889260
Drive TotalTracks    26776020
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 #7, Partition #0
Partition Size111.00 GB (119,184,274,944 bytes)
Starting Offset      32256 bytes
Drive Description    Disk drive
Drive Manufacturer   (Standard disk drives)
```

```
Drive Model   DGC RAID 10 SCSI Disk Device
Drive BytesPerSector 512
Drive MediaLoaded    True
Drive MediaType      Fixed hard disk media
Drive Partitions     1
Drive SCSIBus 0
Drive SCSILogicalUnit0
Drive SCSIPort9
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    142067036160 bytes
Drive TotalCylinders 17272
Drive TotalSectors   277474680
Drive TotalTracks    4404360
Drive TracksPerCylinder     255

Drive  U:
Description   Local Fixed Disk
Compressed    False
File System   NTFS
Size   323.37 GB (347,213,725,696 bytes)
Free Space    254.09 GB (272,823,812,096 bytes)
Volume Name
Volume Serial Number B8F740C2
Partition     Disk #3, Partition #2
Partition Size323.37 GB (347,213,744,640 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 SCSILogicalUnit0
Drive SCSIPort5
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    422376353280 bytes
Drive TotalCylinders 51351
Drive TotalSectors   824953815
Drive TotalTracks    13094505
Drive TracksPerCylinder     255

Drive  V:
Description   Local Fixed Disk
Compressed    False
File System   NTFS
Size   734.37 GB (788,524,630,016 bytes)
Free Space    665.09 GB (714,133,995,520 bytes)
Volume Name
Volume Serial Number 40103FAE
Partition     Disk #4, Partition #2
Partition Size734.37 GB (788,524,692,480 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 SCSILogicalUnit0
Drive SCSIPort6
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    863687301120 bytes
Drive TotalCylinders 105004
```

```
Drive TotalSectors   1686889260
Drive TotalTracks    26776020
Drive TracksPerCylinder     255

Drive  W:
Description   Local Fixed Disk
Compressed    False
File System   NTFS
Size   734.37 GB (788,524,691,456 bytes)
Free Space    734.29 GB (788,433,063,936 bytes)
Volume Name   New Volume
Volume Serial Number 08D7EE5A
Partition     Disk #6, Partition #2
Partition Size734.37 GB (788,524,692,480 bytes)
Starting Offset      Not Available
Drive Description    \\.\PHYSICALDRIVE6
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 SCSILogicalUnit0
Drive SCSIPort8
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    863687301120 bytes
Drive TotalCylinders 105004
Drive TotalSectors   1686889260
Drive TotalTracks    26776020
Drive TracksPerCylinder     255

Drive  X:
Description   Local Fixed Disk
Compressed    False
File System   NTFS
Size   323.37 GB (347,213,725,696 bytes)
Free Space    254.09 GB (272,823,812,096 bytes)
Volume Name
Volume Serial Number F4D17F3E
Partition     Disk #1, Partition #2
Partition Size323.37 GB (347,213,744,640 bytes)
Starting Offset      Not Available
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     3
Drive SCSIBus 4
Drive SCSILogicalUnit0
Drive SCSIPort3
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    422376353280 bytes
Drive TotalCylinders 51351
Drive TotalSectors   824953815
Drive TotalTracks    13094505
Drive TracksPerCylinder     255

Drive  Y:
Description   Local Fixed Disk
Compressed    False
File System   NTFS
Size   323.37 GB (347,213,725,696 bytes)
Free Space    254.09 GB (272,823,812,096 bytes)
Volume Name
Volume Serial Number 64F46F3D
```

```
Partition     Disk #2, Partition #2
Partition Size323.37 GB (347,213,744,640 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 SCSILogicalUnit0
Drive SCSIPort4
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    422376353280 bytes
Drive TotalCylinders 51351
Drive TotalSectors   824953815
Drive TotalTracks    13094505
Drive TracksPerCylinder     255


[SCSI]

Item   Value
Name   Mylex eXtremeRAID 2000 Disk Array Controller
CaptionMylex eXtremeRAID 2000 Disk Array Controller
Driver dac2w2k
Status OK
PNP Device ID PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&2FCD2E6D&0&4020
Device ID     PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&2FCD2E6D&0&4020
Device Map    Not Available
Index  Not Available
Max Number ControlledNot Available
IRQ Number    61
I/O Port      0x2000-0x2FFF
Driver c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name   Symbios Logic 896, 22910 PCI SCSI Adapter
CaptionSymbios Logic 896, 22910 PCI SCSI Adapter
Driver sym_hi
Status OK
PNP Device ID PCI\VEN_1000&DEV_000B&SUBSYS_10001000&REV_05\3&267A616A&0&50
Device ID     PCI\VEN_1000&DEV_000B&SUBSYS_10001000&REV_05\3&267A616A&0&50
Device Map    Not Available
Index  Not Available
Max Number ControlledNot Available
IRQ Number    58
I/O Port      0x1000-0x10FF
Driver c:\winnt\system32\drivers\sym_hi.sys (21136, 5.00.2134.1)

Name   Symbios Logic 896, 22910 PCI SCSI Adapter
CaptionSymbios Logic 896, 22910 PCI SCSI Adapter
Driver sym_hi
Status OK
PNP Device ID PCI\VEN_1000&DEV_000B&SUBSYS_10001000&REV_05\3&267A616A&0&51
Device ID     PCI\VEN_1000&DEV_000B&SUBSYS_10001000&REV_05\3&267A616A&0&51
Device Map    Not Available
Index  Not Available
Max Number ControlledNot Available
IRQ Number    18
I/O Port      0x1400-0x14FF
Driver c:\winnt\system32\drivers\sym_hi.sys (21136, 5.00.2134.1)

Name   Mylex eXtremeRAID 2000 Disk Array Controller
CaptionMylex eXtremeRAID 2000 Disk Array Controller
Driver dac2w2k
Status OK
PNP Device ID PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&20B2DAF0&0&4020
Device ID     PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&20B2DAF0&0&4020
```

```
Device Map    Not Available
Index  Not Available
Max Number ControlledNot Available
IRQ Number    50
I/O Port      0x3000-0x4FFF
Driver c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name   Mylex eXtremeRAID 2000 Disk Array Controller
CaptionMylex eXtremeRAID 2000 Disk Array Controller
Driver dac2w2k
Status OK
PNP Device ID PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&2FBC1DEA&0&4038
Device ID     PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&2FBC1DEA&0&4038
Device Map    Not Available
Index  Not Available
Max Number ControlledNot Available
IRQ Number    36
I/O Port      0x4000-0x4FFF
Driver c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name   Mylex eXtremeRAID 2000 Disk Array Controller
CaptionMylex eXtremeRAID 2000 Disk Array Controller
Driver dac2w2k
Status OK
PNP Device ID PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&8C49857&0&4020
Device ID     PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&8C49857&0&4020
Device Map    Not Available
Index  Not Available
Max Number ControlledNot Available
IRQ Number    32
I/O Port      0x5000-0x6FFF
Driver c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name   Mylex eXtremeRAID 2000 Disk Array Controller
CaptionMylex eXtremeRAID 2000 Disk Array Controller
Driver dac2w2k
Status OK
PNP Device ID PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&375C4928&0&4028
Device ID     PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&375C4928&0&4028
Device Map    Not Available
Index  Not Available
Max Number ControlledNot Available
IRQ Number    28
I/O Port      0x6000-0x6FFF
Driver c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name   Mylex eXtremeRAID 2000 Disk Array Controller
CaptionMylex eXtremeRAID 2000 Disk Array Controller
Driver dac2w2k
Status OK
PNP Device ID PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&1B89A02&0&4020
Device ID     PCI\VEN_1069&DEV_BA56&SUBSYS_00401069&REV_00\4&1B89A02&0&4020
Device Map    Not Available
Index  Not Available
Max Number ControlledNot Available
IRQ Number    24
I/O Port      0x8000-0x8FFF
Driver c:\winnt\system32\drivers\dac2w2k.sys (185488, 6.00-03)

Name   QLogic QLA2200 PCI Fibre Channel Adapter
CaptionQLogic QLA2200 PCI Fibre Channel Adapter
Driver ql2200
Status OK
PNP Device ID PCI\VEN_1077&DEV_2200&SUBSYS_00021077&REV_05\3&29E81982&0&28
Device ID     PCI\VEN_1077&DEV_2200&SUBSYS_00021077&REV_05\3&29E81982&0&28
Device Map    Not Available
Index  Not Available
Max Number ControlledNot Available
IRQ Number    20
I/O Port      0x7000-0x8FFF
```

```
Driver c:\winnt\system32\drivers\ql2200.sys (233008, 7.04.02 (W2K Enh+IP))


[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_0205\5&D2076A&0&0F028
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&D2076A&0&1F028
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&D2076A&0&2F028
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&D2076A&0&3F028
Dell 8 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_8_BAY_U2W_CU&REV_0203\5&1DED6135&0&0F028
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&1DED6135&0&1F0 28
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&1DED6135&0&2F0 28
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&1DED6135&0&3F0 28
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&2E1F7B3C&0&0F0 28
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&2E1F7B3C&0&1F0 28
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&2E1F7B3C&0&2F0 28
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&2E1F7B3C&0&3F0 28
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&2DD424B2&0&0F0 28
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&2DD424B2&0&1F0 28
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&2DD424B2&0&2F0 28
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&2DD424B2&0&3F0 28
Dell 8 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_8_BAY_U2W_CU&REV_0203\5&32A6693B&0&0F028
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&32A6693B&0&1F0 28
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&32A6693B&0&2F0 28
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&32A6693B&0&3F0 28
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&AA6C454&0&0F028
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&AA6C454&0&1F028
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&AA6C454&0&2F028
Dell 12 BAY U2W CU SCSI Processor Device
       SCSI\PROCESSOR&VEN_DELL&PROD_12_BAY_U2W_CU&REV_0203\5&AA6C454&0&3F028

[USB]

Device PNP Device ID
Intel 82371AB/EB PCI to USB Universal Host Controller
       PCI\VEN_8086&DEV_7112&SUBSYS_00000000&REV_01\3&267A616A&0&7A
USB Root Hub  USB\ROOT_HUB\4&B5B4E1B&0

[Software Environment]

