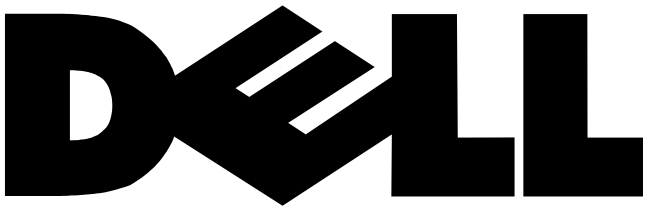

TPC Benchmark™ C
Full Disclosure Report
for
Dell PowerEdge 2650
Using
Microsoft SQL Server 2000 Standard Edition
and
Microsoft Windows 2003 Server

Third Edition
Submitted for Review
Updated to meet TPC-C Version 5.2 specification and updated pricing

March 12, 2004

Third Printing, March 15, 2004

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, March 15, 2004 and is generally available.

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

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

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Abstract

Overview

This report documents the methodology and results of the TPC Benchmark™ C test conducted on Dell PowerEdge 2650. The tests were run in a client/server configuration using one PowerEdge 1600SC as a client. The operating system used for the benchmark was Microsoft Windows 2003 Server on the database server and Microsoft Windows 2003 Server on the client. The database was Microsoft SQL Server 2000 Standard Edition. Microsoft COM+ provided the database connection queues. All tests were done in compliance with Revision 5.2 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 2650	Microsoft Windows 2003 Server with SQL Server 2000 Standard Edition	$40,775	22,052	$1.85	Feb 18, 2004

Auditor

The results of the benchmark and test methodology used to produce the results were audited by Lorna Livingtree of Performance Metrics and have fully met the TPC-C rev 5.2 specifications.

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

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

PowerEdge 2650

Client/Server w/1 PE1600SC Front End

TPC-C Rev 5.2
Report Date
February 18, 2004
Revised Date
March 15, 2004

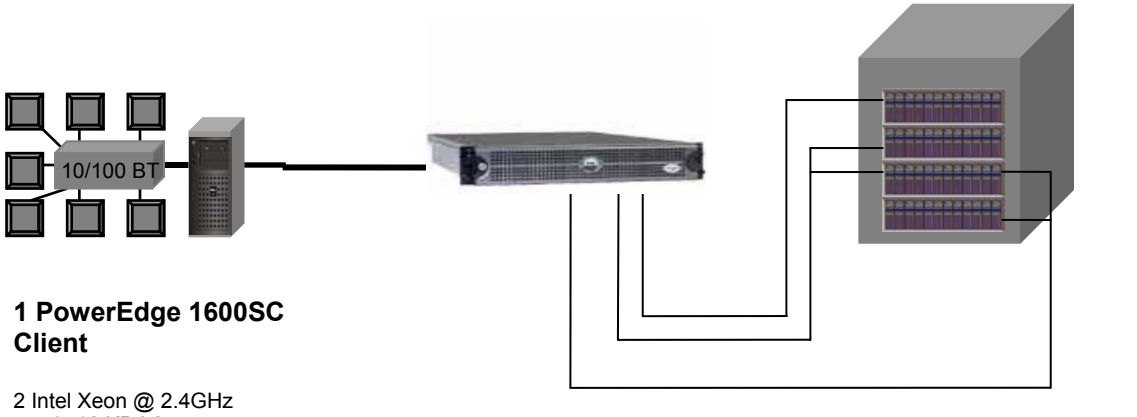
Total System Cost	TPC-C Throughput	Price/Performance	Availability Date
$40,775	**22,052 tpmC**	**$1.85 / tpmC**	FEB 18, 2004

Processors	Database Manager	OS	Other Software	Number of Users
1 x Intel Xeon™ Processors 3.2 GHz 2MB L3 Cache	Microsoft SQL Server 2000 Standard Edition	Microsoft Windows 2003 Server	Windows 2003 Server w/ COM+ Internet Information Server 5.0 Microsoft Visual C++	18,000

PE2650

w/ 1 3.2 GHz Intel Xeon CPUs
w/ 2MB L3 cache,
2.5GB RAM,
2 PERC4-DC Controllers, and
1 On-board Adaptec AIC-7899 RAID Controller
4 36GB 10K RPM U320 SCSI disks
2 Gigabit Ethernet adapters

4 PV220S Disk Pods
56 18GB 15K RPM U320 SCSI Disks



1 PowerEdge 1600SC Client

2 Intel Xeon @ 2.4GHz
w/ 512 KB L2
1024 MB RAM
1 36 GB Disk
2 Intel Pro100+ Ethernet NICs

System Component	Server		Each Client	
Processors Cache	1	Intel Xeon @ 3.2GHz 2MB cache	2	Intel Xeon w/ 512 KB L2 Client @ 2.4 GHz
Memory		2560 MB		1024 MB
Disk Controllers	2 1	PERC4-DC Adaptec AIC-7899 On-Board	1	Adaptec On-Board
Disk Drives	56 4	18 GB SCSI 36 GB SCSI	1	36 GB
Total Storage		1100 GB		36 GB
Other	2 1 1	2GB NIC CD-ROM DAT	2	10/100MB BT NIC

Dell	PowerEdge 2650	TPC-C REV 5.2 EXECUTIVE SUMMARY PAGE 2 OF 2
	Client/Server	Report Date: 23-February-04

Description	Part Number	Third Party Brand	Third Party Pricing	Unit Price	Qty	Extended Price	3 yr. Maint. Price
Server Hardware							
Dell PowerEdge 2650 3.2GHz/2MB	221-4490			1,622	1	1,622	290
PERC3/Di 128MB (2 int. ch)	340-3943			299	1	299	
2GB SDRAM,4X512MB DIMMs	311-2733			1,049	1	1,049	
512MB RAM, 2 x 128MB DIMMS	311-2729			470	1	470	
PV100T,DDS4,20/40G,TBU,NC,INT	340-7297			699	1	699	
Dell E551,15 in Gray (13.8 VIS)	320-0960			149	1	149	
PERC4-DC 2-ch SCSI	340-8157			999	2	1,998	
					Subtotal	6,286	290
PowerVault Disk Subsystem							
PV220S, U3, PS, Tower	220-4477, etc.			2,054	4	8,216	1,604
2 SCSI Cables	310-0679			99	2	198	
18GB U320M SCSI 15K RPM Hard Drive	340-9472			249	56	13,944	
36GB U320M SCSI 10K RPM Hard Drive (OS+LOG)	340-9370			249	4	996	
					Subtotal	23,354	1,604
Server Software							
SQL Server 2000 St. Edition, Per processor licensing **	228-01079	Microsoft	1	4,999	1	4,999	
Windows 2003 Standard Server **	P73-00295	Microsoft	1	738	1	738	
Database Server Support Package	PRO-PRORS-16U-01	Microsoft	1	1,950	3		5,850
					Subtotal	5,737	5,850
Client Hardware							
Dell PowerEdge 1600SC, 2.4 GHz / 512KB L2/400 FSB	221-2207			277	1	277	290
Additional processor , 2.4 GHz / 512KB	311-2456			599	1	599	
1025MB RAM, 2 DIMMs	311-1940			598	1	598	
36GB U160M SCSI 10K RPM Hard Drive	340-7087			249	1	249	
Non-Redundant Power	310-0540			199	1	199	
IntelPro 100S	430-0206			59	1	59	
Dell 15" Monitor	320-0960			149	1	149	
					Subtotal	2,130	290
Client Software							
Windows 2003 Standard Server **	P73-00295	Microsoft	1	738	1	738	
Visual C++ ** .NET	254-00170	Microsoft	1	109	1	109	
					Subtotal	847	
User Connectivity							
7ft Crossover cable	CBLC5C7	LanAdapter	2	1	3	3	
					Subtotal	3	
					Other Discounts	($5,616)	
					Total	**$32,741**	**$8,034**

Notes: * Maint. included in PowerVault 210S disk pod or PV650F/630F fibre channel disk pod

** All Microsoft maintenance is covered by the maintenance costs of Microsoft SQL Server

*** 10% or minimum 2 spares are added in place of onsite service (products have a five year return-to-vendor warranty) Pricing: 1 - Microsoft 2 - LanAdapter

Audited by Lorna Livingtree, Performance Metrics Inc.

Three-Year Cost of Ownership:	**$40,775**
tpmC Rating:	**22052**
$ / tpmC:	**1.85**

Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components. Individually negotiated discounts are not permitted. Special prices based on assumptions about past or future purchases are not permitted. All discounts reflect standard pricing policies for the listed components. For complete details, see the pricing sections of the TPC benchmark specifications. If you find that the stated prices are not available according to these items, please inform the TPC at pricing@tpc.org.

MQTh, computed Maximum Qualified Throughput 22,052 tpmC

Response Times (in seconds)	Average	90th	Max
- Neworder	0.99	1.41	6.60
- Payment	0.62	0.99	4.12
- Delivery (interactive portion)	0.12	0.17	0.64
- Stock-Level	1.78	4.67	11.55
- Order Status	0.85	1.25	6.08
- Delivery (deferred portion)	1.81	2.50	4.39
- Menu	0.12	0.17	0.80

Response time delay added for emulated components Menu 0.1
Resp 0.1

Transaction Mix, in percent of total transactions

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

Keying/Think Times (in seconds),	Min		Average		Max	
- New-Order	18.02	0.0	18.02	12.03	18.05	120.42
- Payment	3.01	0.0	3.02	12.03	3.05	120.41
- Delivery	2.01	0.0	2.02	5.04	2.04	50.40
- Stock-Level	2.01	0.0	2.02	5.05	2.05	50.40
- Order-Status	2.01	0.0	2.02	10.04	2.04	100.41

Test Duration

- Ramp-up time	5 minutes
- Measurement interval	120 minutes
- Number of checkpoints	4
- Checkpoint interval	30 minutes
- Number of transactions (all types) completed in measurement interval	6,140,323

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tpcc_com_all/src/tpcc_com_no.rgs *93*
tpcc_com_all/src/tpcc_com_os.rgs *93*
tpcc_com_all/src/tpcc_com_pay.rgs *94*
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Introduction

Document Structure

The TPC Benchmark C Standard Specification Revision 5.2, written and approved by the Transaction Processing Performance Council (TPC), determines the contents of this report. The format of this report is based on this specification. Most sections of this report begin with the specification requirements printed in italic type, immediately followed by the detail in plain type of how Dell complied with the specification. Where extensive listings are required (such as listing of code), a note is included which references an appendix containing the listing.

Benchmark Overview

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

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

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

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

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

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

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

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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 2650 server driven by one Dell PowerEdge 1600 client. The PE2650 has two internal Gigabit Ethernet adapters, of which only one is in use. The client and server are networked together via a cross-over cable. Five remote terminal emulator (RTE) systems (PowerEdge 2200's) emulate 16,200 users executing the standard TPC-C workload. The RTE's are connected to the client through a 10/100 BaseT switch. The switch connects to the client machine at 100 BaseT and to the RTE machines at 10Mbit/sec, half duplex. Microsoft Windows 2003 Server was the operating system used on the server. Microsoft Windows 2003 Server was used on the client. Microsoft SQL Server 2000 Standard Edition was the database on the server machine.

The PowerEdge 2650 motherboard uses the ServerWorks Grand Champion High End chipset and can hold up to two Pentium® 4 Xeon processors (3.2 GHz with 2 MB L2 cache each). The system has 3 PCI-X 64-bit/100MHz I/O slots and a single legacy 32-bit/33MHz PCI slot. The measured configuration used 2.50 Gbytes of DDR RAM, which was achieved by using four 512 Mbyte DIMMs and two 256Mbyte DIMMs.

The PowerEdge 2650 has an integrated Adaptec AIC-7899 U160 SCSI controller to which was attached 4 36GB hard disks in RAID 10 configuration containing the database log and OS. In addition, three DELL PERC3 2-channel RAID controllers were installed in PCI-X slots. The three PERC3 controllers were connected to four PV220 disk pods enclosing a total of 56 18GB 15K RPM SCSI disks, containing database data. There was one empty PCI-X slots.

The client has dual 2.4GHz Intel Xeon processors with 512 Kbytes of L2 cache. The client has 1024 Mbytes of RAM, one 18 GB hard disk, one intergrated Intel Ether Express Pro100+ PCI Ethernet adapter and one Intel Pro 100 Network Interface Card. The client's Intel Ethernet adapter was connected to the RTE machines through a 10/100 BaseT switch and the Intel Pro NIC was connected to the Database Server through a cross-over cable. The client was driven through twelve network segments to run a total of 18,000 emulated users. The network segments between the switches and RTEs were fixed at 10 Mbit/sec, half duplex.

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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 2003 Server, and Internet Information Service parameters used in this benchmark.

Appendix D contains the 60 day space calculations.

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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

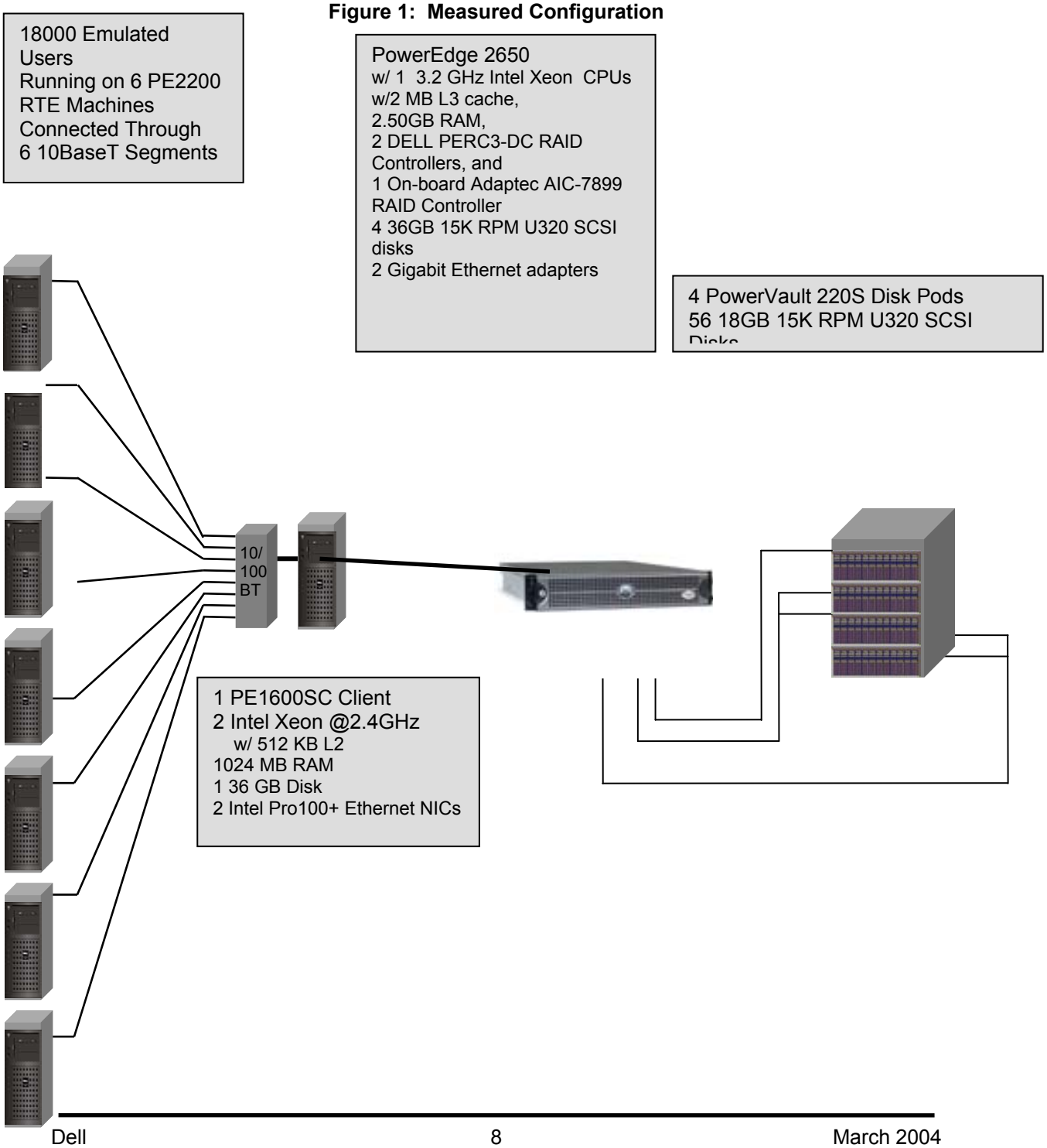

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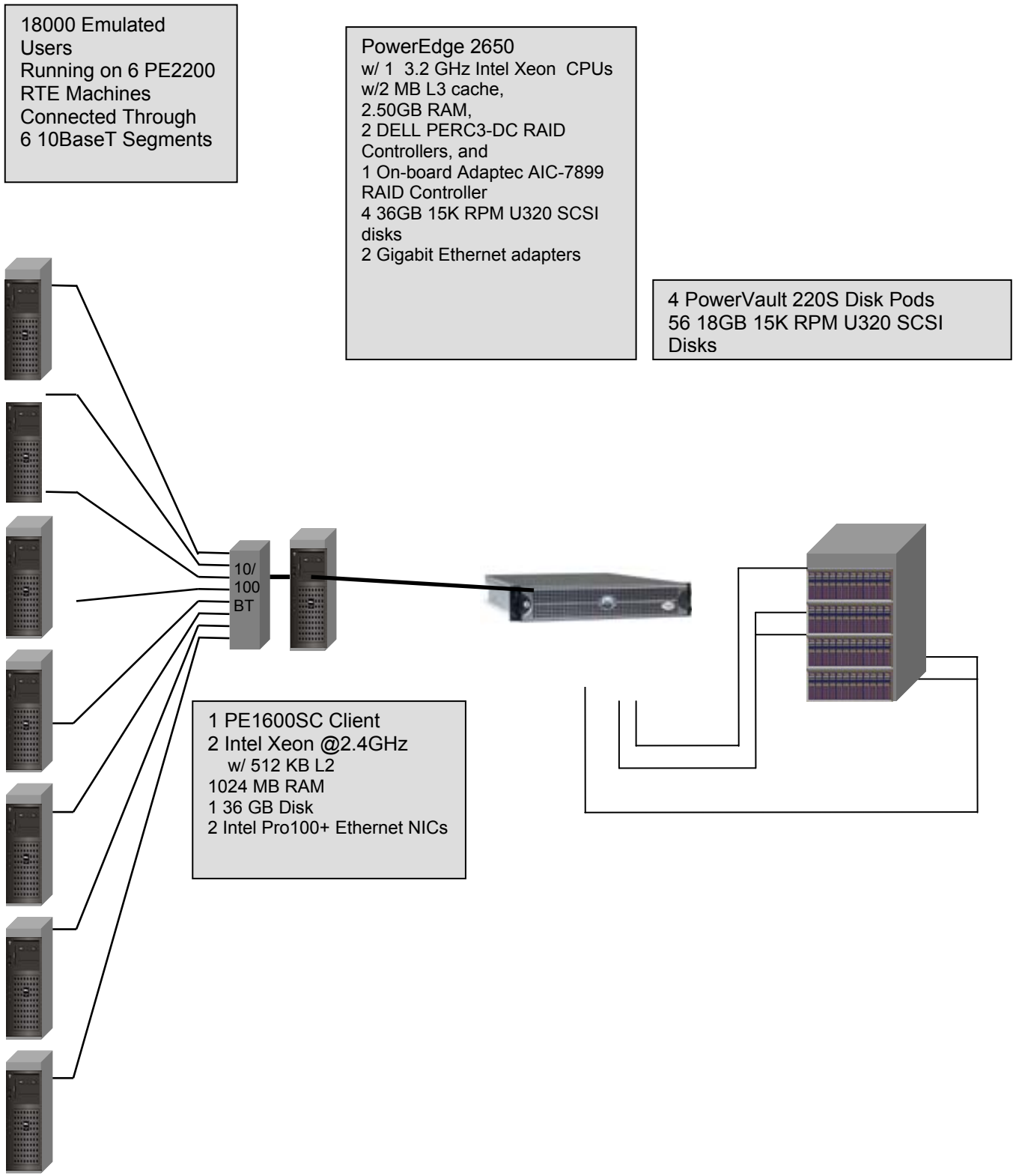
Figure 2: Priced Configuration



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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 60 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.

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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)

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Table 1: Transaction Statistics

Transaction	Function	Value
New Order	Home Warehouse Items	99.00%
	Remote Warehouse Items	1.00%
	Rolled Back Transactions	0.99%
	Average Lines Per Order	10.00
Payment	Home Warehouse	84.99%
	Remote Warehouse	15.01%
	Non-Primary Key Access	60.02%
Order Status	Non-Primary Key Access	60.07%
Delivery	Skipped Transactions	0

Transaction Mix

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

Table 2: Transaction mix

Transaction	Percentage
New Order	44.84%
Payment	43.02%
Order Status	4.04%
Delivery	4.05%
Stock Level	4.05%

Deferred Delivery Mechanism

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

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

The source code is listed in Appendix A.

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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.

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Durability

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

Durable Media Failure

Durability from media failure was demonstrated on the 1900 warehouse database. The standard driving mechanism was used to generate the transaction load of 18000 users for the Loss of Data.

Loss of Data

Loss of data was demonstrated on the 1900 Warehouse database. The standard driving mechanism was used to generate the transaction load of 18000 users for the test. To demonstrate recovery from a permanent failure of durable media containing TPC-C tables, the following steps were executed:

1. The 1900 Warehouse database was used for this test.
2. The database was backed up using SQL Server backup facilities.
3. A sum of D_NEXT_O_ID was taken.
4. 18000 users were logged in to the database and ran transactions.
5. One disk drive in the data array was removed causing SQL Server errors.
6. The RTE was allowed to continue running. Completed transactions enroute from the clients were recorded. Error messages began appearing on the RTE screen.
7. The RTE was stopped.
8. SQL Server was stopped and restarted and a dump of the transaction log was taken.
9. SQL Server was stopped, Windows 2003 was shutdown and the machine powered off.
10. The failed disk was replaced.
11. The machine was powered up, Windows 2003 and SQL Server were started.
12. The TPC-C database was dropped and restored from backup.
13. The transaction log was restored and transactions rolled forward.
14. A new count of D_NEXT_O_ID was taken.
15. This number was compared with the number of new orders reported by the RTE. The difference was valid per the spec.

Instantaneous Interruption and Loss of Memory/Loss of Log

Instantaneous Interruption and Loss of Memory were demonstrated on the full database with 1900 warehouses in a single test. The standard driving mechanism was used to generate the transaction load of 18000 users for the test. To demonstrate recovery an instantaneous system interruption caused by powering off the Server, the following steps were executed:

1. The full database was used.
2. A sum of D_NEXT_O_ID was taken.
3. 18000 users were logged in to the database and ran transactions.
4. The system was run is steady state for 5 minutes
5. One disk drive in the transaction log array was removed with no effect on Windows 2003 or SQL Server.
6. The system ran for an additional 5 minutes.
6. The Server was powered off by normal means, causing instantaneous interruption.

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

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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 1900 warehouses. The performance run used 1800 warehouses and this was verified by runcheck.

Table 3: Table Cardinality

Table	Cardinality as Benchmarked
Warehouse	1,900
District	19,000
Customer	57,000,000
History	57,000,000
NewOrder	17,100,000
Orders	57,000,000
OrderLine	570,001,928
Item	100,000
Stock	190,000,000
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

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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 60 disks: 56 18GB for data, 4 36GB for log and OS and application software. The data drives were configured as hardware RAID 0. Logs and OS were configured as hardware RAID 10. DELL PERC4-DC RAID Controllers 2 and 3 were configured with 1 logical drive each. Each logical drive spanned 28 disk drives. PERC3/Di intergrated controller 1 was configured with 1 logical drive spanning 4 36GB SCSI drives. Each Windows 2003 data drive contained 3 partitions: partition 1 for customer/stock, partition 2 for miscellaneous, and partition 3 for backup. Partitions 1 and 2 were RAW file systems and partition 3 was formatted NTFS. The details are shown in Table 5.

Table 5: Data Distribution

W2K Disk Administration	Adaptec 7899 Configuration					
Disk **2 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	Adaptec 7899 Configuration					
Disk **2 69417MB**	On-Board Controller # **1**					
Partition	On-Board		Channels			
1	Internal	SCSI ID		1		
L: LOG **RAW** **57354 MB**		0		A1-1		
		1		A1-2		
		2		A1-3		
		3		A1-4		

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W2K Disk Administration			DELL PERC4-DC Configuration					
Disk **0 483779MB**				Controller # **2**				
Partition			Slot# **1**		Channels			
1	2	3		SCSI ID	A	B	C	D
K:	**Y:**	**U: Backup1**		0	**A1-1**	**A2-1**		
CS1	**MS1**	**B1**		1	**A1-2**	**A2-2**		
RAW	**RAW**	**NTFS**		2	**A1-3**	**A2-3**		
156.26GB	**156.26GB**	**159.93GB**		3	**A1-4**	**A2-4**		
				4	**A1-5**	**A2-5**		
				5	**A1-6**	**A2-6**		
				8	**A1-7**	**A2-7**		
				9	**A1-8**	**A2-8**		
				10	**A1-9**	**A2-9**		
				11	**A1-10**	**A2-10**		
				12	**A1-11**	**A2-11**		
				13	**A1-12**	**A2-12**		
				14	**A1-13**	**A2-13**		
				15	**A1-14**	**A2-14**		

W2K Disk Administration			DELL PERC4-DC Configuration					
Disk **1 483779MB**				Controller # **3**				
Partition			Slot# **2**		Channels			
1	2	3		SCSI ID	A	B	C	D
S:	**W:**	**V: Backup2**		0	**A1-1**	**A2-1**		
CS2	**MS2**	**B2**		1	**A1-2**	**A2-2**		
RAW	**RAW**	**NTFS**		2	**A1-3**	**A2-3**		
156.26GB	**156.26GB**	**159.93GB**		3	**A1-4**	**A2-4**		
				4	**A1-5**	**A2-5**		
				5	**A1-6**	**A2-6**		
				8	**A1-7**	**A2-7**		
				9	**A1-8**	**A2-8**		
				10	**A1-9**	**A2-9**		
				11	**A1-10**	**A2-10**		
				12	**A1-11**	**A2-11**		
				13	**A1-12**	**A2-12**		
				14	**A1-13**	**A2-13**		
				15	**A1-14**	**A2-14**		

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***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 Standard Edition is a relational DBMS.

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

Partition Mapping

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

The database was not replicated.

60 day Space Calculation

Details of the 60 day space computations along with proof that the database is configured to sustain 8 hours of growth for the dynamic tables (Order, Order-Line, and History) must be disclosed (see Clause 4.2.3). (8.1.5.5)

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

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

The results of the above steps yielded a requirement of 100.2906 GB (including mirror) to sustain the log for 8 hours. Space available on the transaction log volume was 134.98GB (including mirror), indicating that enough storage was configured to sustain 8 hours of growth.

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

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

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Clause 5 -- Performance Metrics and Response Time Related Items

Measured TpmC

Measured tpmC must be reported. (8.1.6.1)

Measured TpmC	22,052
Price per TpmC	$1.85

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	0.99	1.41	6.60
Payment	0.62	0.99	4.12
Interactive Delivery	0.12	0.17	0.64
Stock Level	1.78	4.67	11.55
Order Status	0.85	1.25	6.08
Deferred Delivery	1.81	2.50	4.39
Menu	0.12	0.17	0.80

Think Times & Key Times

The minimum, the average, and the maximum keying and think times must be reported for each transaction type. (8.1.6.3)

Table 7: Transaction Key Times

Transaction	Minimum	Average	Maximum
New Order	18.02	18.02	18.05
Payment	3.01	3.02	3.05
Delivery	2.01	2.02	2.04
Stock Level	2.01	2.02	2.05
Order Status	2.01	2.02	2.04

Table 8: Transaction Think Times

Transaction	Minimum	Average	Maximum
New Order	0.00	12.04	120.42
Payment	0.00	12.03	120.41
Delivery	0.00	5.04	50.40
Stock Level	0.00	5.05	50.40
Order Status	0.00	10.04	100.41

Response Time Distribution Curves

Response Time frequency distribution curves (see Clause 5.6.1) must be reported for each

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transaction type. (8.1.6.4)

Figure 3: New Order Response Time Distribution

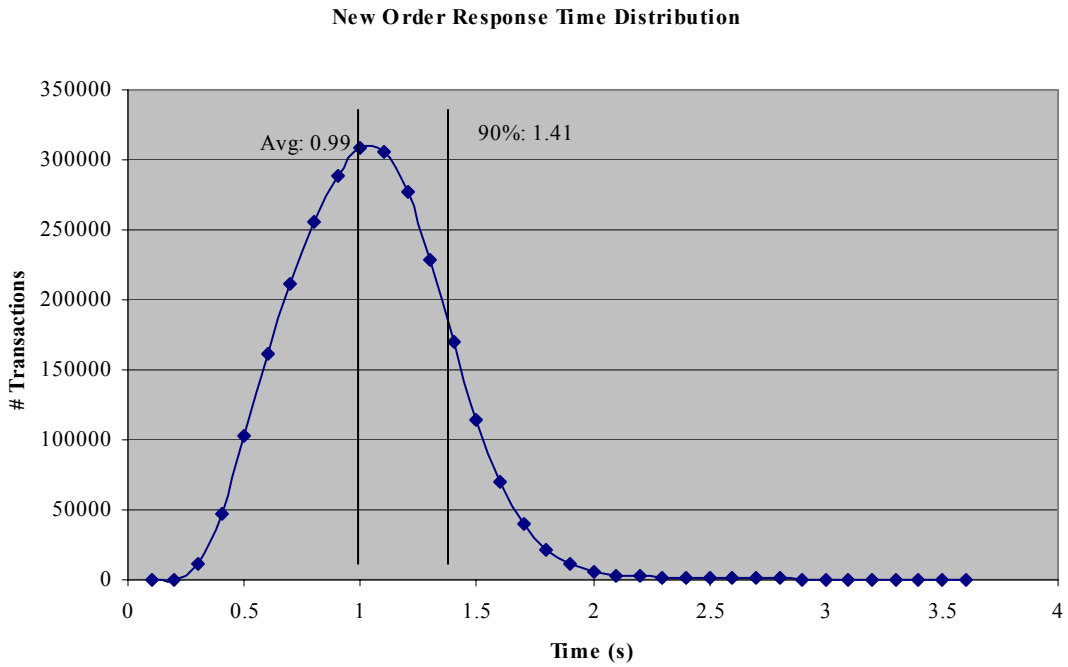

Figure 4: Payment Response Time Distribution

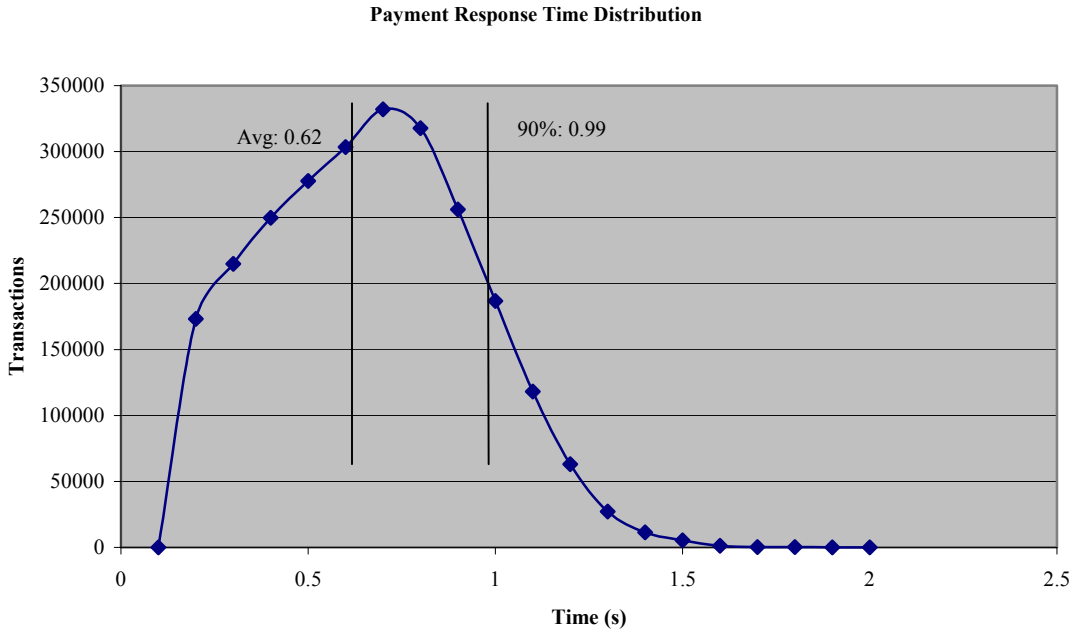

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Figure 5: Order Status Response Time Distribution