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

```
[Drivers]

Name   Description   File   Type   StartedStart 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 Driverc:\winnt\system32\drivers\acpi.sys Kernel Driver True
       Boot   RunningOK     Normal False  True
acpiec ACPIEC c:\winnt\system32\drivers\acpiec.sysKernel Driver False  Disabled
       StoppedOK     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   RunningOK     Normal False  True
aha154xAha154xNot Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
aic116xaic116xNot Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
aic78u2aic78u2Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
aic78xxaic78xxNot Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
ami0nt ami0nt Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
amsint amsint Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
asc    asc    Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
asc3350p      asc3350p      Not Available Kernel Driver False  Disabled      Stopped
       OK     Normal False  False
asc3550asc3550Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
asyncmac      RAS Asynchronous Media Driverc:\winnt\system32\drivers\asyncmac.sys
       Kernel Driver False  Manual StoppedOK     Normal False  False
atapi  Standard IDE/ESDI Hard Disk Controller   c:\winnt\system32\drivers\atapi.sys
       Kernel Driver True   Boot   RunningOK     Normal False  True
atdisk Atdisk Not Available Kernel Driver False  Disabled      StoppedOK     Ignore
       False  False
atmarpcATM ARP Client Protocol    c:\winnt\system32\drivers\atmarpc.sysKernel Driver
       False  Manual StoppedOK     Normal False  False
audstubAudio Stub Driver    c:\winnt\system32\drivers\audstub.sysKernel Driver True
       Manual RunningOK     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
cdaudioCdaudioc:\winnt\system32\drivers\cdaudio.sysKernel Driver False  System Stopped
       OK     Ignore False  False
cdfs   Cdfs   c:\winnt\system32\drivers\cdfs.sys File System Driver   True
       Disabled      RunningOK     Normal False  True
cdrom  CD-ROM Driver c:\winnt\system32\drivers\cdrom.sysKernel Driver True   System
       RunningOK     Normal False  True
changerChangerNot Available Kernel Driver False  System StoppedOK     Ignore False
       False
cirrus cirrus c:\winnt\system32\drivers\cirrus.sysKernel Driver True   Manual Running
       OK     Ignore False  True
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
```

```
dac2w2kdac2w2kc:\winnt\system32\drivers\dac2w2k.sysKernel 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   RunningOK     Normal False  True
disk   Disk Driver   c:\winnt\system32\drivers\disk.sysKernel Driver True   Boot
       RunningOK     Normal False  True
diskperf      Diskperf      c:\winnt\system32\drivers\diskperf.sys   Kernel Driver
       False  Disabled      StoppedOK     Normal False  False
dmboot dmboot c:\winnt\system32\drivers\dmboot.sysKernel Driver False  Disabled
       StoppedOK     Normal False  False
dmio   Logical Disk Manager Driver c:\winnt\system32\drivers\dmio.sysKernel Driver
       True   Boot   RunningOK     Normal False  True
dmload dmload c:\winnt\system32\drivers\dmload.sysKernel Driver True   Boot   Running
       OK     Normal False  True
e100b  Intel PRO Adapter Driver    c:\winnt\system32\drivers\e100bnt5.sys   Kernel
Driver False  Manual StoppedOK     Normal False  False
efs    EFS    c:\winnt\system32\drivers\efs.sys  File System Driver   True
       Disabled      RunningOK     Normal False  True
fastfatFastfatc:\winnt\system32\drivers\fastfat.sysFile System Driver   True
       Disabled      RunningOK     Normal False  True
fd16_700      Fd16_700      Not Available Kernel Driver False  Disabled      Stopped
       OK     Normal False  False
fdc    Floppy Disk Controller Driverc:\winnt\system32\drivers\fdc.sys  Kernel Driver
       True   Manual RunningOK     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 RunningOK     Normal False  True
ftdisk Volume Manager Driverc:\winnt\system32\drivers\ftdisk.sysKernel Driver True
       Boot   RunningOK     Normal False  True
gamdrv gamdrv c:\winnt\system32\drivers\gamdrv.sysKernel Driver True   Boot   Running
       OK     Normal False  True
gnindiscLAN NDIS Driver     c:\winnt\system32\drivers\gnindis.sysKernel Driver True
       Auto   RunningOK     Normal False  True
gninvipl      cLAN VIPL Driver     c:\winnt\system32\drivers\gninvipl.sys   Kernel
Driver False  Manual StoppedOK     Normal False  False
gnivia cLAN VIA Driver      c:\winnt\system32\drivers\gnivia.sysKernel Driver True
       Auto   RunningOK     Normal False  True
gpc    Generic Packet Classifier   c:\winnt\system32\drivers\msgpc.sysKernel Driver
       True   Manual RunningOK     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
ini910uini910uNot Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
intelide      IntelIde      c:\winnt\system32\drivers\intelide.sys   Kernel Driver
       True   Boot   RunningOK     Normal False  True
ipfilterdriverIP Traffic Filter Driver    c:\winnt\system32\drivers\ipfltdrv.sys
       Kernel Driver False  Manual StoppedOK     Normal False  False
ipinip IP in IP Tunnel Driverc:\winnt\system32\drivers\ipinip.sysKernel Driver False
       Manual StoppedOK     Normal False  False
ipnat  IP Network Address Translatorc:\winnt\system32\drivers\ipnat.sysKernel Driver
       False  Manual StoppedOK     Normal False  False
ipsec  IPSEC driver  c:\winnt\system32\drivers\ipsec.sysKernel Driver False  Manual
       StoppedOK     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.sysKernel Driver
       True   Boot   RunningOK     Critical      False  True
kbdclass      Keyboard Class Driverc:\winnt\system32\drivers\kbdclass.sys   Kernel
Driver True   System RunningOK     Normal False  True
ksecdd KSecDD c:\winnt\system32\drivers\ksecdd.sysKernel Driver True   Boot   Running
       OK     Normal False  True
```

```
lbrtfdclbrtfdcNot Available Kernel Driver False  System StoppedOK     Ignore False
       False
lp6nds35      lp6nds35      Not Available Kernel Driver False  Disabled      Stopped
       OK     Normal False  False
macdiskmacdiskc:\winnt\system32\drivers\mac2w2k.sysKernel Driver True   Boot   Running
       OK     Normal False  True
mnmdd  mnmdd  c:\winnt\system32\drivers\mnmdd.sysKernel Driver True   System Running
       OK     Ignore False  True
modem  Modem  c:\winnt\system32\drivers\modem.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
mouclass      Mouse Class Driver   c:\winnt\system32\drivers\mouclass.sys   Kernel
Driver True   System RunningOK     Normal False  True
mountmgr      MountMgr      c:\winnt\system32\drivers\mountmgr.sys   Kernel Driver
       True   Boot   RunningOK     Normal False  True
mraid35x      mraid35x      Not Available Kernel Driver False  Disabled      Stopped
       OK     Normal False  False
mrxsmb MRXSMB c:\winnt\system32\drivers\mrxsmb.sysFile System Driver   True   System
       RunningOK     Normal False  True
msfs   Msfs   c:\winnt\system32\drivers\msfs.sysFile System Driver   True   System
       RunningOK     Normal False  True
mskssrvMicrosoft Streaming Service Proxy c:\winnt\system32\drivers\mskssrv.sysKernel
Driver False  Manual StoppedOK     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 Proxyc:\winnt\system32\drivers\mspqm.sys
       Kernel Driver False  Manual StoppedOK     Normal False  False
mup    Mup    c:\winnt\system32\drivers\mup.sys  File System Driver   True   Boot
       RunningOK     Normal False  True
ncrc710Ncrc710Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
ndis   NDIS System Driver   c:\winnt\system32\drivers\ndis.sys Kernel Driver True
       Boot   RunningOK     Normal False  True
ndistapi      Remote Access NDIS TAPI Driver
       c:\winnt\system32\drivers\ndistapi.sys   Kernel Driver True   Manual Running
       OK     Normal False  True
ndiswanRemote Access NDIS WAN Driverc:\winnt\system32\drivers\ndiswan.sysKernel Driver
       True   Manual RunningOK     Normal False  True
ndproxyNDIS Proxy    c:\winnt\system32\drivers\ndproxy.sysKernel Driver True   Manual
       RunningOK     Normal False  True
netbiosNetBIOS Interface    c:\winnt\system32\drivers\netbios.sysFile System Driver
       True   System RunningOK     Normal False  True
netbt  NetBios over Tcpip   c:\winnt\system32\drivers\netbt.sysKernel Driver True
       System RunningOK     Normal False  True
netdetect     NetDetect     c:\winnt\system32\drivers\netdtect.sys   Kernel Driver
       False  Manual StoppedOK     Normal False  False
npfs   Npfs   c:\winnt\system32\drivers\npfs.sysFile System Driver   True   System
       RunningOK     Normal False  True
ntfs   Ntfs   c:\winnt\system32\drivers\ntfs.sysFile System Driver   True
       Disabled      RunningOK     Normal False  True
null   Null   c:\winnt\system32\drivers\null.sysKernel Driver True   System Running
       OK     Normal False  True
nwlnkflt      IPX Traffic Filter Driver  c:\winnt\system32\drivers\nwlnkflt.sys
       Kernel Driver False  Manual StoppedOK     Normal False  False
nwlnkfwd      IPX Traffic Forwarder Driverc:\winnt\system32\drivers\nwlnkfwd.sys
       Kernel Driver False  Manual StoppedOK     Normal False  False
parallel      Parallel      c:\winnt\system32\drivers\parallel.sys   Kernel Driver
       False  Auto   StoppedOK     Ignore False  False
parportParportc:\winnt\system32\drivers\parport.sysKernel Driver False  Auto   Stopped
       OK     Ignore False  False
partmgrPartMgrc:\winnt\system32\drivers\partmgr.sysKernel Driver True   Boot   Running
       OK     Normal False  True
parvdm ParVdm c:\winnt\system32\drivers\parvdm.sysKernel Driver False  Auto   Stopped
       OK     Ignore False  False
pci    PCI Bus Driverc:\winnt\system32\drivers\pci.sys  Kernel Driver True   Boot
       RunningOK     Critical      False  True
pcidumpPCIDumpNot Available Kernel Driver False  System StoppedOK     Ignore False
       False
pciide PCIIde Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
```

```
pcmcia Pcmcia c:\winnt\system32\drivers\pcmcia.sysKernel Driver False  Disabled
       StoppedOK     Normal False  False
pdcomp PDCOMP Not Available Kernel Driver False  Manual StoppedOK     Ignore False
       False
pdframePDFRAMENot Available Kernel Driver False  Manual StoppedOK     Ignore False
       False
pdreli PDRELI Not Available Kernel Driver False  Manual StoppedOK     Ignore False
       False
pdrframe      PDRFRAME      Not Available Kernel Driver False  Manual StoppedOK
       Ignore False  False
pptpminiport  WAN Miniport (PPTP)  c:\winnt\system32\drivers\raspptp.sysKernel Driver
       True   Manual RunningOK     Normal False  True
ptilinkDirect Parallel Link Driver c:\winnt\system32\drivers\ptilink.sysKernel Driver
       True   Manual RunningOK     Normal False  True
ql1080 ql1080 Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
ql10wntQl10wntNot Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
ql1240 ql1240 Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
ql2100 ql2100 Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
ql2200 ql2200 c:\winnt\system32\drivers\ql2200.sysKernel Driver True   Boot   Running
       OK     Normal False  True
rasacd Remote Access Auto Connection Driverc:\winnt\system32\drivers\rasacd.sysKernel
Driver True   System RunningOK     Normal False  True
rasl2tpWAN Miniport (L2TP)  c:\winnt\system32\drivers\rasl2tp.sysKernel Driver True
       Manual RunningOK     Normal False  True
raspti Direct Parallel      c:\winnt\system32\drivers\raspti.sysKernel Driver True
       Manual RunningOK     Normal False  True
rca    Microsoft Streaming Network Raw Channel Access
       c:\winnt\system32\drivers\rca.sys  Kernel Driver False  Manual StoppedOK
       Normal False  False
rdbss  Rdbss  c:\winnt\system32\drivers\rdbss.sysFile System Driver   True   System
       RunningOK     Normal False  True
rdpwd  RDPWD  c:\winnt\system32\drivers\rdpwd.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
redbookDigital CD Audio Playback Filter Driver  c:\winnt\system32\drivers\redbook.sys
       Kernel Driver False  System StoppedOK     Normal False  False
serenumSerenum Filter Driverc:\winnt\system32\drivers\serenum.sysKernel Driver True
       Manual RunningOK     Normal False  True
serial Serial port driver   c:\winnt\system32\drivers\serial.sysKernel Driver True
       System RunningOK     Ignore False  True
sfloppySfloppyc:\winnt\system32\drivers\sfloppy.sysKernel Driver False  System Stopped
       OK     Ignore False  False
sglfb  sglfb  Not Available Kernel Driver False  System StoppedOK     Normal False
       False
simbad Simbad Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
sparrowSparrowNot Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
srv    Srv    c:\winnt\system32\drivers\srv.sys  File System Driver   True   Manual
       RunningOK     Normal False  True
swenum Software Bus Driver  c:\winnt\system32\drivers\swenum.sysKernel Driver True
       Manual RunningOK     Normal False  True
symc810symc810Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
symc8xxsymc8xxNot Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
sym_hi sym_hi c:\winnt\system32\drivers\sym_hi.sysKernel Driver True   Boot   Running
       OK     Normal False  True
tcpip  TCP/IP Protocol Driverc:\winnt\system32\drivers\tcpip.sysKernel Driver True
       System RunningOK     Normal False  True
tdasyncTDASYNCc:\winnt\system32\drivers\tdasync.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
tdipx  TDIPX  c:\winnt\system32\drivers\tdipx.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
tdnetb TDNETB c:\winnt\system32\drivers\tdnetb.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
```

```
tdpipe TDPIPE c:\winnt\system32\drivers\tdpipe.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
tdspx  TDSPX  c:\winnt\system32\drivers\tdspx.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
tdtcp  TDTCP  c:\winnt\system32\drivers\tdtcp.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
termdd Terminal Device Driverc:\winnt\system32\drivers\termdd.sysKernel Driver False
       Disabled      StoppedOK     Normal False  False
tga    tga    Not Available Kernel Driver False  System StoppedOK     Ignore False
       False
udfs   Udfs   c:\winnt\system32\drivers\udfs.sys File System Driver   False
       Disabled      StoppedOK     Normal False  False
uhcd   Microsoft USB Universal Host Controller Driver
       c:\winnt\system32\drivers\uhcd.sys Kernel Driver True   Manual RunningOK
       Normal False  True
ultra66ultra66Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
update Microcode Update Driver     c:\winnt\system32\drivers\update.sysKernel Driver
       True   Manual RunningOK     Normal False  True
usbhub Microsoft USB Standard Hub Driver  c:\winnt\system32\drivers\usbhub.sysKernel
Driver True   Manual RunningOK     Normal False  True
vgasaveVgaSavec:\winnt\system32\drivers\vga.sys  Kernel Driver False  System Stopped
       OK     Ignore False  False
wanarp Remote Access IP ARP Driver c:\winnt\system32\drivers\wanarp.sysKernel Driver
       True   Manual RunningOK     Normal False  True
wdica  WDICA  Not Available Kernel Driver False  Manual StoppedOK     Ignore False
       False

[Environment Variables]

Variable      Value  User Name
ComSpec%SystemRoot%\system32\cmd.exe<SYSTEM>
NUMBER_OF_PROCESSORS 8      <SYSTEM>
OS     Windows_NT    <SYSTEM>
Os2LibPath    %SystemRoot%\system32\os2\dll;    <SYSTEM>
Path   %SystemRoot%\system32;%SystemRoot%;%SystemRoot%\System32\Wbem;C:\Program
Files\Microsoft SQL Server\MSSQL\BINN;.;C:\Program Files\Microsoft SQL
Server\80\Tools\BINN <SYSTEM>
PATHEXT.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH<SYSTEM>
PROCESSOR_ARCHITECTUREx86    <SYSTEM>
PROCESSOR_IDENTIFIER x86 Family 6 Model 10 Stepping 0, GenuineIntel  <SYSTEM>
PROCESSOR_LEVEL      6      <SYSTEM>
PROCESSOR_REVISION   0a00   <SYSTEM>
TEMP   %SystemRoot%\TEMP    <SYSTEM>
TMP    %SystemRoot%\TEMP    <SYSTEM>
windir %SystemRoot%  <SYSTEM>
TEMP   %USERPROFILE%\Local Settings\Temp  PE8450_01\Administrator
TMP    %USERPROFILE%\Local Settings\Temp  PE8450_01\Administrator

[Jobs]

[ Following are sub-categories of this main category ]

[Print]

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

[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    VersionSize   File Date
```

```
system idle process  Not Available 0      0      Not Available Not Available Not
Available     UnknownUnknownUnknown
system Not Available 8      8      0      1413120Not Available UnknownUnknownUnknown
smss.exe      c:\winnt\system32\smss.exe  188    11     204800 14131206/28/2000
4:30:05 PM    5.00.2195.31  44.27 KB (45,328 bytes)     3/15/2000 6:00:00 PM
csrss.exe     Not Available 216    13     Not Available Not Available 6/28/2000
4:30:11 PM    UnknownUnknownUnknown
winlogon.exe  c:\winnt\system32\winlogon.exe     236    13     204800 1413120
       6/28/2000 4:30:13 PM 5.00.2195.1284173.27 KB (177,424 bytes)  3/15/2000
6:00:00 PM
services.exe  c:\winnt\system32\services.exe     264    9      204800 1413120
       6/28/2000 4:30:14 PM 5.00.2134.1   86.77 KB (88,848 bytes)     3/15/2000
6:00:00 PM
lsass.exe     c:\winnt\system32\lsass.exe 276    13     204800 14131206/28/2000
4:30:14 PM    5.00.2195.128432.77 KB (33,552 bytes)     3/15/2000 6:00:00 PM
gnconmgr.exe  c:\winnt\system32\gnconmgr.exe     404    8      204800 1413120
       6/28/2000 4:30:18 PM 4.00.0196.00 KB (98,304 bytes)     5/4/2000 3:56:45 PM
svchost.exe   c:\winnt\system32\svchost.exe452    8      204800 14131206/28/2000
4:30:18 PM    5.00.2134.1   7.77 KB (7,952 bytes)3/15/2000 6:00:00 PM
msdtc.exe     c:\winnt\system32\msdtc.exe 476    8      204800 14131206/28/2000
4:30:19 PM    1999.9.3421.3 6.77 KB (6,928 bytes)6/15/2000 2:19:55 PM
gamscm.exe    c:\winnt\system32\gamserv\gamscm.exe728    8      204800 1413120
       6/28/2000 4:30:22 PM Not Available 119.28 KB (122,144 bytes)  6/26/2000
11:16:05 AM
gamserv.exe   c:\winnt\system32\gamserv\gamserv.exe760    13     204800 1413120
       6/28/2000 4:30:22 PM Not Available 126.70 KB (129,745 bytes)  6/26/2000
11:16:05 AM
gamevent.exe  c:\winnt\system32\gamserv\gamevent.exe   768    13     204800 1413120
       6/28/2000 4:30:22 PM Not Available 88.71 KB (90,834 bytes)    6/26/2000
11:16:05 AM
gamevlog.exe  c:\winnt\system32\gamserv\gamevlog.exe   776    13     204800 1413120
       6/28/2000 4:30:22 PM Not Available 186.85 KB (191,330 bytes)  6/26/2000
11:16:05 AM
winmgmt.exe   c:\winnt\system32\wbem\winmgmt.exe 800    8      204800 1413120
       6/28/2000 4:30:23 PM 1.50.1085.0009192.08 KB (196,685 bytes)  3/15/2000
6:00:00 PM
explorer.exe  c:\winnt\explorer.exe896    8      204800 14131206/28/2000 4:30:31 PM
       5.00.2920.0000232.77 KB (238,352 bytes)   3/15/2000 6:00:00 PM
sqlmangr.exe  c:\program files\common files\microsoft shared\service
manager\sqlmangr.exe 980    8      204800 14131206/28/2000 4:30:35 PM
       2000.080.0145.01     68.00 KB (69,632 bytes)     6/15/2000 8:29:56 PM
svchost.exe   c:\winnt\system32\svchost.exe740    8      204800 14131206/28/2000
4:32:30 PM    5.00.2134.1   7.77 KB (7,952 bytes)3/15/2000 6:00:00 PM
svchost.exe   c:\winnt\system32\svchost.exe1268   8      204800 14131206/28/2000
4:32:37 PM    5.00.2134.1   7.77 KB (7,952 bytes)3/15/2000 6:00:00 PM
mmc.exec:\winnt\system32\mmc.exe   1104   8      204800 14131206/28/2000 7:15:33 PM
       5.00.2153.1   589.27 KB (603,408 bytes)   3/15/2000 6:00:00 PM
dmremote.exe  c:\winnt\system32\dmremote.exe     884    8      204800 1413120
       6/28/2000 7:15:37 PM 2195.23.297.2 10.27 KB (10,512 bytes)    3/15/2000
6:00:00 PM
dmadmin.exe   c:\winnt\system32\dmadmin.exe1068   8      204800 14131206/28/2000
7:15:37 PM    2195.23.297.2 144.27 KB (147,728 bytes)   3/15/2000 6:00:00 PM
mmc.exec:\winnt\system32\mmc.exe   912    8      204800 14131206/28/2000 7:39:36 PM
       5.00.2153.1   589.27 KB (603,408 bytes)   3/15/2000 6:00:00 PM
rsvp.exe      c:\winnt\system32\rsvp.exe  1340   8      204800 14131206/28/2000
7:43:01 PM    5.00.2167.1   172.77 KB (176,912 bytes)   3/15/2000 6:00:00 PM

[Loaded Modules]

Name   VersionSize   File Date     Manufacturer  Path
traffic.dll   5.00.2139.1   30.77 KB (31,504 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\traffic.dll
rsvp.exe      5.00.2167.1   172.77 KB (176,912 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\rsvp.exe
wbemprox.dll  1.50.1085.001540.08 KB (41,040 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wbem\wbemprox.dll
rassapi.dll   5.00.2188.1   14.27 KB (14,608 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\rassapi.dll
adsnt.dll     5.00.2191.1   194.27 KB (198,928 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\adsnt.dll
```

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dmconfig.dll  2195.23.297.2 307.77 KB (315,152 bytes)   3/15/2000 6:00:00 PM VERITAS
Software Corp.c:\winnt\system32\dmconfig.dll
dmadmin.exe   2195.23.297.2 144.27 KB (147,728 bytes)   3/15/2000 6:00:00 PM VERITAS
Software Corp.c:\winnt\system32\dmadmin.exe
dmremote.exe  2195.23.297.2 10.27 KB (10,512 bytes)     3/15/2000 6:00:00 PM VERITAS
Software Corp.c:\winnt\system32\dmremote.exe
dmintf.dll    2195.23.297.2 12.77 KB (13,072 bytes)     3/15/2000 6:00:00 PM VERITAS
Software Corp.c:\winnt\system32\dmintf.dll
dmdlgs.dll    2195.23.297.2 170.77 KB (174,864 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corp., VERITAS Software c:\winnt\system32\dmdlgs.dll
olepro32.dll  5.0.4514      160.27 KB (164,112 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\olepro32.dll
dmview.ocx    2195.23.297.2 60.77 KB (62,224 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corp., VERITAS Software c:\winnt\system32\dmview.ocx
mlang.dll     5.00.3103.800 510.77 KB (523,024 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\mlang.dll
dbghelp.dll   5.00.2195.1284159.27 KB (163,088 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\dbghelp.dll
localsec.dll  5.00.2134.1   227.27 KB (232,720 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\localsec.dll
devmgr.dll    5.00.2166.1   215.77 KB (220,944 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\devmgr.dll
filemgmt.dll  5.00.2134.1   287.27 KB (294,160 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\filemgmt.dll
pdh.dll5.00.2195.1163143.27 KB (146,704 bytes)   3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\pdh.dll
smlogcfg.dll  5.00.2163.1   273.27 KB (279,824 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\smlogcfg.dll
cabinet.dll   5.00.2147.1   54.77 KB (56,080 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\cabinet.dll
msinfo32.dll  5.00.2177.1   312.27 KB (319,760 bytes)   6/15/2000 7:22:37 PM
       Microsoft Corporationc:\program files\common files\microsoft
shared\msinfo\msinfo32.dll
riched20.dll  5.30.23.1203  402.27 KB (411,920 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\riched20.dll
riched32.dll  5.00.2134.1   3.77 KB (3,856 bytes)3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\riched32.dll
els.dll5.00.2175.1   151.27 KB (154,896 bytes)   3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\els.dll
ntmsmgr.dll   1,0,0,1427.77 KB (438,032 bytes)   3/15/2000 6:00:00 PM Microsoft
Corporation and HighGround Systems, Inc. c:\winnt\system32\ntmsmgr.dll
mmfutil.dll   1.50.1085.000032.06 KB (32,829 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\mmfutil.dll
logdrive.dll  1.50.1085.0000200.06 KB (204,863 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\logdrive.dll
dfrgres.dll   5.00.2150.1   27.50 KB (28,160 bytes)     3/15/2000 6:00:00 PM
       Executive Software International, Inc.   c:\winnt\system32\dfrgres.dll
dfrgsnap.dll  5.00.2195.31  41.77 KB (42,768 bytes)     3/15/2000 6:00:00 PM
       Executive Software International, Inc.   c:\winnt\system32\dfrgsnap.dll
dmdskres.dll  2195.23.297.2 119.50 KB (122,368 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corp., VERITAS Software c:\winnt\system32\dmdskres.dll
dmutil.dll    2195.23.297.2 42.27 KB (43,280 bytes)     3/15/2000 6:00:00 PM VERITAS
Software Corp.c:\winnt\system32\dmutil.dll
ntmsapi.dll   5.00.1948.1   50.27 KB (51,472 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\ntmsapi.dll
dmdskmgr.dll  2195.1163.297.2      160.27 KB (164,112 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corp., VERITAS Software c:\winnt\system32\dmdskmgr.dll
mycomput.dll  5.00.2134.1   107.77 KB (110,352 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\mycomput.dll
mmcndmgr.dll  5.00.2178.1   815.27 KB (834,832 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\mmcndmgr.dll
mfc42u.dll    6.00.8665.0   972.05 KB (995,384 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\mfc42u.dll
mmc.exe5.00.2153.1   589.27 KB (603,408 bytes)   3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\mmc.exe
tapisrv.dll   5.00.2186.1   168.77 KB (172,816 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\tapisrv.dll
rasdlg.dll    5.00.2194.1   514.27 KB (526,608 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\rasdlg.dll
```

```
netcfgx.dll   5.00.2195.1284534.27 KB (547,088 bytes)  3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\netcfgx.dll
sens.dll      5.00.2163.1   36.77 KB (37,648 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\sens.dll
rasmans.dll   5.00.2195.27  146.77 KB (150,288 bytes)  3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\rasmans.dll
netman.dll    5.00.2195.21  93.77 KB (96,016 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\netman.dll
es.dll 1999.9.3422.21231.77 KB (237,328 bytes)  3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\es.dll
sqlmangr.rll  2000.080.0145.01    88.00 KB (90,112 bytes)    6/15/2000 8:29:56 PM
       Microsoft Corporationc:\program files\common files\microsoft shared\service
manager\resources\1033\sqlmangr.rll
odbcint.dll   3.520.6330.0  88.00 KB (90,112 bytes)    6/19/2000 2:22:30 PM
       Microsoft Corporationc:\winnt\system32\odbcint.dll
sqlunirl.dll  2000.080.0145.01    172.06 KB (176,194 bytes)  6/3/2000 3:52:12 PM
       Microsoft Corporationc:\winnt\system32\sqlunirl.dll
comdlg32.dll  5.00.2920.0000220.27 KB (225,552 bytes)  3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\comdlg32.dll
odbc32.dll    3.520.6330.0  216.27 KB (221,456 bytes)  6/19/2000 2:22:30 PM
       Microsoft Corporationc:\winnt\system32\odbc32.dll
w95scm.dll    2000.080.0145.01    48.06 KB (49,216 bytes)    6/15/2000 8:29:56 PM
       Microsoft Corporationc:\program files\common files\microsoft shared\service
manager\w95scm.dll
sqlmangr.exe  2000.080.0145.01    68.00 KB (69,632 bytes)    6/15/2000 8:29:56 PM
       Microsoft Corporationc:\program files\common files\microsoft shared\service
manager\sqlmangr.exe
wininet.dll   5.00.3103.800 429.27 KB (439,568 bytes)  3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wininet.dll
diskcopy.dll  5.00.2134.1   15.77 KB (16,144 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\diskcopy.dll
shdoclc.dll   5.00.3103.800 324.50 KB (332,288 bytes)  3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\shdoclc.dll
wzcab2.dll    2, 0, 0, 0    20.50 KB (20,992 bytes)    6/21/2000 6:09:57 PM Nico
Mak Computing, Inc.  c:\progra~1\winzip\wzcab2.dll
crtdll.dll    4.00   145.77 KB (149,264 bytes)  3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\crtdll.dll
wzshlext.dll  Not Available 33.00 KB (33,792 bytes)    6/21/2000 6:09:57 PM Not
Available     c:\progra~1\winzip\wzshlext.dll
urlmon.dll    5.00.3103.800 397.77 KB (407,312 bytes)  3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\urlmon.dll
faxshell.dll  5.00.2134.1   8.27 KB (8,464 bytes)3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\faxshell.dll
msacm32.dll   5.00.2134.1   65.27 KB (66,832 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\msacm32.dll
avifil32.dll  5.00.2134.1   76.27 KB (78,096 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\avifil32.dll
msvfw32.dll   5.00.2134.1   113.77 KB (116,496 bytes)  3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\msvfw32.dll
docprop2.dll  5.00.2178.1   297.77 KB (304,912 bytes)  3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\docprop2.dll
ntshrui.dll   5.00.2134.1   46.77 KB (47,888 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\ntshrui.dll
linkinfo.dll  5.00.2134.1   15.77 KB (16,144 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\linkinfo.dll
browselc.dll  5.00.3103.800 34.50 KB (35,328 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\browselc.dll
mydocs.dll    5.00.2920.000055.77 KB (57,104 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\mydocs.dll
powrprof.dll  5.00.2920.000013.27 KB (13,584 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\powrprof.dll
batmeter.dll  5.00.2920.000020.27 KB (20,752 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\batmeter.dll
stobject.dll  5.00.2195.18  78.77 KB (80,656 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\stobject.dll
webcheck.dll  5.00.3103.800 253.27 KB (259,344 bytes)  3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\webcheck.dll
netshell.dll  5.00.2176.1   456.77 KB (467,728 bytes)  3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\netshell.dll
```

```
browseui.dll  5.00.3103.800 773.77 KB (792,336 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\browseui.dll
shdocvw.dll   5.00.3103.800 1.05 MB (1,095,952 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\shdocvw.dll
explorer.exe  5.00.2920.0000232.77 KB (238,352 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\explorer.exe
netui1.dll    5.00.2134.1   210.27 KB (215,312 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\netui1.dll
netui0.dll    5.00.2134.1   70.27 KB (71,952 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\netui0.dll
ntlanman.dll  5.00.2157.1   35.27 KB (36,112 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\ntlanman.dll
wshnetbs.dll  5.00.2134.1   7.77 KB (7,952 bytes)3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\wshnetbs.dll
rapilib.dll   5.00.2167.1   25.27 KB (25,872 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\rapilib.dll
rsvpsp.dll    5.00.2167.1   74.77 KB (76,560 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\rsvpsp.dll
ntmarta.dll   5.00.2158.1   98.77 KB (101,136 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\ntmarta.dll
perfos.dll    5.00.2155.1   21.27 KB (21,776 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\perfos.dll
provthrd.dll  1.50.1085.000068.07 KB (69,708 bytes)     6/15/2000 7:22:27 PM
       Microsoft Corporationc:\winnt\system32\wbem\provthrd.dll
ntevt.dll     1.50.1085.0000192.06 KB (196,669 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wbem\ntevt.dll
wmi.dll5.00.2195.12076.27 KB (6,416 bytes)3/15/2000 6:00:00 PM Microsoft Corporation
       c:\winnt\system32\wmi.dll
psapi.dll     5.00.2134.1   28.27 KB (28,944 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\psapi.dll
framedyn.dll  1.50.1085.0000164.05 KB (167,992 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wbem\framedyn.dll
cimwin32.dll  1.50.1085.00161.02 MB (1,073,232 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wbem\cimwin32.dll
wbemsvc.dll   1.50.1085.000740.07 KB (41,036 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wbem\wbemsvc.dll
wbemess.dll   1.50.1085.0007364.07 KB (372,804 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wbem\wbemess.dll
fastprox.dll  1.50.1085.0007144.08 KB (147,536 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wbem\fastprox.dll
wbemcore.dll  1.50.1085.0008628.07 KB (643,140 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wbem\wbemcore.dll
wbemcomn.dll  1.50.1085.0007692.07 KB (708,675 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wbem\wbemcomn.dll
winmgmt.exe   1.50.1085.0009192.08 KB (196,685 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wbem\winmgmt.exe
gamevlog.exe  Not Available 186.85 KB (191,330 bytes)   6/26/2000 11:16:05 AMNot
Available     c:\winnt\system32\gamserv\gamevlog.exe
gamevent.exe  Not Available 88.71 KB (90,834 bytes)     6/26/2000 11:16:05 AMNot
Available     c:\winnt\system32\gamserv\gamevent.exe
gamserv.exe   Not Available 126.70 KB (129,745 bytes)   6/26/2000 11:16:05 AMNot
Available     c:\winnt\system32\gamserv\gamserv.exe
gamscm.exe    Not Available 119.28 KB (122,144 bytes)   6/26/2000 11:16:05 AMNot
Available     c:\winnt\system32\gamserv\gamscm.exe
mtxoci.dll    1999.9.3421.3 109.27 KB (111,888 bytes)   6/15/2000 2:19:57 PM
       Microsoft Corporationc:\winnt\system32\mtxoci.dll
resutils.dll  5.00.2195.128439.77 KB (40,720 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\resutils.dll
clusapi.dll   5.00.2195.128453.27 KB (54,544 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\clusapi.dll
msvcp50.dll   5.00.7051     552.50 KB (565,760 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\msvcp50.dll
xolehlp.dll   1999.9.3421.3 17.27 KB (17,680 bytes)     6/15/2000 2:19:56 PM
       Microsoft Corporationc:\winnt\system32\xolehlp.dll
msdtclog.dll  1999.9.3421.3 89.77 KB (91,920 bytes)     6/15/2000 2:19:55 PM
       Microsoft Corporationc:\winnt\system32\msdtclog.dll
mtxclu.dll    1999.9.3421.3 50.27 KB (51,472 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\mtxclu.dll
msdtcprx.dll  2000.2.3444.0 674.45 KB (690,640 bytes)   6/15/2000 2:19:56 PM
       Microsoft Corporationc:\winnt\system32\msdtcprx.dll
```

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txfaux.dll    1999.9.3422.24341.27 KB (349,456 bytes)   6/15/2000 2:19:56 PM
       Microsoft Corporationc:\winnt\system32\txfaux.dll
msdtctm.dll   2000.2.3444.0 1.28 MB (1,346,448 bytes)   6/15/2000 2:19:56 PM
       Microsoft Corporationc:\winnt\system32\msdtctm.dll
msdtc.exe     1999.9.3421.3 6.77 KB (6,928 bytes)6/15/2000 2:19:55 PM Microsoft
Corporation   c:\winnt\system32\msdtc.exe
rasadhlp.dll  5.00.2168.1   7.27 KB (7,440 bytes)3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\rasadhlp.dll
winrnr.dll    5.00.2195.117519.27 KB (19,728 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\winrnr.dll
rnr20.dll     5.00.2195.120734.77 KB (35,600 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\rnr20.dll
wshtcpip.dll  5.00.2134.1   17.27 KB (17,680 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wshtcpip.dll
dhcpcsvc.dll  5.00.2153.1   88.77 KB (90,896 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\dhcpcsvc.dll
tapi32.dll    5.00.2182.1   123.27 KB (126,224 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\tapi32.dll
rasman.dll    5.00.2188.1   54.77 KB (56,080 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\rasman.dll
rasapi32.dll  5.00.2188.1   189.77 KB (194,320 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\rasapi32.dll
iphlpapi.dll  5.00.2173.2   67.77 KB (69,392 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\iphlpapi.dll
msafd.dll     5.00.2195.128499.77 KB (102,160 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\msafd.dll
rpcss.dll     5.00.2195.25  178.77 KB (183,056 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\rpcss.dll
svchost.exe   5.00.2134.1   7.77 KB (7,952 bytes)3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\svchost.exe
vipl.dll      4.00.0180.00 KB (81,920 bytes)     5/4/2000 3:56:46 PM  Giganet
Incorporated  c:\winnt\system32\vipl.dll
gnconmgr.exe  4.00.0196.00 KB (98,304 bytes)     5/4/2000 3:56:45 PM  Giganet
Incorporated  c:\winnt\system32\gnconmgr.exe
scecli.dll    5.00.2191.1   105.27 KB (107,792 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\scecli.dll
atl.dll3.00.8449     57.56 KB (58,938 bytes)     3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\atl.dll
certcli.dll   5.00.2175.1   132.27 KB (135,440 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\certcli.dll
esent.dll     6.0.3939.6    1.07 MB (1,122,064 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\esent.dll
mswsock.dll   5.00.2195.120762.27 KB (63,760 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\mswsock.dll
ntdsatq.dll   5.00.2195.128430.77 KB (31,504 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\ntdsatq.dll
ntdsa.dll     5.00.2195.1284886.77 KB (908,048 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\ntdsa.dll
kdcsvc.dll    5.00.2195.1284133.77 KB (136,976 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\kdcsvc.dll
sfmapi.dll    5.00.2134.1   38.77 KB (39,696 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\sfmapi.dll
rtutils.dll   5.00.2168.1   43.77 KB (44,816 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\rtutils.dll
activeds.dll  5.00.2172.1   172.77 KB (176,912 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\activeds.dll
mprapi.dll    5.00.2181.1   79.27 KB (81,168 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\mprapi.dll
rassfm.dll    5.00.2195.117921.27 KB (21,776 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\rassfm.dll
mpr.dll5.00.2146.1   53.27 KB (54,544 bytes)     3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\mpr.dll
schannel.dll  5.00.2195.1072140.77 KB (144,144 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\schannel.dll
netlogon.dll  5.00.2195.18  337.27 KB (345,360 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\netlogon.dll
msv1_0.dll    5.00.2164.1   94.77 KB (97,040 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\msv1_0.dll
kerberos.dll  5.00.2181.1   196.77 KB (201,488 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\kerberos.dll
```