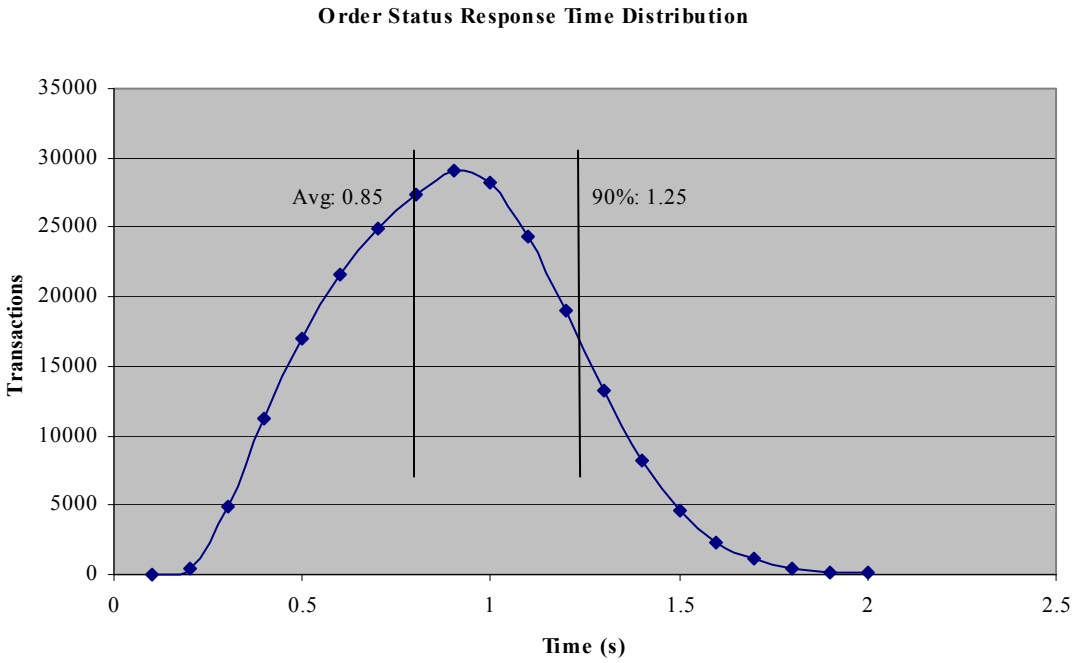

Figure 6: Delivery Response Time Distribution

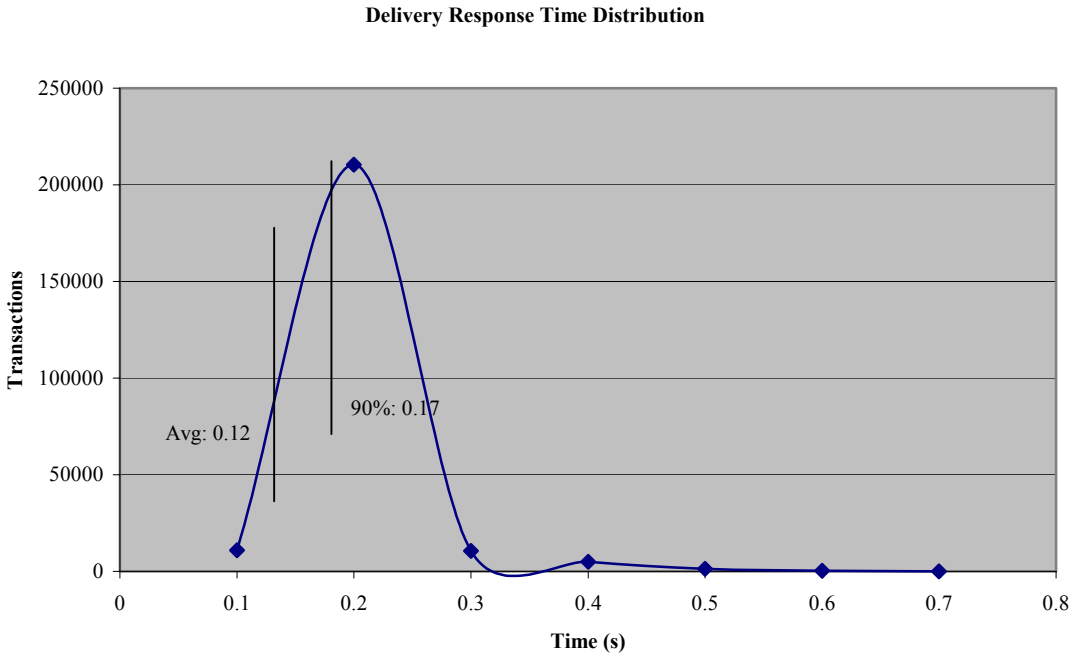

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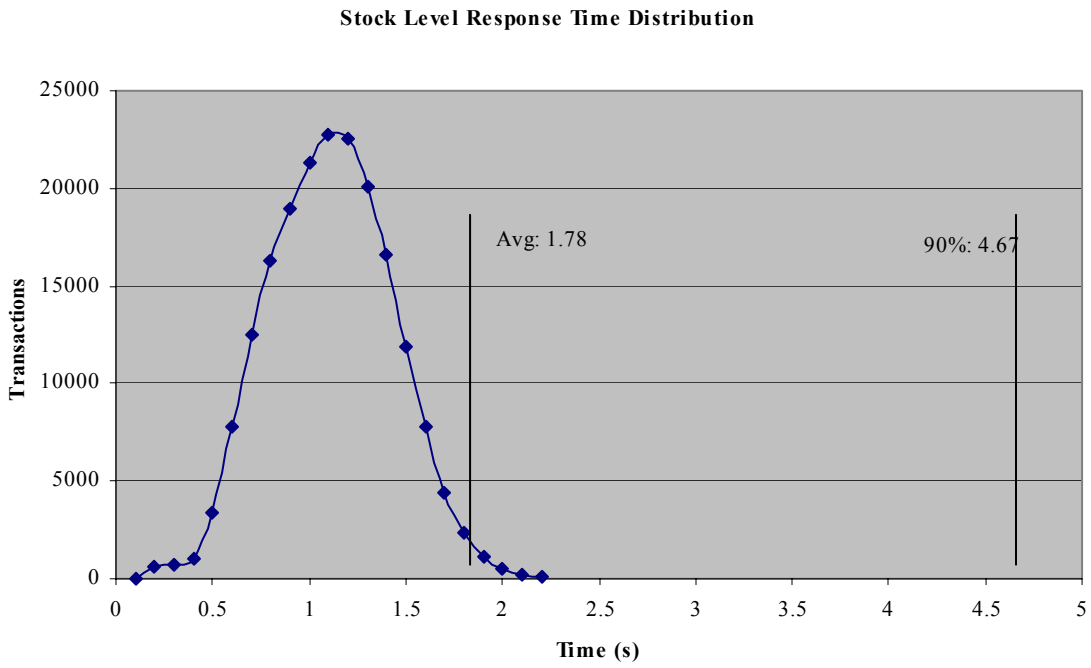
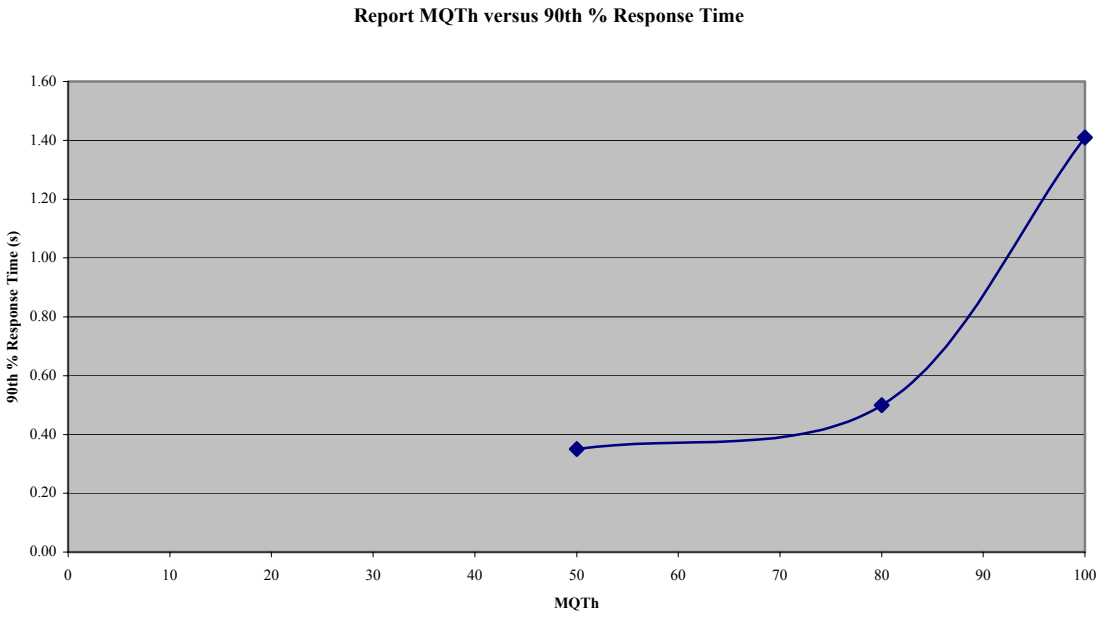
Figure 7: Stock Level Response Time Distribution



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



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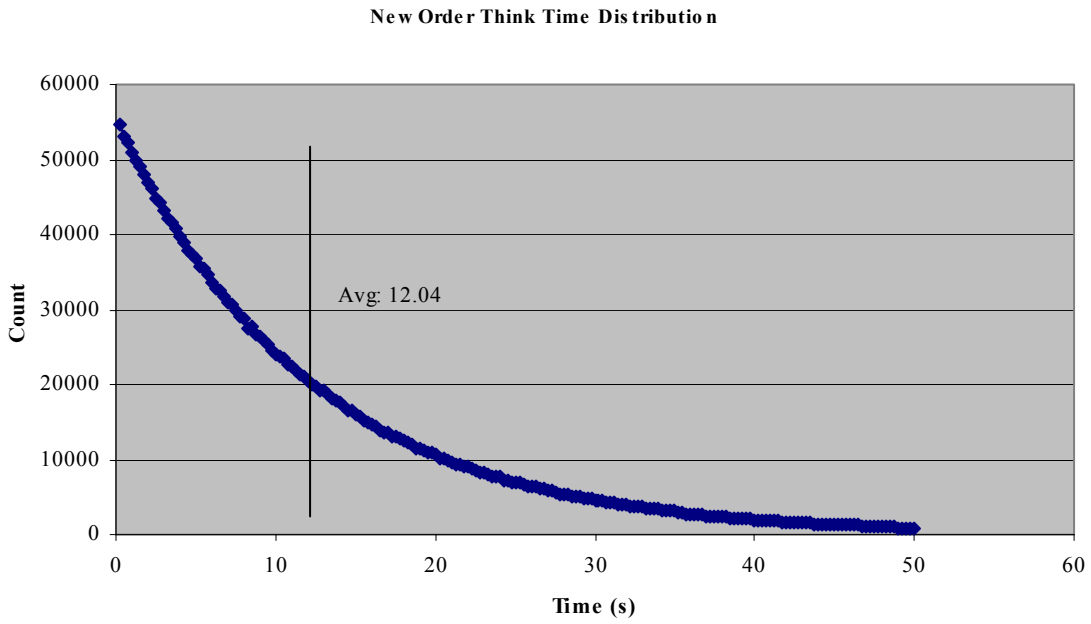
New-Order Think Time Distribution Graph

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



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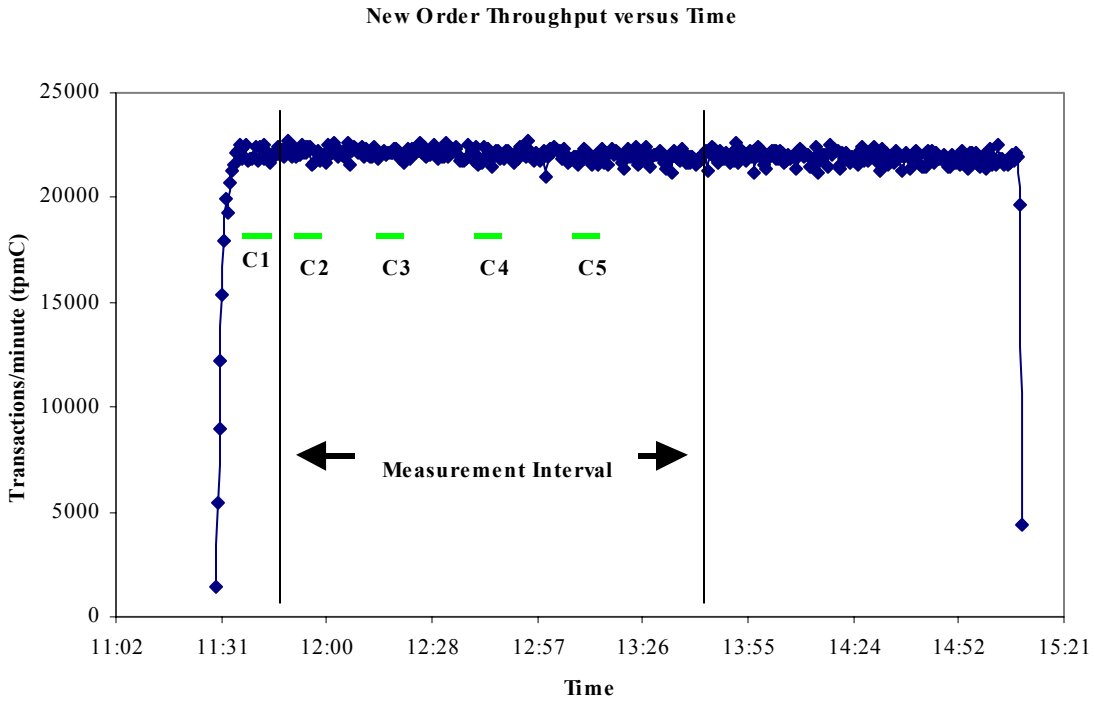
Steady-State Graph

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.

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The difference between these two timestamps was the response time for that transaction and was logged in the RTE log.

The RTE then waited the required think time interval before repeating the process starting at selecting another transaction from the menu.

The RTE transmissions were sent to the web-based application program running on the client machines through Ethernet LANs. These web clients managed the emulated web browser interface as well as all requests to the database on the server. The applications communicated with the database server over another Ethernet LAN using the COM+ transaction monitor and Microsoft SQL Server DBLIB library and RPC calls.

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

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

Measurement Interval

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

The measurement interval was 7200 minutes.

Measurement Period Duration and Checkpoint Duration

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

	Start	**End**	**Duration**
Measurement Interval	11:43:14	13:43:14	7,200
1st Checkpoint	11:44:14	11:46:43	149
2nd Checkpoint	12:14:09	12:16:39	150
3rd Checkpoint	12:44:04	12:46:36	152
4th Checkpoint	13:13:59	13:16:32	153

Transaction Mix

8.1.6.13 The method of regulation of the transaction mix (e.g., card decks or weighted random distribution) must be described. If weighted distribution is used and the RTE adjusts the weights associated with each transaction type, the maximum adjustments to the weight from the initial value must be disclosed. (8.1.6.13)

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

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

Table 9: Transaction Mix

Transaction	Percentage
New Order	44.84%
Payment	43.02%
Order Status	4.04%
Delivery	4.05%
Stock Level	4.05%

Other Metrics

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

Table 10: Transaction Statistics

Transaction	Function	Value
New Order	Home Warehouse Items	99.00%
	Remote Warehouse Items	1.00%
	Rolled Back Transactions	0.99%
	Average Lines Per Order	10.00
Payment	Home Warehouse	84.99%
	Remote Warehouse	15.01%
	Non-Primary Key Access	60.02%
Order Status	Non-Primary Key Access	60.07%
Delivery	Skipped Transactions	0

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

RTE Parameters

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

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

Emulated Components

It must be demonstrated that the functionality and performance of the components being emulated in the Driver System are equivalent to that of the priced system. The results of the test described in Clause 6.6.3.4 must be disclosed. (8.1.7.2)

No components were emulated.

Benchmarked and Targeted System Configuration Diagrams

A complete functional diagram of both the benchmark configuration and the configuration of the proposed (target) system must be disclosed. A detailed list of all software and hardware functionality being performed on the Driver System, and its interface to the SUT must be disclosed (see Clause 6.6.3.6). (8.1.7.3)

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

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

Network Configuration

The network configurations of both the tested services and the proposed (target) services which are being represented and a thorough explanation of exactly which parts of the proposed configuration are being replaced with the Driver System must be disclosed (see Clause 6.6.4). (8.1.7.4)

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

Network Bandwidth

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

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

- 10 BaseT (10 Mbit/sec) network segments between the RTE/Emulated Users and the switch.
- 100 BaseT (100 Mbit/sec) between the Clients and Server.

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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.

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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: Feb 18, 2004
Software Availability Date: Feb 18, 2004

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: 22,052 tpmC
Price Performance Metric: $1.85

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.*

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The component pricing based on usage is shown below:

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

System Pricing

System pricing should include subtotals for the following components: Server Hardware, Server Software, Client Hardware, Client Software, and Network Components used for terminal connection (see Clause 7.2.2.3). Clause 6.1 describes the Server and Client components. An example of the standard pricing sheet is shown in Appendix B. (8.1.8.7)
System pricing must include line item indication where non-sponsoring companies' brands are used. System pricing must also include line item indication of third party pricing. See example in Appendix B. (8.1.8.8)

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

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Clause 9 -- Audit Related Items

Auditor

The auditor's name, address, phone number, and a copy of the auditor's attestation letter indicating compliance must be included in the Full Disclosure Report. (8.1.9.1)
A review of the pricing model is required to ensure that all components required are priced (see Clause 9.2.8). The auditor is not required to review the final Full Disclosure Report or the final pricing prior to issuing the attestations letter. (8.1.9.2)

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

Availability of the Full Disclosure Report

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

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

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

or:

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

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February 5, 2004

Mr. Kong Yang
Dell Computer Corporation
One Dell Way
Round Rock, TX 78682

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

Platform:	Dell PowerEdge 2650
Database Manager:	Microsoft SQL Server 2000 Standard Edition
Operating System:	Microsoft Windows 2003 Standard Server Edition
Transaction Monitor:	COM+

System Under Test: Dell PowerEdge 2650 with:				
CPU's	Memory	Disks (total)	90% Response	TpmC
1 Intel Xeon @ 3.2 Ghz	Main: 2.5 GB	56 @ 18.2GB 4 @ 36GB	1.41	22,052.81

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

- The transactions were correctly implemented.
- The database files were properly sized.
- The database was properly scaled with 1900 warehouses, of which 1800 were active during the measured interval.
- The ACID properties were successfully demonstrated.
- Log loss and system loss were demonstrated on the full database with 1800 active warehouses.
- Data loss durability was demonstrated on a subset of the SUT configured with a database properly populated for 180 warehouses.
- Input data was generated according to the specified percentages.
- Eight hours of mirrored log space was present on the tested system.
- Eight hours of growth space for the dynamic tables was present on the tested system.
- The data for the 60 days space calculation was verified.
- The controller cache for the log disks was disabled.
- The steady state portion of the test was 120 minutes.
- More than one checkpoint was taken before the measured interval opened.
- Four checkpoints were completed inside the measured interval.
- The system pricing was checked for major components and maintenance.
- Third party quotes were verified for compliance.

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Auditor Notes: None

Sincerely,

Lorna Livingtree
Auditor

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Appendix A - Application Source Code

tpcc.dll ISAPI DLL Source Code

isapi_dll/src/tpcc.def

```
LIBRARY TPCC.DLL

EXPORTS

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

lsapi_dll/src/tpcc.h

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

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

#define TP_MAX_RETRIES
         50


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

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


//This structure defines the data necessary to keep distinct for each terminal or client
connection.
typedef struct _CLIENTDATA
{
         int                         iNextFree;
         //index of next free element or -1 if this entry in use.
         int                         w_id;
         //warehouse id assigned at welcome form
         int                         d_id;
         //district id assigned at welcome form

         int                         iSyncId;
         //syncronization id
         int                         iTickCount;
         //time of last access;

         CTPCC_BASE          *pTxn;

} CLIENTDATA, *PCLIENTDATA;


//This structure is used to define the operational interface for terminal id support
typedef struct _TERM
{
         int                         iNumEntries;
         //total allocated terminal array entries
         int                         iFreeList;
                  //next available terminal array element or -1 if none
         int                         iMasterSyncId;
         //syncronization id
         CLIENTDATA          *pClientData;
         //pointer to allocated client data
} TERM;

typedef TERM *PTERM;
         //pointer to terminal structure type


         enum WEBERROR
         {
                  NO_ERR,
                  ERR_COMMAND_UNDEFINED,
                  ERR_D_ID_INVALID,
                  ERR_DELIVERY_CARRIER_ID_RANGE,
                  ERR_DELIVERY_CARRIER_INVALID,
                  ERR_DELIVERY_MISSING_OCD_KEY,
                  ERR_DELIVERY_THREAD_FAILED,
                  ERR_GETPROCADDR_FAILED,
```


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```
                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);
```


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```
void MakeNewOrderForm(int iTermId, NEW_ORDER_DATA *pNewOrderData, BOOL bInput, char
*szForm);
void MakePaymentForm(int iTermId, PAYMENT_DATA *pPaymentData, BOOL bInput, char *szForm);
void MakeOrderStatusForm(int iTermId, ORDER_STATUS_DATA *pOrderStatusData, BOOL bInput,
char *szForm);
void MakeDeliveryForm(int iTermId, DELIVERY_DATA *pDeliveryData, BOOL bInput, char
*szForm);
void ProcessNewOrderForm(EXTENSION_CONTROL_BLOCK  *pECB, int iTermId, char *szBuffer);
void ProcessPaymentForm(EXTENSION_CONTROL_BLOCK *pECB, int iTermId, char *szBuffer);
void ProcessOrderStatusForm(EXTENSION_CONTROL_BLOCK *pECB, int iTermId, char *szBuffer);
void ProcessDeliveryForm(EXTENSION_CONTROL_BLOCK *pECB, int iTermId, char *szBuffer);
void ProcessStockLevelForm(EXTENSION_CONTROL_BLOCK *pECB, int iTermId, char *szBuffer);
void GetNewOrderData(LPSTR lpszQueryString, NEW_ORDER_DATA *pNewOrderData);
void GetPaymentData(LPSTR lpszQueryString, PAYMENT_DATA *pPaymentData);
void GetOrderStatusData(LPSTR lpszQueryString, ORDER_STATUS_DATA *pOrderStatusData);
BOOL PostDeliveryInfo(long w_id, short o_carrier_id);
BOOL IsNumeric(char *ptr);
BOOL IsDecimal(char *ptr);
void DeliveryWorkerThread(void *ptr);
```

isapi_dll/src/tpcc.rc

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

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

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

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

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

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

VS_VERSION_INFO VERSIONINFO
 FILEVERSION 0,4,0,0
 PRODUCTVERSION 0,4,0,0
 FILEFLAGSMASK 0x3fL
#ifdef _DEBUG
 FILEFLAGS 0x1L
#else
 FILEFLAGS 0x0L
#endif
 FILEOS 0x40004L
 FILETYPE 0x2L
 FILESUBTYPE 0x0L
BEGIN
    BLOCK "StringFileInfo"
    BEGIN
        BLOCK "040904b0"
        BEGIN
            VALUE "Comments", "TPC-C HTML DLL Server (DBLIB)\0"
            VALUE "CompanyName", "Microsoft\0"
            VALUE "FileDescription", "TPC-C HTML DLL Server (DBLIB)\0"
            VALUE "FileVersion", "0, 4, 0, 0\0"
            VALUE "InternalName", "tpcc\0"
            VALUE "LegalCopyright", "Copyright © 1997\0"
            VALUE "OriginalFilename", "tpcc.dll\0"
            VALUE "ProductName", "Microsoft tpcc\0"
            VALUE "ProductVersion", "0, 4, 0, 0\0"
        END
    END
    BLOCK "VarFileInfo"
    BEGIN
        VALUE "Translation", 0x409, 1200
    END
END

#endif    // !_MAC


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

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

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

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

#endif    // APSTUDIO_INVOKED


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

IDD_DIALOG1 DIALOG DISCARDABLE  0, 0, 186, 95
STYLE DS_MODALFRAME | WS_POPUP | WS_CAPTION | WS_SYSMENU
CAPTION "Dialog"
```


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```
FONT 8, "MS Sans Serif"
BEGIN
    DEFPUSHBUTTON   "OK",IDOK,129,7,50,14
    PUSHBUTTON      "Cancel",IDCANCEL,129,24,50,14
END


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

#ifdef APSTUDIO_INVOKED
GUIDELINES DESIGNINFO DISCARDABLE
BEGIN
    IDD_DIALOG1, DIALOG
    BEGIN
        LEFTMARGIN, 7
        RIGHTMARGIN, 179
        TOPMARGIN, 7
        BOTTOMMARGIN, 88
    END
END
#endif    // APSTUDIO_INVOKED

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



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


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

isapi_dll/src/tpcc.cpp

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

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

#include <sqltypes.h>

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

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

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

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

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

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


#define   LEN_ERR_STRING      256

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

char               szMyComputerName[MAX_COMPUTERNAME_LENGTH+1];

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

// The WEBCLIENT_VERSION string specifies the version level of this web client interface.
// The RTE must be synchronized with the interface level on login, otherwise the login
```

```
// will fail.  This is a sanity check to catch problems resulting from mismatched
versions
// of the RTE and web client.
#define WEBCLIENT_VERSION "410"

static    CRITICAL_SECTION              TermCriticalSection;

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

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

// For deferred Delivery txns:

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

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

// configuration settings from registry
TPCCREGISTRYDATA              Reg;


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

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

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

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

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

          try
          {
                    switch( ul_reason_for_call )
                    {
                              case DLL_PROCESS_ATTACH:
                                        {
                                                  DWORD dwSize =
MAX_COMPUTERNAME_LENGTH+1;
                                                  GetComputerName(szMyComputerName,
&dwSize);
                                                  szMyComputerName[dwSize] = 0;
                                        }

                                        DisableThreadLibraryCalls((HMODULE)hModule);
                                        InitializeCriticalSection(&TermCriticalSection);

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

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

                                        TermInit();

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

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

```
                                                hLibInstanceTm = LoadLibrary( szDllName
);
                                                if (hLibInstanceTm == NULL)
                                                        throw new CWEBCLNT_ERR(
ERR_LOADDLL_FAILED, szDllName, GetLastError() );
                                                // get function pointer to wrapper for
class constructor
                                                pCTPCC_ENCINA_new =
(TYPE_CTPCC_ENCINA*) GetProcAddress(hLibInstanceTm,"CTPCC_ENCINA_new");
                                                pCTPCC_ENCINA_post_init =
(TYPE_CTPCC_ENCINA*) GetProcAddress(hLibInstanceTm,"CTPCC_ENCINA_post_init");
                                                if (pCTPCC_ENCINA_new == NULL)
                                                        throw new CWEBCLNT_ERR(
ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                                        }
                                        else if (Reg.eTxnMon == COM)
                                        {
                                                strcpy( szDllName, Reg.szPath );
                                                strcat( szDllName, "tpcc_com.dll");
                                                hLibInstanceTm = LoadLibrary( szDllName
);
                                                if (hLibInstanceTm == NULL)
                                                        throw new CWEBCLNT_ERR(
ERR_LOADDLL_FAILED, szDllName, GetLastError() );

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

                                        // load DLL for database connection
                                        if ((Reg.eTxnMon == None) ||
(dwNumDeliveryThreads > 0))
                                        {
                                                if (Reg.eDB_Protocol == DBLIB)
                                                {
                                                        strcpy( szDllName, Reg.szPath
);
                                                        strcat( szDllName,
"tpcc_dblib.dll");
                                                        hLibInstanceDb = LoadLibrary(
szDllName );
                                                        if (hLibInstanceDb == NULL)
                                                                throw new
CWEBCLNT_ERR( ERR_LOADDLL_FAILED, szDllName, GetLastError() );

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

                                                        // get function pointer to
wrapper for class constructor
                                                        pCTPCC_ODBC_new =
(TYPE_CTPCC_ODBC*) GetProcAddress(hLibInstanceDb,"CTPCC_ODBC_new");
                                                        if (pCTPCC_ODBC_new == NULL)
                                                                throw new
CWEBCLNT_ERR( ERR_GETPROCADDR_FAILED, szDllName, GetLastError() );
                                                }
                                        }

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

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

                                                InitJulianTime(NULL);

                                                // create unique log file name based on
delilog-yymmdd-hhmm.log
                                                SYSTEMTIME Time;
                                                GetLocalTime( &Time );
                                                wsprintf( szLogFile, "%sdelivery-
%2.2d%2.2d%2.2d-%2.2d%2.2d.log",
                                                                        Reg.szPath,
Time.wYear % 100, Time.wMonth, Time.wDay, Time.wHour, Time.wMinute );
                                                txnDelilog = new CTxnLog(szLogFile,
TXN_LOG_WRITE);

                                                //write event into txn log for START
                                                txnDelilog-
>WriteCtrlRecToLog(TXN_EVENT_START, szMyComputerName, sizeof(szMyComputerName));

                                                // allocate structures for delivery
buffers and thread mgmt
                                                pDeliHandles = new
HANDLE[dwNumDeliveryThreads];
                                                pDelBuff = new
DELIVERY_TRANSACTION[dwDelBuffSize];
                                                // launch DeliveryWorkerThread to
perform actual delivery txns
                                                for(i=0; i<dwNumDeliveryThreads; i++)
                                                {
                                                        pDeliHandles[i] = (HANDLE)
_beginthread( DeliveryWorkerThread, 0, NULL );
                                                        if (pDeliHandles[i] ==
INVALID_HANDLE_VALUE)
                                                                throw new
CWEBCLNT_ERR( ERR_DELIVERY_THREAD_FAILED );
                                                }
```

```
                                        }

                                        break;

                                case DLL_PROCESS_DETACH:
                                        if (dwNumDeliveryThreads)
                                        {
                                                if (txnDelilog != NULL)
                                                {
                                                        //write event into txn log
for STOP
                                                        txnDelilog-
>WriteCtrlRecToLog(TXN_EVENT_STOP, szMyComputerName, sizeof(szMyComputerName));

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

                                                delete [] pDeliHandles;
                                                delete [] pDelBuff;

                                                CloseHandle( hWorkerSemaphore );
                                                CloseHandle( hDoneEvent );

        DeleteCriticalSection(&DelBuffCriticalSection);
                                        }

                                        DeleteCriticalSection(&TermCriticalSection);

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

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

                                        Sleep(500);
                                        break;

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

                return TRUE;
        }


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

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

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

                return TRUE;
        }

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

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

                TermDeleteAll();
                return TRUE;
        }


        /* FUNCTION: HttpExtensionProc
         *
         * PURPOSE:         This function is the main entry point for the TPCC DLL. The internet
service
         *                          calls this function passing in the http string.
         *
         * ARGUMENTS:       EXTENSION_CONTROL_BLOCK       *pECB     structure pointer to passed
in internet
         *
                                  service information.
         *
         * RETURNS:                   DWORD     HSE_STATUS_SUCCESS
                connection can be dropped if error
```

```
 *
         HSE_STATUS_SUCCESS_AND_KEEP_CONN        keep connect valid comment sent
 *
 * COMMENTS:        None
 *
 */

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

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


#ifdef ICECAP
         StartCAP();
#endif

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

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

                                    throw new CWEBCLNT_ERR( ERR_INVALID_TERMID );
                           }

                           //must have a valid syncid here since termid is valid
                           if (iSyncId != Term.pClientData[TermId].iSyncId)
                                    throw new CWEBCLNT_ERR(
ERR_INVALID_SYNC_CONNECTION );

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


                  switch(iCmd)
                  {
                  case 0:
                           WelcomeForm(pECB, szBuffer);
                           break;
                  case 1:
                           switch( FormId )
                           {
                                    case WELCOME_FORM:
                                    case MAIN_MENU_FORM:
                                             break;
                                    case NEW_ORDER_FORM:
                                             ProcessNewOrderForm(pECB, TermId,
szBuffer);
                                             break;
                                    case PAYMENT_FORM:
                                             ProcessPaymentForm(pECB, TermId,
szBuffer);
                                             break;
                                    case DELIVERY_FORM:
                                             ProcessDeliveryForm(pECB, TermId,
szBuffer);
                                             break;
                                    case ORDER_STATUS_FORM:
                                             ProcessOrderStatusForm(pECB, TermId,
szBuffer);
                                             break;
                                    case STOCK_LEVEL_FORM:
                                             ProcessStockLevelForm(pECB, TermId,
szBuffer);
                                             break;
                           }
                           break;
                  case 2:
                           // new-order selected from menu; display new-order input
form
                           MakeNewOrderForm(TermId, NULL, INPUT_FORM, szBuffer);
                           break;
                  case 3:
                           // payment selected from menu; display payment input form
                           MakePaymentForm(TermId, NULL, INPUT_FORM, szBuffer);
                           break;
                  case 4:
                           // delivery selected from menu; display delivery input form
                           MakeDeliveryForm(TermId, NULL, INPUT_FORM, szBuffer);
                           break;
                  case 5:
                           // order-status selected from menu; display order-status
input form
                           MakeOrderStatusForm(TermId, NULL, INPUT_FORM, szBuffer);
                           break;
                  case 6:
                           // stock-level selected from menu; display stock-level
input form
                           MakeStockLevelForm(TermId, NULL, INPUT_FORM, szBuffer);
                           break;
                  case 7:
                           // ExitCmd
                           TermDelete(TermId);
                           WelcomeForm(pECB, szBuffer);
                           break;
                  case 8:
                           SubmitCmd(pECB, szBuffer);
                           break;
                  case 9:
                           // menu
                           MakeMainMenuForm(TermId, Term.pClientData[TermId].iSyncId,
szBuffer);
                           break;
                  case 10:
                           // CMD=Clear
                           // resets all connections; should only be used when no
other connections are active
                           TermDeleteAll();
```

```
                        TermInit();
                        WelcomeForm(pECB, szBuffer);
                        break;
                case 11:  // CMD=Stats
                        StatsCmd(pECB, szBuffer);
                        break;
                }
        }
        catch (CBaseErr *e)
        {
                ErrorForm( pECB, e->ErrorType(), e->ErrorNum(), TermId, iSyncId, e-
>ErrorText(), szBuffer );
                delete e;
        }
        catch (...)
        {
                ErrorForm( pECB, ERR_TYPE_WEBDLL, 0, TermId, iSyncId, "Error:
Unhandled exception in Web Client.", szBuffer );
        }

#ifdef ICECAP
        StopCAP();
#endif


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

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

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


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

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

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

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

        (VOID) DeregisterEventSource(hEventSource);
    }
}


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

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

        DELIVERY_TRANSACTION                    delivery;
        PDELIVERY_DATA                          pDeliveryData;
        TXN_RECORD_TPCC_DELIV_DEF   txnDeliRec;

        DWORD                                   index;
        HANDLE                                  handles[2];

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

        assert(txnDelilog != NULL);

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


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

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

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

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

                                        LeaveCriticalSection(&DelBuffCriticalSection);

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

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

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

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

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

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

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

ErrorExit:
          delete pTxn;
          _endthread();
}

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

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

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

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


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```
		}
		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);
```


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

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

          sprintf( szTmp,     "Please enter your Warehouse and District for this
session:<BR>"
                                                  "<font face=\"Courier New\"
color=\"blue\"><PRE>" );
          strcat( szBuffer, szTmp);
          strcat( szBuffer,   "Warehouse ID = <INPUT NAME=\"w_id\" SIZE=6><BR>"
                                                        "District ID  = <INPUT
NAME=\"d_id\" SIZE=2><BR>"
                                                        "</PRE></font><HR>"
                                                        "<INPUT TYPE=\"submit\"
NAME=\"CMD\" VALUE=\"Submit\">"
                                                        "</FORM></BODY></HTML>");
}

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

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

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

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

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

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

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


          iNewTerm = TermAdd();

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

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


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

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

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

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

        EnterCriticalSection(&TermCriticalSection);

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

        LeaveCriticalSection(&TermCriticalSection);

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

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


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```
                {       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
```


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

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

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

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

          *pQueryString = ptr;
          return;

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

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

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

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

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

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

          *pQueryString = ptr;
          return atoi(ptr0);

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

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

```
 *
 */

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

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

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

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

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

          LeaveCriticalSection(&TermCriticalSection);
}

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

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

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

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

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

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

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

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

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

          LeaveCriticalSection(&TermCriticalSection);
          return iNewTerm;
}

/* FUNCTION: TermDelete
 *
```

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

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

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

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

                    LeaveCriticalSection(&TermCriticalSection);
          }
}


/* FUNCTION: MakeErrorForm
 */

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

/* FUNCTION: MakeMainMenuForm
 */

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

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

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

          c = wsprintf(szForm,
                    "<HTML><HEAD><TITLE>TPC-C Stock Level</TITLE></HEAD><FORM
ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                    "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\" VALUE=\"0\">"
                    "<INPUT TYPE=\"hidden\" NAME=\"ERROR\" VALUE=\"0\">"
                    "<INPUT TYPE=\"hidden\" NAME=\"FORMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\" NAME=\"TERMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\" VALUE=\"%d\">"
                    "<PRE><font face=\"Courier\">                                        Stock-
Level<BR>"
                    "Warehouse: %6.6d   District: %2.2d<BR> <BR>",
                    STOCK_LEVEL_FORM, iTermId, Term.pClientData[iTermId].iSyncId,
                    Term.pClientData[iTermId].w_id, Term.pClientData[iTermId].d_id);

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


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Appendix A - Application Source Code

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

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

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

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

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

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

        if ( bInput )
        {
                c += wsprintf(szForm+c, "Warehouse: %6.6d   ",
Term.pClientData[iTermId].w_id );

                strcpy( szForm+c,
                        "District: <INPUT NAME=\"DID*\" SIZE=1>
Date:<BR>"
                        "Customer:  <INPUT NAME=\"CID*\" SIZE=4>   Name:
Credit:      %Disc:<BR>"
                        "Order Number:          Number of Lines:          W_tax:
D_tax:<BR> <BR>"
                        " Supp_W  Item_Id  Item Name                Qty  Stock
B/G  Price    Amount<BR>"
                        "  <INPUT NAME=\"SP00*\" SIZE=4>  <INPUT NAME=\"IID00*\"
SIZE=6>                   <INPUT NAME=\"Qty00*\" SIZE=1><BR>"
                        "  <INPUT NAME=\"SP01*\" SIZE=4>  <INPUT NAME=\"IID01*\"
SIZE=6>                   <INPUT NAME=\"Qty01*\" SIZE=1><BR>"
                        "  <INPUT NAME=\"SP02*\" SIZE=4>  <INPUT NAME=\"IID02*\"
SIZE=6>                   <INPUT NAME=\"Qty02*\" SIZE=1><BR>"
                        "  <INPUT NAME=\"SP03*\" SIZE=4>  <INPUT NAME=\"IID03*\"
SIZE=6>                   <INPUT NAME=\"Qty03*\" SIZE=1><BR>"
                        "  <INPUT NAME=\"SP04*\" SIZE=4>  <INPUT NAME=\"IID04*\"
SIZE=6>                   <INPUT NAME=\"Qty04*\" SIZE=1><BR>"
                        "  <INPUT NAME=\"SP05*\" SIZE=4>  <INPUT NAME=\"IID05*\"
SIZE=6>                   <INPUT NAME=\"Qty05*\" SIZE=1><BR>"
                        "  <INPUT NAME=\"SP06*\" SIZE=4>  <INPUT NAME=\"IID06*\"
SIZE=6>                   <INPUT NAME=\"Qty06*\" SIZE=1><BR>"
                        "  <INPUT NAME=\"SP07*\" SIZE=4>  <INPUT NAME=\"IID07*\"
SIZE=6>                   <INPUT NAME=\"Qty07*\" SIZE=1><BR>"
                        "  <INPUT NAME=\"SP08*\" SIZE=4>  <INPUT NAME=\"IID08*\"
SIZE=6>                   <INPUT NAME=\"Qty08*\" SIZE=1><BR>"
                        "  <INPUT NAME=\"SP09*\" SIZE=4>  <INPUT NAME=\"IID09*\"
SIZE=6>                   <INPUT NAME=\"Qty09*\" SIZE=1><BR>"
                        "  <INPUT NAME=\"SP10*\" SIZE=4>  <INPUT NAME=\"IID10*\"
SIZE=6>                   <INPUT NAME=\"Qty10*\" SIZE=1><BR>"
                        "  <INPUT NAME=\"SP11*\" SIZE=4>  <INPUT NAME=\"IID11*\"
SIZE=6>                   <INPUT NAME=\"Qty11*\" SIZE=1><BR>"
                        "  <INPUT NAME=\"SP12*\" SIZE=4>  <INPUT NAME=\"IID12*\"
SIZE=6>                   <INPUT NAME=\"Qty12*\" SIZE=1><BR>"
                        "  <INPUT NAME=\"SP13*\" SIZE=4>  <INPUT NAME=\"IID13*\"
SIZE=6>                   <INPUT NAME=\"Qty13*\" SIZE=1><BR>"
                        "  <INPUT NAME=\"SP14*\" SIZE=4>  <INPUT NAME=\"IID14*\"
SIZE=6>                   <INPUT NAME=\"Qty14*\" SIZE=1><BR>"
                        "Execution Status:
Total:<BR>"
                        "</font></PRE><HR>"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Process\">"
                        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Menu\">"
                        "</FORM></HTML>"
                        );
        }
        else
        {
                c += wsprintf(szForm+c, "Warehouse: %6.6d   District: %2.2d
Date: ",
                        pNewOrderData->w_id,
                        pNewOrderData->d_id);