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msprivs.dll   5.00.2154.1   41.50 KB (42,496 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\msprivs.dll
samsrv.dll    5.00.2195.1175342.77 KB (350,992 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\samsrv.dll
lsasrv.dll    5.00.2195.1284480.27 KB (491,792 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\lsasrv.dll
lsass.exe     5.00.2195.128432.77 KB (33,552 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\lsass.exe
msi.dll1.11.1314.0   1.72 MB (1,798,928 bytes)   3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\msi.dll
adsldpc.dll   5.00.2172.1   127.77 KB (130,832 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\adsldpc.dll
appmgmts.dll  5.00.2168.1   117.77 KB (120,592 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\appmgmts.dll
wmicore.dll   5.00.2178.1   70.77 KB (72,464 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wmicore.dll
psbase.dll    5.00.2146.1   111.77 KB (114,448 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\psbase.dll
cryptsvc.dll  5.00.2181.1   61.77 KB (63,248 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\cryptsvc.dll
cryptdll.dll  5.00.2135.1   41.27 KB (42,256 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\cryptdll.dll
wkssvc.dll    5.00.2195.117595.27 KB (97,552 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wkssvc.dll
srvsvc.dll    5.00.2178.1   79.27 KB (81,168 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\srvsvc.dll
cfgmgr32.dll  5.00.2195.120716.77 KB (17,168 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\cfgmgr32.dll
dmserver.dll  2195.23.297.2 12.77 KB (13,072 bytes)     3/15/2000 6:00:00 PM VERITAS
Software Corp.c:\winnt\system32\dmserver.dll
winsta.dll    5.00.2195.32  36.27 KB (37,136 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\winsta.dll
icmp.dll      5.00.2134.1   7.27 KB (7,440 bytes)3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\icmp.dll
lmhsvc.dll    5.00.2134.1   9.27 KB (9,488 bytes)3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\lmhsvc.dll
eventlog.dll  5.00.2178.1   43.77 KB (44,816 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\eventlog.dll
ntdsapi.dll   5.00.2195.117556.27 KB (57,616 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\ntdsapi.dll
scesrv.dll    5.00.2188.1   225.77 KB (231,184 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\scesrv.dll
umpnpmgr.dll  5.00.2182.1   86.27 KB (88,336 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\umpnpmgr.dll
services.exe  5.00.2134.1   86.77 KB (88,848 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\services.exe
clbcatq.dll   2000.2.3444.0 525.44 KB (538,048 bytes)   6/15/2000 2:19:49 PM
       Microsoft Corporationc:\winnt\system32\clbcatq.dll
oleaut32.dll  2.40.4514     600.27 KB (614,672 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\oleaut32.dll
cscui.dll     5.00.2195.1284226.77 KB (232,208 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\cscui.dll
winspool.drv  5.00.2167.1   109.77 KB (112,400 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\winspool.drv
winscard.dll  5.00.2134.1   77.27 KB (79,120 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\winscard.dll
wlnotify.dll  5.00.2195.116352.27 KB (53,520 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wlnotify.dll
cscdll.dll    5.00.2195.128498.27 KB (100,624 bytes)    3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\cscdll.dll
lz32.dll      5.00.2134.1   9.77 KB (10,000 bytes)3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\lz32.dll
version.dll   5.00.2134.1   15.77 KB (16,144 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\version.dll
rsabase.dll   5.00.2195.1163129.27 KB (132,368 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\rsabase.dll
mscat32.dll   5.131.2134.1  7.77 KB (7,952 bytes)3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\mscat32.dll
ole32.dll     5.00.2195.1179913.77 KB (935,696 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\ole32.dll
```

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imagehlp.dll  5.00.2195.1284120.77 KB (123,664 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\imagehlp.dll
msasn1.dll    5.00.2134.1   51.27 KB (52,496 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\msasn1.dll
crypt32.dll   5.131.2173.1  455.77 KB (466,704 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\crypt32.dll
wintrust.dll  5.131.2143.1  162.27 KB (166,160 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wintrust.dll
setupapi.dll  5.00.2195.1284577.77 KB (591,632 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\setupapi.dll
winmm.dll     5.00.2161.1   184.77 KB (189,200 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\winmm.dll
comctl32.dll  5.81   517.27 KB (529,680 bytes)   3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\comctl32.dll
shlwapi.dll   5.00.3103.800 272.27 KB (278,800 bytes)  3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\shlwapi.dll
shell32.dll   5.00.3103.800 2.21 MB (2,319,120 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\shell32.dll
msgina.dll    5.00.2191.1   309.77 KB (317,200 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\msgina.dll
wsock32.dll   5.00.2195.120721.77 KB (22,288 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wsock32.dll
dnsapi.dll    5.00.2195.1179131.77 KB (134,928 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\dnsapi.dll
wldap32.dll   5.00.2195.1175124.77 KB (127,760 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\wldap32.dll
ws2help.dll   5.00.2134.1   17.77 KB (18,192 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\ws2help.dll
ws2_32.dll    5.00.2134.1   67.77 KB (69,392 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\ws2_32.dll
samlib.dll    5.00.2160.1   46.27 KB (47,376 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\samlib.dll
netrap.dll    5.00.2134.1   11.27 KB (11,536 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\netrap.dll
netapi32.dll  5.00.2195.1175298.77 KB (305,936 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\netapi32.dll
profmap.dll   5.00.2181.1   29.27 KB (29,968 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\profmap.dll
secur32.dll   5.00.2195.128445.27 KB (46,352 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\secur32.dll
sfc.dll5.00.2164.1   84.27 KB (86,288 bytes)     3/15/2000 6:00:00 PM Microsoft
Corporation   c:\winnt\system32\sfc.dll
nddeapi.dll   5.00.2137.1   15.27 KB (15,632 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\nddeapi.dll
userenv.dll   5.00.2185.1   361.27 KB (369,936 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\userenv.dll
user32.dll    5.00.2180.1   393.27 KB (402,704 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\user32.dll
gdi32.dll     5.00.2195.22  216.77 KB (221,968 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\gdi32.dll
rpcrt4.dll    5.00.2195.1284414.77 KB (424,720 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\rpcrt4.dll
advapi32.dll  5.00.2195.1207340.27 KB (348,432 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\advapi32.dll
kernel32.dll  5.00.2195.1284690.77 KB (707,344 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\kernel32.dll
msvcrt.dll    6.10.8637.0   288.09 KB (295,000 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\msvcrt.dll
winlogon.exe  5.00.2195.1284173.27 KB (177,424 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\winlogon.exe
sfcfiles.dll  5.00.2195.1284920.77 KB (942,864 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\sfcfiles.dll
ntdll.dll     5.00.2195.1284454.27 KB (465,168 bytes)   3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\ntdll.dll
smss.exe      5.00.2195.31  44.27 KB (45,328 bytes)     3/15/2000 6:00:00 PM
       Microsoft Corporationc:\winnt\system32\smss.exe

[Services]
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Display Name  Name   State  Start Mode    Service Type  Path   Error Control Start
Name   Tag ID
AlerterAlerterStoppedManual Share Process c:\winnt\system32\services.exe    Normal
       LocalSystem   0
Application ManagementAppMgmtRunningManual Share Process
       c:\winnt\system32\services.exe    Normal LocalSystem   0
Computer Browser     BrowserStoppedManual Share Process
       c:\winnt\system32\services.exe    Normal LocalSystem   0
Indexing Service     cisvc  StoppedManual Share Process c:\winnt\system32\cisvc.exe
       Normal LocalSystem   0
ClipBook      ClipSrvStoppedManual Own Process   c:\winnt\system32\clipsrv.exeNormal
       LocalSystem   0
Distributed File System     Dfs    StoppedManual Own Process
       c:\winnt\system32\dfssvc.exeNormal LocalSystem   0
DHCP Client   Dhcp   StoppedManual Share Process c:\winnt\system32\services.exe
       Normal LocalSystem   0
Logical Disk Manager Administrative ServicedmadminRunningManual Share Process
       c:\winnt\system32\dmadmin.exe /com Normal LocalSystem   0
Logical Disk Manager dmserver      RunningAuto   Share Process
       c:\winnt\system32\services.exe    Normal LocalSystem   0
DNS Client    Dnscache      StoppedManual Share Process
       c:\winnt\system32\services.exe    Normal LocalSystem   0
Event Log     Eventlog      RunningAuto   Share Process
       c:\winnt\system32\services.exe    Normal LocalSystem   0
COM+ Event System    EventSystem   RunningManual Share Process
       c:\winnt\system32\svchost.exe -k netsvcs  Normal LocalSystem   0
Fax Service   Fax    StoppedManual Own Process   c:\winnt\system32\faxsvc.exeNormal
       LocalSystem   0
Mylex Global Array Manager Server  gamscm RunningAuto   Own Process
       c:\winnt\system32\gamserv\gamscm.exeNormal LocalSystem   0
cLAN Connection Manager     GniConMgr     RunningAuto   Own Process
       c:\winnt\system32\gnconmgr.exe    Normal LocalSystem   0
Intersite Messaging  IsmServStoppedDisabled      Own Process
       c:\winnt\system32\ismserv.exeNormal LocalSystem   0
Kerberos Key Distribution Center   kdc    StoppedDisabled      Share Process
       c:\winnt\system32\lsass.exe Normal LocalSystem   0
Server lanmanserver  RunningAuto   Share Process c:\winnt\system32\services.exe
       Normal LocalSystem   0
Workstation   lanmanworkstation    RunningAuto   Share Process
       c:\winnt\system32\services.exe    Normal LocalSystem   0
License Logging Service     LicenseServiceStoppedManual Own Process
       c:\winnt\system32\llssrv.exeNormal LocalSystem   0
TCP/IP NetBIOS Helper ServiceLmHostsRunningAuto   Share Process
       c:\winnt\system32\services.exe    Normal LocalSystem   0
Messenger     Messenger     StoppedManual Share Process
       c:\winnt\system32\services.exe    Normal LocalSystem   0
NetMeeting Remote Desktop Sharing  mnmsrvcStoppedManual Own Process
       c:\winnt\system32\mnmsrvc.exeNormal LocalSystem   0
Distributed Transaction CoordinatorMSDTC  RunningAuto   Own Process
       c:\winnt\system32\msdtc.exe Normal LocalSystem   0
Windows Installer    MSIServer     StoppedManual Share Process
       c:\winnt\system32\msiexec.exe /v  Normal LocalSystem   0
MSSQLSERVER   MSSQLSERVER   StoppedManual Own Process
       c:\progra~1\micros~2\mssql\binn\sqlservr.exeNormal LocalSystem   0
Network DDE   NetDDE StoppedManual Share Process c:\winnt\system32\netdde.exeNormal
       LocalSystem   0
Network DDE DSDM     NetDDEdsdm    StoppedManual Share Process
       c:\winnt\system32\netdde.exeNormal LocalSystem   0
Net Logon     Netlogon      StoppedManual Share Process c:\winnt\system32\lsass.exe
       Normal LocalSystem   0
Network Connections  Netman RunningManual Share Process c:\winnt\system32\svchost.exe
-k netsvcs    Normal LocalSystem   0
File Replication     NtFrs  StoppedManual Own Process   c:\winnt\system32\ntfrs.exe
       Ignore LocalSystem   0
NT LM Security Support Provider    NtLmSspStoppedManual Share Process
       c:\winnt\system32\lsass.exe Normal LocalSystem   0
Removable Storage    NtmsSvcStoppedManual Share Process c:\winnt\system32\svchost.exe
-k netsvcs    Normal LocalSystem   0
Plug and Play PlugPlay      RunningAuto   Share Process
       c:\winnt\system32\services.exe    Normal LocalSystem   0
```

```
IPSEC Policy Agent   PolicyAgent   StoppedManual Share Process
       c:\winnt\system32\lsass.exe Normal LocalSystem   0
Process Control Service     ProcConStoppedManual Own Process
       c:\winnt\system32\procconsvc.exe   Normal LocalSystem   0
Protected Storage    ProtectedStorage     RunningAuto   Share Process
       c:\winnt\system32\services.exe     Normal LocalSystem   0
Remote Access Auto Connection ManagerRasAutoStoppedManual Share Process
       c:\winnt\system32\svchost.exe -k netsvcs  Normal LocalSystem   0
Remote Access Connection Manager   RasMan StoppedManual Share Process
       c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem   0
Routing and Remote Access   RemoteAccess  StoppedDisabled      Share Process
       c:\winnt\system32\svchost.exe -k netsvcs  Normal LocalSystem   0
Remote Registry Service     RemoteRegistryStoppedManual Own Process
       c:\winnt\system32\regsvc.exeNormal LocalSystem   0
Remote Procedure Call (RPC) LocatorRpcLocator    StoppedManual Own Process
       c:\winnt\system32\locator.exeNormal LocalSystem   0
Remote Procedure Call (RPC) RpcSs  RunningAuto   Share Process
       c:\winnt\system32\svchost -k rpcss Normal LocalSystem   0
QoS RSVP      RSVP   RunningManual Own Process   c:\winnt\system32\rsvp.exe -sNormal
       LocalSystem   0
Security Accounts Manager   SamSs  RunningAuto   Share Process
       c:\winnt\system32\lsass.exe Normal LocalSystem   0
Smart Card Helper    SCardDrv      StoppedManual Share Process
       c:\winnt\system32\scardsvr.exe     Ignore LocalSystem   0
Smart Card    SCardSvr      StoppedManual Share Process
       c:\winnt\system32\scardsvr.exe     Ignore LocalSystem   0
Task SchedulerSchedule      StoppedManual Share Process c:\winnt\system32\mstask.exe
       Normal LocalSystem   0
RunAs Service seclogon      StoppedManual Share Process
       c:\winnt\system32\services.exe     Ignore LocalSystem   0
System Event Notification   SENS   StoppedManual Share Process
       c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem   0
Internet Connection Sharing SharedAccess  StoppedManual Share Process
       c:\winnt\system32\svchost.exe -k netsvcs  Normal LocalSystem   0
Print Spooler SpoolerStoppedManual Own Process   c:\winnt\system32\spoolsv.exeNormal
       LocalSystem   0
SQLSERVERAGENTSQLSERVERAGENTStoppedManual Own Process
       c:\progra~1\micros~2\mssql\binn\sqlagent.exeNormal LocalSystem   0
Performance Logs and Alerts SysmonLog     StoppedAuto   Own Process
       c:\winnt\system32\smlogsvc.exe     Normal LocalSystem   0
Telephony     TapiSrvRunningManual Share Process c:\winnt\system32\svchost.exe -k
tapisrvNormal LocalSystem   0
Terminal Services    TermService   StoppedDisabled      Own Process
       c:\winnt\system32\termsrv.exeNormal LocalSystem   0
Telnet TlntSvrStoppedManual Own Process   c:\winnt\system32\tlntsvr.exeNormal
       LocalSystem   0
Distributed Link Tracking Server   TrkSvr StoppedManual Share Process
       c:\winnt\system32\services.exe     Normal LocalSystem   0
Distributed Link Tracking Client   TrkWks StoppedManual Share Process
       c:\winnt\system32\services.exe     Normal LocalSystem   0
Uninterruptible Power SupplyUPS    StoppedManual Own Process
       c:\winnt\system32\ups.exe   Normal LocalSystem   0
Utility Manager      UtilManStoppedManual Own Process   c:\winnt\system32\utilman.exe
       Normal LocalSystem   0
Windows Time  W32TimeStoppedManual Share Process c:\winnt\system32\services.exe
       Normal LocalSystem   0
Windows Management Instrumentation WinMgmtRunningAuto   Own Process
       c:\winnt\system32\wbem\winmgmt.exe Ignore LocalSystem   0
Windows Management Instrumentation Driver ExtensionsWmi    RunningManual 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 ToolsDefault User
StartupDefault User:Startup Default User
Accessories   All Users:AccessoriesAll Users
```

```
Accessories\Accessibility  All Users:Accessories\AccessibilityAll Users
Accessories\Communications All Users:Accessories\CommunicationsAll Users
Accessories\Entertainment  All Users:Accessories\EntertainmentAll Users
Accessories\Games    All Users:Accessories\Games All Users
Accessories\System Tools    All Users:Accessories\System ToolsAll Users
Administrative Tools All Users:Administrative Tools    All Users
Microsoft SQL Server All Users:Microsoft SQL Server    All Users
StartupAll Users:Startup    All Users
WinZip All Users:WinZip     All Users
Accessories   PE8450_01\Administrator:AccessoriesPE8450_01\Administrator
Accessories\Accessibility  PE8450_01\Administrator:Accessories\Accessibility
       PE8450_01\Administrator
Accessories\Entertainment  PE8450_01\Administrator:Accessories\Entertainment
       PE8450_01\Administrator
Accessories\System Tools   PE8450_01\Administrator:Accessories\System Tools
       PE8450_01\Administrator
Administrative Tools PE8450_01\Administrator:Administrative Tools
       PE8450_01\Administrator
StartupPE8450_01\Administrator:Startup   PE8450_01\Administrator

[Startup Programs]

ProgramCommandUser Name     Location
IDW Logging Tool     c:\winnt\system32\idwlog.exe -2    All Users     Common Startup
mdac_runonce  c:\winnt\system32\runonce.exeAll Users
       HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Run

[OLE Registration]

Object Local Server
Sound (OLE2)  sndrec32.exe
Media Clip    mplay32.exe
Video Clip    mplay32.exe /avi
MIDI Sequence mplay32.exe /mid
Sound  Not Available
Media Clip    Not Available
Image Document"C:\Program Files\Windows NT\Accessories\ImageVue\KodakImg.exe"
WordPad Document     "%ProgramFiles%\Windows NT\Accessories\WORDPAD.EXE"
Windows Media Services DRM Storage objectNot Available
Bitmap Image  C:\WINNT\System32\mspaint.exe

[Internet Explorer 5]

[ Following are sub-categories of this main category ]

[Summary]

Item   Value
Version5.00.2920.0000
Build  52920
Product ID    51891-000-0000007-05128
Application Path     C:\Program Files\Internet Explorer
Language      English (United States)
Active PrinterNot Available

Cipher Strength      56-bit
Content Advisor      Disabled
IEAK Install  No

[File Versions]

File   VersionSize   Date   Path   Company
advapi32.dll  5.0.2195.1207 340 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
advapi32.dll  5.0.2195.1207 340 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
advpack.dll   5.0.3103.800  87 KB  3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
advpack.dll   5.0.3103.800  87 KB  3/15/2000 7:00:00 PM .      Microsoft Corporation
browselc.dll  5.0.3103.800  35 KB  3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
```

```
browselc.dll  5.0.3103.800  35 KB  3/15/2000 7:00:00 PM .      Microsoft Corporation
browseui.dll  5.0.3103.800  774 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
browseui.dll  5.0.3103.800  774 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
ckcnv.exe     5.0.2189.1    9 KB   3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
ckcnv.exe     5.0.2189.1    9 KB   3/15/2000 7:00:00 PM .      Microsoft Corporation
comctl32.dll  5.81.3103.800 517 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
comctl32.dll  5.81.3103.800 517 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
crypt32.dll   5.131.2173.1  456 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
crypt32.dll   5.131.2173.1  456 KB 3/15/2000 7:00:00 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   5.0.3103.800  57 KB  3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
iesetup.dll   5.0.3103.800  57 KB  3/15/2000 7:00:00 PM .      Microsoft Corporation
iexplore.exe  5.0.2920.0    59 KB  3/15/2000 7:00:00 PM C:\Program Files\Internet
Explorer      Microsoft Corporation
imagehlp.dll  5.0.2195.1284 121 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
imagehlp.dll  5.0.2195.1284 121 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
imghelp.dll   <File Missing>Not Available Not Available Not Available Not Available
inseng.dll    5.0.3103.800  72 KB  3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
inseng.dll    5.0.3103.800  72 KB  3/15/2000 7:00:00 PM .      Microsoft Corporation
jobexec.dll   5.0.0.147 KB  3/15/2000 7:00:00 PM C:\WINNT\system32    Microsoft
Corporation
jobexec.dll   5.0.0.147 KB  3/15/2000 7:00:00 PM .      Microsoft Corporation
jscript.dll   5.1.0.5010    476 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
jscript.dll   5.1.0.5010    476 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
jsproxy.dll   5.0.2920.0    13 KB  3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
jsproxy.dll   5.0.2920.0    13 KB  3/15/2000 7:00:00 PM .      Microsoft Corporation
msaahtml.dll  <File Missing>Not Available Not Available Not Available Not Available
mshtml.dll    5.0.3103.800  2220 KB3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
mshtml.dll    5.0.3103.800  2220 KB3/15/2000 7:00:00 PM .      Microsoft Corporation
msjava.dll    5.0.3240.0    919 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
msjava.dll    5.0.3240.0    919 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
msoss.dll     <File Missing>Not Available Not Available Not Available Not Available
msxml.dll     5.0.3014.200  495 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
msxml.dll     5.0.3014.200  495 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
occache.dll   5.0.3103.800  86 KB  3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
occache.dll   5.0.3103.800  86 KB  3/15/2000 7:00:00 PM .      Microsoft Corporation
ole32.dll     5.0.2195.1179 914 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
ole32.dll     5.0.2195.1179 914 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
oleaut32.dll  2.40.4514.1   600 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
oleaut32.dll  2.40.4514.1   600 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
olepro32.dll  5.0.4514.1    160 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
olepro32.dll  5.0.4514.1    160 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
rsabase.dll   5.0.2195.1163 129 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
rsabase.dll   5.0.2195.1163 129 KB 3/15/2000 7:00:00 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    141 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
schannel.dll  5.0.2195.0    141 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
shdoc401.dll  <File Missing>Not Available Not Available Not Available Not Available
```

```
shdocvw.dll   5.0.3103.800  1070 KB3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
shdocvw.dll   5.0.3103.800  1070 KB3/15/2000 7:00:00 PM .      Microsoft Corporation
shell32.dll   5.0.3103.800  2265 KB3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
shell32.dll   5.0.3103.800  2265 KB3/15/2000 7:00:00 PM .      Microsoft Corporation
shlwapi.dll   5.0.3103.800  272 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
shlwapi.dll   5.0.3103.800  272 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
url.dll5.0.2920.0    82 KB  3/15/2000 7:00:00 PM C:\WINNT\system32    Microsoft
Corporation
url.dll5.0.2920.0    82 KB  3/15/2000 7:00:00 PM .      Microsoft Corporation
urlmon.dll    5.0.3103.800  398 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
urlmon.dll    5.0.3103.800  398 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
vbscript.dll  5.1.0.5010    428 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
vbscript.dll  5.1.0.5010    428 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
webcheck.dll  5.0.3103.800  253 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
webcheck.dll  5.0.3103.800  253 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
win.com5.0.2134.1    24 KB  3/15/2000 7:00:00 PM C:\WINNT\system32    Microsoft
Corporation
win.com5.0.2134.1    24 KB  3/15/2000 7:00:00 PM .      Microsoft Corporation
wininet.dll   5.0.3103.800  429 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
wininet.dll   5.0.3103.800  429 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
winsock.dll   3.10.0.103    3 KB   3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
winsock.dll   3.10.0.103    3 KB   3/15/2000 7:00:00 PM .      Microsoft Corporation
wintrust.dll  5.131.2143.1  162 KB 3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
wintrust.dll  5.131.2143.1  162 KB 3/15/2000 7:00:00 PM .      Microsoft Corporation
wsock.vxd     <File Missing>Not Available Not Available Not Available Not Available
wsock32.dll   5.0.2195.1207 22 KB  3/15/2000 7:00:00 PM C:\WINNT\system32
       Microsoft Corporation
wsock32.dll   5.0.2195.1207 22 KB  3/15/2000 7:00:00 PM .      Microsoft Corporation
wsock32n.dll  <File Missing>Not Available Not Available Not Available Not Available

[Connectivity]

Item   Value
Connection PreferenceNever dial
EnableHttp1.1 1
ProxyHttp1.1  0

LAN Settings

AutoConfigProxy      Not Available
AutoProxyDetectMode  Enabled
AutoConfigURL
Proxy  Disabled
ProxyServer
ProxyOverride

[Cache]

[ Following are sub-categories of this main category ]

[Summary]

Item   Value
Page Refresh Type    Automatic
Temporary Internet Files Folder   C:\Documents and Settings\Administrator\Local
Settings\Temporary Internet Files
Total Disk Space     8667 MB
Available Disk Space 4667 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 6/15/2000 to 5/22/2100sha1RSA

[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 intranetMedium-low
Trusted sites Low
Internet      Medium
Restricted sites     High
```

Client Configuration Parameters

COM+ Settings

TPCC.AllTxns:
- Activation:
  - Enable Object Pooling selected
  - Minimum Pool Size: 22
  - Maximum Pool Size: 22
  - Creation Timeout: 60,000
  - Enable Object Construction
  - Enable Just in Time Activation
- Concurrency:
  - Concurrency Required

TPCC Application Registry Parameters

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\TPCC]
"Path"="c:\\inetpub\\wwwroot\\"
"NumberOfDeliveryThreads"=dword:00000004
"MaxConnections"=dword:00001f40
"MaxPendingDeliveries"=dword:000003e8
"DB_Protocol"="DBLIB"
"TxnMonitor"="COM"
"DbServer"="PE8450_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:000000be
"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:60,04,02,f4,fc,9b,bf,01,10,25,00,00,00,00,00,00
"WbemAdapFileTime"=hex:00,60,4e,96,aa,40,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\Advanced
DataFactory]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\ADCLaunch\RDSServe
r.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"
"/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:cc,55,1e,f7,fc,9b,bf,01,10,3d,00,00,00,00,00,00
"WbemAdapFileTime"=hex:00,60,4e,96,aa,40,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
```

Microsoft Windows 2000 Server System Information Report for PE1300

```
System Information report written at: 06/26/2000 04:24:44 PM
[System Information]

[ Following are sub-categories of this main category ]

[System Summary]

Item   Value
OS NameMicrosoft Windows 2000 Server
Version5.0.2195  Build 2195
OS Manufacturer      Microsoft Corporation
System Name   CLIENT6
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     CLIENT6\Administrator
Time Zone     Central Daylight Time
Total Physical Memory523,824 KB
Available Physical Memory   443,844 KB
Total Virtual Memory 1,802,916 KB
Available Virtual Memory    1,667,828 KB
Page File Space      1,279,092 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]

ChannelDevice 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 busOK
0x0022-0x003F PCI busOK
0x0044-0x0047 PCI busOK
0x004C-0x006F PCI busOK
0x0072-0x007F PCI busOK
0x0090-0x0091 PCI busOK
0x0093-0x009F PCI busOK
0x00A2-0x00BF PCI busOK
0x00D0-0x00EF PCI busOK
0x0100-0x0CF7 PCI busOK
0x0D00-0xFFFF PCI busOK
```

```
0xE000-0xEFFF Intel 82443BX Pentium(r) II Processor to AGP ControllerOK
0x03B0-0x03BB Intel 82443BX Pentium(r) II Processor to AGP ControllerOK
0x03B0-0x03BB ATI Technologies Inc. 3D RAGE IIC AGPOK
0x03C0-0x03DF Intel 82443BX Pentium(r) II Processor to AGP ControllerOK
0x03C0-0x03DF ATI Technologies Inc. 3D RAGE IIC AGPOK
0xEC00-0xECFF ATI Technologies Inc. 3D RAGE IIC AGPOK
0xD000-0xDFFF DEC 21152 PCI to PCI bridge OK
0xDC00-0xDCFF Adaptec AHA-2940U2/U2W PCI SCSI ControllerOK
0x0A79-0x0A79 ISAPNP Read Data PortOK
0x0279-0x0279 ISAPNP Read Data PortOK
0x0274-0x0277 ISAPNP Read Data PortOK
0xFFA0-0xFFAF Intel(r) 82371AB/EB PCI Bus Master IDE ControllerOK
0x0170-0x0177 Secondary IDE ChannelOK
0x0376-0x0376 Secondary IDE ChannelOK
0xCCE0-0xCCFF Intel 82371AB/EB PCI to USB Universal Host Controller  OK
0xCCC0-0xCCDF Intel(R) PRO/100+ PCI AdapterOK
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 speakerOK
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 processorOK

[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
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 busOK
0xA0000-0xBFFFF      Intel 82443BX Pentium(r) II Processor to AGP ControllerOK
0xA0000-0xBFFFF      ATI Technologies Inc. 3D RAGE IIC AGPOK
0xCD000-0xEFFFF      PCI busOK
0x20000000-0xFEBFFFFFPCI busOK
0xFEC10000-0xFEDFFFFFPCI busOK
0xFEE10000-0xFFF7FFFFPCI busOK
0xFB000000-0xFDFFFFFFIntel 82443BX Pentium(r) II Processor to AGP ControllerOK
0xE2000000-0xE2FFFFFFIntel 82443BX Pentium(r) II Processor to AGP ControllerOK
```

```
0xEC000000-0xEFFFFFFFIntel 82443BX Pentium(r) II Processor to AGP ControllerOK
0xFC000000-0xFCFFFFFFATI Technologies Inc. 3D RAGE IIC AGPOK
0xFBFFF000-0xFBFFFFFFATI Technologies Inc. 3D RAGE IIC AGPOK
0xF9000000-0xFAFFFFFFDEC 21152 PCI to PCI bridge OK
0xF1000000-0xF1FFFFFFDEC 21152 PCI to PCI bridge OK
0xF9FFF000-0xF9FFFFFFAdaptec AHA-2940U2/U2W PCI SCSI ControllerOK
0xFE300000-0xFE31FFFFcLAN Host Adapter    OK
0xFE000000-0xFE1FFFFFcLAN Host Adapter    OK
0xF7000000-0xF7FFFFFFcLAN Host Adapter    OK
0xFE320000-0xFE32FFFFcLAN Host Adapter    OK
0xF3000000-0xF3000FFFIntel(R) PRO/100+ PCI AdapterOK
0xFE200000-0xFE2FFFFFIntel(R) PRO/100+ PCI AdapterOK
0xFEE00000-0xFEE0FFFFAdvanced programmable interrupt controllerOK
0xFEC00000-0xFEC0FFFFAdvanced programmable interrupt controllerOK
0x0000-0x9FFFFSystem board  OK
0x100000-0x1FFFDFFF  System board  OK
0xFFE00000-0xFFFFFFFFSystem 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   VersionSize   Creation Date
c:\winnt\system32\iac25_32.axIntel Corporation    Indeo® audio softwareOK
       C:\WINNT\System32\IAC25_32.AX2.05.53195.00 KB (199,680 bytes)  12/7/1999
6:00:00 AM
c:\winnt\system32\msg723.acmMicrosoft Corporation       OK
       C:\WINNT\System32\MSG723.ACM4.4.3385      106.77 KB (109,328 bytes)
       4/1/2000 5:13:27 PM
c:\winnt\system32\lhacm.acm Microsoft Corporation       OK
       C:\WINNT\System32\LHACM.ACM 4.4.3385      33.27 KB (34,064 bytes)
       4/1/2000 5:13:28 PM
c:\winnt\system32\tssoft32.acm    DSP GROUP, INC.             OK
       C:\WINNT\System32\TSSOFT32.ACM    1.01   9.27 KB (9,488 bytes)12/7/1999
6:00:00 AM
c:\winnt\system32\msgsm32.acmMicrosoft Corporation       OK
       C:\WINNT\System32\MSGSM32.ACM5.00.2134.1   22.27 KB (22,800 bytes)
       12/7/1999 6:00:00 AM
c:\winnt\system32\msg711.acmMicrosoft Corporation       OK
       C:\WINNT\System32\MSG711.ACM5.00.2134.1   10.27 KB (10,512 bytes)
       12/7/1999 6:00:00 AM
c:\winnt\system32\msadp32.acmMicrosoft Corporation       OK
       C:\WINNT\System32\MSADP32.ACM5.00.2134.1   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

[Video Codecs]

Codec  Manufacturer  Description   Status File   VersionSize   Creation Date
c:\winnt\system32\ir50_32.dllIntel Corporation    Indeo® video 5.10    OK
       C:\WINNT\System32\IR50_32.DLLR.5.10.15.2.55737.50 KB (755,200 bytes)
       12/7/1999 6:00:00 AM
c:\winnt\system32\msh263.drvMicrosoft Corporation       OK
       C:\WINNT\System32\MSH263.DRV4.4.3385      252.27 KB (258,320 bytes)
       4/1/2000 5:12:56 PM
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.dllMicrosoft Corporation       OK
       C:\WINNT\System32\MSRLE32.DLL5.00.2134.1   10.77 KB (11,024 bytes)
       12/7/1999 6:00:00 AM
c:\winnt\system32\ir32_32.dllIntel(R) Corporation       OK
       C:\WINNT\System32\IR32_32.DLLNot Available 194.50 KB (199,168 bytes)
       12/7/1999 6:00:00 AM
c:\winnt\system32\iccvid.dllRadius 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\msh261.drvMicrosoft Corporation       OK
       C:\WINNT\System32\MSH261.DRV4.4.3385      163.77 KB (167,696 bytes)
       4/1/2000 5:13:27 PM

[CD-ROM]

Item   Value
Drive  D:
Description   CD-ROM Drive
Media Loaded  False
Media Type    CD-ROM
Name   SAMSUNG CD-ROM SC-140B
Manufacturer  (Standard CD-ROM drives)
Status OK
Transfer Rate Not Available
SCSI Target ID0
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 Version5.00.2174.1
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 Threshold6
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    6/23/2000 9:59:36 AM
Index  0
Service Name  E100B
IP Address    192.1.60.100
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   00:90:27:4E:95:72
Service Name  E100B
IRQ Number    56
I/O Port      0xCCC0-0xCCDF
Driver c:\winnt\system32\drivers\e100bnt5.sys (80144, 4.01.67.0000)

Name   [00000001] RAS Async Adapter
Adapter Type  Not Available
Product Name  RAS Async Adapter
Installed     True
PNP Device ID Not Available
Last Reset    6/23/2000 9:59:36 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    6/23/2000 9:59:36 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    6/23/2000 9:59:36 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    6/23/2000 9:59:36 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    6/23/2000 9:59:36 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    6/23/2000 9:59:36 AM
Index  6
Service Name  GNINDIS
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   00:90:FA:00:0B:82
Service Name  GNINDIS
IRQ Number    52
Driver c:\winnt\system32\drivers\gnindis.sys (22752, 4.00.00)


[Protocol]

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

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

Name   RSVP UDP Service Provider
ConnectionlessServiceTrue
GuaranteesDelivery   False
GuaranteesSequencing False
MaximumAddressSize   16 bytes
MaximumMessageSize   65467 bytes
MessageOriented      True
MinimumAddressSize   16 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData  False
SupportsDisconnectDataFalse
```

```
SupportsEncryption   True
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidthFalse
SupportsMulticasting True

Name   RSVP TCP Service Provider
ConnectionlessServiceFalse
GuaranteesDelivery   True
GuaranteesSequencing True
MaximumAddressSize   16 bytes
MaximumMessageSize   0 bytes
MessageOriented      False
MinimumAddressSize   16 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   True
SupportsExpeditedDataTrue
SupportsGracefulClosing    True
SupportsGuaranteedBandwidthFalse
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{E9B31CAA-497A-4744-80E7-E75BCEA84BF5}]
SEQPACKET 3
ConnectionlessServiceFalse
GuaranteesDelivery   True
GuaranteesSequencing True
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidthFalse
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{E9B31CAA-497A-4744-80E7-E75BCEA84BF5}]
DATAGRAM 3
ConnectionlessServiceTrue
GuaranteesDelivery   False
GuaranteesSequencing False
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidthFalse
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{D1EFAF7A-3EDD-4CCB-976D-F87221AB61A9}]
SEQPACKET 0
ConnectionlessServiceFalse
GuaranteesDelivery   True
GuaranteesSequencing True
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
```

```
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{D1EFAF7A-3EDD-4CCB-976D-F87221AB61A9}]
DATAGRAM 0
ConnectionlessServiceTrue
GuaranteesDelivery   False
GuaranteesSequencing False
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{7CB23457-7463-4329-BDDA-360496744DD6}]
SEQPACKET 1
ConnectionlessServiceFalse
GuaranteesDelivery   True
GuaranteesSequencing True
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{7CB23457-7463-4329-BDDA-360496744DD6}]
DATAGRAM 1
ConnectionlessServiceTrue
GuaranteesDelivery   False
GuaranteesSequencing False
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{FB994C95-5C46-4CA9-8AA1-D37FC394B8C1}]
SEQPACKET 2
```

```
ConnectionlessServiceFalse
GuaranteesDelivery   True
GuaranteesSequencing True
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting False
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidth False
SupportsMulticasting False

Name   MSAFD NetBIOS [\Device\NetBT_Tcpip_{FB994C95-5C46-4CA9-8AA1-D37FC394B8C1}]
DATAGRAM 2
ConnectionlessServiceTrue
GuaranteesDelivery   False
GuaranteesSequencing False
MaximumAddressSize   20 bytes
MaximumMessageSize   64000 bytes
MessageOriented      True
MinimumAddressSize   20 bytes
PseudoStreamOriented False
SupportsBroadcasting True
SupportsConnectData  False
SupportsDisconnectDataFalse
SupportsEncryption   False
SupportsExpeditedDataFalse
SupportsGracefulClosing    False
SupportsGuaranteedBandwidth False
SupportsMulticasting False


[WinSock]

Item   Value
File   c:\winnt\system32\winsock.dll
Version3.10
Size   2.80 KB (2,864 bytes)

File   c:\winnt\system32\wsock32.dll
Version5.00.2152.1
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 ControlNot Available
Settable Parity      Not Available
Settable Parity CheckNot 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   0
Abort Read/Write on Error   0
Binary Mode Enabled  -1
Continue XMit on XOff0
CTS Outflow Control  0
Discard NULL Bytes   0
DSR Outflow Control  0
DSR Sensitivity      0
DTR Flow Control TypeEnable
EOF Character 0
Error Replace Character     0
Error Replacement Enabled   0
Event Character      0
Parity Check Enabled 0
RTS Flow Control TypeEnable
XOff Character19
XOffXMit Threshold   512
XOn Character 17
XOnXMit Threshold    2048
XOnXOff InFlow Control0
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 ROOT\*PNP0501\PNPBIOS_2
Maximum Input Buffer Size   0
Maximum Output Buffer Size  False
Settable Baud Rate   True
Settable Data Bits   True
Settable Flow ControlTrue
Settable Parity      True
Settable Parity CheckTrue
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 XOff0
CTS Outflow Control  0
Discard NULL Bytes   0
DSR Outflow Control  0
DSR Sensitivity      0
DTR Flow Control TypeEnable
EOF Character 0
Error Replace Character     0
Error Replacement Enabled   0
Event Character      0
Parity Check Enabled 0
RTS Flow Control TypeEnable
XOff Character19
XOffXMit Threshold   512
XOn Character 17
XOnXMit Threshold    2048
XOnXOff InFlow Control0
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 (4,548,546,560 bytes)
Free Space    1.91 GB (2,051,444,736 bytes)
Volume Name
Volume Serial Number 8C87CB41
Partition     Disk #0, Partition #0
Partition Size4.24 GB (4,548,547,584 bytes)
Starting Offset      32256 bytes
Drive Description    Disk drive
Drive Manufacturer   (Standard disk drives)
Drive Model   IBM DNES-309170W SCSI Disk Device
Drive BytesPerSector 512
Drive MediaLoaded    True
Drive MediaType      Fixed hard disk media
Drive Partitions     1
Drive SCSIBus 0
Drive SCSILogicalUnit0
Drive SCSIPort1
Drive SCSITargetId   0
Drive SectorsPerTrack63
Drive Size    9097159680 bytes
Drive TotalCylinders 1106
Drive TotalSectors   17767890
Drive TotalTracks    282030
Drive TracksPerCylinder    255


[SCSI]

Item   Value
Name   Adaptec AHA-2940U2/U2W PCI SCSI Controller
CaptionAdaptec 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 ControlledNot 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   StartedStart 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      StoppedOK     Normal
       False  False
acpiec ACPIEC Not Available Kernel Driver False  Disabled      StoppedOK     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   RunningOK     Normal False  True
agp440 Intel AGP Bus Filter c:\winnt\system32\drivers\agp440.sysKernel Driver True
       Boot   RunningOK     Normal False  True
aha154xAha154xNot Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
aic116xaic116xNot Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
aic78u2aic78u2c:\winnt\system32\drivers\aic78u2.sysKernel Driver True   Boot   Running
       OK     Normal False  True
aic78xxaic78xxNot Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
ami0nt ami0nt Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
amsint amsint Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
asc    asc    Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
asc3350p      asc3350p      Not Available Kernel Driver False  Disabled      Stopped
       OK     Normal False  False
asc3550asc3550Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
asyncmac      RAS Asynchronous Media Driverc:\winnt\system32\drivers\asyncmac.sys
       Kernel Driver False  Manual StoppedOK     Normal False  False
atapi  Standard IDE/ESDI Hard Disk Controller   c:\winnt\system32\drivers\atapi.sys
       Kernel Driver True   Boot   RunningOK     Normal False  True
atdisk Atdisk Not Available Kernel Driver False  Disabled      StoppedOK     Ignore
       False  False
atirageatiragec:\winnt\system32\drivers\atiragem.sys   Kernel Driver True   Manual
       RunningOK     Ignore False  True
atmarpcATM ARP Client Protocol    c:\winnt\system32\drivers\atmarpc.sysKernel Driver
       False  Manual StoppedOK     Normal False  False
audstubAudio Stub Driver    c:\winnt\system32\drivers\audstub.sysKernel Driver True
       Manual RunningOK     Normal False  True
beep   Beep   c:\winnt\system32\drivers\beep.sysKernel 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
cdaudioCdaudioc:\winnt\system32\drivers\cdaudio.sysKernel Driver False  System Stopped
       OK     Ignore False  False
cdfs   Cdfs   c:\winnt\system32\drivers\cdfs.sys File System Driver   True
       Disabled      RunningOK     Normal False  True
cdrom  CD-ROM Driver c:\winnt\system32\drivers\cdrom.sysKernel Driver True   System
       RunningOK     Normal False  True
changerChangerNot Available Kernel Driver False  System StoppedOK     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   RunningOK     Normal False  True
disk   Disk Driver   c:\winnt\system32\drivers\disk.sys Kernel Driver True   Boot
       RunningOK     Normal False  True
diskperf      Diskperf      c:\winnt\system32\drivers\diskperf.sys   Kernel Driver
       True   Boot   RunningOK     Normal False  True
dmboot dmboot c:\winnt\system32\drivers\dmboot.sysKernel Driver False  Disabled
       StoppedOK     Normal False  False
dmio   Logical Disk Manager Driver c:\winnt\system32\drivers\dmio.sys Kernel Driver
       True   Boot   RunningOK     Normal False  True
dmload dmload c:\winnt\system32\drivers\dmload.sysKernel Driver True   Boot   Running
       OK     Normal False  True
e100b  Intel PRO Adapter Driver    c:\winnt\system32\drivers\e100bnt5.sys   Kernel
Driver True   Manual RunningOK     Normal False  True
efs    EFS    c:\winnt\system32\drivers\efs.sys  File System Driver   True
       Disabled      RunningOK     Normal False  True
fastfatFastfatc:\winnt\system32\drivers\fastfat.sysFile System Driver   True
       Disabled      RunningOK     Normal False  True
fd16_700      Fd16_700      Not Available Kernel Driver False  Disabled      Stopped
       OK     Normal False  False
fdc    Floppy Disk Controller Driverc:\winnt\system32\drivers\fdc.sys  Kernel Driver
       True   Manual RunningOK     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 RunningOK     Normal False  True
ftdisk Volume Manager Driverc:\winnt\system32\drivers\ftdisk.sysKernel Driver True
       Boot   RunningOK     Normal False  True
gnindiscLAN NDIS Driver     c:\winnt\system32\drivers\gnindis.sysKernel Driver True
       Auto   RunningOK     Normal False  True
gninvipl      cLAN VIPL Service    c:\winnt\system32\drivers\gninvipl.sys   Kernel
Driver False  Manual StoppedOK     Normal False  False
gnivia cLAN VIA Driver      c:\winnt\system32\drivers\gnivia.sysKernel Driver True
       Auto   RunningOK     Normal False  True
gpc    Generic Packet Classifier   c:\winnt\system32\drivers\msgpc.sysKernel Driver
       True   Manual RunningOK     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
ini910uini910uNot Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
intelide      IntelIde      c:\winnt\system32\drivers\intelide.sys   Kernel Driver
       True   Boot   RunningOK     Normal False  True
```

```
ipfilterdriverIP Traffic Filter Driver   c:\winnt\system32\drivers\ipfltdrv.sys
       Kernel Driver False  Manual StoppedOK     Normal False  False
ipinip IP in IP Tunnel Driverc:\winnt\system32\drivers\ipinip.sysKernel Driver False
       Manual StoppedOK     Normal False  False
ipnat  IP Network Address Translatorc:\winnt\system32\drivers\ipnat.sysKernel Driver
       False  Manual StoppedOK     Normal False  False
ipsec  IPSEC driver  c:\winnt\system32\drivers\ipsec.sysKernel Driver False  Manual
       StoppedOK     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.sysKernel Driver
       True   Boot   RunningOK     Critical      False  True
kbdclass      Keyboard Class Driverc:\winnt\system32\drivers\kbdclass.sys   Kernel
Driver True   System RunningOK     Normal False  True
ksecdd KSecDD c:\winnt\system32\drivers\ksecdd.sysKernel Driver True   Boot   Running
       OK     Normal False  True
lbrtfdclbrtfdcNot Available Kernel Driver False  System StoppedOK     Ignore False
       False
lp6nds35      lp6nds35      Not Available Kernel Driver False  Disabled      Stopped
       OK     Normal False  False
mnmdd  mnmdd  c:\winnt\system32\drivers\mnmdd.sysKernel Driver True   System Running
       OK     Ignore False  True
modem  Modem  c:\winnt\system32\drivers\modem.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
mouclass      Mouse Class Driver   c:\winnt\system32\drivers\mouclass.sys   Kernel
Driver True   System RunningOK     Normal False  True
mountmgr      MountMgr      c:\winnt\system32\drivers\mountmgr.sys   Kernel Driver
       True   Boot   RunningOK     Normal False  True
mraid35x      mraid35x      Not Available Kernel Driver False  Disabled      Stopped
       OK     Normal False  False
mrxsmb MRXSMB c:\winnt\system32\drivers\mrxsmb.sysFile System Driver   True   System
       RunningOK     Normal False  True
msfs   Msfs   c:\winnt\system32\drivers\msfs.sysFile System Driver   True   System
       RunningOK     Normal False  True
mskssrvMicrosoft Streaming Service Proxy c:\winnt\system32\drivers\mskssrv.sysKernel
Driver False  Manual StoppedOK     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 Proxyc:\winnt\system32\drivers\mspqm.sys
       Kernel Driver False  Manual StoppedOK     Normal False  False
mup    Mup    c:\winnt\system32\drivers\mup.sys  File System Driver   True   Boot
       RunningOK     Normal False  True
ncrc710Ncrc710Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
ndis   NDIS System Driver   c:\winnt\system32\drivers\ndis.sys Kernel Driver True
       Boot   RunningOK     Normal False  True
ndistapi      Remote Access NDIS TAPI Driver
       c:\winnt\system32\drivers\ndistapi.sys   Kernel Driver True   Manual Running
       OK     Normal False  True
ndiswanRemote Access NDIS WAN Driverc:\winnt\system32\drivers\ndiswan.sysKernel Driver
       True   Manual RunningOK     Normal False  True
ndproxyNDIS Proxy    c:\winnt\system32\drivers\ndproxy.sysKernel Driver True   Manual
       RunningOK     Normal False  True
netbiosNetBIOS Interface    c:\winnt\system32\drivers\netbios.sysFile System Driver
       True   System RunningOK     Normal False  True
netbt  NetBios over Tcpip   c:\winnt\system32\drivers\netbt.sysKernel Driver True
       System RunningOK     Normal False  True
netdetect     NetDetect     c:\winnt\system32\drivers\netdtect.sys   Kernel Driver
       False  Manual StoppedOK     Normal False  False
npfs   Npfs   c:\winnt\system32\drivers\npfs.sysFile System Driver   True   System
       RunningOK     Normal False  True
ntfs   Ntfs   c:\winnt\system32\drivers\ntfs.sysFile System Driver   True
       Disabled      RunningOK     Normal False  True
null   Null   c:\winnt\system32\drivers\null.sysKernel Driver True   System Running
       OK     Normal False  True
nwlnkflt      IPX Traffic Filter Driver  c:\winnt\system32\drivers\nwlnkflt.sys
       Kernel Driver False  Manual StoppedOK     Normal False  False
nwlnkfwd      IPX Traffic Forwarder Driverc:\winnt\system32\drivers\nwlnkfwd.sys
       Kernel Driver False  Manual StoppedOK     Normal False  False
```