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

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

                if ( bValid )
```


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

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

                                i = 0;
                        }

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

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

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

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

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

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

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

        if ( bInput )
        {
                c += wsprintf(szForm+c,
                        "<BR> <BR>Warehouse: %6.6d"
                        "                               District: <INPUT NAME=\"DID*\"
SIZE=1><BR> <BR> <BR> <BR> <BR>"
                        "Customer: <INPUT NAME=\"CID*\" SIZE=4>"
                        "Cust-Warehouse: <INPUT NAME=\"CWI*\" SIZE=4>  "
                        "Cust-District: <INPUT NAME=\"CDI*\" SIZE=1><BR>"
                        "Name:                          <INPUT NAME=\"CLT*\" SIZE=16>
Since:<BR>"
                        "
Credit:<BR>"
                        "
Disc:<BR>"
                        "
Phone:<BR> <BR>"
                        "Amount Paid:          $<INPUT NAME=\"HAM*\" SIZE=7>
New Cust-Balance:<BR>"
```

```
                              "Credit Limit:<BR> <BR>Cust-Data: <BR> <BR> <BR> <BR>
<BR></font></PRE><HR>"
                              "<INPUT TYPE=\"submit\" NAME=\"CMD\"
VALUE=\"Process\"><INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Menu\">"
                              "</BODY></FORM></HTML>"
                              , Term.pClientData[iTermId].w_id);
          }
          else
          {
                    c += wsprintf(szForm+c,
                              "<BR> <BR>Warehouse: %6.6d                         District:
%2.2d<BR>"
                              "%-20s                    %-20s<BR>"
                              "%-20s                    %-20s<BR>"
                              "%-20s %-2s %5.5s-%4.4s       %-20s %-2s %5.5s-%4.4s<BR>
<BR>"
                              "Customer: %4.4d  Cust-Warehouse: %6.6d  Cust-District:
%2.2d<BR>"
                              "Name:   %-16s %-2s %-16s     Since:  %2.2d-%2.2d-
%4.4d<BR>"
                              "        %-20s                    Credit: %-2s<BR>"

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

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

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

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

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

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

}

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

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

          c = wsprintf(szForm,
                    "<HTML><HEAD><TITLE>TPC-C Order-Status</TITLE></HEAD><BODY>"
                    "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                    "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\" VALUE=\"0\">"
                    "<INPUT TYPE=\"hidden\" NAME=\"ERROR\" VALUE=\"0\">"
                    "<INPUT TYPE=\"hidden\" NAME=\"FORMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\" NAME=\"TERMID\" VALUE=\"%d\">"
                    "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\" VALUE=\"%d\">"
                    "<PRE><font face=\"Courier\">                                   Order-
Status<BR>"
                    "Warehouse: %6.6d   ",
                    ORDER_STATUS_FORM, iTermId, Term.pClientData[iTermId].iSyncId,
Term.pClientData[iTermId].w_id);

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


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

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

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

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

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

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

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

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

        c = wsprintf(szForm,
                "<HTML><HEAD><TITLE>TPC-C Delivery</TITLE></HEAD><BODY>"
                "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
                "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\" VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"ERROR\" VALUE=\"0\">"
                "<INPUT TYPE=\"hidden\" NAME=\"FORMID\" VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"TERMID\" VALUE=\"%d\">"
                "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\" VALUE=\"%d\">"
                "<PRE><font face=\"Courier\">
Delivery<BR>"
                "Warehouse: %6.6d<BR> <BR>",
                (!bInput && (pDeliveryData->exec_status_code != eOK)) ?
ERR_TYPE_DELIVERY_POST : 0,
                DELIVERY_FORM, iTermId, Term.pClientData[iTermId].iSyncId,
Term.pClientData[iTermId].w_id);

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

                        , pDeliveryData->o_carrier_id,
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                              (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 );
```


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

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

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

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

        PSTOCK_LEVEL_DATA   pStockLevel;

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

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

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

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

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

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

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

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

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

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

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

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

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


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```
                        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)
 *
```


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```
 * 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];
```


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

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

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

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

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

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

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

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

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

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

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

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

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

        RegCloseKey(hKey);

        return FALSE;
}
```

common/src/ReadRegistry.h

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

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

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

//This structure defines the data necessary to keep distinct for each terminal or client
connection.
typedef struct _TPCCREGISTRYDATA
{
        enum DBPROTOCOL eDB_Protocol;
        enum TXNMON eTxnMon;
        BOOL bCOM_SinglePool;
```


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```
        DWORD dwMaxConnections;
        DWORD dwMaxPendingDeliveries;
        DWORD dwNumberOfDeliveryThreads;
        char szPath[128];
        char szDbServer[32];
        char szDbName[32];
        char szDbUser[32];
        char szDbPassword[32];
        wchar_t szSPPrefix[32];       //tpcc_odbc.dll stored procedures prefix
} TPCCREGISTRYDATA, *PTPCCREGISTRYDATA;

BOOL ReadTPCCRegistrySettings( TPCCREGISTRYDATA *pReg );
```

common/src/error.h

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

#pragma once

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

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

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

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


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

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

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

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



class CBaseErr
{
public:

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


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

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



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


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

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

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

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

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

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

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

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



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


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

          //short   m_errType;
};

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

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

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

        Action    m_eAction;
        char      *m_szErrorText;

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

};

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

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

private:
        char m_szMsg[ERR_MSG_BUF_SIZE];
};

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

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


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

        int ErrorType() {return ERR_BUF_OVERFLOW;}

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

common/src/trans.h

```
/*        FILE:               TRANS.H
 *                                    Microsoft TPC-C Kit Ver. 4.42.000
 *                                    Copyright Microsoft, 2002
 *              All Rights Reserved
 *
 *                                    Version 4.10.000 audited by Richard Gimarc,
Performance Metrics, 3/17/99
 *
 *        PURPOSE:  Header file for TPC-C structure templates.
 *
 *  Change history:
 *                  4.42.000 - changed w_id fields from short to long to support >32K
warehouses
 *                  4.20.000 - updated rev number to match kit
 */
#pragma once

// String length constants
#define SERVER_NAME_LEN            20
#define DATABASE_NAME_LEN          20
#define USER_NAME_LEN              20
#define PASSWORD_LEN               20
#define TABLE_NAME_LEN             20
#define I_DATA_LEN                 50
#define I_NAME_LEN                 24
#define BRAND_LEN                   1
#define LAST_NAME_LEN              16
#define W_NAME_LEN                 10
#define ADDRESS_LEN                20
#define STATE_LEN                   2
```


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```
#define ZIP_LEN                     9
#define S_DIST_LEN                 24
#define S_DATA_LEN                 50
#define D_NAME_LEN                 10
#define FIRST_NAME_LEN             16
#define MIDDLE_NAME_LEN             2
#define PHONE_LEN                  16
#define DATETIME_LEN               30
#define CREDIT_LEN                  2
#define C_DATA_LEN                250
#define H_DATA_LEN                 24
#define DIST_INFO_LEN              24
#define MAX_OL_NEW_ORDER_ITEMS     15
#define MAX_OL_ORDER_STATUS_ITEMS  15
#define STATUS_LEN                 25
#define OL_DIST_INFO_LEN                  24

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

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

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

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

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

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

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

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

typedef struct
{
          long                                      ol_i_id;
          long                              ol_supply_w_id;
          short                                     ol_quantity;
          double                                    ol_amount;
```


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```
        TIMESTAMP_STRUCT    ol_delivery_d;
} OL_ORDER_STATUS_DATA;

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

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


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

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

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

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

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

common/src/txn_base.h

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

#pragma once

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

class DllDecl CTPCC_BASE
{
        public:
                CTPCC_BASE(void) {};
                virtual ~CTPCC_BASE(void) {};

                virtual PNEW_ORDER_DATA             BuffAddr_NewOrder()
        = 0;
                virtual PPAYMENT_DATA               BuffAddr_Payment()
        = 0;
                virtual PDELIVERY_DATA              BuffAddr_Delivery()
        = 0;
                virtual PSTOCK_LEVEL_DATA     BuffAddr_StockLevel()         = 0;
                virtual PORDER_STATUS_DATA    BuffAddr_OrderStatus()        = 0;

                virtual void NewOrder                   () = 0;
                virtual void Payment                    () = 0;
                virtual void Delivery                   () = 0;
                virtual void StockLevel                 () = 0;
                virtual void OrderStatus      () = 0;
};
```

db_dblib_dll/src/tpcc_dblib.cpp

```
/*      FILE:               TPCC_DBLIB.CPP
 *                                      Microsoft TPC-C Kit Ver. 4.42.000
 *                                      Copyright Microsoft, 2002
 *              All Rights Reserved
 *
 *                                      Version 4.10.000 audited by Richard Gimarc,
Performance Metrics, 3/17/99
 *
 *      PURPOSE:  Implements dblib calls for TPC-C txns.
 *      Contact:  Charles Levine (clevine@microsoft.com)
 *
 *  Change history:
 *              4.42.000 - changed w_id fields from short to long to support >32K
warehouses
```

```
 *                  4.20.000 - updated rev number to match kit
 *                  4.10.001 - not deleting error class in catch handler on deadlock
retry;
 *                                       not a functional bug, but a memory leak
 *                                     - had to tweak some declarations to compile with
latest SDK; no functional change
 */

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

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

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

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

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

#define   DEFCLPACKSIZE                          4096

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

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

const int iErrOleDbProvider = 7312;
const char sErrTimeoutExpired[] = "Timeout expired";

BOOL APIENTRY DllMain(HMODULE hModule, DWORD ul_reason_for_call, LPVOID lpReserved)
{
          switch( ul_reason_for_call )
          {
                    case DLL_PROCESS_ATTACH:
                              DisableThreadLibraryCalls(hModule);
                              dbinit();           // initialize dblib
                              break;

                    case DLL_PROCESS_DETACH:
                              dbexit();           // close all dblib
structures/connections
                              break;

                    default:
                              /* nothing */;
          }
          return TRUE;
}


int err_handler(DBPROCESS *dbproc, int severity, int dberr, int oserr, LPCSTR dberrstr,
LPCSTR oserrstr)
{
          CTPCC_DBLIB                              *pConn;

          assert(dbproc != NULL);
          pConn = (CTPCC_DBLIB*)dbgetuserdata(dbproc);

          if (pConn != NULL)
          {
                    pConn->SetDbLibError( severity, dberr, oserr, dberrstr, oserrstr );
          }
          return INT_CANCEL;
}

/* FUNCTION: int msg_handler(DBPROCESS *dbproc, DBINT msgno, int msgstate, int severity,
char *msgtext)
 *
 * PURPOSE:         This function handles DB-Library SQL Server error messages
 *
 * ARGUMENTS:       DBPROCESS           *dbproc                        DBPROCESS id
pointer
 *                                      DBINT                          msgno
          message number
 *                                      int                                      msgstate
          message state
 *                                      int                                      severity
          message severity
 *                                      char                           *msgtext
          printable message description
 *
 * RETURNS:                   int                                      INT_CONTINUE
          continue if error is SQLETIME else INT_CANCEL action
 *
          INT_CANCEL                  cancel operation
 *
 * COMMENTS:        This function also sets the dead lock dbproc variable if necessary.
 *
 */

// typedef INT (SQLAPI *DBMSGHANDLE_PROC)(PDBPROCESS, DBINT, INT, INT, LPCSTR, LPCSTR,
LPCSTR, DBUSMALLINT);

int msg_handler(DBPROCESS *dbproc, DBINT msgno, int msgstate, int severity,
                                      LPCSTR msgtext, LPCSTR srvname, LPCSTR procname,
DBUSMALLINT line)
{
          CTPCC_DBLIB                              *pConn;

          assert(dbproc != NULL);
          pConn = (CTPCC_DBLIB*)dbgetuserdata(dbproc);

          if (pConn != NULL)
          {
                    pConn->SetSqlError( msgno, msgstate, severity, msgtext );
          }

          return 0;
}

/* FUNCTION: void UtilStrCpy(char * pDest, char * pSrc, int n)
 *
 * PURPOSE:         This function copies n characters from string pSrc to pDst and places
a
 *                            null character at the end of the destination string.
```


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```
 *
 * ARGUMENTS:       char                            *pDest    destination string pointer
 *                                  char                              *pSrc     source
string pointer
 *                                  int                                       n
          number of characters to copy
 *
 * RETURNS:                   None
 *
 * COMMENTS:        Unlike strncpy this function ensures that the result string is
 *                                  always null terminated.
 *
 */

inline static void UtilStrCpy(char * pDest, const BYTE * pSrc, int n)
{
    strncpy(pDest, (char *)pSrc, n);
    pDest[n] = '\0';

          return;
}

/* FUNCTION: CTPCC_DBLIB_ERR::ErrorText
 *
 */

char* CTPCC_DBLIB_ERR::ErrorText(void)
{
          int i;

          static SERRORMSG errorMsgs[] =
          {
                    { ERR_WRONG_SP_VERSION,                   "Wrong version of stored
procs on database server"     },
                    { ERR_INVALID_CUST,                       "Invalid Customer id,name."
                                                              },
                    { ERR_NO_SUCH_ORDER,                      "No orders found for
customer."                                                            },
                    { ERR_RETRIED_TRANS,                      "Retries before transaction
succeeded."                                       },
                    { 0,                                                                ""

                              }
          };

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

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

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


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

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

          m_MaxRetries = 10;                // how many retries on deadlock

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

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

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

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


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

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

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

          m_dbproc = dbopen(login, szServer);
```

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

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

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

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

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

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

        DiscardNextResults(2);

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

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

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

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

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


        DiscardNextRows(0);
        DiscardNextResults(0);
}


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

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

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

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

}

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

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

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

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

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

        CDBLIBERR *pDbLibErr;
        if (m_DbLibErr == NULL)
                // this case isn't expected to happen, since it means that an error
was returned
                // but the error handlers were not called.
                pDbLibErr = new CDBLIBERR(eAction);
        else
        {
```


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```
                    pDbLibErr = m_DbLibErr;
                    pDbLibErr->m_eAction = eAction;
                    m_DbLibErr = NULL;            // clear our pointer to instance; catch
handler will delete
          }

          throw pDbLibErr;
}

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

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

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

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

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

                    DiscardNextRows(-1);
                    iResultsRead++;
          }

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

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

          ResetError();

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

                              dbrpcparam(m_dbproc, NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.StockLevel.w_id);                // @w_id int
                              dbrpcparam(m_dbproc, NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.StockLevel.d_id);                // @d_id tinyint
                              dbrpcparam(m_dbproc, NULL, 0, SQLINT2, -1, -1, (BYTE *)
&m_txn.StockLevel.threshold);   // @threshhold smallint

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

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

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

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

                              DiscardNextRows(0);
                              DiscardNextResults(0);

                              m_txn.StockLevel.exec_status_code = eOK;
                              return;
                    }
                    catch (CSQLERR *e)
                    {
                              if ((e->m_msgno == 1205 ||
                                        (e->m_msgno == iErrOleDbProvider &&
                                        strstr(e->m_msgtext, sErrTimeoutExpired) !=
NULL)) &&
                                        (++iTryCount <= iMaxRetries))
                              {
                                        // hit deadlock; backoff for increasingly longer
period
                                        delete e;
                                        Sleep(10 * iTryCount);
                              }
```

```
                                else
                                        throw;
                        }
                }       // while (TRUE)

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


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

        int                             iTryCount = 0;
        const BYTE          *pData;

        ResetError();

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

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

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

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

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


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

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

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

                                if(pData=dbdata(m_dbproc, 1))

        UtilStrCpy(m_txn.NewOrder.OL[i].ol_i_name, pData, dbdatlen(m_dbproc, 1));
                                if(pData=dbdata(m_dbproc, 2))
                                        m_txn.NewOrder.OL[i].ol_stock =
(*(DBSMALLINT *) pData);
                                if(pData=dbdata(m_dbproc, 3))

        UtilStrCpy(m_txn.NewOrder.OL[i].ol_brand_generic, pData, dbdatlen(m_dbproc,
3));
                                if(pData=dbdata(m_dbproc, 4))
                                        dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,4),
                                        SQLFLT8, (BYTE
*)&m_txn.NewOrder.OL[i].ol_i_price, 8);
                                if(pData=dbdata(m_dbproc, 5))

                                        dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,5),
                                        SQLFLT8, (BYTE
*)&m_txn.NewOrder.OL[i].ol_amount, 8);

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

                                DiscardNextRows(0);
                        }


                        // get remaining values for w_tax, d_tax, o_id, c_last,
c_discount, c_credit, o_entry_d, commit_flag
                        if (dbresults(m_dbproc) != SUCCEED)
                                ThrowError(CDBLIBERR::eDbResults);

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

                        if (dbnumcols(m_dbproc) != 8)
                                ThrowError(CDBLIBERR::eWrongNumCols);

                        if (pData=dbdata(m_dbproc, 1))


                                dbconvert(m_dbproc, SQLNUMERIC, (LPCBYTE)pData,
dbdatlen(m_dbproc,1), SQLFLT8, (BYTE *)&m_txn.NewOrder.w_tax, 8);
```

```
                        if (pData=dbdata(m_dbproc, 2))

                                dbconvert(m_dbproc, SQLNUMERIC, (LPCBYTE)pData,
dbdatlen(m_dbproc,2), SQLFLT8, (BYTE *)&m_txn.NewOrder.d_tax, 8);
                        if (pData=dbdata(m_dbproc, 3))
                                m_txn.NewOrder.o_id = (*(DBINT *) pData);
                        if (pData=dbdata(m_dbproc, 4))
                                UtilStrCpy(m_txn.NewOrder.c_last, pData,
dbdatlen(m_dbproc, 4));
                        if (pData=dbdata(m_dbproc, 5))
                                dbconvert(m_dbproc, SQLNUMERIC, (LPCBYTE)pData,
dbdatlen(m_dbproc,5), SQLFLT8, (BYTE *)&m_txn.NewOrder.c_discount, 8);
                        if (pData=dbdata(m_dbproc, 6))
                                UtilStrCpy(m_txn.NewOrder.c_credit, pData,
dbdatlen(m_dbproc, 6));
                        if (pData=dbdata(m_dbproc, 7))
                        {
                                datetime = *((DBDATETIME *) pData);
                                dbdatecrack(m_dbproc, &daterec, &datetime);
                                m_txn.NewOrder.o_entry_d.year   = daterec.year;
                                m_txn.NewOrder.o_entry_d.month  = daterec.month;
                                m_txn.NewOrder.o_entry_d.day    = daterec.day;
                                m_txn.NewOrder.o_entry_d.hour   = daterec.hour;
                                m_txn.NewOrder.o_entry_d.minute = daterec.minute;
                                m_txn.NewOrder.o_entry_d.second = daterec.second;
                        }
                        if (pData=dbdata(m_dbproc, 8))
                                commit_flag = (*(DBTINYINT *) pData);

                        DiscardNextRows(0);
                        DiscardNextResults(0);


                        if (commit_flag == 1)
                        {
                                m_txn.NewOrder.total_amount *= ((1 +
m_txn.NewOrder.w_tax + m_txn.NewOrder.d_tax) * (1 - m_txn.NewOrder.c_discount));
                                m_txn.NewOrder.exec_status_code = eOK;
                        }
                        else
                                m_txn.NewOrder.exec_status_code = eInvalidItem;

                        return;
                }
                catch (CSQLERR *e)
                {
                        if ((e->m_msgno == 1205 ||
                                (e->m_msgno == iErrOleDbProvider &&
                                strstr(e->m_msgtext, sErrTimeoutExpired) !=
NULL)) &&
                                (++iTryCount <= iMaxRetries))
                        {
                                // hit deadlock; backoff for increasingly longer
period
                                delete e;
                                Sleep(10 * iTryCount);
                        }
                        else
                                throw;
                }
        }       // while (TRUE)

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


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

        int                         iTryCount = 0;
        const BYTE          *pData;

        ResetError();

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

                        dbrpcparam(m_dbproc, NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.Payment.w_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.Payment.c_w_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLFLT8, -1, -1, (BYTE *)
&m_txn.Payment.h_amount);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.Payment.d_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.Payment.c_d_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.Payment.c_id);

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

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

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

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

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

                        if (pData=dbdata(m_dbproc, 1))
                                m_txn.Payment.c_id = *((DBINT *) pData);
                        if (pData=dbdata(m_dbproc, 2))
                                UtilStrCpy(m_txn.Payment.c_last, pData,
dbdatlen(m_dbproc, 2));
                        if (pData=dbdata(m_dbproc, 3))
                        {
                                datetime = *((DBDATETIME *) pData);
                                dbdatecrack(m_dbproc, &daterec, &datetime);
                                m_txn.Payment.h_date.year   = daterec.year;
                                m_txn.Payment.h_date.month  = daterec.month;
                                m_txn.Payment.h_date.day    = daterec.day;
```


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```
                                m_txn.Payment.h_date.hour   = daterec.hour;
                                m_txn.Payment.h_date.minute = daterec.minute;
                                m_txn.Payment.h_date.second = daterec.second;
                        }
                        if (pData=dbdata(m_dbproc, 4))
                                UtilStrCpy(m_txn.Payment.w_street_1, pData,
dbdatlen(m_dbproc, 4));
                        if (pData=dbdata(m_dbproc, 5))
                                UtilStrCpy(m_txn.Payment.w_street_2, pData,
dbdatlen(m_dbproc, 5));
                        if (pData=dbdata(m_dbproc, 6))
                                UtilStrCpy(m_txn.Payment.w_city, pData,
dbdatlen(m_dbproc, 6));
                        if (pData=dbdata(m_dbproc, 7))
                                UtilStrCpy(m_txn.Payment.w_state, pData,
dbdatlen(m_dbproc, 7));
                        if (pData=dbdata(m_dbproc, 8))
                                UtilStrCpy(m_txn.Payment.w_zip, pData,
dbdatlen(m_dbproc, 8));
                        if (pData=dbdata(m_dbproc, 9))
                                UtilStrCpy(m_txn.Payment.d_street_1, pData,
dbdatlen(m_dbproc, 9));
                        if (pData=dbdata(m_dbproc, 10))
                                UtilStrCpy(m_txn.Payment.d_street_2, pData,
dbdatlen(m_dbproc, 10));
                        if (pData=dbdata(m_dbproc, 11))
                                UtilStrCpy(m_txn.Payment.d_city, pData,
dbdatlen(m_dbproc, 11));
                        if (pData=dbdata(m_dbproc, 12))
                                UtilStrCpy(m_txn.Payment.d_state, pData,
dbdatlen(m_dbproc, 12));
                        if (pData=dbdata(m_dbproc, 13))
                                UtilStrCpy(m_txn.Payment.d_zip, pData,
dbdatlen(m_dbproc, 13));
                        if (pData=dbdata(m_dbproc, 14))
                                UtilStrCpy(m_txn.Payment.c_first, pData,
dbdatlen(m_dbproc, 14));
                        if (pData=dbdata(m_dbproc, 15))
                                UtilStrCpy(m_txn.Payment.c_middle, pData,
dbdatlen(m_dbproc, 15));
                        if (pData=dbdata(m_dbproc, 16))
                                UtilStrCpy(m_txn.Payment.c_street_1, pData,
dbdatlen(m_dbproc, 16));
                        if (pData=dbdata(m_dbproc, 17))
                                UtilStrCpy(m_txn.Payment.c_street_2, pData,
dbdatlen(m_dbproc, 17));
                        if (pData=dbdata(m_dbproc, 18))
                                UtilStrCpy(m_txn.Payment.c_city, pData,
dbdatlen(m_dbproc, 18));
                        if (pData=dbdata(m_dbproc, 19))
                                UtilStrCpy(m_txn.Payment.c_state, pData,
dbdatlen(m_dbproc, 19));
                        if (pData=dbdata(m_dbproc, 20))
                                UtilStrCpy(m_txn.Payment.c_zip, pData,
dbdatlen(m_dbproc, 20));
                        if (pData=dbdata(m_dbproc, 21))
                                UtilStrCpy(m_txn.Payment.c_phone, pData,
dbdatlen(m_dbproc, 21));
                        if (pData=dbdata(m_dbproc, 22))
                        {
                                datetime = *((DBDATETIME *) pData);
                                dbdatecrack(m_dbproc, &daterec, &datetime);
                                m_txn.Payment.c_since.year   = daterec.year;
                                m_txn.Payment.c_since.month  = daterec.month;
                                m_txn.Payment.c_since.day    = daterec.day;
                                m_txn.Payment.c_since.hour   = daterec.hour;
                                m_txn.Payment.c_since.minute = daterec.minute;
                                m_txn.Payment.c_since.second = daterec.second;
                        }
                        if(pData=dbdata(m_dbproc, 23))
                                UtilStrCpy(m_txn.Payment.c_credit, pData,
dbdatlen(m_dbproc, 23));
                        if(pData=dbdata(m_dbproc, 24))
                                dbconvert(m_dbproc, SQLNUMERIC, (LPCBYTE)pData,
dbdatlen(m_dbproc,24), SQLFLT8, (BYTE *)&m_txn.Payment.c_credit_lim, 8);
                        if(pData=dbdata(m_dbproc, 25))
                                dbconvert(m_dbproc, SQLNUMERIC, (LPCBYTE)pData,
dbdatlen(m_dbproc,25), SQLFLT8, (BYTE *)&m_txn.Payment.c_discount, 8);
                        if(pData=dbdata(m_dbproc, 26))
                                dbconvert(m_dbproc, SQLNUMERIC, (LPCBYTE)pData,
dbdatlen(m_dbproc,26), SQLFLT8, (BYTE *)&m_txn.Payment.c_balance, 8);
                        if(pData=dbdata(m_dbproc, 27))
                                UtilStrCpy(m_txn.Payment.c_data, pData,
dbdatlen(m_dbproc, 27));

                        DiscardNextRows(0);
                        DiscardNextResults(0);


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

                        return;
                }
                catch (CSQLERR *e)
                {
                        if ((e->m_msgno == 1205 ||
                                (e->m_msgno == iErrOleDbProvider &&
                                strstr(e->m_msgtext, sErrTimeoutExpired) !=
NULL)) &&
                                (++iTryCount <= iMaxRetries))
                        {
                                // hit deadlock; backoff for increasingly longer
period
                                delete e;
                                Sleep(10 * iTryCount);
                        }
                        else
                                throw;
                }
        }       // while (TRUE)

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



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


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```
        DBDATEREC daterec;

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

        ResetError();

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

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

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


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

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

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

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

                                if(pData=dbdata(m_dbproc, 1))
                                        m_txn.OrderStatus.OL[i].ol_supply_w_id
= (*(DBSMALLINT *) pData);
                                if(pData=dbdata(m_dbproc, 2))
                                        m_txn.OrderStatus.OL[i].ol_i_id =
(*(DBINT *) pData);
                                if(pData=dbdata(m_dbproc, 3))
                                        m_txn.OrderStatus.OL[i].ol_quantity =
(*(DBSMALLINT *) pData);
                                if(pData=dbdata(m_dbproc, 4))
                                        dbconvert(m_dbproc, SQLNUMERIC,
(LPCBYTE)pData, dbdatlen(m_dbproc,4),
                                                SQLFLT8, (BYTE
*)&m_txn.OrderStatus.OL[i].ol_amount, 8);
                                if(pData=dbdata(m_dbproc, 5))
                                {
                                        datetime = *((DBDATETIME *) pData);
                                        dbdatecrack(m_dbproc, &daterec,
&datetime);

                m_txn.OrderStatus.OL[i].ol_delivery_d.year   = daterec.year;

                m_txn.OrderStatus.OL[i].ol_delivery_d.month  = daterec.month;

                m_txn.OrderStatus.OL[i].ol_delivery_d.day    = daterec.day;

                m_txn.OrderStatus.OL[i].ol_delivery_d.hour   = daterec.hour;

                m_txn.OrderStatus.OL[i].ol_delivery_d.minute = daterec.minute;

                m_txn.OrderStatus.OL[i].ol_delivery_d.second = daterec.second;
                                }
                                i++;
                        }
                        m_txn.OrderStatus.o_ol_cnt = i;


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

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

                        if (dbnumcols(m_dbproc) != 8)
                                ThrowError(CDBLIBERR::eWrongNumCols);

                        if(pData=dbdata(m_dbproc, 1))
                                m_txn.OrderStatus.c_id = (*(DBINT *) pData);
                        if(pData=dbdata(m_dbproc, 2))
                                UtilStrCpy(m_txn.OrderStatus.c_last, pData,
dbdatlen(m_dbproc,2));
                        if(pData=dbdata(m_dbproc, 3))
                                UtilStrCpy(m_txn.OrderStatus.c_first, pData,
dbdatlen(m_dbproc,3));
                        if(pData=dbdata(m_dbproc, 4))
                                UtilStrCpy(m_txn.OrderStatus.c_middle, pData,
dbdatlen(m_dbproc, 4));
                        if(pData=dbdata(m_dbproc, 5))
                        {
                                datetime = *((DBDATETIME *) pData);
                                dbdatecrack(m_dbproc, &daterec, &datetime);
                                m_txn.OrderStatus.o_entry_d.year   =
daterec.year;
                                m_txn.OrderStatus.o_entry_d.month  =
daterec.month;
                                m_txn.OrderStatus.o_entry_d.day    = daterec.day;
                                m_txn.OrderStatus.o_entry_d.hour   =
daterec.hour;
                                m_txn.OrderStatus.o_entry_d.minute =
daterec.minute;
                                m_txn.OrderStatus.o_entry_d.second =
daterec.second;
                        }
```


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```
                                if(pData=dbdata(m_dbproc, 6))
                                        m_txn.OrderStatus.o_carrier_id = (*(DBSMALLINT *)
pData);
                                if(pData=dbdata(m_dbproc, 7))
                                        dbconvert(m_dbproc, SQLNUMERIC, (LPCBYTE)pData,
dbdatlen(m_dbproc,7),
                                                                        SQLFLT8, (BYTE
*)&m_txn.OrderStatus.c_balance, 8);
                                if(pData=dbdata(m_dbproc, 8))
                                        m_txn.OrderStatus.o_id = (*(DBINT *) pData);

                                DiscardNextRows(0);
                                DiscardNextResults(0);


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

                                return;
                        }
                        catch (CSQLERR *e)
                        {
                                if ((e->m_msgno == 1205 ||
                                        (e->m_msgno == iErrOleDbProvider &&
                                        strstr(e->m_msgtext, sErrTimeoutExpired) !=
NULL)) &&
                                        (++iTryCount <= iMaxRetries))
                                {
                                        // hit deadlock; backoff for increasingly longer
period
                                        delete e;
                                        Sleep(10 * iTryCount);
                                }
                                else
                                        throw;
                        }
                }       // while (TRUE)

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


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

        ResetError();

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

                        dbrpcparam(m_dbproc, NULL, 0, SQLINT4, -1, -1, (BYTE *)
&m_txn.Delivery.w_id);
                        dbrpcparam(m_dbproc, NULL, 0, SQLINT1, -1, -1, (BYTE *)
&m_txn.Delivery.o_carrier_id);

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

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

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

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

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

                        DiscardNextRows(0);
                        DiscardNextResults(0);

                        m_txn.Delivery.exec_status_code = eOK;
                        return;
                }
                catch (CSQLERR *e)
                {
                        if ((e->m_msgno == 1205 ||
                                (e->m_msgno == iErrOleDbProvider &&
                                strstr(e->m_msgtext, sErrTimeoutExpired) !=
NULL)) &&
                                (++iTryCount <= iMaxRetries))
                        {
                                // hit deadlock; backoff for increasingly longer
period
                                delete e;
                                Sleep(10 * iTryCount);
                        }
                        else
                                throw;
                }
        }       // while (TRUE)

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

void CTPCC_DBLIB::ResetError()
{
        if (m_DbLibErr != NULL)
        {
                delete m_DbLibErr;
                m_DbLibErr = (CDBLIBERR*)NULL;
        }
```


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```
        if (m_SqlErr != NULL)
        {
                delete m_SqlErr;
                m_SqlErr = (CSQLERR*)NULL;
        }
        return;
}
```

db_dblib_dll/src/tpcc_dblib.h

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

#ifndef PDBPROCESS
#define DBPROCESS void   // dbprocess structure type
typedef DBPROCESS * PDBPROCESS;
#endif

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

class CSQLERR : public CBaseErr
{
        public:

                CSQLERR(void)
                {
                        m_msgno = 0;
                        m_msgstate = 0;
                        m_severity = 0;
                        m_msgtext = NULL;
                };

                ~CSQLERR()
                {
                        delete [] m_msgtext;
                };

                int             m_msgno;
                int             m_msgstate;
                int             m_severity;
                char   *m_msgtext;

                int ErrorType() {return ERR_TYPE_SQL;};
                int ErrorNum() {return m_msgno;};
                char *ErrorText() {return m_msgtext;};

};

class CDBLIBERR : public CBaseErr
{
        public:
                enum ACTION
                {
                        eNone,
                        eUnknown,
                        eLogin,                         // error from
dblogin
                        eDbOpen,                        // error from dbopen
                        eDbUse,                         // error from dbuse
                        eDbSqlExec,                     // error from
dbsqlexec
                        eDbSet,                         // error from one
of the dbset* routines
                        eDbNextRow,                     // error from
dbnextrow
                        eWrongRowCount,                 // more or less rows returned
than expected
                        eWrongNumCols,                  // more or less columns
returned than expected
                        eDbResults,                     // error from
dbresults
                        eDbRpcExec,                     // error from
dbrpcexec
                        eDbSetMaxProcs,                 // error from dbsetmaxprocs
                        eDbProcHandler                  // error from either
dbprocerrhandle or dbprocmsghandle
                };

                CDBLIBERR(ACTION eAction, int severity = 0, int dberror = 0, int
oserr = 0)
                {
                        m_eAction = eAction;
                        m_severity = severity;
                        m_dberror = dberror;
                        m_oserr = oserr;

                        m_dberrstr = NULL;
                        m_oserrstr = NULL;
                };

                ~CDBLIBERR()
                {
                        delete [] m_dberrstr;
                        delete [] m_oserrstr;
                };

                ACTION    m_eAction;
                int             m_severity;
                int             m_dberror;
                int             m_oserr;
                char   *m_dberrstr;
                char   *m_oserrstr;

                int ErrorType() {return ERR_TYPE_DBLIB;};
                int ErrorNum() {return m_dberror;};
                char *ErrorText() {return m_dberrstr;};
```

```
};

class CTPCC_DBLIB_ERR : public CBaseErr
{
          public:
                    enum CTPCC_DBLIB_ERRS
                    {
                              ERR_WRONG_SP_VERSION = 1,     // "Wrong version of stored
procs on database server"
                              ERR_INVALID_CUST,                       // "Invalid
Customer id,name."
                              ERR_NO_SUCH_ORDER                       // "No orders found
for customer."
                    };

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

                    int                m_errno;

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

                    char *ErrorText();
};

class DllDecl CTPCC_DBLIB : public CTPCC_BASE
{
          private:
                    // declare variables and private functions here...
                    PDBPROCESS          m_dbproc;
                    CDBLIBERR *m_DbLibErr;                  // not allocated until needed
(maybe never)
                    CSQLERR             *m_SqlErr;                              // not
allocated until needed (maybe never)
                    int                           m_MaxRetries;                 // retry
count on deadlock

                    void DiscardNextRows(int iExpectedCount);
                    void DiscardNextResults(int iExpectedCount);
                    void ThrowError( CDBLIBERR::ACTION eAction );
                    void ResetError();

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

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

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

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


                    // these are public because they must be called from the dblib
err_handler and msg_hangler
                    // outside of the class
                    void SetDbLibError(int severity, int dberr, int oserr, LPCSTR
dberrstr, LPCSTR oserrstr);
                    void SetSqlError( int msgno, int msgstate, int severity, LPCSTR
msgtext );

};

extern "C" DllDecl CTPCC_DBLIB* CTPCC_DBLIB_new
          ( LPCSTR szServer, LPCSTR szUser, LPCSTR szPassword, LPCSTR szHost, LPCSTR
szDatabase );

typedef CTPCC_DBLIB* (TYPE_CTPCC_DBLIB)(LPCSTR, LPCSTR, LPCSTR, LPCSTR, LPCSTR);
```

tm_com_dll/src/tpcc_com.cpp

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

// needed for CoinitializeEx
#define _WIN32_WINNT 0x0400

#include <windows.h>

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

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

#include "..\..\tpcc_com_ps\src\tpcc_com_ps_i.c"
```

```
#include "..\..\tpcc_com_all\src\tpcc_com_all_i.c"