```
parallel      Parallel class driverc:\winnt\system32\drivers\parallel.sys   Kernel
Driver True   Manual RunningOK     Normal False  True
parportParallel port driver c:\winnt\system32\drivers\parport.sysKernel Driver True
       System RunningOK     Ignore False  True
partmgrPartMgrc:\winnt\system32\drivers\partmgr.sysKernel Driver True   Boot   Running
       OK     Normal False  True
parvdm ParVdm c:\winnt\system32\drivers\parvdm.sysKernel Driver True   Auto   Running
       OK     Ignore False  True
pci    PCI Bus Driverc:\winnt\system32\drivers\pci.sys  Kernel Driver True   Boot
       RunningOK     Critical      False  True
pcidumpPCIDumpNot Available Kernel Driver False  System StoppedOK     Ignore False
       False
pciide PCIIde Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
pcmcia Pcmcia c:\winnt\system32\drivers\pcmcia.sysKernel Driver False  Disabled
       StoppedOK     Normal False  False
pdcomp PDCOMP Not Available Kernel Driver False  Manual StoppedOK     Ignore False
       False
pdframePDFRAMENot Available Kernel Driver False  Manual StoppedOK     Ignore False
       False
pdreli PDRELI Not Available Kernel Driver False  Manual StoppedOK     Ignore False
       False
pdrframe      PDRFRAME      Not Available Kernel Driver False  Manual StoppedOK
       Ignore False  False
pptpminiport  WAN Miniport (PPTP)  c:\winnt\system32\drivers\raspptp.sysKernel Driver
       True   Manual RunningOK     Normal False  True
ptilinkDirect Parallel Link Driver c:\winnt\system32\drivers\ptilink.sysKernel Driver
       True   Manual RunningOK     Normal False  True
ql1080 ql1080 Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
ql10wntQl10wntNot Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
ql1240 ql1240 Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
ql2100 ql2100 Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
rasacd Remote Access Auto Connection Driverc:\winnt\system32\drivers\rasacd.sysKernel
Driver True   System RunningOK     Normal False  True
rasl2tpWAN Miniport (L2TP)  c:\winnt\system32\drivers\rasl2tp.sysKernel Driver True
       Manual RunningOK     Normal False  True
raspti Direct Parallel      c:\winnt\system32\drivers\raspti.sysKernel Driver True
       Manual RunningOK     Normal False  True
rca    Microsoft Streaming Network Raw Channel Access
       c:\winnt\system32\drivers\rca.sys  Kernel Driver False  Manual StoppedOK
       Normal False  False
rdbss  Rdbss  c:\winnt\system32\drivers\rdbss.sysFile System Driver   True   System
       RunningOK     Normal False  True
rdpwd  RDPWD  c:\winnt\system32\drivers\rdpwd.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
redbookDigital CD Audio Playback Filter Driver  c:\winnt\system32\drivers\redbook.sys
       Kernel Driver False  System StoppedOK     Normal False  False
serenumSerenum Filter Driverc:\winnt\system32\drivers\serenum.sysKernel Driver True
       Manual RunningOK     Normal False  True
serial Serial port driver   c:\winnt\system32\drivers\serial.sysKernel Driver True
       System RunningOK     Ignore False  True
sfloppySfloppyc:\winnt\system32\drivers\sfloppy.sysKernel Driver False  System Stopped
       OK     Ignore False  False
sglfb  sglfb  Not Available Kernel Driver False  System StoppedOK     Normal False
       False
simbad Simbad Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
sparrowSparrowNot Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
spud   Special Purpose Utility Driver    c:\winnt\system32\drivers\spud.sys Kernel
Driver True   Manual RunningOK     Normal False  True
srv    Srv    c:\winnt\system32\drivers\srv.sys  File System Driver   True   Manual
       RunningOK     Normal False  True
swenum Software Bus Driver  c:\winnt\system32\drivers\swenum.sysKernel Driver True
       Manual RunningOK     Normal False  True
```

```
symc810symc810Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
symc8xxsymc8xxNot Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
sym_hi sym_hi Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
tcpip  TCP/IP Protocol Driverc:\winnt\system32\drivers\tcpip.sysKernel Driver True
       System RunningOK     Normal False  True
tdasyncTDASYNCc:\winnt\system32\drivers\tdasync.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
tdipx  TDIPX  c:\winnt\system32\drivers\tdipx.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
tdnetb TDNETB c:\winnt\system32\drivers\tdnetb.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
tdpipe TDPIPE c:\winnt\system32\drivers\tdpipe.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
tdspx  TDSPX  c:\winnt\system32\drivers\tdspx.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
tdtcp  TDTCP  c:\winnt\system32\drivers\tdtcp.sysKernel Driver False  Manual Stopped
       OK     Ignore False  False
termdd Terminal Device Driverc:\winnt\system32\drivers\termdd.sysKernel Driver False
       Disabled      StoppedOK     Normal False  False
tga    tga    Not Available Kernel Driver False  System StoppedOK     Ignore False
       False
udfs   Udfs   c:\winnt\system32\drivers\udfs.sysFile System Driver   False
       Disabled      StoppedOK     Normal False  False
uhcd   Microsoft USB Universal Host Controller Driver
       c:\winnt\system32\drivers\uhcd.sysKernel Driver True   Manual RunningOK
       Normal False  True
ultra66ultra66Not Available Kernel Driver False  Disabled      StoppedOK     Normal
       False  False
update Microcode Update Driver     c:\winnt\system32\drivers\update.sysKernel Driver
       True   Manual RunningOK     Normal False  True
usbhub Microsoft USB Standard Hub Driver  c:\winnt\system32\drivers\usbhub.sysKernel
Driver True   Manual RunningOK     Normal False  True
vgasaveVgaSavec:\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.sysKernel Driver
       True   Manual RunningOK     Normal False  True
wdica  WDICA  Not Available Kernel Driver False  Manual StoppedOK     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_80_2k_145_01_ENT\x86\binn<SYSTEM>
PATHEXT.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH<SYSTEM>
PROCESSOR_ARCHITECTUREx86    <SYSTEM>
PROCESSOR_IDENTIFIER x86 Family 6 Model 7 Stepping 3, GenuineIntel   <SYSTEM>
PROCESSOR_LEVEL      6      <SYSTEM>
PROCESSOR_REVISION   0703   <SYSTEM>
ROOTDIRC:/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  CLIENT6\Administrator
TMP    %USERPROFILE%\Local Settings\Temp  CLIENT6\Administrator

[Jobs]

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

```
[Print]

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

[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    VersionSize   File Date
system idle process  Not Available 0      0      Not Available Not Available Not
Available     UnknownUnknownUnknown
system Not Available 8      8      0      1413120Not Available UnknownUnknownUnknown
smss.exe      c:\winnt\system32\smss.exe  156    11     204800 14131206/23/2000
2:59:54 PM    5.00.2170.1   44.27 KB (45,328 bytes)     12/7/1999 6:00:00 AM
csrss.exe     Not Available 184    13     Not Available Not Available 6/23/2000
2:59:58 PM    UnknownUnknownUnknown
winlogon.exe  c:\winnt\system32\winlogon.exe     204    13     204800 1413120
       6/23/2000 3:00:00 PM 5.00.2182.1   173.27 KB (177,424 bytes)  12/7/1999
6:00:00 AM
services.exe  c:\winnt\system32\services.exe     232    9      204800 1413120
       6/23/2000 3:00:01 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 14131206/23/2000
3:00:01 PM    5.00.2184.1   32.77 KB (33,552 bytes)     12/7/1999 6:00:00 AM
gnconmgr.exe  c:\winnt\system32\gnconmgr.exe     384    8      204800 1413120
       6/23/2000 3:00:04 PM 4.00.0096.00 KB (98,304 bytes)     8/16/1999 9:09:37 AM
svchost.exe   c:\winnt\system32\svchost.exe432    8      204800 14131206/23/2000
3:00:05 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 456    8      204800 14131206/23/2000
3:00:06 PM    1999.9.3421.3 6.77 KB (6,928 bytes)4/1/2000 11:08:06 AM
svchost.exe   c:\winnt\system32\svchost.exe568    8      204800 14131206/23/2000
3:00:09 PM    5.00.2134.1   7.77 KB (7,952 bytes)12/7/1999 6:00:00 AM
regsvc.exe    c:\winnt\system32\regsvc.exe592    8      204800 14131206/23/2000
3:00:09 PM    5.00.2155.1   65.27 KB (66,832 bytes)     12/7/1999 6:00:00 AM
mstask.exe    c:\winnt\system32\mstask.exe608    8      204800 14131206/23/2000
3:00:09 PM    4.71.2137.1   115.27 KB (118,032 bytes)   4/1/2000 5:13:15 PM
winmgmt.exe   c:\winnt\system32\wbem\winmgmt.exe632    8      204800 1413120
       6/23/2000 3:00:10 PM 1.50.1085.0001188.05 KB (192,567 bytes)  12/7/1999
6:00:00 AM
inetinfo.exe  c:\winnt\system32\inetsrv\inetinfo.exe   672    8      204800 1413120
       6/23/2000 3:00:11 PM 5.00.0984     14.27 KB (14,608 bytes)     4/1/2000
11:08:52 AM
explorer.exe  c:\winnt\explorer.exe832    8      204800 14131206/23/2000 3:00:17 PM
       5.00.2920.0000232.77 KB (238,352 bytes)  12/7/1999 6:00:00 AM
sqlmangr.exe  c:\program files\common files\microsoft shared\service
manager\sqlmangr.exe 900    8      204800 14131206/23/2000 3:00:22 PM
       2000.080.0145.01     68.00 KB (69,632 bytes)     4/2/2000 1:53:44 PM
svchost.exe   c:\winnt\system32\svchost.exe1056   8      204800 14131206/23/2000
3:00:30 PM    5.00.2134.1   7.77 KB (7,952 bytes)12/7/1999 6:00:00 AM
mmc.exec:\winnt\system32\mmc.exe   648    8      204800 14131206/26/2000 4:23:13 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 14131206/26/2000
4:24:07 PM    5.00.2167.1   172.77 KB (176,912 bytes)  12/7/1999 6:00:00 AM

[Loaded Modules]

Name   VersionSize   File Date     Manufacturer  Path
traffic.dll   5.00.2139.1   30.77 KB (31,504 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\traffic.dll
rsvp.exe      5.00.2167.1   172.77 KB (176,912 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\rsvp.exe
```

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wbemprox.dll  1.50.1085.000140.05 KB (41,016 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wbem\wbemprox.dll
mlang.dll     5.00.2920.0000510.77 KB (523,024 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\mlang.dll
rassapi.dll   5.00.2188.1   14.27 KB (14,608 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\rassapi.dll
adsnt.dll     5.00.2191.1   194.27 KB (198,928 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\adsnt.dll
dbghelp.dll   5.00.2195.1   159.27 KB (163,088 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\dbghelp.dll
localsec.dll  5.00.2134.1   227.27 KB (232,720 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\localsec.dll
devmgr.dll    5.00.2166.1   215.77 KB (220,944 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\devmgr.dll
filemgmt.dll  5.00.2134.1   287.27 KB (294,160 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\filemgmt.dll
pdh.dll5.00.2174.1   143.27 KB (146,704 bytes)   12/7/1999 6:00:00 AM 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 Corporationc:\winnt\system32\smlogcfg.dll
cabinet.dll   5.00.2147.1   54.77 KB (56,080 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\cabinet.dll
msinfo32.dll  5.00.2177.1   312.27 KB (319,760 bytes)   4/1/2000 5:13:23 PM
       Microsoft Corporationc:\program files\common files\microsoft
shared\msinfo\msinfo32.dll
riched20.dll  5.30.23.1200  421.27 KB (431,376 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\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.dll5.00.2175.1   151.27 KB (154,896 bytes)   12/7/1999 6:00:00 AM Microsoft
Corporation   c:\winnt\system32\els.dll
ntmsmgr.dll   1,0,0,1427.77 KB (438,032 bytes)   12/7/1999 6:00:00 AM Microsoft
Corporation and HighGround Systems, Inc. c:\winnt\system32\ntmsmgr.dll
mmfutil.dll   1.50.1085.000032.06 KB (32,829 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\mmfutil.dll
logdrive.dll  1.50.1085.0000200.06 KB (204,863 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\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  5.00.2150.1   41.77 KB (42,768 bytes)     12/7/1999 6:00:00 AM
       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    2191.1.296.2  41.77 KB (42,768 bytes)     12/7/1999 6:00:00 AM VERITAS
Software Corp.c:\winnt\system32\dmutil.dll
ntmsapi.dll   5.00.1948.1   50.27 KB (51,472 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\ntmsapi.dll
dmdskmgr.dll  2191.1.296.2  158.77 KB (162,576 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corp., VERITAS Software c:\winnt\system32\dmdskmgr.dll
mycomput.dll  5.00.2134.1   107.77 KB (110,352 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\mycomput.dll
mmcndmgr.dll  5.00.2178.1   815.27 KB (834,832 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\mmcndmgr.dll
mfc42u.dll    6.00.8665.0   972.05 KB (995,384 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\mfc42u.dll
mmc.exe5.00.2153.1   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 Corporationc:\winnt\system32\tapisrv.dll
sqlmangr.rll  2000.080.0145.01     88.00 KB (90,112 bytes)     4/2/2000 1:53:45 PM
       Microsoft Corporationc:\program files\common files\microsoft shared\service
manager\resources\1033\sqlmangr.rll
odbcint.dll   3.520.6330.0  88.00 KB (90,112 bytes)     6/12/2000 3:01:01 PM
       Microsoft Corporationc:\winnt\system32\odbcint.dll
sqlunirl.dll  2000.080.0145.01     172.06 KB (176,194 bytes)   6/3/2000 3:52:12 PM
       Microsoft Corporationc:\winnt\system32\sqlunirl.dll
comdlg32.dll  5.00.2920.0000236.77 KB (242,448 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\comdlg32.dll
odbc32.dll    3.520.6330.0  216.27 KB (221,456 bytes)   6/12/2000 3:01:01 PM
       Microsoft Corporationc:\winnt\system32\odbc32.dll
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w95scm.dll    2000.080.0145.01     48.06 KB (49,216 bytes)     4/2/2000 1:53:44 PM
       Microsoft Corporationc:\program files\common files\microsoft shared\service
manager\w95scm.dll
sqlmangr.exe  2000.080.0145.01     68.00 KB (69,632 bytes)     4/2/2000 1:53:44 PM
       Microsoft Corporationc:\program files\common files\microsoft shared\service
manager\sqlmangr.exe
shdoclc.dll   5.00.2920.0000324.50 KB (332,288 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\shdoclc.dll
wininet.dll   5.00.2920.0000456.77 KB (467,728 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wininet.dll
urlmon.dll    5.00.2920.0000426.77 KB (437,008 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\urlmon.dll
ntshrui.dll   5.00.2134.1   46.77 KB (47,888 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\ntshrui.dll
linkinfo.dll  5.00.2134.1   15.77 KB (16,144 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\linkinfo.dll
browselc.dll  5.00.2920.000034.50 KB (35,328 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\browselc.dll
msi.dll1.10.1029.0   1.71 MB (1,794,320 bytes)  12/7/1999 6:00:00 AM Microsoft
Corporation   c:\winnt\system32\msi.dll
powrprof.dll  5.00.2920.000013.27 KB (13,584 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\powrprof.dll
batmeter.dll  5.00.2920.000020.27 KB (20,752 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\batmeter.dll
stobject.dll  5.00.2144.1   81.77 KB (83,728 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\stobject.dll
webcheck.dll  5.00.2920.0000251.77 KB (257,808 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\webcheck.dll
browseui.dll  5.00.2920.0000793.27 KB (812,304 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\browseui.dll
shdocvw.dll   5.00.2920.00001.05 MB (1,104,144 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\shdocvw.dll
explorer.exe  5.00.2920.0000232.77 KB (238,352 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\explorer.exe
iislog.dll    5.00.0984     76.27 KB (78,096 bytes)     4/1/2000 11:08:52 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\iislog.dll
httpext.dll   0.9.3939.9    418.27 KB (428,304 bytes)   4/1/2000 11:08:52 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\httpext.dll
md5filt.dll   5.00.0984     32.77 KB (33,552 bytes)     4/1/2000 11:08:58 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\md5filt.dll
gzip.dll      5.00.0984     30.27 KB (30,992 bytes)     4/1/2000 11:08:58 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\gzip.dll
compfilt.dll  5.00.0984     22.27 KB (22,800 bytes)     4/1/2000 11:08:57 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\compfilt.dll
sspifilt.dll  5.00.0984     43.27 KB (44,304 bytes)     4/1/2000 11:08:59 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\sspifilt.dll
iscomlog.dll  5.00.0984     24.77 KB (25,360 bytes)     4/1/2000 11:08:53 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\iscomlog.dll
lonsint.dll   5.00.0984     11.77 KB (12,048 bytes)     4/1/2000 11:08:53 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\lonsint.dll
inetsloc.dll  5.00.0984     20.27 KB (20,752 bytes)     4/1/2000 11:08:54 AM
       Microsoft Corporationc:\winnt\system32\inetsloc.dll
iisfecnv.dll  5.00.0984     7.27 KB (7,440 bytes)4/1/2000 11:08:52 AM Microsoft
Corporation   c:\winnt\system32\inetsrv\iisfecnv.dll
isatq.dll     5.00.0984     61.27 KB (62,736 bytes)     4/1/2000 11:08:55 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\isatq.dll
infocomm.dll  5.00.0984     234.27 KB (239,888 bytes)   4/1/2000 11:08:52 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\infocomm.dll
w3svc.dll     5.00.0984     347.27 KB (355,600 bytes)   4/1/2000 11:09:00 AM
       Microsoft Corporationc:\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)     4/1/2000 11:08:53 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\svcext.dll
admexs.dll    5.00.0984     27.77 KB (28,432 bytes)     4/1/2000 11:08:52 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\admexs.dll
wamreg.dll    5.00.0984     46.27 KB (47,376 bytes)     4/1/2000 11:09:00 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\wamreg.dll
metadata.dll  5.00.0984     70.77 KB (72,464 bytes)     4/1/2000 11:08:53 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\metadata.dll
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iismap.dll    5.00.0984     56.27 KB (57,616 bytes)    4/1/2000 11:08:54 AM
       Microsoft Corporationc:\winnt\system32\iismap.dll
nsepm.dll     5.00.0984     43.27 KB (44,304 bytes)    4/1/2000 11:08:53 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\nsepm.dll
admwprox.dll  5.00.0984     31.77 KB (32,528 bytes)    4/1/2000 11:08:54 AM
       Microsoft Corporationc:\winnt\system32\admwprox.dll
coadmin.dll   5.00.0984     39.77 KB (40,720 bytes)    4/1/2000 11:08:54 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\coadmin.dll
iisadmin.dll  5.00.0984     14.77 KB (15,120 bytes)    4/1/2000 11:08:52 AM
       Microsoft Corporationc:\winnt\system32\inetsrv\iisadmin.dll
rpcref.dll    5.00.0984     4.27 KB (4,368 bytes)4/1/2000 11:08:53 AM Microsoft
Corporation   c:\winnt\system32\inetsrv\rpcref.dll
iisrtl.dll    5.00.0984     120.77 KB (123,664 bytes)  4/1/2000 11:08:53 AM
       Microsoft Corporationc:\winnt\system32\iisrtl.dll
inetinfo.exe  5.00.0984     14.27 KB (14,608 bytes)    4/1/2000 11:08:52 AM
       Microsoft Corporationc:\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 Corporationc:\winnt\system32\netui1.dll
netui0.dll    5.00.2134.1   70.27 KB (71,952 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\netui0.dll
ntlanman.dll  5.00.2157.1   35.27 KB (36,112 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\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 Corporationc:\winnt\system32\rapilib.dll
rsvpsp.dll    5.00.2167.1   74.77 KB (76,560 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\rsvpsp.dll
ntmarta.dll   5.00.2158.1   98.77 KB (101,136 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\ntmarta.dll
provthrd.dll  1.50.1085.000068.07 KB (69,708 bytes)    4/1/2000 5:13:15 PM
       Microsoft Corporationc:\winnt\system32\wbem\provthrd.dll
ntevt.dll     1.50.1085.0000192.06 KB (196,669 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\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 Corporationc:\winnt\system32\perfos.dll
psapi.dll     5.00.2134.1   28.27 KB (28,944 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\psapi.dll
framedyn.dll  1.50.1085.0000164.05 KB (167,992 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wbem\framedyn.dll
cimwin32.dll  1.50.1085.00001.03 MB (1,077,306 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wbem\cimwin32.dll
wbemsvc.dll   1.50.1085.0000140.07 KB (143,430 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wbem\wbemsvc.dll
wbemess.dll   1.50.1085.0001352.05 KB (360,503 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wbem\wbemess.dll
fastprox.dll  1.50.1085.0001144.08 KB (147,534 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wbem\fastprox.dll
wbemcore.dll  1.50.1085.0001632.05 KB (647,224 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wbem\wbemcore.dll
wbemcomn.dll  1.50.1085.0001684.05 KB (700,472 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wbem\wbemcomn.dll
winmgmt.exe   1.50.1085.0001188.05 KB (192,567 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wbem\winmgmt.exe
msidle.dll    5.00.2920.00006.27 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)  4/1/2000 5:13:15 PM
       Microsoft Corporationc:\winnt\system32\mstask.exe
regsvc.exe    5.00.2155.1   65.27 KB (66,832 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\regsvc.exe
rasdlg.dll    5.00.2194.1   514.27 KB (526,608 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\rasdlg.dll
netcfgx.dll   5.00.2175.1   533.77 KB (546,576 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\netcfgx.dll
rasmans.dll   5.00.2188.1   146.77 KB (150,288 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\rasmans.dll
wmi.dll5.00.2191.1   6.27 KB (6,416 bytes)12/7/1999 6:00:00 AM Microsoft Corporation
       c:\winnt\system32\wmi.dll
netshell.dll  5.00.2176.1   456.77 KB (467,728 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\netshell.dll
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netman.dll    5.00.2175.1   88.77 KB (90,896 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\netman.dll
sens.dll      5.00.2163.1   36.77 KB (37,648 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\sens.dll
es.dll 1999.9.3422.21231.77 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)  4/1/2000 11:08:07 AM
       Microsoft Corporationc:\winnt\system32\mtxoci.dll
resutils.dll  5.00.2191.1   39.77 KB (40,720 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\resutils.dll
clusapi.dll   5.00.2179.1   50.27 KB (51,472 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\clusapi.dll
msvcp50.dll   5.00.7051     552.50 KB (565,760 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\msvcp50.dll
xolehlp.dll   1999.9.3421.3 17.27 KB (17,680 bytes)    4/1/2000 11:08:07 AM
       Microsoft Corporationc:\winnt\system32\xolehlp.dll
msdtclog.dll  1999.9.3421.3 89.77 KB (91,920 bytes)    4/1/2000 11:08:06 AM
       Microsoft Corporationc:\winnt\system32\msdtclog.dll
mtxclu.dll    1999.9.3421.3 50.27 KB (51,472 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\mtxclu.dll
msdtcprx.dll  1999.9.3422.10619.27 KB (634,128 bytes)  4/1/2000 11:08:07 AM
       Microsoft Corporationc:\winnt\system32\msdtcprx.dll
txfaux.dll    1999.9.3422.24341.27 KB (349,456 bytes)  4/1/2000 11:08:07 AM
       Microsoft Corporationc:\winnt\system32\txfaux.dll
msdtctm.dll   1999.9.3422.121.02 MB (1,070,864 bytes)  4/1/2000 11:08:07 AM
       Microsoft Corporationc:\winnt\system32\msdtctm.dll
msdtc.exe     1999.9.3421.3 6.77 KB (6,928 bytes)4/1/2000 11:08:06 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 Corporationc:\winnt\system32\winrnr.dll
dhcpcsvc.dll  5.00.2153.1   88.77 KB (90,896 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\dhcpcsvc.dll
tapi32.dll    5.00.2182.1   123.27 KB (126,224 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\tapi32.dll
rasman.dll    5.00.2188.1   54.77 KB (56,080 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\rasman.dll
rasapi32.dll  5.00.2188.1   189.77 KB (194,320 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\rasapi32.dll
iphlpapi.dll  5.00.2173.2   67.77 KB (69,392 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\iphlpapi.dll
rnr20.dll     5.00.2152.1   35.77 KB (36,624 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\rnr20.dll
wshtcpip.dll  5.00.2134.1   17.27 KB (17,680 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wshtcpip.dll
msafd.dll     5.00.2153.1   54.27 KB (55,568 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\msafd.dll
rpcss.dll     5.00.2181.1   229.27 KB (234,768 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\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      4.00.0080.00 KB (81,920 bytes)     1/7/2000 4:13:07 PM  Giganet
Incorporated  c:\winnt\system32\vipl.dll
gnconmgr.exe  4.00.0096.00 KB (98,304 bytes)     8/16/1999 9:09:37 AM 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 Corporationc:\winnt\system32\scecli.dll
atl.dll3.00.8449     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 Corporationc:\winnt\system32\certcli.dll
esent.dll     6.0.3939.6    1.07 MB (1,120,016 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\esent.dll
mswsock.dll   5.00.2152.1   62.27 KB (63,760 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\mswsock.dll
ntdsatq.dll   5.00.2181.1   31.27 KB (32,016 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\ntdsatq.dll
ntdsa.dll     5.00.2195.1   993.27 KB (1,017,104 bytes) 12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\ntdsa.dll
```