// wrapper routine for class constructor
__declspec(dllexport) CTPCC_COM* CTPCC_COM_new(BOOL bSinglePool)
{
          return new CTPCC_COM(bSinglePool);
}

CTPCC_COM::CTPCC_COM(BOOL bSinglePool)
{
          HRESULT hr = NULL;
          long lRet = 0;
          ULONG ulTmpSize = 0;

          m_pTxn                         = NULL;
          m_pNewOrder                    = NULL;
          m_pPayment                     = NULL;
          m_pStockLevel       = NULL;
          m_pOrderStatus      = NULL;

          m_bSinglePool       = bSinglePool;

          ulTmpSize = (ULONG) sizeof(COM_DATA);
          VariantInit(&m_vTxn);
          m_vTxn.vt = VT_SAFEARRAY;

          m_vTxn.parray = SafeArrayCreateVector(VT_UI1, ulTmpSize, ulTmpSize);
          if (!m_vTxn.parray)
                    throw new CCOMERR( E_FAIL );

          memset((void*)m_vTxn.parray->pvData,0,ulTmpSize);
          m_pTxn = (COM_DATA*)m_vTxn.parray->pvData;

          hr = CoInitializeEx(NULL, COINIT_MULTITHREADED);
          if (FAILED(hr))
          {
                    throw new CCOMERR( hr );
          }

          // create components
          if (m_bSinglePool)
          {
                    hr = CoCreateInstance(CLSID_TPCC, NULL, CLSCTX_SERVER, IID_ITPCC,
(void **)&m_pNewOrder);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    // all txns will use same component
                    m_pPayment = m_pNewOrder;
                    m_pStockLevel = m_pNewOrder;
                    m_pOrderStatus = m_pNewOrder;
          }
          else
          {
                    // use different components for each txn

                    hr = CoCreateInstance(CLSID_NewOrder, NULL, CLSCTX_SERVER, IID_ITPCC,
(void **)&m_pNewOrder);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    hr = CoCreateInstance(CLSID_Payment, NULL, CLSCTX_SERVER, IID_ITPCC,
(void **)&m_pPayment);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    hr = CoCreateInstance(CLSID_StockLevel, NULL, CLSCTX_SERVER,
IID_ITPCC, (void **)&m_pStockLevel);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    hr = CoCreateInstance(CLSID_OrderStatus, NULL, CLSCTX_SERVER,
IID_ITPCC, (void **)&m_pOrderStatus);
                    if (FAILED(hr))
                              throw new CCOMERR(hr);
          }

          // call setcomplete to release each component back into pool
          hr = m_pNewOrder->CallSetComplete();
          if (FAILED(hr))
                    throw new CCOMERR(hr);

          if (!m_bSinglePool)
          {
                    hr = m_pPayment->CallSetComplete();
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    hr = m_pStockLevel->CallSetComplete();
                    if (FAILED(hr))
                              throw new CCOMERR(hr);

                    hr = m_pOrderStatus->CallSetComplete();
                    if (FAILED(hr))
                              throw new CCOMERR(hr);
          }
}

CTPCC_COM::~CTPCC_COM()
{
          if (m_pTxn)
                    SafeArrayDestroy(m_vTxn.parray);

          ReleaseInterface(m_pNewOrder);
          if (!m_bSinglePool)
          {
                    ReleaseInterface(m_pPayment);
                    ReleaseInterface(m_pStockLevel);
                    ReleaseInterface(m_pOrderStatus);
          }
          CoUninitialize();
}

void CTPCC_COM::NewOrder()
{
          VARIANT   vTxn_out;

          HRESULT hr = m_pNewOrder->NewOrder(m_vTxn, &vTxn_out);
          if (FAILED(hr))
                    throw new CCOMERR( hr );
          memcpy(m_pTxn, (void *)vTxn_out.parray->pvData,vTxn_out.parray-
>rgsabound[0].cElements);
          SafeArrayDestroy(vTxn_out.parray);

          if ( m_pTxn->ErrorType != ERR_SUCCESS )
                    throw new CCOMERR( m_pTxn->ErrorType, m_pTxn->error );
```

```
}

void CTPCC_COM::Payment()
{
          VARIANT   vTxn_out;

          HRESULT hr = m_pPayment->Payment(m_vTxn, &vTxn_out);
          if (FAILED(hr))
                    throw new CCOMERR( hr );
          memcpy(m_pTxn, (void *)vTxn_out.parray->pvData,vTxn_out.parray-
>rgsabound[0].cElements);
          SafeArrayDestroy(vTxn_out.parray);

          if ( m_pTxn->ErrorType != ERR_SUCCESS )
                    throw new CCOMERR( m_pTxn->ErrorType, m_pTxn->error );
}

void CTPCC_COM::StockLevel()
{
          VARIANT   vTxn_out;

          HRESULT hr = m_pStockLevel->StockLevel(m_vTxn, &vTxn_out);
          if (FAILED(hr))
                    throw new CCOMERR( hr );
          memcpy(m_pTxn, (void *)vTxn_out.parray->pvData,vTxn_out.parray-
>rgsabound[0].cElements);
          SafeArrayDestroy(vTxn_out.parray);

          if ( m_pTxn->ErrorType != ERR_SUCCESS )
                    throw new CCOMERR( m_pTxn->ErrorType, m_pTxn->error );
}

void CTPCC_COM::OrderStatus()
{
          VARIANT   vTxn_out;

          HRESULT hr = m_pOrderStatus->OrderStatus(m_vTxn, &vTxn_out);
          if (FAILED(hr))
                    throw new CCOMERR( hr );
          memcpy(m_pTxn, (void *)vTxn_out.parray->pvData,vTxn_out.parray-
>rgsabound[0].cElements);
          SafeArrayDestroy(vTxn_out.parray);

          if ( m_pTxn->ErrorType != ERR_SUCCESS )
                    throw new CCOMERR( m_pTxn->ErrorType, m_pTxn->error );
}
```

tm_com_dll/src/tpcc_com.h

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

#pragma once

#include <stdio.h>
#include "..\..\tpcc_com_ps\src\tpcc_com_ps.h"

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

class CCOMERR : public CBaseErr
{
          private:
                    char m_szErrorText[64];

          public:
                    // use this interface for genuine COM errors
                    CCOMERR( HRESULT hr )
                    {
                              m_hr = hr;
                              m_iErrorType = 0;
                              m_iError = 0;
                    }

                    // use this interface to impersonate a non-COM error type
                    CCOMERR( int iErrorType, int iError )
                    {
                              m_iErrorType = iErrorType;
                              m_iError = iError;
                              m_hr = S_OK;
                    }

                    int                 m_hr;
                    int                 m_iErrorType;
                    int                 m_iError;

                    // A CCOMERR class can impersonate another class, which happens if
the error
                    // was not actually a COM Services error, but was simply transmitted
back via COM.
                    int ErrorType()
                    {
                              if (m_iErrorType == 0)
                                        return ERR_TYPE_COM;
                              else
                                        return m_iErrorType;
                    }

                    int ErrorNum() {return m_hr;}

                    char *ErrorText()
                    {
                              if (m_hr == S_OK)
                                        sprintf( m_szErrorText, "Error: Class %d, error #
%d", m_iErrorType, m_iError );
                              else
                                        sprintf( m_szErrorText, "Error: COM HRESULT %x",
m_hr );
                              return m_szErrorText;
```


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```
                    }
};

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 definations 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;
          }
```


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```
          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;
```


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```
        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;
```


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```
                    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__
```


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```
#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"
```


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```
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>
```


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```
#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;
```


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```
#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,
```


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```
    /* [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)
```


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```
#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
```


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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

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```
#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,
```


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```
    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
```


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```
/* 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 */
```


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```
/* 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
```


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```
#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 */
```


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```
                                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 */
```


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```
                            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 */
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/* 498 */ 0x5c,             /* FC_PAD */
                            0x5b,               /* FC_END */
/* 500 */
                            0x11, 0x0,          /* FC_RP */
/* 502 */ NdrFcShort( 0xfffffffe0 ),     /* 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( 0xfffffffe0 ),     /* 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( 0xfffffffe4 ),     /* 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 */
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/* 652 */ NdrFcShort( 0x0 ),  /* 0 */
/* 654 */ 0x12, 0x0,          /* FC_UP */
/* 656 */ NdrFcShort( 0xffffffd4 ),     /* Offset= -44 (612) */
/* 658 */
                               0x5b,               /* FC_END */

                               0x8,                /* FC_LONG */
/* 660 */ 0x5c,               /* FC_PAD */
                               0x5b,               /* FC_END */
/* 662 */
                               0x1a,               /* FC_BOGUS_STRUCT */
                               0x3,                /* 3 */
/* 664 */ NdrFcShort( 0x8 ),  /* 8 */
/* 666 */ NdrFcShort( 0x0 ),  /* 0 */
/* 668 */ NdrFcShort( 0x6 ),  /* Offset= 6 (674) */
/* 670 */ 0x8,                /* FC_LONG */
                               0x36,               /* FC_POINTER */
/* 672 */ 0x5c,               /* FC_PAD */
                               0x5b,               /* FC_END */
/* 674 */
                               0x11, 0x0,          /* FC_RP */
/* 676 */ NdrFcShort( 0xffffffd4 ),     /* Offset= -44 (632) */
/* 678 */
                               0x1d,               /* FC_SMFARRAY */
                               0x0,                /* 0 */
/* 680 */ NdrFcShort( 0x8 ),  /* 8 */
/* 682 */ 0x2,                /* FC_CHAR */
                               0x5b,               /* FC_END */
/* 684 */
                               0x15,               /* FC_STRUCT */
                               0x3,                /* 3 */
/* 686 */ NdrFcShort( 0x10 ), /* 16 */
/* 688 */ 0x8,                /* FC_LONG */
                               0x6,                /* FC_SHORT */
/* 690 */ 0x6,                /* FC_SHORT */
                               0x4c,               /* FC_EMBEDDED_COMPLEX */
/* 692 */ 0x0,                /* 0 */
                               NdrFcShort( 0xfffffff1 ),     /* Offset= -15 (678) */
                               0x5b,               /* FC_END */
/* 696 */
                               0x1a,               /* FC_BOGUS_STRUCT */
                               0x3,                /* 3 */
/* 698 */ NdrFcShort( 0x18 ), /* 24 */
/* 700 */ NdrFcShort( 0x0 ),  /* 0 */
/* 702 */ NdrFcShort( 0xa ),  /* Offset= 10 (712) */
/* 704 */ 0x8,                /* FC_LONG */
                               0x36,               /* FC_POINTER */
/* 706 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
                               0x0,                /* 0 */
/* 708 */ NdrFcShort( 0xffffffe8 ),     /* Offset= -24 (684) */
/* 710 */ 0x5c,               /* FC_PAD */
                               0x5b,               /* FC_END */
/* 712 */
                               0x11, 0x0,          /* FC_RP */
/* 714 */ NdrFcShort( 0xffffff0c ),     /* Offset= -244 (470) */
/* 716 */
                               0x1b,               /* FC_CARRAY */
                               0x0,                /* 0 */
/* 718 */ NdrFcShort( 0x1 ),  /* 1 */
/* 720 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                               0x0,                /*  */
/* 722 */ NdrFcShort( 0x0 ),  /* 0 */
/* 724 */ 0x1,                /* FC_BYTE */
                               0x5b,               /* FC_END */
/* 726 */
                               0x16,               /* FC_PSTRUCT */
                               0x3,                /* 3 */
/* 728 */ NdrFcShort( 0x8 ),  /* 8 */
/* 730 */
                               0x4b,               /* FC_PP */
                               0x5c,               /* FC_PAD */
/* 732 */
                               0x46,               /* FC_NO_REPEAT */
                               0x5c,               /* FC_PAD */
/* 734 */ NdrFcShort( 0x4 ),  /* 4 */
/* 736 */ NdrFcShort( 0x4 ),  /* 4 */
/* 738 */ 0x12, 0x0,          /* FC_UP */
/* 740 */ NdrFcShort( 0xffffffe8 ),     /* Offset= -24 (716) */
/* 742 */
                               0x5b,               /* FC_END */

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

                               0x8,                /* FC_LONG */
/* 774 */ 0x8,                /* FC_LONG */
                               0x5b,               /* FC_END */
/* 776 */
                               0x1b,               /* FC_CARRAY */
                               0x3,                /* 3 */
/* 778 */ NdrFcShort( 0x4 ),  /* 4 */
/* 780 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                               0x0,                /*  */
/* 782 */ NdrFcShort( 0x0 ),  /* 0 */
/* 784 */ 0x8,                /* FC_LONG */
                               0x5b,               /* FC_END */
/* 786 */
                               0x16,               /* FC_PSTRUCT */
                               0x3,                /* 3 */
/* 788 */ NdrFcShort( 0x8 ),  /* 8 */
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/* 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( 0xfffffff8 ),     /* Offset= -24 (776) */
/* 802 */
                                0x5b,               /* FC_END */

                                0x8,                /* FC_LONG */
/* 804 */ 0x8,                 /* FC_LONG */
                                0x5b,               /* FC_END */
/* 806 */
                                0x1b,               /* FC_CARRAY */
                                0x7,                /* 7 */
/* 808 */ NdrFcShort( 0x8 ),  /* 8 */
/* 810 */ 0x19,                /* Corr desc:  field pointer, FC_ULONG */
                                0x0,                /*  */
/* 812 */ NdrFcShort( 0x0 ),  /* 0 */
/* 814 */ 0xb,                 /* FC_HYPER */
                                0x5b,               /* FC_END */
/* 816 */
                                0x16,               /* FC_PSTRUCT */
                                0x3,                /* 3 */
/* 818 */ NdrFcShort( 0x8 ),  /* 8 */
/* 820 */
                                0x4b,               /* FC_PP */
                                0x5c,               /* FC_PAD */
/* 822 */
                                0x46,               /* FC_NO_REPEAT */
                                0x5c,               /* FC_PAD */
/* 824 */ NdrFcShort( 0x4 ),  /* 4 */
/* 826 */ NdrFcShort( 0x4 ),  /* 4 */
/* 828 */ 0x12, 0x0,          /* FC_UP */
/* 830 */ NdrFcShort( 0xfffffff8 ),     /* Offset= -24 (806) */
/* 832 */
                                0x5b,               /* FC_END */

                                0x8,                /* FC_LONG */
/* 834 */ 0x8,                 /* FC_LONG */
                                0x5b,               /* FC_END */
/* 836 */
                                0x15,               /* FC_STRUCT */
                                0x3,                /* 3 */
/* 838 */ NdrFcShort( 0x8 ),  /* 8 */
/* 840 */ 0x8,                 /* FC_LONG */
                                0x8,                /* FC_LONG */
/* 842 */ 0x5c,                /* FC_PAD */
                                0x5b,               /* FC_END */
/* 844 */
                                0x1b,               /* FC_CARRAY */
                                0x3,                /* 3 */
/* 846 */ NdrFcShort( 0x8 ),  /* 8 */
/* 848 */ 0x7,                 /* Corr desc: FC_USHORT */
                                0x0,                /*  */
/* 850 */ NdrFcShort( 0xffd8 ),        /* -40 */
/* 852 */ 0x4c,                /* FC_EMBEDDED_COMPLEX */
                                0x0,                /* 0 */
/* 854 */ NdrFcShort( 0xffffffee ),     /* Offset= -18 (836) */
/* 856 */ 0x5c,                /* FC_PAD */
                                0x5b,               /* FC_END */
/* 858 */
                                0x1a,               /* FC_BOGUS_STRUCT */
                                0x3,                /* 3 */
/* 860 */ NdrFcShort( 0x28 ), /* 40 */
/* 862 */ NdrFcShort( 0xffffffee ),     /* Offset= -18 (844) */
/* 864 */ NdrFcShort( 0x0 ),  /* Offset= 0 (864) */
/* 866 */ 0x6,                 /* FC_SHORT */
                                0x6,                /* FC_SHORT */
/* 868 */ 0x38,                /* FC_ALIGNM4 */
                                0x8,                /* FC_LONG */
/* 870 */ 0x8,                 /* FC_LONG */
                                0x4c,               /* FC_EMBEDDED_COMPLEX */
/* 872 */ 0x0,                 /* 0 */
                                NdrFcShort( 0xfffffdf7 ),     /* Offset= -521 (352) */
                                0x5b,               /* FC_END */
/* 876 */
                                0x12, 0x0,          /* FC_UP */
/* 878 */ NdrFcShort( 0xfffffef6 ),     /* Offset= -266 (612) */
/* 880 */
                                0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 882 */ 0x1,                 /* FC_BYTE */
                                0x5c,               /* FC_PAD */
/* 884 */
                                0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 886 */ 0x6,                 /* FC_SHORT */
                                0x5c,               /* FC_PAD */
/* 888 */
                                0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 890 */ 0x8,                 /* FC_LONG */
                                0x5c,               /* FC_PAD */
/* 892 */
                                0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 894 */ 0xa,                 /* FC_FLOAT */
                                0x5c,               /* FC_PAD */
/* 896 */
                                0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 898 */ 0xc,                 /* FC_DOUBLE */
                                0x5c,               /* FC_PAD */
/* 900 */
                                0x12, 0x0,          /* FC_UP */
/* 902 */ NdrFcShort( 0xfffffd90 ),     /* Offset= -624 (278) */
/* 904 */
                                0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 906 */ NdrFcShort( 0xfffffd92 ),     /* Offset= -622 (284) */
/* 908 */
                                0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 910 */ NdrFcShort( 0xfffffda6 ),     /* Offset= -602 (308) */
/* 912 */
                                0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 914 */ NdrFcShort( 0xfffffdb4 ),     /* Offset= -588 (326) */
/* 916 */
                                0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 918 */ NdrFcShort( 0xfffffdc2 ),     /* Offset= -574 (344) */
/* 920 */
                                0x12, 0x10,         /* FC_UP [pointer_deref] */
/* 922 */ NdrFcShort( 0x2 ),  /* Offset= 2 (924) */
/* 924 */
                                0x12, 0x0,          /* FC_UP */
/* 926 */ NdrFcShort( 0x16 ), /* Offset= 22 (948) */
/* 928 */
                                0x15,               /* FC_STRUCT */
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                            0x7,                /* 7 */
/* 930 */ NdrFcShort( 0x10 ), /* 16 */
/* 932 */ 0x6,                /* FC_SHORT */
                            0x1,                /* FC_BYTE */
/* 934 */ 0x1,                /* FC_BYTE */
                            0x38,               /* FC_ALIGNM4 */
/* 936 */ 0x8,                /* FC_LONG */
                            0x39,               /* FC_ALIGNM8 */
/* 938 */ 0xb,                /* FC_HYPER */
                            0x5b,               /* FC_END */
/* 940 */
                            0x12, 0x0,          /* FC_UP */
/* 942 */ NdrFcShort( 0xfffffff2 ),     /* Offset= -14 (928) */
/* 944 */
                            0x12, 0x8,          /* FC_UP [simple_pointer] */
/* 946 */ 0x2,                /* FC_CHAR */
                            0x5c,               /* FC_PAD */
/* 948 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x7,                /* 7 */
/* 950 */ NdrFcShort( 0x20 ), /* 32 */
/* 952 */ NdrFcShort( 0x0 ),  /* 0 */
/* 954 */ NdrFcShort( 0x0 ),  /* Offset= 0 (954) */
/* 956 */ 0x8,                /* FC_LONG */
                            0x8,                /* FC_LONG */
/* 958 */ 0x6,                /* FC_SHORT */
                            0x6,                /* FC_SHORT */
/* 960 */ 0x6,                /* FC_SHORT */
                            0x6,                /* FC_SHORT */
/* 962 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
                            0x0,                /* 0 */
/* 964 */ NdrFcShort( 0xfffffc42 ),     /* Offset= -958 (6) */
/* 966 */ 0x5c,               /* FC_PAD */
                            0x5b,               /* FC_END */
/* 968 */ 0xb4,               /* FC_USER_MARSHAL */
                            0x83,               /* 131 */
/* 970 */ NdrFcShort( 0x0 ),  /* 0 */
/* 972 */ NdrFcShort( 0x10 ), /* 16 */
/* 974 */ NdrFcShort( 0x0 ),  /* 0 */
/* 976 */ NdrFcShort( 0xfffffc32 ),     /* Offset= -974 (2) */
/* 978 */
                            0x11, 0x4,          /* FC_RP [alloced_on_stack] */
/* 980 */ NdrFcShort( 0x6 ),  /* Offset= 6 (986) */
/* 982 */
                            0x13, 0x0,          /* FC_OP */
/* 984 */ NdrFcShort( 0xffffffdc ),     /* Offset= -36 (948) */
/* 986 */ 0xb4,               /* FC_USER_MARSHAL */
                            0x83,               /* 131 */
/* 988 */ NdrFcShort( 0x0 ),  /* 0 */
/* 990 */ NdrFcShort( 0x10 ), /* 16 */
/* 992 */ NdrFcShort( 0x0 ),  /* 0 */
/* 994 */ NdrFcShort( 0xfffffff4 ),     /* Offset= -12 (982) */

                            0x0
        }
    };

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

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

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


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

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

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

    return 0;
}

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


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


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

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


 /* File created by MIDL compiler version 5.03.0280 */
/* at Sat Apr 08 16:40:10 2000
 */
/* Compiler settings for .\src\tpcc_com_ps.idl:
    Oicf (OptLev=i2), W1, Zp8, env=Win64 (32b run,appending), ms_ext, c_ext, robust
    error checks: allocation ref bounds_check enum stub_data
    VC __declspec() decoration level:
         __declspec(uuid()), __declspec(selectany), __declspec(novtable)
         DECLSPEC_UUID(), MIDL_INTERFACE()
*/
//@@MIDL_FILE_HEADING(  )
```


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```
#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,
```


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```
    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
```


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```
                            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
```


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```
/* 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 */
```


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```
/* 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 */
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                            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( 0xfffffffdc ),    /* 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( 0xfffffffdc ),    /* 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( 0xfffffffdc ),    /* Offset= -36 (500) */
/* 538 */
                            0x21,               /* FC_BOGUS_ARRAY */
                            0x3,                /* 3 */
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/* 540 */ NdrFcShort( 0x0 ),  /* 0 */
/* 542 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
          0x0,                /*  */
/* 544 */ NdrFcShort( 0x0 ),  /* 0 */
/* 546 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 548 */ NdrFcLong( 0xffffffff ),      /* -1 */
/* 552 */ NdrFcShort( 0x0 ),  /* Corr flags:  */
/* 554 */
          0x12, 0x0,          /* FC_UP */
/* 556 */ NdrFcShort( 0x176 ),          /* Offset= 374 (930) */
/* 558 */ 0x5c,               /* FC_PAD */
          0x5b,               /* FC_END */
/* 560 */
          0x1a,               /* FC_BOGUS_STRUCT */
          0x3,                /* 3 */
/* 562 */ NdrFcShort( 0x10 ), /* 16 */
/* 564 */ NdrFcShort( 0x0 ),  /* 0 */
/* 566 */ NdrFcShort( 0x6 ),  /* Offset= 6 (572) */
/* 568 */ 0x8,                /* FC_LONG */
          0x39,               /* FC_ALIGNM8 */
/* 570 */ 0x36,               /* FC_POINTER */
          0x5b,               /* FC_END */
/* 572 */
          0x11, 0x0,          /* FC_RP */
/* 574 */ NdrFcShort( 0xffffffdc ),     /* Offset= -36 (538) */
/* 576 */
          0x2f,               /* FC_IP */
          0x5a,               /* FC_CONSTANT_IID */
/* 578 */ NdrFcLong( 0x2f ),  /* 47 */
/* 582 */ NdrFcShort( 0x0 ),  /* 0 */
/* 584 */ NdrFcShort( 0x0 ),  /* 0 */
/* 586 */ 0xc0,               /* 192 */
          0x0,                /* 0 */
/* 588 */ 0x0,                /* 0 */
          0x0,                /* 0 */
/* 590 */ 0x0,                /* 0 */
          0x0,                /* 0 */
/* 592 */ 0x0,                /* 0 */
          0x46,               /* 70 */
/* 594 */
          0x1b,               /* FC_CARRAY */
          0x0,                /* 0 */
/* 596 */ NdrFcShort( 0x1 ),  /* 1 */
/* 598 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
          0x0,                /*  */
/* 600 */ NdrFcShort( 0x4 ),  /* 4 */
/* 602 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 604 */ 0x1,                /* FC_BYTE */
          0x5b,               /* FC_END */
/* 606 */
          0x1a,               /* FC_BOGUS_STRUCT */
          0x3,                /* 3 */
/* 608 */ NdrFcShort( 0x18 ), /* 24 */
/* 610 */ NdrFcShort( 0x0 ),  /* 0 */
/* 612 */ NdrFcShort( 0xc ),  /* Offset= 12 (624) */
/* 614 */ 0x8,                /* FC_LONG */
          0x8,                /* FC_LONG */
/* 616 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
          0x0,                /* 0 */
/* 618 */ NdrFcShort( 0xffffffd6 ),     /* Offset= -42 (576) */
/* 620 */ 0x39,               /* FC_ALIGNM8 */
          0x36,               /* FC_POINTER */
/* 622 */ 0x5c,               /* FC_PAD */
          0x5b,               /* FC_END */
/* 624 */
          0x12, 0x0,          /* FC_UP */
/* 626 */ NdrFcShort( 0xfffffff0 ),     /* 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 */
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                            0x11, 0x0,          /* FC_RP */
/* 702 */ NdrFcShort( 0xffffff10 ),     /* Offset= -240 (462) */
/* 704 */
                            0x1b,               /* FC_CARRAY */
                            0x0,                /* 0 */
/* 706 */ NdrFcShort( 0x1 ),  /* 1 */
/* 708 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                            0x0,                /*  */
/* 710 */ NdrFcShort( 0x0 ),  /* 0 */
/* 712 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 714 */ 0x1,                /* FC_BYTE */
                            0x5b,               /* FC_END */
/* 716 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x3,                /* 3 */
/* 718 */ NdrFcShort( 0x10 ), /* 16 */
/* 720 */ NdrFcShort( 0x0 ),  /* 0 */
/* 722 */ NdrFcShort( 0x6 ),  /* Offset= 6 (728) */
/* 724 */ 0x8,                /* FC_LONG */
                            0x39,               /* FC_ALIGNM8 */
/* 726 */ 0x36,               /* FC_POINTER */
                            0x5b,               /* FC_END */
/* 728 */
                            0x12, 0x0,          /* FC_UP */
/* 730 */ NdrFcShort( 0xfffffffe6 ),     /* Offset= -26 (704) */
/* 732 */
                            0x1b,               /* FC_CARRAY */
                            0x1,                /* 1 */
/* 734 */ NdrFcShort( 0x2 ),  /* 2 */
/* 736 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                            0x0,                /*  */
/* 738 */ NdrFcShort( 0x0 ),  /* 0 */
/* 740 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 742 */ 0x6,                /* FC_SHORT */
                            0x5b,               /* FC_END */
/* 744 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x3,                /* 3 */
/* 746 */ NdrFcShort( 0x10 ), /* 16 */
/* 748 */ NdrFcShort( 0x0 ),  /* 0 */
/* 750 */ NdrFcShort( 0x6 ),  /* Offset= 6 (756) */
/* 752 */ 0x8,                /* FC_LONG */
                            0x39,               /* FC_ALIGNM8 */
/* 754 */ 0x36,               /* FC_POINTER */
                            0x5b,               /* FC_END */
/* 756 */
                            0x12, 0x0,          /* FC_UP */
/* 758 */ NdrFcShort( 0xfffffffe6 ),     /* Offset= -26 (732) */
/* 760 */
                            0x1b,               /* FC_CARRAY */
                            0x3,                /* 3 */
/* 762 */ NdrFcShort( 0x4 ),  /* 4 */
/* 764 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                            0x0,                /*  */
/* 766 */ NdrFcShort( 0x0 ),  /* 0 */
/* 768 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 770 */ 0x8,                /* FC_LONG */
                            0x5b,               /* FC_END */
/* 772 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x3,                /* 3 */
/* 774 */ NdrFcShort( 0x10 ), /* 16 */
/* 776 */ NdrFcShort( 0x0 ),  /* 0 */
/* 778 */ NdrFcShort( 0x6 ),  /* Offset= 6 (784) */
/* 780 */ 0x8,                /* FC_LONG */
                            0x39,               /* FC_ALIGNM8 */
/* 782 */ 0x36,               /* FC_POINTER */
                            0x5b,               /* FC_END */
/* 784 */
                            0x12, 0x0,          /* FC_UP */
/* 786 */ NdrFcShort( 0xfffffffe6 ),     /* Offset= -26 (760) */
/* 788 */
                            0x1b,               /* FC_CARRAY */
                            0x7,                /* 7 */
/* 790 */ NdrFcShort( 0x8 ),  /* 8 */
/* 792 */ 0x19,               /* Corr desc:  field pointer, FC_ULONG */
                            0x0,                /*  */
/* 794 */ NdrFcShort( 0x0 ),  /* 0 */
/* 796 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 798 */ 0xb,                /* FC_HYPER */
                            0x5b,               /* FC_END */
/* 800 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x3,                /* 3 */
/* 802 */ NdrFcShort( 0x10 ), /* 16 */
/* 804 */ NdrFcShort( 0x0 ),  /* 0 */
/* 806 */ NdrFcShort( 0x6 ),  /* Offset= 6 (812) */
/* 808 */ 0x8,                /* FC_LONG */
                            0x39,               /* FC_ALIGNM8 */
/* 810 */ 0x36,               /* FC_POINTER */
                            0x5b,               /* FC_END */
/* 812 */
                            0x12, 0x0,          /* FC_UP */
/* 814 */ NdrFcShort( 0xfffffffe6 ),     /* Offset= -26 (788) */
/* 816 */
                            0x15,               /* FC_STRUCT */
                            0x3,                /* 3 */
/* 818 */ NdrFcShort( 0x8 ),  /* 8 */
/* 820 */ 0x8,                /* FC_LONG */
                            0x8,                /* FC_LONG */
/* 822 */ 0x5c,               /* FC_PAD */
                            0x5b,               /* FC_END */
/* 824 */
                            0x1b,               /* FC_CARRAY */
                            0x3,                /* 3 */
/* 826 */ NdrFcShort( 0x8 ),  /* 8 */
/* 828 */ 0x7,                /* Corr desc: FC_USHORT */
                            0x0,                /*  */
/* 830 */ NdrFcShort( 0xffc8 ),        /* -56 */
/* 832 */ NdrFcShort( 0x1 ),  /* Corr flags:  early, */
/* 834 */ 0x4c,               /* FC_EMBEDDED_COMPLEX */
                            0x0,                /* 0 */
/* 836 */ NdrFcShort( 0xffffffec ),     /* Offset= -20 (816) */
/* 838 */ 0x5c,               /* FC_PAD */
                            0x5b,               /* FC_END */
/* 840 */
                            0x1a,               /* FC_BOGUS_STRUCT */
                            0x3,                /* 3 */
/* 842 */ NdrFcShort( 0x38 ), /* 56 */
/* 844 */ NdrFcShort( 0xffffffec ),     /* Offset= -20 (824) */
/* 846 */ NdrFcShort( 0x0 ),  /* Offset= 0 (846) */
/* 848 */ 0x6,                /* FC_SHORT */
                            0x6,                /* FC_SHORT */
/* 850 */ 0x38,               /* FC_ALIGNM4 */
                            0x8,                /* FC_LONG */
/* 852 */ 0x8,                /* FC_LONG */
```


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```
                            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( 0xfffffdc ),     /* 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
};
```


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```
#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
```


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```
                    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);
```


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```
                    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 "";};
};
```


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Appendix B - Database Design

Build Scripts

setup.cmd

```
ECHO OFF

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

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

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

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

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

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

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

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

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

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

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


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

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

goto end

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

:end

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


use master
go

--        Create temporary table for timing

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

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

insert    into tpcc_timer values (0,0)
go

--        Store starting time

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

--  create main database files

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

LOG ON
(         NAME                =MSSQL_tpcc_log,
          FILENAME  ="L:",
          SIZE                =54000MB,
          FILEGROWTH          =0)

COLLATE Latin1_General_BIN
go

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

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

--        remove temporary table
```


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```
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
```


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```
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
```


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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
```


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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
```


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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

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


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

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

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

go
```

restore.sql

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


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

load database tpcc from tpccback1, tpccback2 with stats = 1

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

go
```


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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,
```


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```
@w_id_local,

@datetime,

@h_amount,                                                              @w_name
+ "    " + @d_name)

commit tran p

--  return data to client

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

go
```

ordstat.sql

```
--  File:     ORDSTAT.SQL
--            Microsoft TPC-C Benchmark Kit Ver. 4.00
--            Copyright Microsoft, 1996
--  Purpose:  Creates order status transaction stored procedure


use tpcc
go

if exists ( select name from sysobjects where name = "tpcc_orderstatus" )
          drop procedure   tpcc_orderstatus
go

create proc tpcc_orderstatus @w_id               smallint,
          tinyint,

          int,
= ""

as

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

begin tran o

          if (@c_id = 0)
                    begin

--  get customer id and info using last name

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

                    set rowcount @cnt

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

                    set rowcount 0
                    end

          else
                    begin

--  get customer info if by id

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

                    select @cnt = @@rowcount

                    end
                                                                        @d_id

                                                                        @c_id

                                                                        @c_last  char(16)
```


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```
--  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
```


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```
--  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();
```


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```
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
{
```


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```
    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
```


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```
    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
//
//===============================================================================
```


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```
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;
```


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```
	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];
```


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```
    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");
```


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```
    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);
```


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```
        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;
```


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```
		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;
}
```


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```
//====================================================================
//
// 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");
```


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```
                    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);
```


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```
          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)
```


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```
                        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)
```


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```
                                {
                                        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,"");
                }
        }


}


//================================================================================
//
```


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```
// 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);
```


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```
    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");

          }
}


//===============================================================================
```


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```
//
// 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;
```


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```
          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)
```


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```
                    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);
```


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```
          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++;
```


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```
    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
```


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```
    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);
    }
```


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```
    // 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;
```


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```
        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;
}
```


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Appendix C - Tunable Parameters

Server Configuration Parameters

Microsoft Windows 2003 Server Parameters

The following registry key was added to disable the kernel counters for Global and Per-Process I/Os:

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\I/O System]
"CountOperations"=dword:00000000
```

Microsoft Windows 2003 Server Configuration

The following services were disabled on the server:

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

Microsoft SQL Server 2000 Startup Parameters

Microsoft SQL Server was started with the following command line options

sqlservr -c -x -T3502 –g100

where

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

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

Microsoft SQL Server Stack Size

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

Microsoft SQL Server 2000 Configuration Parameters

name	minimum	maximum	config_value	run_value
affinity mask	0	2147483647	3	3
allow updates	0	1	1	1
c2 audit mode	0	1	0	0
cost threshold for parallelism	0	32767	5	5
cursor threshold	-1	2147483647	-1	-1
default full-text language	0	2147483647	1033	1033
default language	0	9999	0	0
fill factor (%)	0	100	0	0
index create memory (KB)	704	1600000	0	0
language in cache	3	100	3	3
lightweight pooling	0	1	1	1
locks	5000	2147483647	0	0
max degree of parallelism	0	32	1	1
max server memory (MB)	4	2147483647	2000	2000
max text repl size (B)	0	2147483647	65536	65536
max worker threads	10	1024	320	320
media retention	0	365	0	0
min memory per query (KB)	512	2147483647	1024	1024
min server memory (MB)	0	2147483647	0	0
nested triggers	0	1	1	1
network packet size (B)	512	65535	4096	4096
open objects	0	2147483647	0	0
priority boost	0	1	1	1
query governor cost limit	0	2147483647	0	0
query wait (s)	-1	2147483647	-1	-1
recovery interval (min)	0	32767	32767	32767
remote access	0	1	0	0
remote login timeout (s)	0	2147483647	5	5
remote proc trans	0	1	0	0
remote query timeout (s)	0	2147483647	0	0
scan for startup procs	0	1	0	0
set working set size	0	1	0	0
show advanced options	0	1	1	1
two digit year cutoff	1753	9999	2049	2049
user connections	0	32767	0	0
user options	0	16383	0	0

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Appendix C – Tunable Parameters

System Information report written at: 01/09/04 14:54:17
System Name: PE2650
[System Summary]

Item Value
OS Name Microsoft(R) Windows(R) Server 2003, Standard Edition
Version 5.2.3790 Build 3790
OS Manufacturer Microsoft Corporation
System Name PE2650
System Manufacturer Dell Computer Corporation
System Model PowerEdge 2650
System Type X86-based PC
Processor x86 Family 15 Model 2 Stepping 5 GenuineIntel ~3189 Mhz
Processor x86 Family 15 Model 2 Stepping 5 GenuineIntel ~3189 Mhz
BIOS Version/Date Dell Computer Corporation X46, 6/23/2003
SMBIOS Version 2.3
Windows Directory C:\WINDOWS
System Directory C:\WINDOWS\system32
Boot Device \Device\HarddiskVolume1
Locale United States
Hardware Abstraction Layer Version = "5.2.3790.0 (srv03_rtm.030324-2048)"
User Name PE2650\Administrator
Time Zone Central Standard Time
Total Physical Memory 2,560.00 MB
Available Physical Memory 837.16 MB
Total Virtual Memory 6.85 GB
Available Virtual Memory 3.19 GB
Page File Space 4.35 GB
Page File C:\pagefile.sys

[Hardware Resources]

[Conflicts/Sharing]

Resource Device
Memory Address 0xF0000000-0xF7FFFFFF PCI bus
Memory Address 0xF0000000-0xF7FFFFFF DELL PERC 3/DC Plus RAID Controller

IRQ 30 Dell PERC 3 RAID (SCSI chip)
IRQ 30 Dell PERC 3/Di RAID Controller

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

Memory Address 0xFD000000-0xFEBFFFFF PCI bus
Memory Address 0xFD000000-0xFEBFFFFF RAGE XL PCI Family (Microsoft Corporation)

Memory Address 0xE0000000-0xEFDFFFFF PCI bus
Memory Address 0xE0000000-0xEFDFFFFF Dell PERC 3/Di RAID Controller

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

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Memory Address 0xF8000000-0xFCFFFFFF PCI bus
Memory Address 0xF8000000-0xFCFFFFFF DELL PERC 3/DC Plus RAID Controller

I/O Port 0x000003B0-0x000003DF PCI bus
I/O Port 0x000003B0-0x000003DF RAGE XL PCI Family (Microsoft Corporation)

I/O Port 0x0000C000-0x0000CFFF PCI bus
I/O Port 0x0000C000-0x0000CFFF PCI standard PCI-to-PCI bridge

[DMA]

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

[Forced Hardware]

Device PNP Device ID

[I/O]

Resource	Device	Status
0x00000000-0x000003AF	PCI bus	OK
0x00000000-0x000003AF	Direct memory access controller	OK
0x000003B0-0x000003DF	PCI bus	OK
0x000003B0-0x000003DF	RAGE XL PCI Family (Microsoft Corporation)	OK
0x000003E0-0x00000CF7	PCI bus	OK
0x00000D00-0x00000FFF	PCI bus	OK
0x0000E000-0x0000EFFF	PCI bus	OK
0x0000ECF8-0x0000ECFF	PCI Device	OK
0x0000ECE8-0x0000ECEF	PCI Device	OK
0x0000EC80-0x0000ECBF	PCI Device	OK
0x0000ECF4-0x0000ECF7	PCI Device	OK
0x0000E800-0x0000E8FF	RAGE XL PCI Family (Microsoft Corporation)	OK
0x000003C0-0x000003DF	RAGE XL PCI Family (Microsoft Corporation)	OK
0x00000080-0x0000009F	Direct memory access controller	OK
0x000000C0-0x000000DF	Direct memory access controller	OK
0x0000040B-0x0000040B	Direct memory access controller	OK
0x000004D6-0x000004D6	Direct memory access controller	OK
0x000000F0-0x000000FF	Numeric data processor	OK
0x00000020-0x0000003F	Programmable interrupt controller	OK
0x000000A0-0x000000BF	Programmable interrupt controller	OK
0x000004D0-0x000004D1	Programmable interrupt controller	OK
0x00000061-0x00000061	System speaker	OK
0x00000040-0x0000005F	System timer	OK
0x000003F0-0x000003F5	Standard floppy disk controller	OK
0x000003F7-0x000003F7	Standard floppy disk controller	OK
0x00000060-0x00000060	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard	OK
0x00000064-0x00000064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard	OK
0x000003F8-0x000003FF	Communications Port (COM2)	OK
0x000002F8-0x000002FF	Communications Port (COM1)	OK
0x00000070-0x0000007F	System CMOS/real time clock	OK
0x00000800-0x0000089F	System board	OK
0x000008A0-0x000008AF	System board	OK

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0x00000C00-0x00000CD7 System board OK
0x00000F50-0x00000F58 System board OK
0x000008E0-0x000008E3 System board OK
0x000000E0-0x000000EF System board OK
0x000008B0-0x000008BF CSB5 IDE Controller OK
0x000001F0-0x000001F7 Primary IDE Channel OK
0x000003F6-0x000003F6 Primary IDE Channel OK
0x00000170-0x00000177 Secondary IDE Channel OK
0x00000376-0x00000376 Secondary IDE Channel OK
0x00000A79-0x00000A79 ISAPNP Read Data Port OK
0x00000279-0x00000279 ISAPNP Read Data Port OK
0x00000274-0x00000277 ISAPNP Read Data Port OK
0x0000C000-0x0000CFFF PCI bus OK
0x0000C000-0x0000CFFF PCI standard PCI-to-PCI bridge OK
0x0000CC00-0x0000CCFF Dell PERC 3 RAID (SCSI chip) OK
0x0000C800-0x0000C8FF Dell PERC 3 RAID (SCSI chip) OK
0x0000D000-0x0000DFFF PCI bus OK

[IRQs]

Resource Device Status
IRQ 9 Microsoft ACPI-Compliant System OK
IRQ 11 PCI Device OK
IRQ 10 PCI Device OK
IRQ 7 PCI Device OK
IRQ 13 Numeric data processor OK
IRQ 0 System timer OK
IRQ 6 Standard floppy disk controller OK
IRQ 1 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard OK
IRQ 12 PS/2 Compatible Mouse OK
IRQ 4 Communications Port (COM2) OK
IRQ 3 Communications Port (COM1) OK
IRQ 8 System CMOS/real time clock OK
IRQ 14 Primary IDE Channel OK
IRQ 5 ServerWorks (RCC) PCI to USB Open Host Controller OK
IRQ 30 Dell PERC 3 RAID (SCSI chip) OK
IRQ 30 Dell PERC 3/Di RAID Controller OK
IRQ 31 Dell PERC 3 RAID (SCSI chip) OK
IRQ 28 Broadcom NetXtreme Gigabit Ethernet #3 OK
IRQ 29 Broadcom NetXtreme Gigabit Ethernet #4 OK
IRQ 24 DELL PERC 3/DC Plus RAID Controller OK
IRQ 20 DELL PERC 3/DC Plus RAID Controller OK

[Memory]

Resource Device Status
0xA0000-0xBFFFF PCI bus OK
0xA0000-0xBFFFF RAGE XL PCI Family (Microsoft Corporation) OK
0xD0000-0xE7FFF PCI bus OK
0xFD000000-0xFEBFFFFF PCI bus OK
0xFD000000-0xFEBFFFFF RAGE XL PCI Family (Microsoft Corporation) OK
0xFEB80000-0xFEB80FFF PCI Device OK
0xFE102000-0xFE102FFF PCI Device OK
0xFEB00000-0xFEB7FFFF PCI Device OK
0xFE101000-0xFE101FFF RAGE XL PCI Family (Microsoft Corporation) OK

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0xFE100000-0xFE100FFF ServerWorks (RCC) PCI to USB Open Host Controller OK
0xE0000000-0xEFDFFFFF PCI bus OK
0xE0000000-0xEFDFFFFF Dell PERC 3/Di RAID Controller OK
0xEFC00000-0xEFDFFFFF PCI standard PCI-to-PCI bridge OK
0xEFCFF000-0xEFCFFFFF Dell PERC 3 RAID (SCSI chip) OK
0xEFCFE000-0xEFCFEFFF Dell PERC 3 RAID (SCSI chip) OK
0xEFE00000-0xEFFFFFFF PCI bus OK
0xEFF10000-0xEFF1FFFF Broadcom NetXtreme Gigabit Ethernet #3 OK
0xEFF00000-0xEFF0FFFF Broadcom NetXtreme Gigabit Ethernet #4 OK
0xF0000000-0xF7FFFFFFPCI bus OK
0xF0000000-0xF7FFFFFFDELL PERC 3/DC Plus RAID Controller OK
0xF8000000-0xFCFFFFFF PCI bus OK
0xF8000000-0xFCFFFFFF DELL PERC 3/DC Plus RAID Controller OK

[Components]

[Multimedia]

[Audio Codecs]

CODEC Manufacturer Description Status File Version Size Creation Date
c:\windows\system32\msg711.acm Microsoft Corporation OK
C:\WINDOWS\system32\MSG711.ACM 5.2.3790.0 (srv03_rtm.030324-2048) 10.00 KB (10,240 bytes) 3/29/2003 12:00 AM
c:\windows\system32\msadp32.acm Microsoft Corporation OK
C:\WINDOWS\system32\MSADP32.ACM 5.2.3790.0 (srv03_rtm.030324-2048) 14.50 KB (14,848 bytes) 3/29/2003 12:00 AM
c:\windows\system32\tssoft32.acm DSP GROUP, INC. OK
C:\WINDOWS\system32\TSSOFT32.ACM 1.01 9.50 KB (9,728 bytes) 3/29/2003 12:00 AM
c:\windows\system32\sl_anet.acm Sipro Lab Telecom Inc. Sipro Lab Telecom Audio Codec OK
C:\WINDOWS\system32\SL_ANET.ACM 3.02 84.00 KB (86,016 bytes) 3/29/2003 12:00 AM
c:\windows\system32\l3codeca.acm Fraunhofer Institut Integrierte Schaltungen IIS
Fraunhofer IIS MPEG Layer-3 Codec OK
C:\WINDOWS\system32\L3CODECA.ACM 1, 9, 0, 0305 284.00 KB (290,816 bytes) 3/29/2003 12:00 AM
c:\windows\system32\imaadp32.acm Microsoft Corporation OK
C:\WINDOWS\system32\IMAADP32.ACM5.2.3790.0 (srv03_rtm.030324-2048) 15.50 KB (15,872 bytes) 3/29/2003 12:00 AM
c:\windows\system32\msgsm32.acm Microsoft Corporation OK
C:\WINDOWS\system32\MSGSM32.ACM 5.2.3790.0 (srv03_rtm.030324-2048) 20.50 KB (20,992 bytes) 3/29/2003 12:00 AM
c:\windows\system32\msaud32.acm Microsoft Corporation Windows Media Audio Codec
OK C:\WINDOWS\system32\MSAUD32.ACM 8.00.00.4487 288.00 KB (294,912 bytes) 3/29/2003 12:00 AM
c:\windows\system32\msg723.acm Microsoft Corporation OK
C:\WINDOWS\system32\MSG723.ACM 4.4.4000 116.00 KB (118,784 bytes)
5/30/2003 3:10 PM

[Video Codecs]

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CODEC Manufacturer Description Status File Version Size Creation Date
c:\windows\system32\msh261.drv Microsoft Corporation OK
C:\WINDOWS\system32\MSH261.DRV 4.4.4000 180.00 KB (184,320 bytes)
5/30/2003 3:10 PM
c:\windows\system32\tsbyuv.dll Microsoft Corporation OK
C:\WINDOWS\system32\TSBYUV.DLL 5.2.3790.0 (srv03_rtm.030324-2048) 8.00 KB
(8,192 bytes) 3/24/2003 7:50 PM
c:\windows\system32\msrle32.dll Microsoft Corporation OK
C:\WINDOWS\system32\MSRLE32.DLL 5.2.3790.0 (srv03_rtm.030324-2048) 10.50
KB (10,752 bytes) 3/29/2003 12:00 AM
c:\windows\system32\iyuv_32.dll Microsoft Corporation OK
C:\WINDOWS\system32\IYUV_32.DLL 5.2.3790.0 (srv03_rtm.030324-2048) 45.00
KB (46,080 bytes) 3/24/2003 7:49 PM
c:\windows\system32\msvidc32.dll Microsoft Corporation OK
C:\WINDOWS\system32\MSVIDC32.DLL 5.2.3790.0 (srv03_rtm.030324-2048) 26.50
KB (27,136 bytes) 3/29/2003 12:00 AM
c:\windows\system32\msyuv.dll Microsoft Corporation OK
C:\WINDOWS\system32\MSYUV.DLL 5.2.3790.0 (srv03_rtm.030324-2048) 16.50
KB (16,896 bytes) 3/24/2003 7:49 PM
c:\windows\system32\msh263.drv Microsoft Corporation OK
C:\WINDOWS\system32\MSH263.DRV 4.4.4000 284.00 KB (290,816 bytes)
3/24/2003 7:46 PM

[CD-ROM]

Item Value
Drive D:
Description CD-ROM Drive
Media Loaded No
Media Type CD-ROM
Name SAMSUNG CD-ROM SN-124
Manufacturer (Standard CD-ROM drives)
Status OK
Transfer Rate Not Available
SCSI Target ID 0
PNP Device ID IDE\CDROMSAMSUNG_CD-ROM_SN-
124_____Q009____\5&3125DC91&0&0.0.0
Driver c:\windows\system32\drivers\cdrom.sys (5.2.3790.0 (srv03_rtm.030324-2048), 49.50 KB (50,688
bytes), 3/29/2003 12:00 AM)

[Sound Device]

Item Value

[Display]

Item Value
Name RAGE XL PCI Family (Microsoft Corporation)
PNP Device ID PCI\VEN_1002&DEV_4752&SUBSYS_01211028&REV_27\3&13C0B0C5&0&70
Adapter Type ATI RAGE XL PCI (B41), ATI Technologies Inc. compatible
Adapter Description RAGE XL PCI Family (Microsoft Corporation)
Adapter RAM 8.00 MB (8,388,608 bytes)
Installed Drivers ati2drad.dll
Driver Version 5.10.3663.6013

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INF File atiixpad.inf (ati2mpad section)
Color Planes 1
Color Table Entries 65536
Resolution 1024 x 768 x 60 hertz
Bits/Pixel 16
Memory Address 0xFD000000-0xFEBFFFFF
I/O Port 0x0000E800-0x0000E8FF
Memory Address 0xFE101000-0xFE101FFF
I/O Port 0x000003B0-0x000003DF
I/O Port 0x000003C0-0x000003DF
Memory Address 0xA0000-0xBFFFF
Driver c:\windows\system32\drivers\ati2mpad.sys (5.10.3663.6013, 335.38 KB (343,424 bytes), 5/30/2003 10:02 AM)

[Infrared]

Item Value

[Input]

[Keyboard]

Item Value
Description Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
Name Enhanced (101- or 102-key)
Layout 00000409
PNP Device ID ACPI\PNP0303\4&25F73A82&0
Number of Function Keys 12
I/O Port 0x00000060-0x00000060
I/O Port 0x00000064-0x00000064
IRQ Channel IRQ 1
Driver c:\windows\system32\drivers\i8042prt.sys (5.2.3790.0 (srv03_rtm.030324-2048), 68.50 KB (70,144 bytes), 3/29/2003 12:00 AM)

[Pointing Device]

Item Value
Hardware Type PS/2 Compatible Mouse
Number of Buttons 3
Status OK
PNP Device ID ACPI\PNP0F13\4&25F73A82&0
Power Management Supported No
Double Click Threshold 6
Handedness Right Handed Operation
IRQ Channel IRQ 12
Driver c:\windows\system32\drivers\i8042prt.sys (5.2.3790.0 (srv03_rtm.030324-2048), 68.50 KB (70,144 bytes), 3/29/2003 12:00 AM)

[Modem]

Item Value

[Network]

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[Adapter]

Item Value
Name [00000001] Broadcom NetXtreme Gigabit Ethernet
Adapter Type Not Available
Product Type Broadcom NetXtreme Gigabit Ethernet
Installed Yes
PNP Device ID Not Available
Last Reset 1/8/2004 4:54 PM
Index 1
Service Name b57w2k
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available

Name [00000002] Broadcom NetXtreme Gigabit Ethernet
Adapter Type Not Available
Product Type Broadcom NetXtreme Gigabit Ethernet
Installed Yes
PNP Device ID Not Available
Last Reset 1/8/2004 4:54 PM
Index 2
Service Name b57w2k
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available

Name [00000003] RAS Async Adapter
Adapter Type Not Available
Product Type RAS Async Adapter
Installed Yes
PNP Device ID Not Available
Last Reset 1/8/2004 4:54 PM
Index 3
Service Name AsyncMac
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available

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MAC Address Not Available

Name [00000004] WAN Miniport (L2TP)
Adapter Type Not Available
Product Type WAN Miniport (L2TP)
Installed Yes
PNP Device ID ROOT\MS_L2TPMINIPORT\0000
Last Reset 1/8/2004 4:54 PM
Index 4
Service Name Rasl2tp
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Driver c:\windows\system32\drivers\rasl2tp.sys (5.2.3790.0 (srv03_rtm.030324-2048), 77.00 KB (78,848 bytes), 3/29/2003 12:00 AM)

Name [00000005] WAN Miniport (PPTP)
Adapter Type Wide Area Network (WAN)
Product Type WAN Miniport (PPTP)
Installed Yes
PNP Device ID ROOT\MS_PPTPMINIPORT\0000
Last Reset 1/8/2004 4:54 PM
Index 5
Service Name PptpMiniport
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 50:50:54:50:30:30
Driver c:\windows\system32\drivers\raspptp.sys (5.2.3790.0 (srv03_rtm.030324-2048), 70.50 KB (72,192 bytes), 3/29/2003 12:00 AM)

Name [00000006] WAN Miniport (PPPOE)
Adapter Type Wide Area Network (WAN)
Product Type WAN Miniport (PPPOE)
Installed Yes
PNP Device ID ROOT\MS_PPPOEMINIPORT\0000
Last Reset 1/8/2004 4:54 PM
Index 6
Service Name RasPppoe
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available

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MAC Address 33:50:6F:45:30:30
Driver c:\windows\system32\drivers\raspppoe.sys (5.2.3790.0 (srv03_rtm.030324-2048), 38.00 KB (38,912 bytes), 3/29/2003 12:00 AM)

Name [00000007] Direct Parallel
Adapter Type Not Available
Product Type Direct Parallel
Installed Yes
PNP Device ID ROOT\MS_PTIMINIPORT\0000
Last Reset 1/8/2004 4:54 PM
Index 7
Service Name Raspti
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Driver c:\windows\system32\drivers\raspti.sys (5.2.3790.0 (srv03_rtm.030324-2048), 18.50 KB (18,944 bytes), 3/29/2003 12:00 AM)

Name [00000008] WAN Miniport (IP)
Adapter Type Not Available
Product Type WAN Miniport (IP)
Installed Yes
PNP Device ID ROOT\MS_NDISWANIP\0000
Last Reset 1/8/2004 4:54 PM
Index 8
Service Name NdisWan
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Driver c:\windows\system32\drivers\ndiswan.sys (5.2.3790.0 (srv03_rtm.030324-2048), 96.50 KB (98,816 bytes), 3/29/2003 12:00 AM)

Name [00000009] Broadcom NetXtreme Gigabit Ethernet
Adapter Type Ethernet 802.3
Product Type Broadcom NetXtreme Gigabit Ethernet
Installed Yes
PNP Device ID PCI\VEN_14E4&DEV_16A7&SUBSYS_01211028&REV_02\3&172E68DD&0&30
Last Reset 1/8/2004 4:54 PM
Index 9
Service Name b57w2k
IP Address 192.1.10.78
IP Subnet 255.255.255.0
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available

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DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:06:5B:F8:5D:AA
Memory Address 0xEFF10000-0xEFF1FFFF
IRQ Channel IRQ 28
Driver c:\windows\system32\drivers\b57xp32.sys (2.91.0.0 built by: WinDDK, 137.00 KB (140,288 bytes), 5/30/2003 10:02 AM)

Name [00000010] Broadcom NetXtreme Gigabit Ethernet
Adapter Type Ethernet 802.3
Product Type Broadcom NetXtreme Gigabit Ethernet
Installed Yes
PNP Device ID PCI\VEN_14E4&DEV_16A7&SUBSYS_01211028&REV_02\3&172E68DD&0&40
Last Reset 1/8/2004 4:54 PM
Index 10
Service Name b57w2k
IP Address 192.1.1.78
IP Subnet 255.255.255.0
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:06:5B:F8:5D:AB
Memory Address 0xEFF00000-0xEFF0FFFF
IRQ Channel IRQ 29
Driver c:\windows\system32\drivers\b57xp32.sys (2.91.0.0 built by: WinDDK, 137.00 KB (140,288 bytes), 5/30/2003 10:02 AM)

[Protocol]

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

Name MSAFD Tcpip [UDP/IP]
Connectionless Service Yes
Guarantees Delivery No
Guarantees Sequencing No
Maximum Address Size 16 bytes

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

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

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

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{2EF7CB45-6E02-4028-A9B2-7207ECD6BD5B}] SEQPACKET 5
Connectionless Service No
Guarantees Delivery Yes
Guarantees Sequencing Yes
Maximum Address Size 20 bytes

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Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting No
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{2EF7CB45-6E02-4028-A9B2-7207ECD6BD5B}] DATAGRAM 5
Connectionless Service Yes
Guarantees Delivery No
Guarantees Sequencing No
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting Yes
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{D6D57ED7-08E8-4E49-AE34-29F7F2B4AC24}] SEQPACKET 4
Connectionless Service No
Guarantees Delivery Yes
Guarantees Sequencing Yes
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting No
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{D6D57ED7-08E8-4E49-AE34-29F7F2B4AC24}] DATAGRAM 4
Connectionless Service Yes
Guarantees Delivery No

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Guarantees Sequencing No
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting Yes
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{6068DFB2-35CC-4334-A1CD-99BF402C2EB1}] SEQPACKET 0
Connectionless Service No
Guarantees Delivery Yes
Guarantees Sequencing Yes
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting No
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{6068DFB2-35CC-4334-A1CD-99BF402C2EB1}] DATAGRAM 0
Connectionless Service Yes
Guarantees Delivery No
Guarantees Sequencing No
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting Yes
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{84CBEDAE-78F6-4C0F-A714-0B9A6BAD30DA}] SEQPACKET 1

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Connectionless Service No
Guarantees Delivery Yes
Guarantees Sequencing Yes
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting No
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{84CBEDAE-78F6-4C0F-A714-0B9A6BAD30DA}] DATAGRAM 1
Connectionless Service Yes
Guarantees Delivery No
Guarantees Sequencing No
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting Yes
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{D5B83B02-01EF-4E50-9720-1B8E810DE871}] SEQPACKET 2
Connectionless Service No
Guarantees Delivery Yes
Guarantees Sequencing Yes
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting No
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

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Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{D5B83B02-01EF-4E50-9720-1B8E810DE871}]
DATAGRAM 2
Connectionless Service Yes
Guarantees Delivery No
Guarantees Sequencing No
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting Yes
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{AA843776-1681-4379-B2C9-EC445DC298EF}]
SEQPACKET 3
Connectionless Service No
Guarantees Delivery Yes
Guarantees Sequencing Yes
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting No
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{AA843776-1681-4379-B2C9-EC445DC298EF}]
DATAGRAM 3
Connectionless Service Yes
Guarantees Delivery No
Guarantees Sequencing No
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting Yes
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No

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Supports Multicasting No

[WinSock]

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

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

[Ports]

[Serial]

Item Value
Name Communications Port (COM2)
Status OK
PNP Device ID ACPI\PNP0501\1
Maximum Input Buffer Size 0
Maximum Output Buffer Size No
Settable Baud Rate Yes
Settable Data Bits Yes
Settable Flow Control Yes
Settable Parity Yes
Settable Parity Check Yes
Settable Stop Bits Yes
Settable RLSD Yes
Supports RLSD Yes
Supports 16 Bit Mode No
Supports Special Characters No
Baud Rate 9600
Bits/Byte 8
Stop Bits 1
Parity None
Busy No
Abort Read/Write on Error No
Binary Mode Enabled Yes
Continue XMit on XOff No
CTS Outflow Control No
Discard NULL Bytes No
DSR Outflow Control 0
DSR Sensitivity 0
DTR Flow Control Type Enable
EOF Character 0
Error Replace Character 0
Error Replacement Enabled No
Event Character 0
Parity Check Enabled No
RTS Flow Control Type Enable
XOff Character 19

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XOffXMit Threshold 512
XOn Character 17
XOnXMit Threshold 2048
XOnXOff InFlow Control 0
XOnXOff OutFlow Control 0
I/O Port 0x000003F8-0x000003FF
IRQ Channel IRQ 4
Driver c:\windows\system32\drivers\serial.sys (5.2.3790.0 (srv03_rtm.030324-2048), 76.00 KB (77,824 bytes), 3/29/2003 12:00 AM)

Name Communications Port (COM1)
Status OK
PNP Device ID ACPI\PNP0501\2
Maximum Input Buffer Size 0
Maximum Output Buffer Size No
Settable Baud Rate Yes
Settable Data Bits Yes
Settable Flow Control Yes
Settable Parity Yes
Settable Parity Check Yes
Settable Stop BitsYes
Settable RLSD Yes
Supports RLSD Yes
Supports 16 Bit Mode No
Supports Special Characters No
Baud Rate 9600
Bits/Byte 8
Stop Bits 1
Parity None
Busy No
Abort Read/Write on Error No
Binary Mode Enabled Yes
Continue XMit on XOff No
CTS Outflow Control No
Discard NULL Bytes No
DSR Outflow Control 0
DSR Sensitivity 0
DTR Flow Control Type Enable
EOF Character 0
Error Replace Character 0
Error Replacement Enabled No
Event Character 0
Parity Check Enabled No
RTS Flow Control Type Enable
XOff Character 19
XOffXMit Threshold 512
XOn Character 17
XOnXMit Threshold 2048
XOnXOff InFlow Control 0
XOnXOff OutFlow Control 0
I/O Port 0x000002F8-0x000002FF
IRQ Channel IRQ 3
Driver c:\windows\system32\drivers\serial.sys (5.2.3790.0 (srv03_rtm.030324-2048), 76.00 KB (77,824 bytes), 3/29/2003 12:00 AM)

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[Parallel]

Item Value

[Storage]

[Drives]

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

Drive C:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 8.79 GB (9,434,361,856 bytes)
Free Space 3.44 GB (3,694,940,160 bytes)
Volume Name
Volume Serial Number 18A97566

Drive D:
Description CD-ROM Disc

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

Drive 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

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

Drive U:
Description Local Fixed Disk

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Compressed No
File System NTFS
Size 159.93 GB (171,719,131,136 bytes)
Free Space 95.41 GB (102,441,680,896 bytes)
Volume Name Backup1
Volume Serial Number C47CFDC0

Drive V:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 159.93 GB (171,719,131,136 bytes)
Free Space 95.41 GB (102,441,746,432 bytes)
Volume Name Backup2
Volume Serial Number 6C8D077B

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

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

[Disks]

Item Value
Description Disk drive
Manufacturer (Standard disk drives)
Model DELL Container SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 2
SCSI Bus 4
SCSI Logical Unit 0
SCSI Port 6
SCSI Target ID 0
Sectors/Track 63
Size 67.79 GB (72,793,728,000 bytes)
Total Cylinders 8,850
Total Sectors 142,175,250
Total Tracks 2,256,750
Tracks/Cylinder 255
Partition Disk #2, Partition #0

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Partition Size 8.79 GB (9,434,363,904 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #2, Partition #1
Partition Size 59.01 GB (63,359,331,840 bytes)
Partition Starting Offset 9,434,396,160 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model PERC LD 0 PERCRAID SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 3
SCSI Bus 3
SCSI Logical Unit 0
SCSI Port 3
SCSI Target ID 0
Sectors/Track 63
Size 472.44 GB (507,277,693,440 bytes)
Total Cylinders 61,673
Total Sectors 990,776,745
Total Tracks 15,726,615
Tracks/Cylinder 255
Partition Disk #1, Partition #0
Partition Size 156.26 GB (167,779,229,184 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #1, Partition #1
Partition Size 156.26 GB (167,779,261,440 bytes)
Partition Starting Offset 167,779,261,440 bytes
Partition Disk #1, Partition #2
Partition Size 159.93 GB (171,719,170,560 bytes)
Partition Starting Offset 335,558,522,880 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model PERC LD 0 PERCRAID SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 3
SCSI Bus 3
SCSI Logical Unit 0
SCSI Port 2
SCSI Target ID 0
Sectors/Track 63
Size 472.44 GB (507,277,693,440 bytes)
Total Cylinders 61,673
Total Sectors 990,776,745
Total Tracks 15,726,615
Tracks/Cylinder 255
Partition Disk #0, Partition #0
Partition Size 156.26 GB (167,779,229,184 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #0, Partition #1
Partition Size 156.26 GB (167,779,261,440 bytes)

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Partition Starting Offset 167,779,261,440 bytes
Partition Disk #0, Partition #2
Partition Size 159.93 GB (171,719,170,560 bytes)
Partition Starting Offset 335,558,522,880 bytes

[SCSI]

Item Value
Name Dell PERC 3 RAID (SCSI chip)
Manufacturer Dell
Status OK
PNP Device ID PCI\VEN_9005&DEV_00C5&SUBSYS_00C51028&REV_01\4&22300438&0&3040
I/O Port 0x0000CC00-0x0000CCFF
Memory Address 0xEFCFF000-0xEFCFFFFF
IRQ Channel IRQ 30
Driver c:\windows\system32\drivers\perc2.sys (5.2.3646.0 (Lab01_N(portbld).020612-1346), 27.63 KB (28,288 bytes), 3/29/2003 12:00 AM)

Name Dell PERC 3 RAID (SCSI chip)
Manufacturer Dell
Status OK
PNP Device ID PCI\VEN_9005&DEV_00C5&SUBSYS_00C51028&REV_01\4&22300438&0&3140
I/O Port 0x0000C800-0x0000C8FF
Memory Address 0xEFCFE000-0xEFCFEFFF
IRQ Channel IRQ 31
Driver c:\windows\system32\drivers\perc2.sys (5.2.3646.0 (Lab01_N(portbld).020612-1346), 27.63 KB (28,288 bytes), 3/29/2003 12:00 AM)

Name Dell PERC 3/Di RAID Controller
Manufacturer Dell
Status OK
PNP Device ID PCI\VEN_1028&DEV_000A&SUBSYS_01211028&REV_01\3&474B838&0&41
Memory Address 0xE0000000-0xEFDFFFFF
IRQ Channel IRQ 30
Driver c:\windows\system32\drivers\perc2.sys (5.2.3646.0 (Lab01_N(portbld).020612-1346), 27.63 KB (28,288 bytes), 3/29/2003 12:00 AM)

Name DELL PERC 3/DC Plus RAID Controller
Manufacturer DELL
Status OK
PNP Device ID PCI\VEN_101E&DEV_1960&SUBSYS_04941028&REV_01\3&29E81982&0&30
Memory Address 0xF0000000-0xF7FFFFFF
IRQ Channel IRQ 24
Driver c:\windows\system32\drivers\mraid35x.sys (5.2.22.4 built by: WinDDK, 17.88 KB (18,304 bytes), 1/9/2003 11:54 AM)

Name DELL PERC 3/DC Plus RAID Controller
Manufacturer DELL
Status OK
PNP Device ID PCI\VEN_101E&DEV_1960&SUBSYS_04941028&REV_01\3&1070020&0&40
Memory Address 0xF8000000-0xFCFFFFFF
IRQ Channel IRQ 20
Driver c:\windows\system32\drivers\mraid35x.sys (5.2.22.4 built by: WinDDK, 17.88 KB (18,304 bytes), 1/9/2003 11:54 AM)

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[IDE]

Item Value
Name CSB5 IDE Controller
Manufacturer ServerWorks
Status OK
PNP Device ID PCI\VEN_1166&DEV_0212&SUBSYS_02121166&REV_93\3&13C0B0C5&0&79
I/O Port 0x000008B0-0x000008BF
Driver c:\windows\system32\drivers\pciide.sys (5.2.3790.0 (srv03_rtm.030324-2048), 5.50 KB (5,632 bytes), 3/29/2003 12:00 AM)

Name Primary IDE Channel
Manufacturer (Standard IDE ATA/ATAPI controllers)
Status OK
PNP Device ID PCIIDE\IDECHANNEL\4&10A8249&0&0
I/O Port 0x000001F0-0x000001F7
I/O Port 0x000003F6-0x000003F6
IRQ Channel IRQ 14
Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.0 (srv03_rtm.030324-2048), 89.00 KB (91,136 bytes), 3/29/2003 12:00 AM)

Name Secondary IDE Channel
Manufacturer (Standard IDE ATA/ATAPI controllers)
Status OK
PNP Device ID PCIIDE\IDECHANNEL\4&10A8249&0&1
I/O Port 0x00000170-0x00000177
I/O Port 0x00000376-0x00000376
Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.0 (srv03_rtm.030324-2048), 89.00 KB (91,136 bytes), 3/29/2003 12:00 AM)

[Printing]

Name Driver Port Name Server Name

[Problem Devices]

Device PNP Device ID Error Code
PCI Device PCI\VEN_1028&DEV_000C&SUBSYS_000C1028&REV_00\3&13C0B0C5&0&20
The drivers for this device are not installed.
PCI Device PCI\VEN_1028&DEV_0008&SUBSYS_00081028&REV_00\3&13C0B0C5&0&21
The drivers for this device are not installed.
PCI Device PCI\VEN_1028&DEV_000D&SUBSYS_000D1028&REV_00\3&13C0B0C5&0&22
The drivers for this device are not installed.

[USB]

Device PNP Device ID
ServerWorks (RCC) PCI to USB Open Host Controller
PCI\VEN_1166&DEV_0220&SUBSYS_02201166&REV_05\3&13C0B0C5&0&7A
USB Root Hub USB\ROOT_HUB\4&1A0F8909&0

[Software Environment]

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[System Drivers]

Name	Description	File	Type	Started	Start Mode	State	Status	Error Control	Accept Pause	Accept Stop
abiosdsk	Abiosdsk	Not Available	Kernel Driver	No	Disabled	Stopped	OK	Ignore	No	No
acpi	Microsoft ACPI Driver	c:\windows\system32\drivers\acpi.sys	Kernel Driver	Yes	Boot	Running	OK	Normal	No	Yes
acpiec	ACPIEC	c:\windows\system32\drivers\acpiec.sys	Kernel Driver	No	Disabled	Stopped	OK	Normal	No	No
adpu160m	adpu160m	Not Available	Kernel Driver	No	Disabled	Stopped	OK	Normal	No	No
adpu320	adpu320	Not Available	Kernel Driver	No	Disabled	Stopped	OK	Normal	No	No
afcnt	afcnt	Not Available	Kernel Driver	No	Disabled	Stopped	OK	Normal	No	No
afd	AFD Networking Support Environment	c:\windows\system32\drivers\afd.sys	Kernel Driver	Yes	Auto	Running	OK	Normal	No	Yes
aha154x	Aha154x	Not Available	Kernel Driver	No	Disabled	Stopped	OK	Normal	No	No
aic78u2	aic78u2	Not Available	Kernel Driver	No	Disabled	Stopped	OK	Normal	No	No
aic78xx	aic78xx	Not Available	Kernel Driver	No	Disabled	Stopped	OK	Normal	No	No
aliide	AliIde	Not Available	Kernel Driver	No	Disabled	Stopped	OK	Normal	No	No
asyncmac	RAS Asynchronous Media Driver	c:\windows\system32\drivers\asyncmac.sys	Kernel Driver	No	Manual	Stopped	OK	Normal	No	No
atapi	Standard IDE/ESDI Hard Disk Controller	c:\windows\system32\drivers\atapi.sys	Kernel Driver	Yes	Boot	Running	OK	Normal	No	Yes
atdisk	Atdisk	Not Available	Kernel Driver	No	Disabled	Stopped	OK	Ignore	No	No
ati2mpad	ati2mpad	c:\windows\system32\drivers\ati2mpad.sys	Kernel Driver	Yes	Manual	Running	OK	Ignore	No	Yes
atmarpc	ATM ARP Client Protocol	c:\windows\system32\drivers\atmarpc.sys	Kernel Driver	No	Manual	Stopped	OK	Normal	No	No
audstub	Audio Stub Driver	c:\windows\system32\drivers\audstub.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No	Yes
b57w2k	Broadcom NetXtreme Gigabit Ethernet	c:\windows\system32\drivers\b57xp32.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No	Yes
beep	Beep	c:\windows\system32\drivers\beep.sys	Kernel Driver	Yes	System	Running	OK	Normal	No	Yes
cbidf2k	cbidf2k	c:\windows\system32\drivers\cbidf2k.sys	Kernel Driver	No	Disabled	Stopped	OK	Normal	No	No
cd20xrnt	cd20xrnt	Not Available	Kernel Driver	No	Disabled	Stopped	OK	Normal	No	No
cdfs	Cdfs	c:\windows\system32\drivers\cdfs.sys	File System Driver	Yes	Disabled	Running	OK	Normal	No	Yes
cdrom	CD-ROM Driver	c:\windows\system32\drivers\cdrom.sys	Kernel Driver	Yes	System	Running	OK	Normal	No	Yes
changer	Changer	Not Available	Kernel Driver	No	System	Stopped	OK	Ignore	No	No
clusdisk	Cluster Disk Driver	c:\windows\system32\drivers\clusdisk.sys	Kernel Driver	No	Disabled	Stopped	OK	Normal	No	No

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cmdide CmdIde Not Available Kernel Driver No DisabledStopped OK Normal No
No
cpqarray Cpqarray Not Available Kernel Driver No DisabledStopped OK Normal
No No
cpqarry2 cpqarry2 Not Available Kernel Driver No DisabledStopped OK Normal No
No
cpqcissm cpqcissm Not Available Kernel Driver No DisabledStopped OK
Normal No No
cpqfcalm cpqfcalm Not Available Kernel Driver No DisabledStopped OK
Normal No No
crcdisk CRC Disk Filter Driver c:\windows\system32\drivers\crcdisk.sys Kernel Driver Yes
Boot Running OK Normal No Yes
dac960nt dac960nt Not Available Kernel Driver No DisabledStopped OK
Normal No No
dcesmwdm Instrumentation service device driver
c:\windows\system32\drivers\dcesmwdm.sys Kernel Driver No Manual Stopped