```
kdcsvc.dll    5.00.2181.1   133.77 KB (136,976 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\kdcsvc.dll
sfmapi.dll    5.00.2134.1   38.77 KB (39,696 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\sfmapi.dll
rtutils.dll   5.00.2168.1   43.77 KB (44,816 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\rtutils.dll
adsldpc.dll   5.00.2172.1   127.77 KB (130,832 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\adsldpc.dll
activeds.dll  5.00.2172.1   172.77 KB (176,912 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\activeds.dll
mprapi.dll    5.00.2181.1   79.27 KB (81,168 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\mprapi.dll
rassfm.dll    5.00.2168.1   21.27 KB (21,776 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\rassfm.dll
mpr.dll5.00.2146.1   53.27 KB (54,544 bytes)    12/7/1999 6:00:00 AM Microsoft
Corporation   c:\winnt\system32\mpr.dll
schannel.dll  5.00.2170.1   139.77 KB (143,120 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\schannel.dll
netlogon.dll  5.00.2182.1   347.77 KB (356,112 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\netlogon.dll
msv1_0.dll    5.00.2164.1   94.77 KB (97,040 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\msv1_0.dll
kerberos.dll  5.00.2181.1   196.77 KB (201,488 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\kerberos.dll
msprivs.dll   5.00.2154.1   41.50 KB (42,496 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\msprivs.dll
samsrv.dll    5.00.2192.1   357.77 KB (366,352 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\samsrv.dll
lsasrv.dll    5.00.2184.1   487.77 KB (499,472 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\lsasrv.dll
lsass.exe     5.00.2184.1   32.77 KB (33,552 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\lsass.exe
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 Corporationc:\winnt\system32\wmicore.dll
browser.dll   5.00.2142.1   48.27 KB (49,424 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\browser.dll
alrsvc.dll    5.00.2134.1   17.77 KB (18,192 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\alrsvc.dll
psbase.dll    5.00.2146.1   111.77 KB (114,448 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\psbase.dll
cryptsvc.dll  5.00.2181.1   61.77 KB (63,248 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\cryptsvc.dll
cryptdll.dll  5.00.2135.1   41.27 KB (42,256 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\cryptdll.dll
wkssvc.dll    5.00.2181.1   95.27 KB (97,552 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wkssvc.dll
srvsvc.dll    5.00.2178.1   79.27 KB (81,168 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\srvsvc.dll
cfgmgr32.dll  5.00.2134.1   16.77 KB (17,168 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\cfgmgr32.dll
dmserver.dll  2191.1.296.2  11.77 KB (12,048 bytes)    12/7/1999 6:00:00 AM VERITAS
Software Corp.c:\winnt\system32\dmserver.dll
winsta.dll    5.00.2134.1   36.27 KB (37,136 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\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 Corporationc:\winnt\system32\eventlog.dll
ntdsapi.dll   5.00.2160.1   56.27 KB (57,616 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\ntdsapi.dll
scesrv.dll    5.00.2188.1   225.77 KB (231,184 bytes)  12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\scesrv.dll
umpnpmgr.dll  5.00.2182.1   86.27 KB (88,336 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\umpnpmgr.dll
services.exe  5.00.2134.1   86.77 KB (88,848 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\services.exe
```

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clbcatq.dll   1999.9.3422.14479.27 KB (490,768 bytes)   4/1/2000 11:08:00 AM
       Microsoft Corporationc:\winnt\system32\clbcatq.dll
oleaut32.dll  2.40.4512     600.27 KB (614,672 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\oleaut32.dll
cscui.dll     5.00.2172.1   227.27 KB (232,720 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\cscui.dll
winspool.drv  5.00.2167.1   109.77 KB (112,400 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\winspool.drv
winscard.dll  5.00.2134.1   77.27 KB (79,120 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\winscard.dll
wlnotify.dll  5.00.2164.1   53.27 KB (54,544 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wlnotify.dll
cscdll.dll    5.00.2189.1   98.27 KB (100,624 bytes)    12/7/1999 6:00:00 AM
       Microsoft Corporationc:\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 Corporationc:\winnt\system32\version.dll
rsabase.dll   5.00.2150.1   128.77 KB (131,856 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\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     5.00.2181.1   966.27 KB (989,456 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\ole32.dll
imagehlp.dll  5.00.2195.1   125.27 KB (128,272 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\imagehlp.dll
msasn1.dll    5.00.2134.1   51.27 KB (52,496 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\msasn1.dll
crypt32.dll   5.131.2173.1  465.77 KB (476,944 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\crypt32.dll
wintrust.dll  5.131.2143.1  162.27 KB (166,160 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wintrust.dll
setupapi.dll  5.00.2183.1   554.27 KB (567,568 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\setupapi.dll
winmm.dll     5.00.2161.1   184.77 KB (189,200 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\winmm.dll
comctl32.dll  5.81   540.27 KB (553,232 bytes)   12/7/1999 6:00:00 AM Microsoft
Corporation   c:\winnt\system32\comctl32.dll
shlwapi.dll   5.00.2920.0000282.77 KB (289,552 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\shlwapi.dll
shell32.dll   5.00.2920.00002.24 MB (2,352,400 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\shell32.dll
msgina.dll    5.00.2191.1   309.77 KB (317,200 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\msgina.dll
wsock32.dll   5.00.2152.1   21.27 KB (21,776 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wsock32.dll
dnsapi.dll    5.00.2181.1   129.77 KB (132,880 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\dnsapi.dll
wldap32.dll   5.00.2168.1   155.77 KB (159,504 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\wldap32.dll
ws2help.dll   5.00.2134.1   17.77 KB (18,192 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\ws2help.dll
ws2_32.dll    5.00.2134.1   69.77 KB (71,440 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\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 Corporationc:\winnt\system32\samlib.dll
netrap.dll    5.00.2134.1   11.27 KB (11,536 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\netrap.dll
netapi32.dll  5.00.2194.1   302.77 KB (310,032 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\netapi32.dll
profmap.dll   5.00.2181.1   29.27 KB (29,968 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\profmap.dll
secur32.dll   5.00.2154.1   46.77 KB (47,888 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\secur32.dll
sfc.dll5.00.2164.1   84.27 KB (86,288 bytes)     12/7/1999 6:00:00 AM 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 Corporationc:\winnt\system32\nddeapi.dll
userenv.dll   5.00.2185.1   361.27 KB (369,936 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\userenv.dll
```

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user32.dll    5.00.2180.1   393.27 KB (402,704 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\user32.dll
gdi32.dll     5.00.2180.1   228.77 KB (234,256 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\gdi32.dll
rpcrt4.dll    5.00.2193.1   434.27 KB (444,688 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\rpcrt4.dll
advapi32.dll  5.00.2191.1   349.27 KB (357,648 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\advapi32.dll
kernel32.dll  5.00.2191.1   715.27 KB (732,432 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\kernel32.dll
msvcrt.dll    6.10.8637.0   288.09 KB (295,000 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\msvcrt.dll
winlogon.exe  5.00.2182.1   173.27 KB (177,424 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\winlogon.exe
sfcfiles.dll  5.00.2195.1   973.27 KB (996,624 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\sfcfiles.dll
ntdll.dll     5.00.2163.1   469.77 KB (481,040 bytes)   12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\ntdll.dll
smss.exe      5.00.2170.1   44.27 KB (45,328 bytes)     12/7/1999 6:00:00 AM
       Microsoft Corporationc:\winnt\system32\smss.exe

[Services]