OK Normal No No
dellcerc dellcerc Not Available Kernel Driver No DisabledStopped OK Normal No
No
dfsdriver DfsDriver c:\windows\system32\drivers\dfs.sys File System Driver
Yes Boot Running OK Normal No Yes
disk Disk Driver c:\windows\system32\drivers\disk.sys Kernel Driver Yes Boot
Running OK Normal No Yes
dmboot dmboot c:\windows\system32\drivers\dmboot.sys Kernel Driver No DisabledStopped
OK Normal No No
dmio Logical Disk Manager Driver c:\windows\system32\drivers\dmio.sys Kernel Driver
Yes Boot Running OK Normal No Yes
dmload dmload c:\windows\system32\drivers\dmload.sys Kernel Driver Yes Boot Running
OK Normal No Yes
dpti2o dpti2o Not Available Kernel Driver No DisabledStopped OK Normal No
No
fastfat Fastfat c:\windows\system32\drivers\fastfat.sys File System Driver Yes Disabled
Running OK Normal No Yes
fdc Floppy Disk Controller Driver c:\windows\system32\drivers\fdc.sys Kernel Driver
Yes Manual Running OK Normal No Yes
fips Fips c:\windows\system32\drivers\fips.sys Kernel Driver Yes System Running
OK Normal No Yes
flpydisk Floppy Disk Driver c:\windows\system32\drivers\flpydisk.sys Kernel Driver Yes
Manual Running OK Normal No Yes
ftdisk Volume Manager Driver c:\windows\system32\drivers\ftdisk.sys Kernel Driver Yes
Boot Running OK Normal No Yes
gpc Generic Packet Classifier c:\windows\system32\drivers\msgpc.sys Kernel Driver Yes
Manual Running OK Normal No Yes
hpn hpn Not Available Kernel Driver No DisabledStopped OK Normal No
No
hpt3xx hpt3xx Not Available Kernel Driver No DisabledStopped OK Normal No
No
http HTTP c:\windows\system32\drivers\http.sys Kernel Driver No Manual Stopped
OK Normal No No
i2omgmt i2omgmt Not Available Kernel Driver No System Stopped OK
Normal No No
i2omp i2omp Not Available Kernel Driver No DisabledStopped OK Normal No
No
i8042prt i8042 Keyboard and PS/2 Mouse Port Driver c:\windows\system32\drivers\i8042prt.sys
Kernel Driver Yes System Running OK Normal No Yes

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iirsp      iirsp      Not Available      Kernel Driver      No      DisabledStopped OK      Normal  No
           No
imapi      CD-Burning Filter Driver      c:\windows\system32\drivers\imapi.sys      Kernel Driver      No
           System     Stopped OK      Normal  No      No
intelide   IntelIde   Not Available      Kernel Driver      No      DisabledStopped OK      Normal  No
           No
ipfilterdriver      IP Traffic Filter Driver      c:\windows\system32\drivers\ipfltdrv.sys      Kernel Driver
           No      Manual     Stopped OK      Normal  No      No
ipinip     IP in IP Tunnel Driver      c:\windows\system32\drivers\ipinip.sys      Kernel Driver      No
           Manual     Stopped OK      Normal  No      No
ipnat      IP Network Address Translator      c:\windows\system32\drivers\ipnat.sys      Kernel Driver
           No      Manual     Stopped OK      Normal  No      No
ipsec      IPSEC driver      c:\windows\system32\drivers\ipsec.sys      Kernel Driver      Yes      System
           Running OK      Normal  No      Yes
ipsraidn   ipsraidn   Not Available      Kernel Driver      No      DisabledStopped OK      Normal  No
           No
irenum     IR Enumerator Service      c:\windows\system32\drivers\irenum.sys      Kernel Driver      No
           Manual     Stopped OK      Normal  No      No
isapnp     PnP ISA/EISA Bus Driver      c:\windows\system32\drivers\isapnp.sys      Kernel Driver      Yes
           Boot       Running OK      Critical  No      Yes
kbdclass   Keyboard Class Driver      c:\windows\system32\drivers\kbdclass.sys      Kernel Driver      Yes
           System     Running OK      Normal  No      Yes
ksecdd     KSecDD     c:\windows\system32\drivers\ksecdd.sys      Kernel Driver      Yes      Boot
           Running OK      Normal  No      Yes
lp6nds35   lp6nds35   Not Available      Kernel Driver      No      DisabledStopped OK
           Normal     No      No
mnmdd      mnmdd      c:\windows\system32\drivers\mnmdd.sys      Kernel Driver      Yes      System  Running
           OK      Ignore     No      Yes
modem      Modem      c:\windows\system32\drivers\modem.sys      Kernel Driver      No      Manual  Stopped
           OK      Ignore     No      No
mouclass   Mouse Class Driver      c:\windows\system32\drivers\mouclass.sys      Kernel Driver
           Yes     System     Running OK      Normal  No      Yes
mountmgr   Mount Point Manager      c:\windows\system32\drivers\mountmgr.sys      Kernel Driver
           Yes     Boot       Running OK      Normal  No      Yes
mraid35x   mraid35x   c:\windows\system32\drivers\mraid35x.sys      Kernel Driver      Yes
           Boot       Running OK      Normal  No      Yes
mrxdav     WebDav Client Redirector      c:\windows\system32\drivers\mrxdav.sys      File System Driver
           No      Manual     Stopped OK      Normal  No      No
mrxsmb     MRXSMB     c:\windows\system32\drivers\mrxsmb.sys      File System Driver      Yes
           System     Running OK      Normal  No      Yes
msfs       Msfs       c:\windows\system32\drivers\msfs.sys      File System Driver      Yes      System
           Running OK      Normal  No      Yes
mup        Mup        c:\windows\system32\drivers\mup.sys      File System Driver      Yes      Boot
           Running OK      Normal  No      Yes
ndis       NDIS System Driver      c:\windows\system32\drivers\ndis.sys      Kernel Driver      Yes
           Boot       Running OK      Normal  No      Yes
ndistapi   Remote Access NDIS TAPI Driver      c:\windows\system32\drivers\ndistapi.sys      Kernel Driver
           Yes     Manual     Running OK      Normal  No      Yes
ndisuio    NDIS Usermode I/O Protocol      c:\windows\system32\drivers\ndisuio.sys      Kernel Driver
           No      Manual     Stopped OK      Normal  No      No
ndiswan    Remote Access NDIS WAN Driver      c:\windows\system32\drivers\ndiswan.sys      Kernel Driver
           Yes     Manual     Running OK      Normal  No      Yes
ndproxy    NDIS Proxy      c:\windows\system32\drivers\ndproxy.sys      Kernel Driver      Yes      Manual
           Running OK      Normal  No      Yes
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netbios NetBIOS Interface c:\windows\system32\drivers\netbios.sys File System Driver
Yes System Running OK Normal No Yes
netbt NetBios over Tcpip c:\windows\system32\drivers\netbt.sys Kernel Driver Yes
System Running OK Normal No Yes
nfrd960 nfrd960 Not Available Kernel Driver No DisabledStopped OK Normal No
No
npfs Npfs c:\windows\system32\drivers\npfs.sys File System Driver Yes System
Running OK Normal No Yes
ntfs Ntfs c:\windows\system32\drivers\ntfs.sys File System Driver Yes Disabled
Running OK Normal No Yes
null Null c:\windows\system32\drivers\null.sys Kernel Driver Yes System Running
OK Normal No Yes
parport Parport c:\windows\system32\drivers\parport.sys Kernel Driver No Manual Stopped
OK Ignore No No
partmgr Partition Manager c:\windows\system32\drivers\partmgr.sys Kernel Driver Yes
Boot Running OK Normal No Yes
pci PCI Bus Driver c:\windows\system32\drivers\pci.sys Kernel Driver Yes Boot
Running OK Critical No Yes
pciide PCIIde c:\windows\system32\drivers\pciide.sys Kernel Driver Yes Boot Running
OK Normal No Yes
pcmcia Pcmcia c:\windows\system32\drivers\pcmcia.sys Kernel Driver No DisabledStopped
OK Normal No No
pdcomp PDCOMP Not Available Kernel Driver No Manual Stopped OK Ignore
No No
pdframe PDFRAME Not Available Kernel Driver No Manual Stopped OK Ignore
No No
pdreli PDRELI Not Available Kernel Driver No Manual Stopped OK Ignore No
No
pdrframe PDRFRAME Not Available Kernel Driver No Manual Stopped OK
Ignore No No
perc2 perc2 c:\windows\system32\drivers\perc2.sys Kernel Driver Yes Boot Running
OK Normal No Yes
perc2hib perc2hib c:\windows\system32\drivers\perc2hib.sys Kernel Driver Yes Boot Running
OK Normal No Yes
pptpminiport WAN Miniport (PPTP) c:\windows\system32\drivers\raspptp.sys Kernel Driver
Yes Manual Running OK Normal No Yes
processor Processor Driver c:\windows\system32\drivers\processr.sys Kernel Driver Yes
Manual Running OK Normal No Yes
ptilink Direct Parallel Link Driver c:\windows\system32\drivers\ptilink.sys Kernel Driver
Yes Manual Running OK Normal No Yes
ql1080 ql1080 Not Available Kernel Driver No DisabledStopped OK Normal No
No
ql10wnt Ql10wnt Not Available Kernel Driver No DisabledStopped OK Normal No
No
ql12160 ql12160 Not Available Kernel Driver No DisabledStopped OK Normal No
No
ql1240 ql1240 Not Available Kernel Driver No DisabledStopped OK Normal No
No
ql1280 ql1280 Not Available Kernel Driver No DisabledStopped OK Normal No
No
ql2100 ql2100 Not Available Kernel Driver No DisabledStopped OK Normal No
No
ql2200 ql2200 Not Available Kernel Driver No DisabledStopped OK Normal No
No

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ql2300  ql2300  Not Available  Kernel Driver  No  DisabledStopped OK  Normal  No
        No
rasacd  Remote Access Auto Connection Driver  c:\windows\system32\drivers\rasacd.sys  Kernel
Driver  Yes  System  Running OK  Normal  No  Yes
rasl2tp  WAN Miniport (L2TP)  c:\windows\system32\drivers\rasl2tp.sys  Kernel Driver  Yes
        Manual  Running OK  Normal  No  Yes
raspppoe  Remote Access PPPOE Driver  c:\windows\system32\drivers\raspppoe.sys  Kernel
Driver  Yes  Manual  Running OK  Normal  No  Yes
raspti  Direct Parallel  c:\windows\system32\drivers\raspti.sys  Kernel Driver  Yes  Manual
        Running OK  Normal  No  Yes
rdbss  Rdbss  c:\windows\system32\drivers\rdbss.sys  File System Driver  Yes  System
        Running OK  Normal  No  Yes
rdpcdd  RDPCDD  c:\windows\system32\drivers\rdpcdd.sys  Kernel Driver  Yes  System
        Running OK  Ignore  No  Yes
rdpdr  Terminal Server Device Redirector Driver  c:\windows\system32\drivers\rdpdr.sys  Kernel
Driver  Yes  Manual  Running OK  Normal  No  Yes
rdpwd  RDPWD  c:\windows\system32\drivers\rdpwd.sys  Kernel Driver  Yes  Manual
        Running OK  Ignore  No  Yes
redbook  Digital CD Audio Playback Filter Driver  c:\windows\system32\drivers\redbook.sys  Kernel
Driver  Yes  System  Running OK  Normal  No  Yes
scsiprnt  Microsoft SCSI/1394 Generic Printer Class  c:\windows\system32\drivers\scsiprnt.sys  Kernel
Driver  No  Manual  Stopped OK  Normal  No  No
secdrv  Secdrv  c:\windows\system32\drivers\secdrv.sys  Kernel Driver  No  Manual  Stopped
        OK  Normal  No  No
serenum  Serenum Filter Driver  c:\windows\system32\drivers\serenum.sys  Kernel Driver  Yes
        Manual  Running OK  Normal  No  Yes
serial  Serial port driver  c:\windows\system32\drivers\serial.sys  Kernel Driver  Yes  System
        Running OK  Ignore  No  Yes
sfloppy  Sfloppy  c:\windows\system32\drivers\sfloppy.sys  Kernel Driver  No  System  Stopped
        OK  Ignore  No  No
simbad  Simbad  Not Available  Kernel Driver  No  DisabledStopped OK  Normal  No
        No
sparrow  Sparrow  Not Available  Kernel Driver  No  DisabledStopped OK  Normal  No
        No
srv  Srv  c:\windows\system32\drivers\srv.sys  File System Driver  Yes  Manual
        Running OK  Normal  No  Yes
swenum  Software Bus Driver  c:\windows\system32\drivers\swenum.sys  Kernel Driver  Yes
        Manual  Running OK  Normal  No  Yes
symc810  symc810  Not Available  Kernel Driver  No  DisabledStopped OK
        Normal  No  No
symc8xx  symc8xx  Not Available  Kernel Driver  No  DisabledStopped OK
        Normal  No  No
symmpi  symmpi  Not Available  Kernel Driver  No  DisabledStopped OK  Normal  No
        No
sym_hi  sym_hi  Not Available  Kernel Driver  No  DisabledStopped OK  Normal  No
        No
sym_u3  sym_u3  Not Available  Kernel Driver  No  DisabledStopped OK  Normal  No
        No
tcpip  TCP/IP Protocol Driver  c:\windows\system32\drivers\tcpip.sys  Kernel Driver  Yes
        System  Running OK  Normal  No  Yes
tdpipe  TDPIPE  c:\windows\system32\drivers\tdpipe.sys  Kernel Driver  No  Manual  Stopped
        OK  Ignore  No  No
tdtcp  TDTCP  c:\windows\system32\drivers\tdtcp.sys  Kernel Driver  Yes  Manual  Running
        OK  Ignore  No  Yes
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termdd Terminal Device Driver c:\windows\system32\drivers\termdd.sys Kernel Driver Yes
System Running OK Normal No Yes
toside TosIde Not Available Kernel Driver No DisabledStopped OK Normal No
No
udfs Udfs c:\windows\system32\drivers\udfs.sys File System Driver No Disabled
Stopped OK Normal No No
ultra ultra Not Available Kernel Driver No DisabledStopped OK Normal No
No
update Microcode Update Driver c:\windows\system32\drivers\update.sys Kernel Driver Yes
Manual Running OK Normal No Yes
usbhub USB2 Enabled Hub c:\windows\system32\drivers\usbhub.sys Kernel Driver Yes
Manual Running OK Normal No Yes
usbohci Microsoft USB Open Host Controller Miniport Driver
c:\windows\system32\drivers\usbohci.sys Kernel Driver Yes Manual Running OK
Normal No Yes
usbstor USB Mass Storage Driver c:\windows\system32\drivers\usbstor.sys Kernel Driver No
Manual Stopped OK Normal No No
vgasave VGA Display Controller. c:\windows\system32\drivers\vga.sys Kernel Driver Yes
System Running OK Ignore No Yes
viaide ViaIde Not Available Kernel Driver No DisabledStopped OK Normal No
No
volsnap Storage volumes c:\windows\system32\drivers\volsnap.sys Kernel Driver Yes Boot
Running OK Normal No Yes
wanarp Remote Access IP ARP Driver c:\windows\system32\drivers\wanarp.sys Kernel Driver
Yes Manual Running OK Normal No Yes
wdica WDICA Not Available Kernel Driver No Manual Stopped OK Ignore No
No
wlbs Network Load Balancing c:\windows\system32\drivers\wlbs.sys Kernel Driver No
Manual Stopped OK Normal No No

[Signed Drivers]

Device Name Signed Device Class Driver Version Driver Date Manufacturer INF
Name Driver Name Device ID
Not Available Not Available Not Available Not Available Not Available Not Available
Not Available Not Available HTREE\ROOT\0
ACPI Multiprocessor PC No COMPUTER 5.2.3790.0 10/1/2002 (Standard
computers) hal.inf Not Available ROOT\ACPI_HAL\0000
Microsoft ACPI-Compliant System No SYSTEM 5.2.3790.0 10/1/2002
Microsoft acpi.inf Not Available ACPI_HAL\PNP0C08\0
Processor No PROCESSOR 5.2.3790.0 10/1/2002 (Standard processor types)
cpu.inf Not Available ACPI\GENUINEINTEL_-_X86_FAMILY_15_MODEL_2_0
Processor No PROCESSOR 5.2.3790.0 10/1/2002 (Standard processor types)
cpu.inf Not Available ACPI\GENUINEINTEL_-_X86_FAMILY_15_MODEL_2_2
PCI bus No SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices)
machine.inf Not Available ACPI\PNP0A03\1
ServerWorks (RCC) CMIC_LE Processor to PCI Bridge(*) No SYSTEM 5.2.3790.0
10/1/2002 ServerWorks (RCC) machine.inf Not Available
PCI\VEN_1166&DEV_0014&SUBSYS_00000000&REV_32\3&13C0B0C5&0&00
ServerWorks (RCC) CMIC_LE Processor to PCI Bridge(*) No SYSTEM 5.2.3790.0
10/1/2002 ServerWorks (RCC) machine.inf Not Available
PCI\VEN_1166&DEV_0014&SUBSYS_00000000&REV_00\3&13C0B0C5&0&01
ServerWorks (RCC) CMIC_LE Processor to PCI Bridge(*) No SYSTEM 5.2.3790.0
10/1/2002 ServerWorks (RCC) machine.inf Not Available
PCI\VEN_1166&DEV_0014&SUBSYS_00000000&REV_00\3&13C0B0C5&0&02

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PCI Device Not Available UNKNOWN Not Available Not Available Not Available
Not Available Not Available
PCI\VEN_1028&DEV_000C&SUBSYS_000C1028&REV_00\3&13C0B0C5&0&20
PCI Device Not Available UNKNOWN Not Available Not Available Not Available
Not Available Not Available
PCI\VEN_1028&DEV_0008&SUBSYS_00081028&REV_00\3&13C0B0C5&0&21
PCI Device Not Available UNKNOWN Not Available Not Available Not Available
Not Available Not Available
PCI\VEN_1028&DEV_000D&SUBSYS_000D1028&REV_00\3&13C0B0C5&0&22
RAGE XL PCI Family (Microsoft Corporation) No DISPLAY 5.10.2600.6014 8/8/2001
ATI Technologies Inc. atiixpad.inf Not Available
PCI\VEN_1002&DEV_4752&SUBSYS_01211028&REV_27\3&13C0B0C5&0&70
Default Monitor No MONITOR 5.1.2001.0 6/6/2001 (Standard monitor types)
monitor.inf Not Available
DISPLAY\DEFAULT_MONITOR\4&2664298A&0&80000000&00&0E
ServerWorks Champion CSB5 - SouthBridge 5 No SYSTEM 5.2.3790.0
10/1/2002 ServerWorks (RCC) machine.inf Not Available
PCI\VEN_1166&DEV_0201&SUBSYS_00000000&REV_93\3&13C0B0C5&0&78
Direct memory access controller No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available ACPI\PNP0200\4&25F73A82&0
Numeric data processor No SYSTEM 5.2.3790.0 10/1/2002 (Standard system
devices) machine.inf Not Available ACPI\PNP0C04\4&25F73A82&0
Programmable interrupt controller No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available ACPI\PNP0000\4&25F73A82&0
System speaker No SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices)
machine.inf Not Available ACPI\PNP0800\4&25F73A82&0
System timer No SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices)
machine.inf Not Available ACPI\PNP0100\4&25F73A82&0
Standard floppy disk controller No FDC 5.2.3790.0 10/1/2002 (Standard floppy
disk controllers) fdc.inf Not Available ACPI\PNP0700\4&25F73A82&0
Floppy disk drive No FLOPPYDISK 5.2.3790.0 10/1/2002 (Standard floppy disk
drives) flpydisk.inf Not Available FDC\GENERIC_FLOPPY_DRIVE\5&1AE2F47D&0&0
Standard 101/102-Key or Microsoft Natural PS/2 Keyboard No KEYBOARD 5.2.3790.0
10/1/2002 (Standard keyboards) keyboard.inf Not Available
ACPI\PNP0303\4&25F73A82&0
PS/2 Compatible Mouse No MOUSE 5.2.3790.0 10/1/2002 Microsoft
msmouse.inf Not Available ACPI\PNP0F13\4&25F73A82&0
Communications Port No PORTS 5.2.3790.0 10/1/2002 (Standard port types)
msports.inf Not Available ACPI\PNP0501\1
Communications Port No PORTS 5.2.3790.0 10/1/2002 (Standard port types)
msports.inf Not Available ACPI\PNP0501\2
System CMOS/real time clock No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available ACPI\PNP0B00\4&25F73A82&0
System board No SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices)
machine.inf Not Available ACPI\PNP0C01\2
CSB5 IDE Controller No HDC 5.2.3790.0 10/1/2002 ServerWorks
mshdc.inf Not Available
PCI\VEN_1166&DEV_0212&SUBSYS_02121166&REV_93\3&13C0B0C5&0&79
Primary IDE Channel No HDC 5.2.3790.0 10/1/2002 (Standard IDE
ATA/ATAPI controllers) mshdc.inf Not Available PCIIDE\IDECHANNEL\4&10A8249&0&0
CD-ROM Drive No CDROM 5.2.3790.0 10/1/2002 (Standard CD-ROM
drives) cdrom.inf Not Available IDE\CDROMSAMSUNG_CD-ROM_SN-
124_____Q009____\5&3125DC91&0&0.0.0
Secondary IDE Channel No HDC 5.2.3790.0 10/1/2002 (Standard IDE
ATA/ATAPI controllers) mshdc.inf Not Available PCIIDE\IDECHANNEL\4&10A8249&0&1

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ServerWorks (RCC) PCI to USB Open Host Controller No USB 5.2.3790.0
10/1/2002 ServerWorks (RCC) usbport.inf Not Available
PCI\VEN_1166&DEV_0220&SUBSYS_02201166&REV_05\3&13C0B0C5&0&7A
USB Root Hub No USB 5.2.3790.0 10/1/2002 (Standard USB Host Controller)
usbport.inf Not Available USB\ROOT_HUB\4&1A0F8909&0
Serverworks Champion CSB5 - SouthBridge 5 LPC No SYSTEM 5.2.3790.0
10/1/2002 ServerWorks (RCC) machine.inf Not Available
PCI\VEN_1166&DEV_0225&SUBSYS_00000000&REV_00\3&13C0B0C5&0&7B
ISAPNP Read Data Port No SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ISAPNP\READDATAPORT\0
ServerWorks Grand Champion CIOB_X2 - I/O Bridge 133 Mhz No SYSTEM
5.2.3790.0 10/1/2002 ServerWorks (RCC) machine.inf Not Available
PCI\VEN_1166&DEV_0101&SUBSYS_00000000&REV_05\3&13C0B0C5&0&80
ServerWorks Grand Champion CIOB_X2 - I/O Bridge 133 Mhz No SYSTEM
5.2.3790.0 10/1/2002 ServerWorks (RCC) machine.inf Not Available
PCI\VEN_1166&DEV_0101&SUBSYS_00000000&REV_05\3&13C0B0C5&0&82
ServerWorks Grand Champion CIOB_X2 - I/O Bridge 133 Mhz No SYSTEM
5.2.3790.0 10/1/2002 ServerWorks (RCC) machine.inf Not Available
PCI\VEN_1166&DEV_0101&SUBSYS_00000000&REV_03\3&13C0B0C5&0&88
ServerWorks Grand Champion CIOB_X2 - I/O Bridge 133 Mhz No SYSTEM
5.2.3790.0 10/1/2002 ServerWorks (RCC) machine.inf Not Available
PCI\VEN_1166&DEV_0101&SUBSYS_00000000&REV_03\3&13C0B0C5&0&8A
PCI bus No SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices)
machine.inf Not Available ACPI\PNP0A03\5
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
PCI\VEN_8086&DEV_0309&SUBSYS_00000000&REV_01\3&474B838&0&40
Dell PERC 3 RAID (SCSI chip) No SCSIADAPTER 5.2.3790.0 10/1/2002 Dell
pnpscsi.inf Not Available
PCI\VEN_9005&DEV_00C5&SUBSYS_00C51028&REV_01\4&22300438&0&3040
Dell PERC 3 RAID (SCSI chip) No SCSIADAPTER 5.2.3790.0 10/1/2002 Dell
pnpscsi.inf Not Available
PCI\VEN_9005&DEV_00C5&SUBSYS_00C51028&REV_01\4&22300438&0&3140
Dell PERC 3/Di RAID Controller No SCSIADAPTER 5.2.3790.0 10/1/2002 Dell
pnpscsi.inf Not Available
PCI\VEN_1028&DEV_000A&SUBSYS_01211028&REV_01\3&474B838&0&41
Disk drive No DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives)
disk.inf Not Available
SCSI\DISK&VEN_DELL&PROD_CONTAINER&REV_V1.0\4&318925A3&0&400
Dell PERC 2 Management Device No SYSTEM 5.2.3790.0 10/1/2002 Adaptec
scsidev.inf Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_MANAGEMENT&REV_V1.0\4&318925A3&0&500
PCI bus No SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices)
machine.inf Not Available ACPI\PNP0A03\4
Broadcom NetXtreme Gigabit Ethernet No NET 2.91.0.0 10/1/2002 Broadcom
netb57xp.inf Not Available
PCI\VEN_14E4&DEV_16A7&SUBSYS_01211028&REV_02\3&172E68DD&0&30
Broadcom NetXtreme Gigabit Ethernet No NET 2.91.0.0 10/1/2002 Broadcom
netb57xp.inf Not Available
PCI\VEN_14E4&DEV_16A7&SUBSYS_01211028&REV_02\3&172E68DD&0&40
PCI bus No SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices)
machine.inf Not Available ACPI\PNP0A03\3

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DELL PERC 3/DC Plus RAID Controller No SCSIADAPTER 5.2.22.4 12/3/2002 DELL oem1.infNot Available
PCI\VEN_101E&DEV_1960&SUBSYS_04941028&REV_01\3&29E81982&0&30
DELL PV22XS Backplane No SYSTEM 5.2.3790.0 10/1/2002 Dell scsidev.inf Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.10\4&19309C39&0&060
DELL PV22XS Backplane No SYSTEM 5.2.3790.0 10/1/2002 Dell scsidev.inf Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.10\4&19309C39&0&160
RAID Virtual Device No SYSTEM 5.2.3790.0 10/1/2002 American Megatrends, Inc. scsidev.inf Not Available
SCSI\OTHER&VEN___RAID&PROD__DUMMYDEVICE&REV_0000\4&19309C39&0&2F0
Disk drive No DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_PERC&PROD__LD__0_PERCRAID&REV_\4&19309C39&0&300
PCI bus No SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ACPI\PNP0A03\2
DELL PERC 3/DC Plus RAID Controller No SCSIADAPTER 5.2.22.4 12/3/2002 DELL oem1.infNot Available
PCI\VEN_101E&DEV_1960&SUBSYS_04941028&REV_01\3&1070020&0&40
DELL PV22XS Backplane No SYSTEM 5.2.3790.0 10/1/2002 Dell scsidev.inf Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.10\4&116608EE&0&060
DELL PV22XS Backplane No SYSTEM 5.2.3790.0 10/1/2002 Dell scsidev.inf Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.10\4&116608EE&0&160
RAID Virtual Device No SYSTEM 5.2.3790.0 10/1/2002 American Megatrends, Inc. scsidev.inf Not Available
SCSI\OTHER&VEN___RAID&PROD__DUMMYDEVICE&REV_0000\4&116608EE&0&2F0
Disk drive No DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_PERC&PROD__LD__0_PERCRAID&REV_\4&116608EE&0&300
ACPI Fixed Feature Button No SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available
ACPI\FIXEDBUTTON\2&DABA3FF&0
Logical Disk Manager No SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ROOT\DMIO\0000
Volume Manager No SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ROOT\FTDISK\0000
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATURECF72CF72OFFSET7E00LENGTH23254F800
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATURECF72CF72OFFSET232557600LENGTHEC082AE00
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREE18FCF8BOFFSET7E00LENGTH27106BDE00
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREE18FCF8BOFFSET27106C5C00LENGTH27106C5C00

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Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREE18FCF8BOFFSET4E20D8B800LENGTH27FB429A00
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREE18FCF85OFFSET7E00LENGTH27106BDE00
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREE18FCF85OFFSET27106C5C00LENGTH27106C5C00
Generic volume No VOLUME 5.2.3790.0 10/1/2002 Microsoft
volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREE18FCF85OFFSET4E20D8B800LENGTH27FB429A00
AFD Networking Support Environment Not Available LEGACYDRIVER Not Available
Not Available Not Available Not Available Not Available
ROOT\LEGACY_AFD\0000
Beep Not Available LEGACYDRIVER Not Available Not Available Not Available
Not Available Not Available ROOT\LEGACY_BEEP\0000
CRC Disk Filter Driver Not Available LEGACYDRIVER Not Available Not Available
Not Available Not Available Not Available ROOT\LEGACY_CRCDISK\0000
dmboot Not Available LEGACYDRIVER Not Available Not Available Not Available
Not Available Not Available ROOT\LEGACY_DMBOOT\0000
dmload Not Available LEGACYDRIVER Not Available Not Available Not Available
Not Available Not Available ROOT\LEGACY_DMLOAD\0000
Fips Not Available LEGACYDRIVER Not Available Not Available Not Available
Not Available Not Available ROOT\LEGACY_FIPS\0000
Generic Packet Classifier Not Available LEGACYDRIVER Not Available Not Available
Not Available Not Available Not Available ROOT\LEGACY_GPC\0000
IPSEC driver Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_IPSEC\0000
ksecdd Not Available LEGACYDRIVER Not Available Not Available Not Available
Not Available Not Available ROOT\LEGACY_KSECDD\0000
mnmdd Not Available LEGACYDRIVER Not Available Not Available Not Available
Not Available Not Available ROOT\LEGACY_MNMDD\0000
mountmgr Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_MOUNTMGR\0000
NDIS System Driver Not Available LEGACYDRIVER Not Available Not Available
Not Available Not Available Not Available ROOT\LEGACY_NDIS\0000
Remote Access NDIS TAPI Driver Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NDISTAPI\0000
NDIS Usermode I/O Protocol Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NDISUIO\0000
NDProxy Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NDPROXY\0000
NetBios over Tcpip Not Available LEGACYDRIVER Not Available Not Available
Not Available Not Available Not Available ROOT\LEGACY_NETBT\0000
Null Not Available LEGACYDRIVER Not Available Not Available Not Available
Not Available Not Available ROOT\LEGACY_NULL\0000
Partition Manager Not Available LEGACYDRIVER Not Available Not Available
Not Available Not Available Not Available ROOT\LEGACY_PARTMGR\0000

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

[Environment Variables]

Variable Value User Name
ComSpec %SystemRoot%\system32\cmd.exe <SYSTEM>

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Appendix C – Tunable Parameters

Path
C:\MKS\mksnt;C:\WINDOWS\system32;C:\WINDOWS;C:\WINDOWS\System32\Wbem;C:\PROGRA~1\MICROS~1\80\Tools\BINN;C:\Program Files\Microsoft SQL Server\80\Tools\BINN
<SYSTEM>
windir %SystemRoot% <SYSTEM>
OS Windows_NT <SYSTEM>
PROCESSOR_ARCHITECTURE x86 <SYSTEM>
PROCESSOR_LEVEL 15 <SYSTEM>
PROCESSOR_IDENTIFIER x86 Family 15 Model 2 Stepping 5, GenuineIntel <SYSTEM>
PROCESSOR_REVISION 0205 <SYSTEM>
NUMBER_OF_PROCESSORS 2 <SYSTEM>
ClusterLog C:\WINDOWS\Cluster\cluster.log <SYSTEM>
PATHEXT .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH <SYSTEM>
TEMP %SystemRoot%\TEMP <SYSTEM>
TMP %SystemRoot%\TEMP <SYSTEM>
ROOTDIR C:/MKS <SYSTEM>
SHELL C:/MKS/mksnt/sh.exe <SYSTEM>
HOME C:/Documents and Settings/Administrator <SYSTEM>
TMPDIR C:/WINDOWS/TEMP <SYSTEM>
TEMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\SYSTEM
TMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\SYSTEM
TEMP %USERPROFILE%\Local Settings\Temp PE2650\Administrator
TMP %USERPROFILE%\Local Settings\Temp PE2650\Administrator

[Print Jobs]

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

[Network Connections]

Local Name Remote Name Type Status User Name

[Running Tasks]

Name Path Process ID Priority Min Working Set Max Working Set Start Time Version
Size File Date
system idle process Not Available 0 0 Not Available Not Available Not Available Not Available Not Available Not Available
system Not Available 4 8 0 1413120 Not Available Not Available Not Available Not Available Not Available
smss.exe Not Available 344 11 204800 1413120 1/8/2004 4:54 PM Not Available
Not Available Not Available
csrss.exe Not Available 540 13 Not Available Not Available 1/8/2004 4:54 PM
Not Available Not Available Not Available
winlogon.exe c:\windows\system32\winlogon.exe 564 13 204800 1413120 1/8/2004 4:54 PM 5.2.3790.0 (srv03_rtm.030324-2048) 536.50 KB (549,376 bytes) 3/29/2003 12:00 AM
services.exe c:\windows\system32\services.exe 608 9 204800 1413120 1/8/2004 4:54 PM 5.2.3790.0 (srv03_rtm.030324-2048) 102.00 KB (104,448 bytes) 3/29/2003 12:00 AM
lsass.exe c:\windows\system32\lsass.exe 620 9 204800 1413120 1/8/2004 4:54 PM
5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 12:00 AM

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svchost.exe c:\windows\system32\svchost.exe 800 8 204800 1413120 1/8/2004 4:54 PM 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 12:00 AM
svchost.exe c:\windows\system32\svchost.exe 864 8 204800 1413120 1/8/2004 4:54 PM 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 12:00 AM
svchost.exe c:\windows\system32\svchost.exe 1016 8 204800 1413120 1/8/2004 4:54 PM 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 12:00 AM
explorer.exe c:\windows\explorer.exe 1188 8 204800 1413120 1/8/2004 4:55 PM 6.00.3790.0 (srv03_rtm.030324-2048) 1,008.50 KB (1,032,704 bytes) 3/29/2003 12:00 AM
sqlmangr.exe c:\program files\microsoft sql server\80\tools\binn\sqlmangr.exe 1268 8 204800 1413120 1/8/2004 4:55 PM 2000.080.0760.00 72.57 KB (74,308 bytes) 11/7/2003 2:42 PM
winvnc.exe c:\program files\orl\vnc\winvnc.exe 1276 8 204800 1413120 1/8/2004 4:55 PM 3, 3, 3, 7 204.00 KB (208,896 bytes) 5/30/2003 4:28 PM
mmc.exe c:\windows\system32\mmc.exe 1424 8 204800 1413120 1/8/2004 4:55 PM 5.2.3790.0 (srv03_rtm.030324-2048) 762.50 KB (780,800 bytes) 3/29/2003 12:00 AM
cmd.exe c:\windows\system32\cmd.exe 1828 8 204800 1413120 1/8/2004 4:55 PM 5.2.3790.0 (srv03_rtm.030324-2048) 374.00 KB (382,976 bytes) 3/29/2003 12:00 AM
sqlservr.exe c:\program files\microsoft sql server\mssql\binn\sqlservr.exe 1872 13 204800 1413120 1/8/2004 4:55 PM 2000.080.0857.00 7.18 MB (7,532,584 bytes) 11/7/2003 2:42 PM
wmiprvse.exe Not Available 276 8 Not Available Not Available 1/8/2004 4:56 PM Not Available Not Available Not Available
cmd.exe c:\windows\system32\cmd.exe 1584 8 204800 1413120 1/9/2004 2:41 PM 5.2.3790.0 (srv03_rtm.030324-2048) 374.00 KB (382,976 bytes) 3/29/2003 12:00 AM
isql.exe c:\progra~1\micros~1\80\tools\binn\isql.exe 1116 8 204800 1413120 1/9/2004 2:41 PM 2000.080.0194.00 96.00 KB (98,304 bytes) 11/7/2003 2:42 PM
tail.exe c:\mks\mksnt\tail.exe 200 8 204800 1413120 1/9/2004 2:42 PM 5.2 build 63 43.50 KB (44,544 bytes) 6/2/2003 11:09 AM
helpctr.exe c:\windows\pchealth\helpctr\binaries\helpctr.exe 180 8 204800 1413120 1/9/2004 2:52 PM 5.2.3790.0 (srv03_rtm.030324-2048) 764.00 KB (782,336 bytes) 5/30/2003 3:10 PM
helpsvc.exe c:\windows\pchealth\helpctr\binaries\helpsvc.exe 920 8 204800 1413120 1/9/2004 2:52 PM 5.2.3790.0 (srv03_rtm.030324-2048) 720.00 KB (737,280 bytes) 5/30/2003 3:10 PM
helphost.exe c:\windows\pchealth\helpctr\binaries\helphost.exe 828 8 204800 1413120 1/9/2004 2:52 PM 5.2.3790.0 (srv03_rtm.030324-2048) 106.00 KB (108,544 bytes) 5/30/2003 3:10 PM
helpctr.exe c:\windows\pchealth\helpctr\binaries\helpctr.exe 1772 8 204800 1413120 1/9/2004 2:52 PM 5.2.3790.0 (srv03_rtm.030324-2048) 764.00 KB (782,336 bytes) 5/30/2003 3:10 PM
wmiprvse.exe Not Available 720 8 Not Available Not Available 1/9/2004 2:52 PM Not Available Not Available Not Available

[Loaded Modules]

Name Version Size File Date Manufacturer Path
winlogon 5.2.3790.0 (srv03_rtm.030324-2048) 536.50 KB (549,376 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\winlogon.exe
ntdll 5.2.3790.0 (srv03_rtm.030324-2048) 722.50 KB (739,840 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\ntdll.dll

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kernel32 5.2.3790.0 (srv03_rtm.030324-2048) 965.00 KB (988,160 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\kernel32.dll
msvcrt 7.0.3790.0 (srv03_rtm.030324-2048) 319.50 KB (327,168 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msvcrt.dll
advapi32 5.2.3790.0 (srv03_rtm.030324-2048) 559.50 KB (572,928 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\advapi32.dll
rpcrt4 5.2.3790.0 (srv03_rtm.030324-2048) 643.50 KB (658,944 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rpcrt4.dll
user32 5.2.3790.0 (srv03_rtm.030324-2048) 562.00 KB (575,488 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\user32.dll
gdi32 5.2.3790.0 (srv03_rtm.030324-2048) 263.00 KB (269,312 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\gdi32.dll
userenv 5.2.3790.0 (srv03_rtm.030324-2048) 732.50 KB (750,080 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\userenv.dll
nddeapi 5.2.3790.0 (srv03_rtm.030324-2048) 16.00 KB (16,384 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\nddeapi.dll
crypt32 5.131.3790.0 (srv03_rtm.030324-2048) 598.00 KB (612,352 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\crypt32.dll
msasn1 5.2.3790.0 (srv03_rtm.030324-2048) 58.00 KB (59,392 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msasn1.dll
secur32 5.2.3790.0 (srv03_rtm.030324-2048) 63.00 KB (64,512 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\secur32.dll
winsta 5.2.3790.0 (srv03_rtm.030324-2048) 51.00 KB (52,224 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\winsta.dll
netapi32 5.2.3790.0 (srv03_rtm.030324-2048) 317.00 KB (324,608 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\netapi32.dll
profmap 5.2.3790.0 (srv03_rtm.030324-2048) 22.00 KB (22,528 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\profmap.dll
regapi 5.2.3790.0 (srv03_rtm.030324-2048) 48.50 KB (49,664 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\regapi.dll
ws2_32 5.2.3790.0 (srv03_rtm.030324-2048) 87.50 KB (89,600 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\ws2_32.dll
ws2help 5.2.3790.0 (srv03_rtm.030324-2048) 19.50 KB (19,968 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\ws2help.dll