Display Name  Name   State  Start Mode    Service Type  Path   Error Control Start
Name   Tag ID
AlerterAlerterRunningAuto   Share Process c:\winnt\system32\services.exe    Normal
       LocalSystem   0
Application ManagementAppMgmtStoppedManual Share Process
       c:\winnt\system32\services.exe     Normal LocalSystem   0
Computer Browser     BrowserRunningAuto   Share Process
       c:\winnt\system32\services.exe     Normal LocalSystem   0
Indexing Service     cisvc  StoppedManual Share Process c:\winnt\system32\cisvc.exe
       Normal LocalSystem   0
ClipBook      ClipSrvStoppedManual Own Process   c:\winnt\system32\clipsrv.exeNormal
       LocalSystem   0
Distributed File System     Dfs    StoppedManual Own Process
       c:\winnt\system32\dfssvc.exeNormal LocalSystem   0
DHCP Client   Dhcp   StoppedManual Share Process c:\winnt\system32\services.exe
       Normal LocalSystem   0
Logical Disk Manager Administrative ServicedmadminStoppedManual Share Process
       c:\winnt\system32\dmadmin.exe /com Normal LocalSystem   0
Logical Disk Manager dmserver      RunningAuto   Share Process
       c:\winnt\system32\services.exe     Normal LocalSystem   0
DNS Client    Dnscache      StoppedManual Share Process
       c:\winnt\system32\services.exe     Normal LocalSystem   0
Event Log     Eventlog      RunningAuto   Share Process
       c:\winnt\system32\services.exe     Normal LocalSystem   0
COM+ Event System    EventSystem   RunningManual Share Process
       c:\winnt\system32\svchost.exe -k netsvcs  Normal LocalSystem   0
Fax Service   Fax    StoppedManual Own Process   c:\winnt\system32\faxsvc.exeNormal
       LocalSystem   0
cLAN Connection Manager     GniConMgr     RunningAuto   Own Process
       c:\winnt\system32\gnconmgr.exe     Normal LocalSystem   0
IIS Admin Service    IISADMIN      RunningAuto   Share Process
       c:\winnt\system32\inetsrv\inetinfo.exe    Normal LocalSystem   0
Intersite Messaging  IsmServStoppedDisabled      Own Process
       c:\winnt\system32\ismserv.exeNormal LocalSystem   0
Kerberos Key Distribution Center   kdc    StoppedDisabled      Share Process
       c:\winnt\system32\lsass.exe Normal LocalSystem   0
Server lanmanserver  RunningAuto   Share Process c:\winnt\system32\services.exe
       Normal LocalSystem   0
Workstation   lanmanworkstation    RunningAuto   Share Process
       c:\winnt\system32\services.exe     Normal LocalSystem   0
License Logging Service     LicenseServiceStoppedManual Own Process
       c:\winnt\system32\llssrv.exeNormal LocalSystem   0
TCP/IP NetBIOS Helper ServiceLmHostsRunningAuto   Share Process
       c:\winnt\system32\services.exe     Normal LocalSystem   0
Messenger     Messenger     StoppedManual Share Process
       c:\winnt\system32\services.exe     Normal LocalSystem   0
```

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NetMeeting Remote Desktop Sharing mnmsrvcStoppedManual Own Process
       c:\winnt\system32\mnmsrvc.exeNormal LocalSystem   0
Distributed Transaction CoordinatorMSDTC  RunningAuto   Own Process
       c:\winnt\system32\msdtc.exe Normal LocalSystem   0
Windows Installer    MSIServer     StoppedManual Share Process
       c:\winnt\system32\msiexec.exe /v  Normal LocalSystem   0
MSSQLSERVER   MSSQLSERVER   StoppedManual Own Process
       c:\progra~1\micros~2\mssql\binn\sqlservr.exeNormal LocalSystem   0
Network DDE   NetDDE StoppedManual Share Process c:\winnt\system32\netdde.exeNormal
       LocalSystem   0
Network DDE DSDM     NetDDEdsdm    StoppedManual Share Process
       c:\winnt\system32\netdde.exeNormal LocalSystem   0
Net Logon     Netlogon      StoppedManual Share Process c:\winnt\system32\lsass.exe
       Normal LocalSystem   0
Network Connections  Netman RunningManual Share Process c:\winnt\system32\svchost.exe
-k netsvcs    Normal LocalSystem   0
File Replication     NtFrs  StoppedManual Own Process   c:\winnt\system32\ntfrs.exe
       Ignore LocalSystem   0
NT LM Security Support Provider    NtLmSspStoppedManual Share Process
       c:\winnt\system32\lsass.exe Normal LocalSystem   0
Removable Storage    NtmsSvcStoppedManual Share Process c:\winnt\system32\svchost.exe
-k netsvcs    Normal LocalSystem   0
Plug and Play PlugPlay      RunningAuto   Share Process
       c:\winnt\system32\services.exe     Normal LocalSystem   0
IPSEC Policy Agent   PolicyAgent   StoppedManual Share Process
       c:\winnt\system32\lsass.exe Normal LocalSystem   0
Protected Storage    ProtectedStorage     RunningAuto   Share Process
       c:\winnt\system32\services.exe     Normal LocalSystem   0
Remote Access Auto Connection ManagerRasAutoStoppedManual Share Process
       c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem   0
Remote Access Connection Manager   RasMan StoppedManual Share Process
       c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem   0
Routing and Remote Access   RemoteAccess  StoppedDisabled      Share Process
       c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem   0
Remote Registry Service     RemoteRegistryRunningAuto   Own Process
       c:\winnt\system32\regsvc.exeNormal LocalSystem   0
Remote Procedure Call (RPC) LocatorRpcLocator    StoppedManual Own Process
       c:\winnt\system32\locator.exeNormal LocalSystem   0
Remote Procedure Call (RPC) RpcSs  RunningAuto   Share Process
       c:\winnt\system32\svchost -k rpcss Normal LocalSystem   0
QoS RSVP      RSVP   RunningManual Own Process   c:\winnt\system32\rsvp.exe -sNormal
       LocalSystem   0
Security Accounts Manager   SamSs  RunningAuto   Share Process
       c:\winnt\system32\lsass.exe Normal LocalSystem   0
Smart Card Helper    SCardDrv      StoppedManual Share Process
       c:\winnt\system32\scardsvr.exe     Ignore LocalSystem   0
Smart Card    SCardSvr      StoppedManual Share Process
       c:\winnt\system32\scardsvr.exe     Ignore LocalSystem   0
Task SchedulerSchedule      RunningAuto   Share Process c:\winnt\system32\mstask.exe
       Normal LocalSystem   0
RunAs Service seclogon      StoppedManual Share Process
       c:\winnt\system32\services.exe     Ignore LocalSystem   0
System Event Notification   SENS   RunningAuto   Share Process
       c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem   0
Internet Connection Sharing SharedAccess  StoppedManual Share Process
       c:\winnt\system32\svchost.exe -k netsvcs Normal LocalSystem   0
Print Spooler SpoolerStoppedManual Own Process   c:\winnt\system32\spoolsv.exeNormal
       LocalSystem   0
SQLSERVERAGENTSQLSERVERAGENTStoppedManual Own Process
       c:\progra~1\micros~2\mssql\binn\sqlagent.exeNormal LocalSystem   0
Performance Logs and Alerts SysmonLog     StoppedManual Own Process
       c:\winnt\system32\smlogsvc.exe     Normal LocalSystem   0
Telephony     TapiSrvRunningManual Share Process c:\winnt\system32\svchost.exe -k
tapisrvNormal LocalSystem   0
Terminal Services    TermService   StoppedDisabled      Own Process
       c:\winnt\system32\termsrv.exeNormal LocalSystem   0
Telnet TlntSvrStoppedManual Own Process   c:\winnt\system32\tlntsvr.exeNormal
       LocalSystem   0
Distributed Link Tracking Server   TrkSvr StoppedManual Share Process
       c:\winnt\system32\services.exe     Normal LocalSystem   0
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Distributed Link Tracking Client  TrkWks StoppedManual Share Process
       c:\winnt\system32\services.exe    Normal LocalSystem   0
Uninterruptible Power SupplyUPS    StoppedManual Own Process
       c:\winnt\system32\ups.exe   Normal LocalSystem   0
Utility Manager      UtilManStoppedManual Own Process   c:\winnt\system32\utilman.exe
       Normal LocalSystem   0
Windows Time  W32TimeStoppedManual Share Process c:\winnt\system32\services.exe
       Normal LocalSystem   0
World Wide Web Publishing Service W3SVC  RunningAuto   Share Process
       c:\winnt\system32\inetsrv\inetinfo.exe   Normal LocalSystem   0
Windows Management Instrumentation WinMgmtRunningAuto   Own Process
       c:\winnt\system32\wbem\winmgmt.exe Ignore LocalSystem   0
Windows Management Instrumentation Driver ExtensionsWmi    RunningManual 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 ToolsDefault User
StartupDefault User:Startup Default User
Accessories   All Users:AccessoriesAll Users
Accessories\Accessibility   All Users:Accessories\AccessibilityAll Users
Accessories\Communications  All Users:Accessories\CommunicationsAll Users
Accessories\Entertainment   All Users:Accessories\EntertainmentAll 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
Microsoft SQL Server All Users:Microsoft SQL Server     All Users
MKS Toolkit   All Users:MKS ToolkitAll Users
StartupAll Users:Startup    All Users
Accessories   CLIENT6\Administrator:Accessories CLIENT6\Administrator
Accessories\Accessibility   CLIENT6\Administrator:Accessories\Accessibility
       CLIENT6\Administrator
Accessories\Entertainment   CLIENT6\Administrator:Accessories\Entertainment
       CLIENT6\Administrator
Accessories\System Tools    CLIENT6\Administrator:Accessories\System Tools
       CLIENT6\Administrator
Administrative Tools CLIENT6\Administrator:Administrative ToolsCLIENT6\Administrator
StartupCLIENT6\Administrator:StartupCLIENT6\Administrator

[Startup Programs]

ProgramCommandUser Name     Location
Service Manager      c:\progra~1\common~1\micros~1\servic~1\sqlmangr.exe  /nAll
Users  Common Startup

[OLE Registration]

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

[Internet Explorer 5]

[ Following are sub-categories of this main category ]

[Summary]

Item   Value
```

```
Version5.00.2920.0000
Build  52920
Product ID    51876-OEM-0000007-00000
Application Path     C:\Program Files\Internet Explorer
Language      English (United States)
Active PrinterNot Available

Cipher Strength      56-bit
Content Advisor      Disabled
IEAK Install  No

[File Versions]

File   VersionSize   Date   Path   Company
advapi32.dll  5.0.2191.1    349 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
advapi32.dll  5.0.2191.1    349 KB 12/7/1999 7:00:00 AM .      Microsoft Corporation
advpack.dll   5.0.2920.0    87 KB  12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
advpack.dll   5.0.2920.0    87 KB  12/7/1999 7:00:00 AM .      Microsoft Corporation
browselc.dll  5.0.2920.0    35 KB  12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
browselc.dll  5.0.2920.0    35 KB  12/7/1999 7:00:00 AM .      Microsoft Corporation
browseui.dll  5.0.2920.0    793 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
browseui.dll  5.0.2920.0    793 KB 12/7/1999 7:00:00 AM .      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  5.81.2920.0   540 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
comctl32.dll  5.81.2920.0   540 KB 12/7/1999 7:00:00 AM .      Microsoft Corporation
crypt32.dll   5.131.2173.1  466 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
crypt32.dll   5.131.2173.1  466 KB 12/7/1999 7:00:00 AM .      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   5.0.2920.0    57 KB  12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
iesetup.dll   5.0.2920.0    57 KB  12/7/1999 7:00:00 AM .      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    5.0.2920.0    72 KB  12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
inseng.dll    5.0.2920.0    72 KB  12/7/1999 7:00:00 AM .      Microsoft Corporation
jobexec.dll   5.0.0.147 KB  12/7/1999 7:00:00 AM C:\WINNT\system32    Microsoft
Corporation
jobexec.dll   5.0.0.147 KB  12/7/1999 7:00:00 AM .      Microsoft Corporation
jscript.dll   5.1.0.4615    476 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
jscript.dll   5.1.0.4615    476 KB 12/7/1999 7:00:00 AM .      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    5.0.2920.0    2302 KB12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
mshtml.dll    5.0.2920.0    2302 KB12/7/1999 7:00:00 AM .      Microsoft Corporation
msjava.dll    5.0.3234.0    918 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
msjava.dll    5.0.3234.0    918 KB 12/7/1999 7:00:00 AM .      Microsoft Corporation
msoss.dll     <File Missing>Not Available Not Available Not Available Not Available
msxml.dll     5.0.2920.0    521 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
msxml.dll     5.0.2920.0    521 KB 12/7/1999 7:00:00 AM .      Microsoft Corporation
```

```
occache.dll   5.0.2920.0    86 KB  12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
occache.dll   5.0.2920.0    86 KB  12/7/1999 7:00:00 AM .      Microsoft Corporation
ole32.dll     5.0.2181.1    966 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
ole32.dll     5.0.2181.1    966 KB 12/7/1999 7:00:00 AM .      Microsoft Corporation
oleaut32.dll  2.40.4512.1   600 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
oleaut32.dll  2.40.4512.1   600 KB 12/7/1999 7:00:00 AM .      Microsoft Corporation
olepro32.dll  5.0.4512.1    160 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
olepro32.dll  5.0.4512.1    160 KB 12/7/1999 7:00:00 AM .      Microsoft Corporation
rsabase.dll   5.0.2150.1    129 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
rsabase.dll   5.0.2150.1    129 KB 12/7/1999 7:00:00 AM .      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  5.0.2170.0    140 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
schannel.dll  5.0.2170.0    140 KB 12/7/1999 7:00:00 AM .      Microsoft Corporation
shdoc401.dll  <File Missing>Not Available Not Available Not Available Not Available
shdocvw.dll   5.0.2920.0    1078 KB12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
shdocvw.dll   5.0.2920.0    1078 KB12/7/1999 7:00:00 AM .      Microsoft Corporation
shell32.dll   5.0.2920.0    2297 KB12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
shell32.dll   5.0.2920.0    2297 KB12/7/1999 7:00:00 AM .      Microsoft Corporation
shlwapi.dll   5.0.2920.0    283 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
shlwapi.dll   5.0.2920.0    283 KB 12/7/1999 7:00:00 AM .      Microsoft Corporation
url.dll5.0.2920.0    82 KB  12/7/1999 7:00:00 AM C:\WINNT\system32    Microsoft
Corporation
url.dll5.0.2920.0    82 KB  12/7/1999 7:00:00 AM .      Microsoft Corporation
urlmon.dll    5.0.2920.0    427 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
urlmon.dll    5.0.2920.0    427 KB 12/7/1999 7:00:00 AM .      Microsoft Corporation
vbscript.dll  5.1.0.4615    428 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
vbscript.dll  5.1.0.4615    428 KB 12/7/1999 7:00:00 AM .      Microsoft Corporation
webcheck.dll  5.0.2920.0    252 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
webcheck.dll  5.0.2920.0    252 KB 12/7/1999 7:00:00 AM .      Microsoft Corporation
win.com5.0.2134.1    24 KB  12/7/1999 7:00:00 AM C:\WINNT\system32    Microsoft
Corporation
win.com5.0.2134.1    24 KB  12/7/1999 7:00:00 AM .      Microsoft Corporation
wininet.dll   5.0.2920.0    457 KB 12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
wininet.dll   5.0.2920.0    457 KB 12/7/1999 7:00:00 AM .      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   5.0.2152.1    21 KB  12/7/1999 7:00:00 AM C:\WINNT\system32
       Microsoft Corporation
wsock32.dll   5.0.2152.1    21 KB  12/7/1999 7:00:00 AM .      Microsoft Corporation
wsock32n.dll  <File Missing>Not Available Not Available Not Available Not Available

[Connectivity]

Item   Value
Connection PreferenceNever dial
EnableHttp1.1 1
ProxyHttp1.1  0

LAN Settings
```

```
AutoConfigProxy      Not Available
AutoProxyDetectMode  Enabled
AutoConfigURL
Proxy  Disabled
ProxyServer
ProxyOverride

[Cache]

[ Following are sub-categories of this main category ]

[Summary]

Item   Value
Page Refresh Type    Automatic
Temporary Internet Files Folder   C:\Documents and Settings\Administrator\Local
Settings\Temporary Internet Files
Total Disk Space     4337 MB
Available Disk Space 1956 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 4/2/2000 to 3/9/2100 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 intranetMedium-low
Trusted sites Low
Internet      Medium
Restricted sites     High
```

RTE Input Parameters

BenchCraft Configuration File

Profile: 4600_42_7_01
File Path: C:\benchcrf\4600_42_7_01.pro
Version: 1.0.1

Number of Engines: 11

Name: DRIVER2A
Description: RTE2A
Directory: c:\tpcclog\rte2a.log
Machine: RTE2A
Parameter Set: PARAM2
Index: 0
Seed: 98176
Configured Users: 4400
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: 4400
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: 4400
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: 4400
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: 4400
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: 4400
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: 4400
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: 4400
Pipe Name: DRIVER222420160
Connect Rate: 2000
Start Rate: 0
CLIENT_NURAND: 208
CPU: 0

Name: DRIVER6A
Description: RTE6A
Directory: c:\tpcclog\rte6a.log
Machine: RTE6A
Parameter Set: PARAM2
Index: 800000000
Seed: 98176
Configured Users: 4400
Pipe Name: DRIVER192556896
Connect Rate: 2000
Start Rate: 0
CLIENT_NURAND: 208
CPU: 0

Name: DRIVER6B
Description: RTE6B
Directory: c:\tpcclog\rte6b.log
Machine: RTE6B
Parameter Set: PARAM2
Index: 900000000
Seed: 98176
Configured Users: 4400
Pipe Name: DRIVER162653836
Connect Rate: 2000
Start Rate: 0
CLIENT_NURAND: 208
CPU: 0

Name: DRIVERM1
Description: RTE1 - Master
Directory: c:\tpcclog\rte1.log
Machine: RTE1
Parameter Set: PARAM2
Index: 1000000000
Seed: 98176
Configured Users: 2000
Pipe Name: DRIVER132751416
Connect Rate: 2000
Start Rate: 0

CLIENT_NURAND: 208
CPU: 0

Number of User groups: 42

Driver Engine: DRIVER2A
IIS Server: CLIENT2_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 1 - 110
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER5A
IIS Server: CLIENT5_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 2641 - 2750
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER5A
IIS Server: CLIENT6_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 2751 - 2860
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER3A
IIS Server: CLIENT3_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 1101 - 1210
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER5A
IIS Server: CLIENT7_1

SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 2861 - 2970
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER5A
IIS Server: CLIENT8_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 2971 - 3080
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER5B
IIS Server: CLIENT2_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 3081 - 3190
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER2A
IIS Server: CLIENT4_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 221 - 330
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER5B
IIS Server: CLIENT3_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 3191 - 3300
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100

District id: 1
Scale Down: No

Driver Engine: DRIVER5B
IIS Server: CLIENT4_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 3301 - 3410
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER5B
IIS Server: CLIENT5_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 3411 - 3520
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER4A
IIS Server: CLIENT5_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 1871 - 1980
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER6A
IIS Server: CLIENT6_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 3521 - 3630
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER6A
IIS Server: CLIENT7_1
SQL Server: PE8450_01
User: sa

Protocol: Html
w_id Range: 3631 - 3740
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER6A
IIS Server: CLIENT8_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 3741 - 3850
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER3A
IIS Server: CLIENT4_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 1211 - 1320
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER6A
IIS Server: client2_1
SQL Server: pe8450_01
User: sa
Protocol: Html
w_id Range: 3851 - 3960
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER6B
IIS Server: client3_1
SQL Server: pe8450_01
User: sa
Protocol: Html
w_id Range: 3961 - 4070
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER6B
IIS Server: client4_1
SQL Server: pe8450_01
User: sa
Protocol: Html
w_id Range: 4071 - 4180
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER6B
IIS Server: client5_1
SQL Server: pe8450_01
User: sa
Protocol: Html
w_id Range: 4181 - 4290
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER2A
IIS Server: CLIENT5_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 331 - 440
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER6B
IIS Server: client6_1
SQL Server: pe8450_01
User: sa
Protocol: Html
w_id Range: 4291 - 4400
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER4A
IIS Server: CLIENT6_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 1981 - 2090

w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVERM1
IIS Server: CLIENT7_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 4401 - 4500
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1000
District id: 1
Scale Down: No

Driver Engine: DRIVERM1
IIS Server: CLIENT8_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 4501 - 4600
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1000
District id: 1
Scale Down: No

Driver Engine: DRIVER2B
IIS Server: CLIENT6_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 441 - 550
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER2B
IIS Server: CLIENT7_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 551 - 660
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER3A

IIS Server: CLIENT5_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 881 - 990
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER2B
IIS Server: CLIENT8_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 661 - 770
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER2B
IIS Server: CLIENT2_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 771 - 880
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER3A
IIS Server: CLIENT6_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 991 - 1100
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER3B
IIS Server: CLIENT7_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 1321 - 1430
w_id Max Warehouse: 4600
Scale: Normal

User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER3B
IIS Server: CLIENT8_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 1431 - 1540
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER2A
IIS Server: CLIENT3_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 111 - 220
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER3B
IIS Server: CLIENT2_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 1541 - 1650
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER3B
IIS Server: CLIENT3_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 1651 - 1760
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER4A
IIS Server: CLIENT4_1
SQL Server: PE8450_01

User: sa
Protocol: Html
w_id Range: 1761 - 1870
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER4A
IIS Server: CLIENT7_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 2091 - 2200
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER4B
IIS Server: CLIENT8_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 2201 - 2310
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER4B
IIS Server: CLIENT2_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 2311 - 2420
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1
Scale Down: No

Driver Engine: DRIVER4B
IIS Server: CLIENT3_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 2421 - 2530
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
District id: 1

Scale Down: No

Driver Engine: DRIVER4B
IIS Server: CLIENT4_1
SQL Server: PE8450_01
User: sa
Protocol: Html
w_id Range: 2531 - 2640
w_id Max Warehouse: 4600
Scale: Normal
User Count: 1100
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 daySpace

TPC-C 60 Day Space Requirements						
Warehouses	**4,700**				**TpmC**	**57,014.00**
Table	**Rows**	**Data KB**	**Index KB**	**Extra 5% KB**	**8hr Space**	**Total Space KB**
Warehouse	4,700	504	48	28		580
District	47,000	5,224	56	264		5544
Customer	141,000,000	102,545,456	6,114,784	5,433,012		114093252
History	141,000,000	7,833,344	144		1,520,403	7833488
NewOrder	42,300,000	668,776	1,576			670352
Orders	141,000,000	4,321,840	1,965,328		1,220,278	6287168
OrderLine	1,409,999,206	88,124,952	186,568		17,140,402	88311520
Item	100,000	9,528	72	480		10080
Stock	470,000,000	150,400,008	281,144	7,534,058		158215210
Total		353,909,632	8,549,720	12,967,841	19,881,083	375,427,193
MB					19,415.12	
	MB					
Dynamic Space	97,930	Sum of Data for Order, Orderline and History				
Static Space	268,698	Sum of Data+Index+5%-Dynamic Space				
Free Space	na	Total Allocated Spac - (Dynamic + Static Space)				
Daily Growth	19,007	(Dynamic Space/(W*62.5))*tpmc				
Daily Spread	-	(Free Space -1.5*Daily Growth) Zero Assumed				
60 Day Space MB	1,409,131		18 GB Drive	16.758	GB	
60 Day Space GB	**1,376.10**	**GB**	9 GB Drive	8.195	GB	
			4 GB Drive	3.999	GB	
Log Size	43,603	MB				
KB Per New Order	5.0135	KB				
8 hr log MB	133,987	MB				
8 hr log GB	**130.8470**	**GB**				
Space Usage	**GB Needed**	**Disks Measured**	**GB Priced**		Disks Needed	
60 Day Space DB	1,376.10	144	2,413.15	18GB		
		144	1,180.08	9GB		
		0	0.00	4GB		
Total DB		**288.00**	**3,593.23**	**GB**		
8-hr log + mirror	261.6941	16	268.13	GB	16.00	

OS, Swap	3	1	8.195	GB		
Total Storage	**1,640.80**	**GB**	**3,869.56**	**GB**		

Log Space OK

Total Space OK	-271.96534	-132.9965
	9GB	18GB

Appendix E - Price Quotations

Mylex ExtremeRAID 2000 Quotation

To: Nicholas Wakou **Phone: 512/723-2437** **Email: Nicholas_Wakou@dell.com**	**From: Bruce Foster** **Phone: 510/608-2328** **Fax: 510/745-8016** **Email: brucef@mylex.com**
Company: Dell Computer – Enterprise Performance Group	**Date: 09/16/01**
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] $1849

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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 27, 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	8	$ 132,328
C11-00821	**Windows 2000 Server** *Server license only - No CALs* *Discount schedule: Open Program - No Level*	$ 738	1	$ 738
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: Pjvoi0127092689

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