psapi 5.2.3790.0 (srv03_rtm.030324-2048) 21.50 KB (22,016 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\psapi.dll
version 5.2.3790.0 (srv03_rtm.030324-2048) 17.00 KB (17,408 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\version.dll
setupapi 5.2.3790.0 (srv03_rtm.030324-2048) 1,014.50 KB (1,038,848 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\setupapi.dll
msgina 5.2.3790.0 (srv03_rtm.030324-2048) 1.14 MB (1,191,936 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msgina.dll
shsvcs 6.00.3790.0 (srv03_rtm.030324-2048) 121.50 KB (124,416 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\shsvcs.dll
shlwapi 6.00.3790.0 (srv03_rtm.030324-2048) 281.00 KB (287,744 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\shlwapi.dll
sfc 5.2.3790.0 (srv03_rtm.030324-2048) 4.50 KB (4,608 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\sfc.dll
sfc_os 5.2.3790.0 (srv03_rtm.030324-2048) 133.00 KB (136,192 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\sfc_os.dll
wintrust 5.131.3790.0 (srv03_rtm.030324-2048) 161.50 KB (165,376 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wintrust.dll
ole32 5.2.3790.0 (srv03_rtm.030324-2048) 1.13 MB (1,187,328 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\ole32.dll

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imagehlp 5.2.3790.0 (srv03_rtm.030324-2048) 142.50 KB (145,920 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\imagehlp.dll
comctl32 6.0 (srv03_rtm.030324-2048) 907.00 KB (928,768 bytes) 5/30/2003 9:53 AM Microsoft Corporation c:\windows\winsxs\x86_microsoft.windows.common-controls_6595b64144ccf1df_6.0.100.0_x-ww_8417450b\comctl32.dll
winscard 5.2.3790.0 (srv03_rtm.030324-2048) 98.50 KB (100,864 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\winscard.dll
wtsapi32 5.2.3790.0 (srv03_rtm.030324-2048) 17.50 KB (17,920 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wtsapi32.dll
sxs 5.2.3790.0 (srv03_rtm.030324-2048) 733.00 KB (750,592 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\sxs.dll
winmm 5.2.3790.0 (srv03_rtm.030324-2048) 166.00 KB (169,984 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\winmm.dll
wldap32 5.2.3790.0 (srv03_rtm.030324-2048) 158.00 KB (161,792 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wldap32.dll
rsaenh 5.2.3790.0 (srv03_rtm.030324-2048) 176.83 KB (181,072 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rsaenh.dll
cscdll 5.2.3790.0 (srv03_rtm.030324-2048) 99.00 KB (101,376 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\cscdll.dll
wlnotify 5.2.3790.0 (srv03_rtm.030324-2048) 87.50 KB (89,600 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wlnotify.dll
winspool 5.2.3790.0 (srv03_rtm.030324-2048) 140.00 KB (143,360 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\winspool.drv
mpr 5.2.3790.0 (srv03_rtm.030324-2048) 56.00 KB (57,344 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mpr.dll
shell32 6.00.3790.0 (srv03_rtm.030324-2048) 7.79 MB (8,166,400 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\shell32.dll
comctl32 5.82 (srv03_rtm.030324-2048) 561.00 KB (574,464 bytes) 5/30/2003 9:53 AM Microsoft Corporation c:\windows\winsxs\x86_microsoft.windows.common-controls_6595b64144ccf1df_5.82.0.0_x-ww_8a69ba05\comctl32.dll
uxtheme 6.00.3790.0 (srv03_rtm.030324-2048) 196.00 KB (200,704 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\uxtheme.dll
samlib 5.2.3790.0 (srv03_rtm.030324-2048) 49.00 KB (50,176 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\samlib.dll
cscui 5.2.3790.0 (srv03_rtm.030324-2048) 305.00 KB (312,320 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\cscui.dll
ntmarta 5.2.3790.0 (srv03_rtm.030324-2048) 114.00 KB (116,736 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\ntmarta.dll
oleaut32 5.2.3790.0 486.00 KB (497,664 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\oleaut32.dll
clbcatq 2001.12.4720.0 (srv03_rtm.030324-2048) 481.00 KB (492,544 bytes) 5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\clbcatq.dll
comres 2001.12.4720.0 (srv03_rtm.030324-2048) 778.00 KB (796,672 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\comres.dll
wbemprox 5.2.3790.0 (srv03_rtm.030324-2048) 17.50 KB (17,920 bytes) 5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\wbem\wbemprox.dll
wbemcomn 5.2.3790.0 (srv03_rtm.030324-2048) 211.50 KB (216,576 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wbem\wbemcomn.dll
wbemsvc 5.2.3790.0 (srv03_rtm.030324-2048) 42.50 KB (43,520 bytes) 5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\wbem\wbemsvc.dll
fastprox 5.2.3790.0 (srv03_rtm.030324-2048) 443.00 KB (453,632 bytes) 5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\wbem\fastprox.dll
msvcp60 6.05.2144.0 388.00 KB (397,312 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msvcp60.dll

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ntdsapi 5.2.3790.0 (srv03_rtm.030324-2048) 76.00 KB (77,824 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\ntdsapi.dll
dnsapi 5.2.3790.0 (srv03_rtm.030324-2048) 147.50 KB (151,040 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\dnsapi.dll
services 5.2.3790.0 (srv03_rtm.030324-2048) 102.00 KB (104,448 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\services.exe
scesrv 5.2.3790.0 (srv03_rtm.030324-2048) 316.50 KB (324,096 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\scesrv.dll
authz 5.2.3790.0 (srv03_rtm.030324-2048) 67.00 KB (68,608 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\authz.dll
umpnpmgr 5.2.3790.0 (srv03_rtm.030324-2048) 121.50 KB (124,416 bytes)
3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\umpnpmgr.dll
ncobjapi 5.2.3790.0 (srv03_rtm.030324-2048) 34.50 KB (35,328 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\ncobjapi.dll
eventlog 5.2.3790.0 (srv03_rtm.030324-2048) 60.50 KB (61,952 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\eventlog.dll
lsass 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\lsass.exe
lsasrv 5.2.3790.0 (srv03_rtm.030324-2048) 780.50 KB (799,232 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\lsasrv.dll
samsrv 5.2.3790.0 (srv03_rtm.030324-2048) 452.00 KB (462,848 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\samsrv.dll
cryptdll 5.2.3790.0 (srv03_rtm.030324-2048) 34.00 KB (34,816 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\cryptdll.dll
msprivs 5.2.3790.0 (srv03_rtm.030324-2048) 46.50 KB (47,616 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\msprivs.dll
kerberos 5.2.3790.0 (srv03_rtm.030324-2048) 332.50 KB (340,480 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\kerberos.dll
msv1_0 5.2.3790.0 (srv03_rtm.030324-2048) 127.00 KB (130,048 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\msv1_0.dll
netlogon 5.2.3790.0 (srv03_rtm.030324-2048) 409.00 KB (418,816 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\netlogon.dll
w32time 5.2.3790.0 (srv03_rtm.030324-2048) 216.00 KB (221,184 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\w32time.dll
iphlpapi 5.2.3790.0 (srv03_rtm.030324-2048) 82.50 KB (84,480 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\iphlpapi.dll
schannel 5.2.3790.0 (srv03_rtm.030324-2048) 149.50 KB (153,088 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\schannel.dll
wdigest 5.2.3790.0 (srv03_rtm.030324-2048) 61.00 KB (62,464 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\wdigest.dll
rassfm 5.2.3790.0 (srv03_rtm.030324-2048) 20.50 KB (20,992 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\rassfm.dll
kdcsvc 5.2.3790.0 (srv03_rtm.030324-2048) 221.00 KB (226,304 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\kdcsvc.dll
ntdsa 5.2.3790.0 (srv03_rtm.030324-2048) 1.45 MB (1,520,640 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\ntdsa.dll
ntdsatq 5.2.3790.0 (srv03_rtm.030324-2048) 32.00 KB (32,768 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\ntdsatq.dll
mswsock 5.2.3790.0 (srv03_rtm.030324-2048) 254.00 KB (260,096 bytes)
3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mswsock.dll
esent 5.2.3790.0 (srv03_rtm.030324-2048) 1.01 MB (1,056,256 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\esent.dll
scecli 5.2.3790.0 (srv03_rtm.030324-2048) 179.50 KB (183,808 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\scecli.dll

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Appendix C – Tunable Parameters

wshtcpip 5.2.3790.0 (srv03_rtm.030324-2048) 18.00 KB (18,432 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wshtcpip.dll
dssenh 5.2.3790.0 (srv03_rtm.030324-2048) 131.33 KB (134,480 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\dssenh.dll
svchost 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\svchost.exe
rpcss 5.2.3790.0 (srv03_rtm.030324-2048) 276.50 KB (283,136 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rpcss.dll
termsrv 5.2.3790.0 (srv03_rtm.030324-2048) 216.50 KB (221,696 bytes) 5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\termsrv.dll
icaapi 5.2.3790.0 (srv03_rtm.030324-2048) 10.50 KB (10,752 bytes) 5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\icaapi.dll
mstlsapi 5.2.3790.0 (srv03_rtm.030324-2048) 104.50 KB (107,008 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mstlsapi.dll
activeds 5.2.3790.0 (srv03_rtm.030324-2048) 189.00 KB (193,536 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\activeds.dll
adsldpc 5.2.3790.0 (srv03_rtm.030324-2048) 142.50 KB (145,920 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\adsldpc.dll
credui 5.2.3790.0 (srv03_rtm.030324-2048) 159.00 KB (162,816 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\credui.dll
atl 3.05.2283 83.00 KB (84,992 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\atl.dll
rdpwsx 5.2.3790.0 (srv03_rtm.030324-2048) 80.13 KB (82,056 bytes) 5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\rdpwsx.dll
wkssvc 5.2.3790.0 (srv03_rtm.030324-2048) 125.00 KB (128,000 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wkssvc.dll
wiarpc 5.2.3790.0 (srv03_rtm.030324-2048) 30.00 KB (30,720 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wiarpc.dll
srvsvc 5.2.3790.0 (srv03_rtm.030324-2048) 89.00 KB (91,136 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\srvsvc.dll
wmisvc 5.2.3790.0 (srv03_rtm.030324-2048) 131.00 KB (134,144 bytes) 5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\wbem\wmisvc.dll
vssapi 5.2.3790.0 (srv03_rtm.030324-2048) 528.00 KB (540,672 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\vssapi.dll
es 2001.12.4720.0 (srv03_rtm.030324-2048) 221.50 KB (226,816 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\es.dll
netman 5.2.3790.0 (srv03_rtm.030324-2048) 209.00 KB (214,016 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\netman.dll
mprapi 5.2.3790.0 (srv03_rtm.030324-2048) 81.00 KB (82,944 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mprapi.dll
rtutils 5.2.3790.0 (srv03_rtm.030324-2048) 32.00 KB (32,768 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rtutils.dll
rasapi32 5.2.3790.0 (srv03_rtm.030324-2048) 227.50 KB (232,960 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rasapi32.dll
rasman 5.2.3790.0 (srv03_rtm.030324-2048) 56.50 KB (57,856 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rasman.dll
tapi32 5.2.3790.0 (srv03_rtm.030324-2048) 175.00 KB (179,200 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\tapi32.dll
wzcsvc 5.2.3790.0 (srv03_rtm.030324-2048) 272.50 KB (279,040 bytes) 3/25/2003 6:15 AM Microsoft Corporation c:\windows\system32\wzcsvc.dll
wmi 5.2.3790.0 (srv03_rtm.030324-2048) 6.50 KB (6,656 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wmi.dll
dhcpcsvc 5.2.3790.0 (srv03_rtm.030324-2048) 101.50 KB (103,936 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\dhcpcsvc.dll

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wzcsapi 5.2.3790.0 (srv03_rtm.030324-2048) 24.50 KB (25,088 bytes) 3/25/2003 6:15 AM
Microsoft Corporation c:\windows\system32\wzcsapi.dll
netshell 5.2.3790.0 (srv03_rtm.030324-2048) 1.67 MB (1,747,456 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\netshell.dll
clusapi 5.2.3790.0 (srv03_rtm.030324-2048) 56.00 KB (57,344 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\clusapi.dll
comsvcs 2001.12.4720.0 (srv03_rtm.030324-2048) 1.14 MB (1,199,616 bytes) 5/30/2003 3:07
PM Microsoft Corporation c:\windows\system32\comsvcs.dll
sens 5.2.3790.0 (srv03_rtm.030324-2048) 35.50 KB (36,352 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\sens.dll
hnetcfg 5.2.3790.0 (srv03_rtm.030324-2048) 243.50 KB (249,344 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\hnetcfg.dll
wininet 6.00.3790.0 (srv03_rtm.030324-2048) 609.00 KB (623,616 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\wininet.dll
wbemcore 5.2.3790.0 (srv03_rtm.030324-2048) 457.00 KB (467,968 bytes)
5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\wbem\wbemcore.dll
esscli 5.2.3790.0 (srv03_rtm.030324-2048) 235.50 KB (241,152 bytes) 5/30/2003 3:07
PM Microsoft Corporation c:\windows\system32\wbem\esscli.dll
wmiutils 5.2.3790.0 (srv03_rtm.030324-2048) 90.50 KB (92,672 bytes) 5/30/2003 3:07 PM
Microsoft Corporation c:\windows\system32\wbem\wmiutils.dll
repdrvfs 5.2.3790.0 (srv03_rtm.030324-2048) 165.00 KB (168,960 bytes) 5/30/2003 3:07
PM Microsoft Corporation c:\windows\system32\wbem\repdrvfs.dll
rasdlg 5.2.3790.0 (srv03_rtm.030324-2048) 642.00 KB (657,408 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\rasdlg.dll
wmiprvsd 5.2.3790.0 (srv03_rtm.030324-2048) 405.50 KB (415,232 bytes)
5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\wbem\wmiprvsd.dll
wbemess 5.2.3790.0 (srv03_rtm.030324-2048) 256.50 KB (262,656 bytes)
5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\wbem\wbemess.dll
rasadhlp 5.2.3790.0 (srv03_rtm.030324-2048) 6.50 KB (6,656 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\rasadhlp.dll
ncprov 5.2.3790.0 (srv03_rtm.030324-2048) 43.00 KB (44,032 bytes) 5/30/2003 3:07 PM
Microsoft Corporation c:\windows\system32\wbem\ncprov.dll
dmserver 5.2.3790.0 (srv03_rtm.030324-2048) 24.00 KB (24,576 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\dmserver.dll
ntlsapi 5.2.3790.0 (srv03_rtm.030324-2048) 8.00 KB (8,192 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\ntlsapi.dll
pchsvc 5.2.3790.0 (srv03_rtm.030324-2048) 31.50 KB (32,256 bytes) 5/30/2003 3:10 PM
Microsoft Corporation c:\windows\pchealth\helpctr\binaries\pchsvc.dll
wbemcons 5.2.3790.0 (srv03_rtm.030324-2048) 69.00 KB (70,656 bytes) 5/30/2003 3:07
PM Microsoft Corporation c:\windows\system32\wbem\wbemcons.dll
explorer 6.00.3790.0 (srv03_rtm.030324-2048) 1,008.50 KB (1,032,704 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\explorer.exe
browseui 6.00.3790.0 (srv03_rtm.030324-2048) 1.01 MB (1,057,280 bytes)
3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\browseui.dll
shdocvw 6.00.3790.0 (srv03_rtm.030324-2048) 1.33 MB (1,393,664 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\shdocvw.dll
apphelp 5.2.3790.0 (srv03_rtm.030324-2048) 122.00 KB (124,928 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\apphelp.dll
themeui 6.00.3790.0 (srv03_rtm.030324-2048) 360.50 KB (369,152 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\themeui.dll
msimg32 5.2.3790.0 (srv03_rtm.030324-2048) 4.50 KB (4,608 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\msimg32.dll
linkinfo 5.2.3790.0 (srv03_rtm.030324-2048) 16.50 KB (16,896 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\linkinfo.dll

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ntshrui 6.00.3790.0 (srv03_rtm.030324-2048) 136.00 KB (139,264 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\ntshrui.dll
urlmon 6.00.3790.0 (srv03_rtm.030324-2048) 501.50 KB (513,536 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\urlmon.dll
webcheck 6.00.3790.0 (srv03_rtm.030324-2048) 261.50 KB (267,776 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\webcheck.dll
wsock32 5.2.3790.0 (srv03_rtm.030324-2048) 22.00 KB (22,528 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wsock32.dll
stobject 5.2.3790.0 (srv03_rtm.030324-2048) 117.50 KB (120,320 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\stobject.dll
batmeter 6.00.3790.0 (srv03_rtm.030324-2048) 28.50 KB (29,184 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\batmeter.dll
powrprof 6.00.3790.0 (srv03_rtm.030324-2048) 14.50 KB (14,848 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\powrprof.dll
printui 5.2.3790.0 (srv03_rtm.030324-2048) 536.50 KB (549,376 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\printui.dll
cfgmgr32 5.2.3790.0 (srv03_rtm.030324-2048) 17.50 KB (17,920 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\cfgmgr32.dll
drprov 5.2.3790.0 (srv03_rtm.030324-2048) 12.50 KB (12,800 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\drprov.dll
ntlanman 5.2.3790.0 (srv03_rtm.030324-2048) 41.00 KB (41,984 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\ntlanman.dll
netui0 5.2.3790.0 (srv03_rtm.030324-2048) 75.50 KB (77,312 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\netui0.dll
netui1 5.2.3790.0 (srv03_rtm.030324-2048) 184.00 KB (188,416 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\netui1.dll
davclnt 5.2.3790.0 (srv03_rtm.030324-2048) 23.50 KB (24,064 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\davclnt.dll
browselc 6.00.3790.0 (srv03_rtm.030324-2048) 62.00 KB (63,488 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\browselc.dll
shdoclc 6.00.3790.0 (srv03_rtm.030324-2048) 588.50 KB (602,624 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\shdoclc.dll
wzshlstb 3.0 (32-bit) 24.07 KB (24,644 bytes) 4/19/2000 8:00 AM WinZip Computing, Inc. c:\progra~1\winzip\wzshlstb.dll
zipfldr 6.00.3790.0 (srv03_rtm.030324-2048) 316.00 KB (323,584 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\zipfldr.dll
sendmail 6.00.3790.0 (srv03_rtm.030324-2048) 52.00 KB (53,248 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\sendmail.dll
mydocs 6.00.3790.0 (srv03_rtm.030324-2048) 88.00 KB (90,112 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mydocs.dll
actxprxy 6.00.3790.0 (srv03_rtm.030324-2048) 95.00 KB (97,280 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\actxprxy.dll
sqlmangr 2000.080.0760.00 72.57 KB (74,308 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\sqlmangr.exe
sqlunirl 2000.080.0728.00 176.56 KB (180,800 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\sqlunirl.dll
comdlg32 6.00.3790.0 (srv03_rtm.030324-2048) 261.00 KB (267,264 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\comdlg32.dll
w95scm 2000.080.0760.00 48.56 KB (49,728 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\w95scm.dll
odbc32 3.525.1022.0 (srv03_rtm.030324-2048) 232.00 KB (237,568 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\odbc32.dll
sqlsvc 2000.080.0760.00 92.56 KB (94,784 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\sqlsvc.dll

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odbcbcp 2000.085.1022.00 (srv03_rtm.030324-2048) 24.00 KB (24,576 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\odbcbcp.dll
sqlresld 2000.080.0382.00 28.56 KB (29,248 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\sqlresld.dll
odbcint 3.525.1022.0 (srv03_rtm.030324-2048) 92.00 KB (94,208 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\odbcint.dll
resutils 5.2.3790.0 (srv03_rtm.030324-2048) 59.00 KB (60,416 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\resutils.dll
mfc42u 6.05.3014.0 960.00 KB (983,040 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mfc42u.dll
sqlsvc 2000.080.0194.00 24.00 KB (24,576 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\resources\1033\sqlsvc.rll
sqlmangr 2000.080.0194.00 96.00 KB (98,304 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\80\tools\binn\resources\1033\sqlmangr.rll
winvnc 3, 3, 3, 7 204.00 KB (208,896 bytes) 5/30/2003 4:28 PM AT&T Research Labs Cambridge c:\program files\orl\vnc\winvnc.exe
vnchooks 3, 3, 3, 6 32.00 KB (32,768 bytes) 5/30/2003 4:28 PM AT&T Research Labs Cambridge c:\program files\orl\vnc\vnchooks.dll
omnithread_rt Not Available 44.00 KB (45,056 bytes) 5/30/2003 4:28 PM Not Available c:\windows\system32\omnithread_rt.dll
winrnr 5.2.3790.0 (srv03_rtm.030324-2048) 15.00 KB (15,360 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\winrnr.dll
mmc 5.2.3790.0 (srv03_rtm.030324-2048) 762.50 KB (780,800 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mmc.exe
oleacc 4.2.5406.0 (srv03_rtm.030324-2048) 171.00 KB (175,104 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\oleacc.dll
mmcbase 5.2.3790.0 (srv03_rtm.030324-2048) 70.50 KB (72,192 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mmcbase.dll
mmcndmgr 5.2.3790.0 (srv03_rtm.030324-2048) 1.13 MB (1,182,720 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mmcndmgr.dll
msxml3 8.40.9419.0 1.28 MB (1,337,344 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msxml3.dll
sysmon 5.2.3790.0 (srv03_rtm.030324-2048) 241.50 KB (247,296 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\sysmon.ocx
pdh 5.2.3790.0 (srv03_rtm.030324-2048) 274.50 KB (281,088 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\pdh.dll
perfos 5.2.3790.0 (srv03_rtm.030324-2048) 24.50 KB (25,088 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\perfos.dll
perfdisk 5.2.3790.0 (srv03_rtm.030324-2048) 25.00 KB (25,600 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\perfdisk.dll
mlang 6.00.3790.0 (srv03_rtm.030324-2048) 570.00 KB (583,680 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mlang.dll
mscoree 1.1.4322.573 152.00 KB (155,648 bytes) 5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\mscoree.dll
PerfCounter 1.1.4322.573 88.00 KB (90,112 bytes) 5/30/2003 3:08 PM Microsoft Corporation c:\windows\microsoft.net\framework\v1.1.4322\perfcounter.dll
msvcr71 7.10.3052.4 340.00 KB (348,160 bytes) 5/30/2003 3:08 PM Microsoft Corporation c:\windows\microsoft.net\framework\v1.1.4322\msvcr71.dll
cmd 5.2.3790.0 (srv03_rtm.030324-2048) 374.00 KB (382,976 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\cmd.exe
sqlservr 2000.080.0857.00 7.18 MB (7,532,584 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\sqlservr.exe
opends60 2000.080.0194.00 24.06 KB (24,639 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\opends60.dll

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ums 2000.080.0760.00 52.55 KB (53,808 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\ums.dll
sqlsort 2000.080.0760.00 576.56 KB (590,396 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\sqlsort.dll
msvcirt 7.0.3790.0 (srv03_rtm.030324-2048) 50.00 KB (51,200 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msvcirt.dll
sqlevn70 2000.080.0760.00 28.00 KB (28,672 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\resources\1033\sqlevn70.rll
xolehlp 2001.12.4720.0 (srv03_rtm.030324-2048) 8.50 KB (8,704 bytes) 5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\xolehlp.dll
msdtcprx 2001.12.4720.0 (srv03_rtm.030324-2048) 427.50 KB (437,760 bytes) 5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\msdtcprx.dll
mtxclu 2001.12.4720.0 (srv03_rtm.030324-2048) 74.50 KB (76,288 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mtxclu.dll
ssnetlib 2000.080.0851.00 80.07 KB (81,989 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\ssnetlib.dll
security 5.2.3790.0 (srv03_rtm.030324-2048) 5.50 KB (5,632 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\security.dll
ssmslpcn 2000.080.0760.00 28.56 KB (29,244 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\ssmslpcn.dll
ssnmpn70 2000.080.0534.00 24.56 KB (25,148 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\ssnmpn70.dll
sqloledb 2000.085.1022.00 (srv03_rtm.030324-2048) 536.00 KB (548,864 bytes) 5/30/2003 3:10 PM Microsoft Corporation c:\program files\common files\system\ole db\sqloledb.dll
msdart 2.80.1022.0 (srv03_rtm.030324-2048) 164.00 KB (167,936 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msdart.dll
msdatl3 2.80.1022.0 (srv03_rtm.030324-2048) 96.00 KB (98,304 bytes) 5/30/2003 3:10 PM Microsoft Corporation c:\program files\common files\system\ole db\msdatl3.dll
oledb32 2.80.1022.0 (srv03_rtm.030324-2048) 500.00 KB (512,000 bytes) 5/30/2003 3:10 PM Microsoft Corporation c:\program files\common files\system\ole db\oledb32.dll
oledb32r 2.80.1022.0 (srv03_rtm.030324-2048) 68.00 KB (69,632 bytes) 5/30/2003 3:10 PM Microsoft Corporation c:\program files\common files\system\ole db\oledb32r.dll
xpstar 2000.080.0760.00 280.56 KB (287,296 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\xpstar.dll
sqlresld 2000.080.0382.00 28.56 KB (29,248 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\sqlresld.dll
sqlsvc 2000.080.0760.00 92.56 KB (94,784 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\sqlsvc.dll
w95scm 2000.080.0760.00 48.56 KB (49,728 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\w95scm.dll
shfolder 6.00.3790.0 (srv03_rtm.030324-2048) 23.00 KB (23,552 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\shfolder.dll
sqlsvc 2000.080.0194.00 24.00 KB (24,576 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\resources\1033\sqlsvc.rll
xpstar 2000.080.0760.00 36.00 KB (36,864 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\program files\microsoft sql server\mssql\binn\resources\1033\xpstar.rll
isql 2000.080.0194.00 96.00 KB (98,304 bytes) 11/7/2003 2:42 PM Microsoft Corporation c:\progra~1\micros~1\80\tools\binn\isql.exe
ntwdblib 2000.080.0194.00 268.06 KB (274,489 bytes) 6/1/2003 1:13 PM Microsoft Corporation c:\windows\system32\ntwdblib.dll
dbnetlib 2000.085.1022 (srv03_rtm.030324-2048) 76.00 KB (77,824 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\dbnetlib.dll
tail 5.2 build 63 43.50 KB (44,544 bytes) 6/2/2003 11:09 AM Mortice Kern Systems Inc. c:\mks\mksnt\tail.exe

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helpctr 5.2.3790.0 (srv03_rtm.030324-2048) 764.00 KB (782,336 bytes) 5/30/2003 3:10 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\helpctr.exe
hcappres 5.2.3790.0 (srv03_rtm.030324-2048) 6.50 KB (6,656 bytes) 5/30/2003 3:10 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\hcappres.dll
itss 5.2.3790.0 (srv03_rtm.030324-2048) 119.50 KB (122,368 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\itss.dll
pchshell 5.2.3790.0 (srv03_rtm.030324-2048) 100.50 KB (102,912 bytes) 5/30/2003 3:10 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\pchshell.dll
mshtml 6.00.3790.0 (srv03_rtm.030324-2048) 2.78 MB (2,916,352 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mshtml.dll
msimtf 5.2.3790.0 (srv03_rtm.030324-2048) 149.00 KB (152,576 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msimtf.dll
msctf 5.2.3790.0 (srv03_rtm.030324-2048) 287.00 KB (293,888 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msctf.dll
jscript 5.6.0.8515 436.00 KB (446,464 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\jscript.dll
mshtmled 6.00.3790.0 (srv03_rtm.030324-2048) 443.50 KB (454,144 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mshtmled.dll
msls31 3.10.349.0 147.00 KB (150,528 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msls31.dll
imm32 5.2.3790.0 (srv03_rtm.030324-2048) 105.50 KB (108,032 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\imm32.dll
imgutil 5.2.3790.0 (srv03_rtm.030324-2048) 35.00 KB (35,840 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\imgutil.dll
wbemdisp 5.2.3790.0 (srv03_rtm.030324-2048) 165.50 KB (169,472 bytes) 5/30/2003 3:07 PM Microsoft Corporation c:\windows\system32\wbem\wbemdisp.dll
wshom 5.6.0.8515 92.00 KB (94,208 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wshom.ocx
scrrun 5.6.0.8515 148.00 KB (151,552 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\scrrun.dll
mfc42 6.05.3014.0 960.00 KB (983,040 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mfc42.dll
helpsvc 5.2.3790.0 (srv03_rtm.030324-2048) 720.00 KB (737,280 bytes) 5/30/2003 3:10 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\helpsvc.exe
helphost 5.2.3790.0 (srv03_rtm.030324-2048) 106.00 KB (108,544 bytes) 5/30/2003 3:10 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\helphost.exe
sensapi 5.2.3790.0 (srv03_rtm.030324-2048) 6.00 KB (6,144 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\sensapi.dll
vbscript 5.6.0.8515 404.00 KB (413,696 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\vbscript.dll
msinfo 5.2.3790.0 (srv03_rtm.030324-2048) 358.50 KB (367,104 bytes) 5/30/2003 3:10 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\msinfo.dll
riched32 5.2.3790.0 (srv03_rtm.030324-2048) 3.50 KB (3,584 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\riched32.dll
riched20 5.31.23.1218 406.00 KB (415,744 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\riched20.dll

[Services]

Display Name Name State Start Mode Service Type Path Error Control Start Name Tag ID
Alerter Alerter Stopped Disabled Share Process c:\windows\system32\svchost.exe -k localservice Normal NT AUTHORITY\LocalService 0
Application Layer Gateway Service ALG Stopped Manual Own Process c:\windows\system32\alg.exe Normal NT AUTHORITY\LocalService 0

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Appendix C – Tunable Parameters

Application Management AppMgmt Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Windows Audio AudioSrv Stopped Manual Share Process c:\windows\system32\svchost.exe -
k netsvcs Normal LocalSystem 0
Background Intelligent Transfer Service BITS Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Computer Browser Browser Stopped Disabled Share Process c:\windows\system32\svchost.exe -
k netsvcs Normal LocalSystem 0
Indexing Service CiSvc Stopped Disabled Share Process c:\windows\system32\cisvc.exe Normal
LocalSystem 0
ClipBook ClipSrv Stopped Disabled Own Process c:\windows\system32\clipsrv.exe Normal
LocalSystem 0
COM+ System Application COMSysApp Stopped Manual Own Process
c:\windows\system32\dllhost.exe /processid:{02d4b3f1-fd88-11d1-960d-00805fc79235} Normal
LocalSystem 0
Cryptographic Services CryptSvc Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Distributed File System Dfs Stopped Manual Own Process c:\windows\system32\dfssvc.exe
Normal LocalSystem 0
DHCP Client Dhcp Stopped Manual Share Process c:\windows\system32\svchost.exe -k
networkservice Normal NT AUTHORITY\NetworkService 0
Logical Disk Manager Administrative Service dmadmin Stopped Manual Share Process
c:\windows\system32\dmadmin.exe /com Normal LocalSystem 0
Logical Disk Manager dmserver Running Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
DNS Client Dnscache Stopped Manual Share Process c:\windows\system32\svchost.exe -
k networkservice Normal NT AUTHORITY\NetworkService 0
Error Reporting Service ERSvc Stopped Manual Share Process c:\windows\system32\svchost.exe -
k winerr Ignore LocalSystem 0
Event Log Eventlog Running Auto Share Process c:\windows\system32\services.exe
Normal LocalSystem 0
COM+ Event System EventSystem Running Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Help and Support helpsvc Running Manual Share Process c:\windows\system32\svchost.exe -k netsvcs
Normal LocalSystem 0
Human Interface Device Access HidServ Stopped Disabled Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
HTTP SSL HTTPFilter Stopped Manual Share Process c:\windows\system32\lsass.exe
Normal LocalSystem 0
IMAPI CD-Burning COM Service ImapiService Stopped Disabled Own Process
c:\windows\system32\imapi.exe Normal LocalSystem 0
Intersite Messaging IsmServ Stopped Disabled Own Process c:\windows\system32\ismserv.exe
Normal LocalSystem 0
Kerberos Key Distribution Center kdc Stopped Disabled Share Process
c:\windows\system32\lsass.exe Normal LocalSystem 0
Server lanmanserver Running Auto Share Process c:\windows\system32\svchost.exe -k netsvcs
Normal LocalSystem 0
Workstation lanmanworkstation Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
License Logging LicenseService Stopped Disabled Own Process c:\windows\system32\llssrv.exe
Normal NT AUTHORITY\NetworkService 0
TCP/IP NetBIOS Helper LmHosts Stopped Manual Share Process
c:\windows\system32\svchost.exe -k localservice Normal NT AUTHORITY\LocalService
0

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Messenger Messenger Stopped Disabled Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
NetMeeting Remote Desktop Sharing mnmsrvc Stopped Disabled Own Process c:\windows\system32\mnmsrvc.exe Normal LocalSystem 0
Distributed Transaction Coordinator MSDTC Stopped Manual Own Process c:\windows\system32\msdtc.exe Normal NT AUTHORITY\NetworkService 0
Windows Installer MSIServer Stopped Manual Share Process c:\windows\system32\msiexec.exe /v Normal LocalSystem 0
MSSQLSERVER MSSQLSERVER Stopped Manual Own Process c:\progra~1\micros~1\mssql\binn\sqlservr.exe Normal LocalSystem 0
MSSQLServerADHelper MSSQLServerADHelper Stopped Manual Own Process c:\program files\microsoft sql server\80\tools\binn\sqladhlp.exe Normal LocalSystem 0
Network DDE NetDDE Stopped Disabled Share Process c:\windows\system32\netdde.exe Normal LocalSystem 0
Network DDE DSDM NetDDEdsdm Stopped Disabled Share Process c:\windows\system32\netdde.exe Normal LocalSystem 0
Net Logon Netlogon Stopped Manual Share Process c:\windows\system32\lsass.exe Normal LocalSystem 0
Network Connections Netman Running Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Network Location Awareness (NLA) Nla Running Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
File Replication NtFrs Stopped Manual Own Process c:\windows\system32\ntfrs.exe Ignore LocalSystem 0
NT LM Security Support Provider NtLmSsp Stopped Manual Share Process c:\windows\system32\lsass.exe Normal LocalSystem 0
Removable Storage NtmsSvc Stopped Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Plug and Play PlugPlay Running Auto Share Process c:\windows\system32\services.exe Normal LocalSystem 0
IPSEC Services PolicyAgent Stopped Manual Share Process c:\windows\system32\lsass.exe Normal LocalSystem 0
Protected Storage ProtectedStorage Stopped Manual Share Process c:\windows\system32\lsass.exe Normal LocalSystem 0
Remote Access Auto Connection Manager RasAuto Stopped Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Remote Access Connection Manager RasMan Stopped Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Remote Desktop Help Session Manager RDSessMgr Stopped Manual Own Process c:\windows\system32\sessmgr.exe Normal LocalSystem 0
Routing and Remote Access RemoteAccess Stopped Disabled Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Remote Registry RemoteRegistry Stopped Manual Share Process c:\windows\system32\svchost.exe -k regsvc Normal NT AUTHORITY\LocalService 0
Remote Procedure Call (RPC) Locator RpcLocator Stopped Manual Own Process c:\windows\system32\locator.exe Normal NT AUTHORITY\NetworkService 0
Remote Procedure Call (RPC) RpcSs Running Auto Share Process c:\windows\system32\svchost -k rpcss Normal LocalSystem 0
Resultant Set of Policy Provider RSoPProv Stopped Manual Share Process c:\windows\system32\rsopprov.exe Normal LocalSystem 0
Special Administration Console Helper sacsvr Stopped Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Security Accounts Manager SamSs Stopped Manual Share Process c:\windows\system32\lsass.exe Normal LocalSystem 0

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Appendix C – Tunable Parameters

Smart Card SCardSvr Stopped Manual Share Process c:\windows\system32\scardsvr.exe
Ignore NT AUTHORITY\LocalService 0
Task Scheduler Schedule Stopped Manual Share Process c:\windows\system32\svchost.exe -
k netsvcs Normal LocalSystem 0
Secondary Logon seclogon Stopped Manual Share Process c:\windows\system32\svchost.exe -k netsvcs
Ignore LocalSystem 0
System Event Notification SENS Running Manual Share Process c:\windows\system32\svchost.exe -
k netsvcs Normal LocalSystem 0
Internet Connection Firewall (ICF) / Internet Connection Sharing (ICS) SharedAccess Stopped Disabled
Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Shell Hardware Detection ShellHWDetection Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Ignore LocalSystem 0
Print Spooler Spooler Stopped Manual Own Process c:\windows\system32\spoolsv.exe Normal
LocalSystem 0
SQLSERVERAGENT SQLSERVERAGENT Stopped Manual Own Process
c:\progra~1\micros~1\mssql\binn\sqlagent.exe Normal LocalSystem 0
Windows Image Acquisition (WIA) stisvc Stopped DisabledShare Process
c:\windows\system32\svchost.exe -k imgsvc Normal NT AUTHORITY\LocalService 0
Microsoft Software Shadow Copy Provider swprv Stopped Manual Own Process
c:\windows\system32\svchost.exe -k swprv Normal LocalSystem 0
Performance Logs and Alerts SysmonLog Stopped Manual Own Process
c:\windows\system32\smlogsvc.exeNormal NT Authority\NetworkService 0
Telephony TapiSrv Stopped Manual Share Process c:\windows\system32\svchost.exe -k tapisrv
Normal LocalSystem 0
Terminal Services TermService Running Manual Share Process
c:\windows\system32\svchost.exe -k termsvcs Normal LocalSystem 0
Themes Themes Stopped DisabledShare Process c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem 0
Telnet TlntSvr Stopped DisabledOwn Process c:\windows\system32\tlntsvr.exe Normal NT
AUTHORITY\LocalService 0
Distributed Link Tracking Server TrkSvr Stopped DisabledShare Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Distributed Link Tracking Client TrkWks Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Terminal Services Session Directory Tssdis Stopped DisabledOwn Process
c:\windows\system32\tssdis.exe Normal LocalSystem 0
Upload Manager uploadmgr Stopped Manual Share Process c:\windows\system32\svchost.exe -
k netsvcs Normal LocalSystem 0
Uninterruptible Power Supply UPS Stopped Manual Own Process
c:\windows\system32\ups.exe Normal NT AUTHORITY\LocalService 0
Virtual Disk Service vds Stopped Manual Own Process c:\windows\system32\vds.exe
Normal LocalSystem 0
Volume Shadow Copy VSS Stopped Manual Own Process c:\windows\system32\vssvc.exe
Normal LocalSystem 0
Windows Time W32Time Stopped Manual Share Process c:\windows\system32\svchost.exe -
k netsvcs Normal LocalSystem 0
WebClient WebClient Stopped DisabledShare Process c:\windows\system32\svchost.exe -
k localservice Normal NT AUTHORITY\LocalService 0
WinHTTP Web Proxy Auto-Discovery Service WinHttpAutoProxySvc Stopped Manual Share
Process c:\windows\system32\svchost.exe -k localservice Normal NT AUTHORITY\LocalService
0
Windows Management Instrumentation winmgmt Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Ignore LocalSystem 0
Portable Media Serial Number Service WmdmPmSN Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0

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Windows Management Instrumentation Driver Extensions Wmi Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
WMI Performance Adapter WmiApSrv Stopped Manual Own Process
c:\windows\system32\wbem\wmiapsrv.exe Normal LocalSystem 0
Automatic Updates wuauserv Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Wireless Configuration WZCSVC Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0

[Program Groups]

Group Name Name User Name
Accessories Default User:Accessories Default User
Accessories\Accessibility Default User:Accessories\Accessibility Default User
Accessories\Entertainment Default User:Accessories\Entertainment Default User
Startup Default User:Startup Default User
Accessories All Users:Accessories All Users
Accessories\Accessibility All Users:Accessories\Accessibility All Users
Accessories\Communications All Users:Accessories\Communications All Users
Accessories\Entertainment All Users:Accessories\Entertainment All Users
Accessories\System Tools All Users:Accessories\System Tools All Users
Administrative Tools All Users:Administrative Tools All Users
Microsoft SQL Server All Users:Microsoft SQL Server All Users
MKS Toolkit All Users:MKS Toolkit All Users
Startup All Users:Startup All Users
VNC All Users:VNC All Users
VNC\Administrative Tools All Users:VNC\Administrative Tools All Users
WinZip All Users:WinZip All Users
Accessories NT AUTHORITY\SYSTEM:Accessories NT AUTHORITY\SYSTEM
Accessories\Accessibility NT AUTHORITY\SYSTEM:Accessories\Accessibility NT AUTHORITY\SYSTEM
Accessories\Entertainment NT AUTHORITY\SYSTEM:Accessories\Entertainment NT AUTHORITY\SYSTEM
Startup NT AUTHORITY\SYSTEM:Startup NT AUTHORITY\SYSTEM
Accessories PE2650\Administrator:Accessories PE2650\Administrator
Accessories\Accessibility PE2650\Administrator:Accessories\Accessibility PE2650\Administrator
Accessories\Entertainment PE2650\Administrator:Accessories\Entertainment PE2650\Administrator
Administrative Tools PE2650\Administrator:Administrative Tools PE2650\Administrator
Startup PE2650\Administrator:Startup PE2650\Administrator

[Startup Programs]

Program Command User Name Location
desktop desktop.ini NT AUTHORITY\SYSTEM Startup
desktop desktop.ini PE2650\Administrator Startup
Run WinVNC (App Mode) run winvnc (app mode).lnk PE2650\Administrator Startup
desktop desktop.ini .DEFAULT Startup
desktop desktop.ini All Users Common Startup
Service Manager c:\progra~1\micros~1\80\tools\binn\sqlmangr.exe /n All Users Common Startup

[OLE Registration]

Object Local Server
Sound (OLE2) sndrec32.exe
Media Clip mplay32.exe

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Video Clip mplay32.exe /avi
MIDI Sequence mplay32.exe /mid
Sound Not Available
Media Clip Not Available
WordPad Document "%programfiles%\windows nt\accessories\wordpad.exe"
Windows Media Services DRM Storage object Not Available
Bitmap Image mspaint.exe

[Windows Error Reporting]

Time Type Details

[Internet Settings]

[Internet Explorer]

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

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

Cipher Strength 128-bit
Content Advisor Disabled
IEAK Install No

[File Versions]

File	Version	Size	Date	Path	Company
actxprxy.dll	6.0.3790.0	95 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
advpack.dll	6.0.3790.0	94 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
asctrls.ocx	6.0.3790.0	90 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
browselc.dll	6.0.3790.0	62 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
browseui.dll	6.0.3790.0	1,033 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
cdfview.dll	6.0.3790.0	144 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
comctl32.dll	5.82.3790.0	561 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
dxtrans.dll	6.3.3790.0	198 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
dxtmsft.dll	6.3.3790.0	344 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
iecont.dll	<File Missing>	Not Available	Not Available	Not Available	Not Available
iecontlc.dll	<File Missing>	Not Available	Not Available	Not Available	Not Available

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iedkcs32.dll	16.0.3790.0	300 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
iepeers.dll	6.0.3790.0	230 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
iesetup.dll	6.0.3790.0	59 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
ieuinit.inf	Not Available	20 KB	3/29/2003	C:\WINDOWS\system32	Not Available
iexplore.exe	6.0.3790.0	90 KB	3/29/2003	C:\Program Files\Internet Explorer	Microsoft Corporation
imgutil.dll	5.2.3790.0	35 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
inetcpl.cpl	6.0.3790.0	303 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
inetcplc.dll	6.0.3790.0	109 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
inseng.dll	6.0.3790.0	72 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
mlang.dll	6.0.3790.0	570 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
msencode.dll	2002.10.4.0	112 KB	3/29/2003	C:\WINDOWS\system32	Not Available
mshta.exe	6.0.3790.0	26 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
mshtml.dll	6.0.3790.0	2,848 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
mshtml.tlb	6.0.3790.0	1,319 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
mshtmled.dll	6.0.3790.0	444 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
mshtmler.dll	6.0.3790.0	55 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
msident.dll	6.0.3790.0	47 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
msidntld.dll	6.0.3790.0	15 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
msieftp.dll	6.0.3790.0	230 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
msrating.dll	6.0.3790.0	132 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
mstime.dll	6.0.3790.0	491 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
occache.dll	6.0.3790.0	89 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
proctexe.ocx	6.3.3790.0	78 KB	3/29/2003	C:\WINDOWS\system32	Intel Corporation
sendmail.dll	6.0.3790.0	52 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
shdoclc.dll	6.0.3790.0	589 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
shdocvw.dll	6.0.3790.0	1,361 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
shfolder.dll	6.0.3790.0	23 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
shlwapi.dll	6.0.3790.0	281 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
tdc.ocx	1.3.0.3130	58 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
url.dll	6.0.3790.0	36 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation

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urlmon.dll 6.0.3790.0 502 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
webcheck.dll 6.0.3790.0 262 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
wininet.dll 6.0.3790.0 609 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation

[Connectivity]

Item Value
Connection Preference Never dial

LAN Settings

AutoConfigProxyNot Available
AutoProxyDetectMode Disabled
AutoConfigURL
Proxy Disabled
ProxyServer
ProxyOverride

[Cache]

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

Item Value
Page Refresh Type Automatic
Temporary Internet Files Folder C:\WINDOWS\system32\config\systemprofile\Local Settings\Temporary Internet Files
Total Disk Space Not Available
Available Disk Space Not Available
Maximum Cache Size Not Available
Available Cache Size Not Available

[List of Objects]

Program File Status CodeBase
No cached object information available

[Content]

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

Item Value
Content Advisor Disabled

[Personal Certificates]

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

[Other People Certificates]

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

[Publishers]

Name
No publisher information available

[Security]

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

Microsoft Windows 2003 Server System Info For PE1600SC

System Information report written at: 01/14/04 11:41:30
System Name: CLIENT77
[System Summary]

Item Value
OS Name Microsoft(R) Windows(R) Server 2003, Standard Edition
Version 5.2.3790 Build 3790
OS Manufacturer Microsoft Corporation
System Name CLIENT77
System Manufacturer Dell Computer Corporation
System Model PowerEdge 1600SC
System Type X86-based PC
Processor x86 Family 15 Model 2 Stepping 7 GenuineIntel ~2392 Mhz
Processor x86 Family 15 Model 2 Stepping 7 GenuineIntel ~2392 Mhz
Processor x86 Family 15 Model 2 Stepping 7 GenuineIntel ~2392 Mhz
Processor x86 Family 15 Model 2 Stepping 7 GenuineIntel ~2392 Mhz
BIOS Version/Date Dell Computer Corporation X22, 1/14/2003
SMBIOS Version 2.3
Windows Directory C:\WINDOWS
System Directory C:\WINDOWS\system32
Boot Device \Device\HarddiskVolume1
Locale United States
Hardware Abstraction Layer Version = "5.2.3790.0 (srv03_rtm.030324-2048)"
User Name CLIENT77\Administrator
Time Zone Central Standard Time
Total Physical Memory 1,024.00 MB
Available Physical Memory 818.53 MB
Total Virtual Memory 3.41 GB
Available Virtual Memory 3.10 GB
Page File Space 2.41 GB
Page File C:\pagefile.sys

[Hardware Resources]

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[Conflicts/Sharing]

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

Memory Address 0xFD000000-0xFE1FFFFF PCI bus
Memory Address 0xFD000000-0xFE1FFFFF RAGE XL PCI Family (Microsoft Corporation)

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

I/O Port 0x000003B0-0x000003DF PCI bus
I/O Port 0x000003B0-0x000003DF RAGE XL PCI Family (Microsoft Corporation)

Memory Address 0xFCB00000-0xFCDFFFFF PCI bus
Memory Address 0xFCB00000-0xFCDFFFFF Intel(R) PRO/100+ Server Adapter (PILA8470B)

[DMA]

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

[Forced Hardware]

Device PNP Device ID

[I/O]

Resource Device Status
0x00000000-0x000003AF PCI bus OK
0x00000000-0x000003AF Direct memory access controller OK
0x000003B0-0x000003DF PCI bus OK
0x000003B0-0x000003DF RAGE XL PCI Family (Microsoft Corporation) OK
0x000003E0-0x00000FFF PCI bus OK
0x0000E000-0x0000EFFF PCI bus OK
0x0000ECC0-0x0000ECFF Intel(R) PRO/1000 MT Network Connection OK
0x0000E800-0x0000E8FF RAGE XL PCI Family (Microsoft Corporation) OK
0x000003C0-0x000003DF RAGE XL PCI Family (Microsoft Corporation) OK
0x00000080-0x0000009F Direct memory access controller OK
0x000000C0-0x000000DF Direct memory access controller OK
0x000000F0-0x000000FF Numeric data processor OK
0x00000020-0x0000003F Programmable interrupt controller OK
0x000000A0-0x000000BF Programmable interrupt controller OK
0x000004D0-0x000004D1 Programmable interrupt controller OK
0x00000061-0x00000061 System speaker OK
0x00000040-0x0000005F System timer OK
0x000003F0-0x000003F5 Standard floppy disk controller OK
0x000003F7-0x000003F7 Standard floppy disk controller OK
0x00000060-0x00000060 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard OK
0x00000064-0x00000064 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard OK
0x000003F8-0x000003FF Communications Port (COM1) OK
0x00000378-0x0000037F ECP Printer Port (LPT1) OK

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0x00000778-0x0000077F ECP Printer Port (LPT1) OK
0x00000070-0x0000007F System CMOS/real time clock OK
0x00000814-0x0000085B System board OK
0x00000820-0x0000083F System board OK
0x000008A0-0x000008AF System board OK
0x00000C00-0x00000CD7 System board OK
0x00000F50-0x00000F58 System board OK
0x000008B0-0x000008BF Standard Dual Channel PCI IDE Controller OK
0x000001F0-0x000001F7 Primary IDE Channel OK
0x000003F6-0x000003F6 Primary IDE Channel OK
0x00000170-0x00000177 Secondary IDE Channel OK
0x00000376-0x00000376 Secondary IDE Channel OK
0x00000A79-0x00000A79 ISAPNP Read Data Port OK
0x00000279-0x00000279 ISAPNP Read Data Port OK
0x00000274-0x00000277 ISAPNP Read Data Port OK
0x0000D000-0x0000DFFF PCI bus OK
0x0000DC00-0x0000DCFF LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
0x0000C000-0x0000CFFF PCI bus OK
0x0000CCC0-0x0000CCFF Intel(R) PRO/100+ Server Adapter (PILA8470B) OK

[IRQs]

Resource Device Status
IRQ 9 Microsoft ACPI-Compliant System OK
IRQ 16 Intel(R) PRO/1000 MT Network Connection OK
IRQ 13 Numeric data processor OK
IRQ 0 System timer OK
IRQ 6 Standard floppy disk controller OK
IRQ 1 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard OK
IRQ 12 PS/2 Compatible Mouse OK
IRQ 4 Communications Port (COM1) OK
IRQ 8 System CMOS/real time clock OK
IRQ 15 Secondary IDE Channel OK
IRQ 10 ServerWorks (RCC) PCI to USB Open Host Controller OK
IRQ 29 LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
IRQ 24 Intel(R) PRO/100+ Server Adapter (PILA8470B) OK

[Memory]

Resource Device Status
0xA0000-0xBFFFF PCI bus OK
0xA0000-0xBFFFF RAGE XL PCI Family (Microsoft Corporation) OK
0xD0000-0xE7FFF PCI bus OK
0xFD000000-0xFE1FFFFF PCI bus OK
0xFD000000-0xFE1FFFFF RAGE XL PCI Family (Microsoft Corporation) OK
0xFE100000-0xFE11FFFF Intel(R) PRO/1000 MT Network Connection OK
0xFE121000-0xFE121FFF RAGE XL PCI Family (Microsoft Corporation) OK
0xFE120000-0xFE120FFF ServerWorks (RCC) PCI to USB Open Host Controller OK
0x0000-0x9FFFF System board OK
0x100000-0x3FFFFFFF System board OK
0xF0000-0xFFFFF System board OK
0xFEC00000-0xFEC0FFFF System board OK
0xFEE00000-0xFEE0FFFF System board OK
0xFFE00000-0xFFFFFFFF System board OK
0xFCE00000-0xFCFFFFFF PCI bus OK

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0xFCF10000-0xFCF1FFFF LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
0xFCF00000-0xFCF0FFFF LSI Logic PCI-X Ultra320 SCSI Host Adapter OK
0xFCB00000-0xFCDFFFFF PCI bus OK
0xFCB00000-0xFCDFFFFF Intel(R) PRO/100+ Server Adapter (PILA8470B) OK
0xFCD00000-0xFCD00FFF Intel(R) PRO/100+ Server Adapter (PILA8470B) OK

[Components]

[Multimedia]

[Audio Codecs]

CODEC Manufacturer Description Status File Version Size Creation Date
c:\windows\system32\sl_anet.acm Sipro Lab Telecom Inc. Sipro Lab Telecom Audio Codec OK
C:\WINDOWS\system32\SL_ANET.ACM 3.02 84.00 KB (86,016 bytes) 3/29/2003 12:00 AM
c:\windows\system32\msaud32.acm Microsoft Corporation Windows Media Audio Codec
OK C:\WINDOWS\system32\MSAUD32.ACM 8.00.00.4487 288.00 KB (294,912 bytes) 3/29/2003 12:00 AM
c:\windows\system32\tssoft32.acm DSP GROUP, INC. OK
C:\WINDOWS\system32\TSSOFT32.ACM 1.01 9.50 KB (9,728 bytes) 3/29/2003 12:00 AM
c:\windows\system32\msadp32.acm Microsoft Corporation OK
C:\WINDOWS\system32\MSADP32.ACM 5.2.3790.0 (srv03_rtm.030324-2048) 14.50 KB (14,848 bytes) 3/29/2003 12:00 AM
c:\windows\system32\msg711.acm Microsoft Corporation OK
C:\WINDOWS\system32\MSG711.ACM 5.2.3790.0 (srv03_rtm.030324-2048) 10.00 KB (10,240 bytes) 3/29/2003 12:00 AM
c:\windows\system32\msg723.acm Microsoft Corporation OK
C:\WINDOWS\system32\MSG723.ACM 4.4.4000 116.00 KB (118,784 bytes) 11/13/2003 1:32 PM
c:\windows\system32\msgsm32.acm Microsoft Corporation OK
C:\WINDOWS\system32\MSGSM32.ACM 5.2.3790.0 (srv03_rtm.030324-2048) 20.50 KB (20,992 bytes) 3/29/2003 12:00 AM
c:\windows\system32\l3codeca.acm Fraunhofer Institut Integrierte Schaltungen IIS
Fraunhofer IIS MPEG Layer-3 Codec OK
C:\WINDOWS\system32\L3CODECA.ACM 1, 9, 0, 0305 284.00 KB (290,816 bytes) 3/29/2003 12:00 AM
c:\windows\system32\imaadp32.acm Microsoft Corporation OK
C:\WINDOWS\system32\IMAADP32.ACM 5.2.3790.0 (srv03_rtm.030324-2048) 15.50 KB (15,872 bytes) 3/29/2003 12:00 AM

[Video Codecs]

CODEC Manufacturer Description Status File Version Size Creation Date
c:\windows\system32\msyuv.dll Microsoft Corporation OK
C:\WINDOWS\system32\MSYUV.DLL 5.2.3790.0 (srv03_rtm.030324-2048) 16.50 KB (16,896 bytes) 3/24/2003 7:49 PM
c:\windows\system32\msvidc32.dll Microsoft Corporation OK
C:\WINDOWS\system32\MSVIDC32.DLL 5.2.3790.0 (srv03_rtm.030324-2048) 26.50 KB (27,136 bytes) 3/29/2003 12:00 AM

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c:\windows\system32\msh261.drv Microsoft Corporation OK
C:\WINDOWS\system32\MSH261.DRV 4.4.4000 180.00 KB (184,320 bytes)
11/13/2003 1:32 PM
c:\windows\system32\tsbyuv.dll Microsoft Corporation OK
C:\WINDOWS\system32\TSBYUV.DLL 5.2.3790.0 (srv03_rtm.030324-2048) 8.00 KB (8,192 bytes) 3/24/2003 7:50 PM
c:\windows\system32\msrle32.dll Microsoft Corporation OK
C:\WINDOWS\system32\MSRLE32.DLL 5.2.3790.0 (srv03_rtm.030324-2048) 10.50 KB (10,752 bytes) 3/29/2003 12:00 AM
c:\windows\system32\iyuv_32.dll Microsoft Corporation OK
C:\WINDOWS\system32\IYUV_32.DLL 5.2.3790.0 (srv03_rtm.030324-2048) 45.00 KB (46,080 bytes) 3/24/2003 7:49 PM
c:\windows\system32\msh263.drv Microsoft Corporation OK
C:\WINDOWS\system32\MSH263.DRV 4.4.4000 284.00 KB (290,816 bytes)
3/24/2003 7:46 PM

[CD-ROM]

Item Value
Drive D:
Description CD-ROM Drive
Media Loaded No
Media Type CD-ROM
Name LITEON DVD-ROM LTD163
Manufacturer (Standard CD-ROM drives)
Status OK
Transfer Rate Not Available
SCSI Target ID 0
PNP Device ID IDE\CDROMLITEON_DVD-ROM_LTD163_____GDHB____\5&1A6C219A&0&0.0.0
Driver c:\windows\system32\drivers\cdrom.sys (5.2.3790.0 (srv03_rtm.030324-2048), 49.50 KB (50,688 bytes), 3/29/2003 12:00 AM)

[Sound Device]

Item Value

[Display]

Item Value
Name RAGE XL PCI Family (Microsoft Corporation)
PNP Device ID PCI\VEN_1002&DEV_4752&SUBSYS_01351028&REV_27\3&13C0B0C5&0&70
Adapter Type ATI RAGE XL PCI (B41), ATI Technologies Inc. compatible
Adapter Description RAGE XL PCI Family (Microsoft Corporation)
Adapter RAM 8.00 MB (8,388,608 bytes)
Installed Drivers ati2drad.dll
Driver Version 5.10.3663.6013
INF File atiixpad.inf (ati2mpad section)
Color Planes 1
Color Table Entries 65536
Resolution 1024 x 768 x 60 hertz
Bits/Pixel 16
Memory Address 0xFD000000-0xFE1FFFFF
I/O Port 0x0000E800-0x0000E8FF
Memory Address 0xFE121000-0xFE121FFF

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I/O Port 0x000003B0-0x000003DF
I/O Port 0x000003C0-0x000003DF
Memory Address 0xA0000-0xBFFFF
Driver c:\windows\system32\drivers\ati2mpad.sys (5.10.3663.6013, 335.38 KB (343,424 bytes), 11/13/2003 7:22 AM)

[Infrared]

Item Value

[Input]

[Keyboard]

Item Value
Description Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
Name Enhanced (101- or 102-key)
Layout 00000409
PNP Device ID ACPI\PNP0303\4&25F73A82&0
Number of Function Keys 12
I/O Port 0x00000060-0x00000060
I/O Port 0x00000064-0x00000064
IRQ Channel IRQ 1
Driver c:\windows\system32\drivers\i8042prt.sys (5.2.3790.0 (srv03_rtm.030324-2048), 68.50 KB (70,144 bytes), 3/29/2003 12:00 AM)

[Pointing Device]

Item Value
Hardware Type PS/2 Compatible Mouse
Number of Buttons 3
Status OK
PNP Device ID ACPI\PNP0F13\4&25F73A82&0
Power Management Supported No
Double Click Threshold 6
Handedness Right Handed Operation
IRQ Channel IRQ 12
Driver c:\windows\system32\drivers\i8042prt.sys (5.2.3790.0 (srv03_rtm.030324-2048), 68.50 KB (70,144 bytes), 3/29/2003 12:00 AM)

[Modem]

Item Value

[Network]

[Adapter]

Item Value
Name [00000001] Intel(R) PRO/1000 MT Network Connection
Adapter Type Ethernet 802.3

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Product Type Intel(R) PRO/1000 MT Network Connection
Installed Yes
PNP Device ID PCI\VEN_8086&DEV_100E&SUBSYS_01351028&REV_02\3&13C0B0C5&0&10
Last Reset 1/14/2004 11:39 AM
Index 1
Service Name E1000
IP Address 192.1.100.77
IP Subnet 255.255.255.0
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:C0:9F:1D:77:0D
Memory Address 0xFE100000-0xFE11FFFF
I/O Port 0x0000ECC0-0x0000ECFF
IRQ Channel IRQ 16
Driver c:\windows\system32\drivers\e1000325.sys (6.3.6.31 built by: WinDDK, 99.00 KB (101,376 bytes), 11/13/2003 7:22 AM)

Name [00000002] Intel(R) PRO/100+ Server Adapter (PILA8470B)
Adapter Type Ethernet 802.3
Product Type Intel(R) PRO/100+ Server Adapter (PILA8470B)
Installed Yes
PNP Device ID PCI\VEN_8086&DEV_1229&SUBSYS_100C8086&REV_08\3&29E81982&0&20
Last Reset 1/14/2004 11:39 AM
Index 2
Service Name E100B
IP Address 192.1.1.77
IP Subnet 255.255.255.0
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:D0:B7:9E:A8:B9
Memory Address 0xFCD00000-0xFCD00FFF
I/O Port 0x0000CCC0-0x0000CCFF
Memory Address 0xFCB00000-0xFCDFFFFF
IRQ Channel IRQ 24
Driver c:\windows\system32\drivers\e100b325.sys (6.6.8.1 built by: WinDDK, 138.50 KB (141,824 bytes), 11/13/2003 7:22 AM)

Name [00000003] Intel(R) PRO/100+ Dual Port Server Adapter
Adapter Type Not Available
Product Type Intel(R) PRO/100+ Dual Port Server Adapter
Installed Yes
PNP Device ID Not Available
Last Reset 1/14/2004 11:39 AM
Index 3
Service Name E100B
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No

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DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available

Name [00000004] Intel(R) PRO/100+ Dual Port Server Adapter
Adapter Type Not Available
Product Type Intel(R) PRO/100+ Dual Port Server Adapter
Installed Yes
PNP Device ID Not Available
Last Reset 1/14/2004 11:39 AM
Index 4
Service Name E100B
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available

Name [00000005] RAS Async Adapter
Adapter Type Not Available
Product Type RAS Async Adapter
Installed Yes
PNP Device ID Not Available
Last Reset 1/14/2004 11:39 AM
Index 5
Service Name AsyncMac
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available

Name [00000006] WAN Miniport (L2TP)
Adapter Type Not Available
Product Type WAN Miniport (L2TP)
Installed Yes
PNP Device ID ROOT\MS_L2TPMINIPORT\0000
Last Reset 1/14/2004 11:39 AM
Index 6
Service Name Rasl2tp
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available

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Driver c:\windows\system32\drivers\rasl2tp.sys (5.2.3790.0 (srv03_rtm.030324-2048), 77.00 KB (78,848 bytes), 3/29/2003 12:00 AM)

Name [00000007] WAN Miniport (PPTP)
Adapter Type Wide Area Network (WAN)
Product Type WAN Miniport (PPTP)
Installed Yes
PNP Device ID ROOT\MS_PPTPMINIPORT\0000
Last Reset 1/14/2004 11:39 AM
Index 7
Service Name PptpMiniport
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 50:50:54:50:30:30
Driver c:\windows\system32\drivers\raspptp.sys (5.2.3790.0 (srv03_rtm.030324-2048), 70.50 KB (72,192 bytes), 3/29/2003 12:00 AM)

Name [00000008] WAN Miniport (PPPOE)
Adapter Type Wide Area Network (WAN)
Product Type WAN Miniport (PPPOE)
Installed Yes
PNP Device ID ROOT\MS_PPPOEMINIPORT\0000
Last Reset 1/14/2004 11:39 AM
Index 8
Service Name RasPppoe
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 33:50:6F:45:30:30
Driver c:\windows\system32\drivers\raspppoe.sys (5.2.3790.0 (srv03_rtm.030324-2048), 38.00 KB (38,912 bytes), 3/29/2003 12:00 AM)

Name [00000009] Direct Parallel
Adapter Type Not Available
Product Type Direct Parallel
Installed Yes
PNP Device ID ROOT\MS_PTIMINIPORT\0000
Last Reset 1/14/2004 11:39 AM
Index 9
Service Name Raspti
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available

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DHCP Lease Obtained Not Available
MAC Address Not Available
Driver c:\windows\system32\drivers\raspti.sys (5.2.3790.0 (srv03_rtm.030324-2048), 18.50 KB (18,944 bytes), 3/29/2003 12:00 AM)

Name [00000010] WAN Miniport (IP)
Adapter Type Not Available
Product Type WAN Miniport (IP)
Installed Yes
PNP Device ID ROOT\MS_NDISWANIP\0000
Last Reset 1/14/2004 11:39 AM
Index 10
Service Name NdisWan
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Driver c:\windows\system32\drivers\ndiswan.sys (5.2.3790.0 (srv03_rtm.030324-2048), 96.50 KB (98,816 bytes), 3/29/2003 12:00 AM)

[Protocol]

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

Name MSAFD Tcpip [UDP/IP]
Connectionless Service Yes
Guarantees Delivery No
Guarantees Sequencing No
Maximum Address Size 16 bytes
Maximum Message Size 63.93 KB (65,467 bytes)
Message Oriented Yes
Minimum Address Size 16 bytes
Pseudo Stream Oriented No
Supports Broadcasting Yes

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Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting Yes

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

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

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{833FA836-11FC-4387-9F56-9082062D338A}] SEQPACKET 0
Connectionless Service No
Guarantees Delivery Yes
Guarantees Sequencing Yes
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting No

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Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{833FA836-11FC-4387-9F56-9082062D338A}] DATAGRAM 0
Connectionless Service Yes
Guarantees Delivery No
Guarantees Sequencing No
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting Yes
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{915E7CCF-F641-4E79-A07A-8707F1BF2257}] SEQPACKET 1
Connectionless Service No
Guarantees Delivery Yes
Guarantees Sequencing Yes
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting No
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{915E7CCF-F641-4E79-A07A-8707F1BF2257}] DATAGRAM 1
Connectionless Service Yes
Guarantees Delivery No
Guarantees Sequencing No
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes

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Pseudo Stream Oriented No
Supports Broadcasting Yes
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{D92CDA13-25CE-4C24-8E01-DEE40289EF21}] SEQPACKET 2
Connectionless Service No
Guarantees Delivery Yes
Guarantees Sequencing Yes
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting No
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{D92CDA13-25CE-4C24-8E01-DEE40289EF21}] DATAGRAM 2
Connectionless Service Yes
Guarantees Delivery No
Guarantees Sequencing No
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting Yes
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{A92BF397-E0A5-448C-B3AE-8B34875D7FA4}] SEQPACKET 3
Connectionless Service No
Guarantees Delivery Yes
Guarantees Sequencing Yes
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)

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Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting No
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{A92BF397-E0A5-448C-B3AE-8B34875D7FA4}] DATAGRAM 3
Connectionless Service Yes
Guarantees Delivery No
Guarantees Sequencing No
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting Yes
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{A1741045-84FE-47EA-904F-5DFCE3307C20}] SEQPACKET 4
Connectionless Service No
Guarantees Delivery Yes
Guarantees Sequencing Yes
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting No
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{A1741045-84FE-47EA-904F-5DFCE3307C20}] DATAGRAM 4
Connectionless Service Yes
Guarantees Delivery No
Guarantees Sequencing No

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Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting Yes
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{F767E01D-2EAF-4E3A-AC93-B92C2D2CB4A4}] SEQPACKET 5
Connectionless Service No
Guarantees Delivery Yes
Guarantees Sequencing Yes
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting No
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{F767E01D-2EAF-4E3A-AC93-B92C2D2CB4A4}] DATAGRAM 5
Connectionless Service Yes
Guarantees Delivery No
Guarantees Sequencing No
Maximum Address Size 20 bytes
Maximum Message Size 62.50 KB (64,000 bytes)
Message Oriented Yes
Minimum Address Size 20 bytes
Pseudo Stream Oriented No
Supports Broadcasting Yes
Supports Connect Data No
Supports Disconnect Data No
Supports Encryption No
Supports Expedited Data No
Supports Graceful Closing No
Supports Guaranteed Bandwidth No
Supports Multicasting No

[WinSock]

Item Value

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

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

[Ports]

[Serial]

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

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I/O Port 0x000003F8-0x000003FF
IRQ Channel IRQ 4
Driver c:\windows\system32\drivers\serial.sys (5.2.3790.0 (srv03_rtm.030324-2048), 76.00 KB (77,824 bytes), 3/29/2003 12:00 AM)

[Parallel]

Item Value
Name LPT1
PNP Device ID ACPI\PNP0401\4&25F73A82&0
I/O Port 0x00000378-0x0000037F
I/O Port 0x00000778-0x0000077F
Driver c:\windows\system32\drivers\parport.sys (5.2.3790.0 (srv03_rtm.030324-2048), 76.50 KB (78,336 bytes), 3/24/2003 5:04 PM)

[Storage]

[Drives]

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

Drive C:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 7.81 GB (8,389,750,784 bytes)
Free Space 4.54 GB (4,874,027,008 bytes)
Volume Name
Volume Serial Number 98DEBC9B

Drive D:
Description CD-ROM Disc

Drive E:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 26.10 GB (28,023,521,280 bytes)
Free Space 21.31 GB (22,880,321,536 bytes)
Volume Name Work
Volume Serial Number 5C407C96

[Disks]

Item Value
Description Disk drive
Manufacturer (Standard disk drives)
Model SEAGATE ST336752LW SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk

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Partitions 2
SCSI Bus 0
SCSI Logical Unit 0
SCSI Port 2
SCSI Target ID 0
Sectors/Track 63
Size 33.91 GB (36,413,314,560 bytes)
Total Cylinders 4,427
Total Sectors 71,119,755
Total Tracks 1,128,885
Tracks/Cylinder 255
Partition Disk #0, Partition #0
Partition Size 7.81 GB (8,389,753,344 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #0, Partition #1
Partition Size 26.10 GB (28,023,528,960 bytes)
Partition Starting Offset 8,389,785,600 bytes

[SCSI]

Item Value
Name LSI Logic PCI-X Ultra320 SCSI Host Adapter
Manufacturer LSI Logic Inc.
Status OK
PNP Device ID PCI\VEN_1000&DEV_0030&SUBSYS_01351028&REV_07\3&1070020&0&20
I/O Port 0x0000DC00-0x0000DCFF
Memory Address 0xFCF10000-0xFCF1FFFF
Memory Address 0xFCF00000-0xFCF0FFFF
IRQ Channel IRQ 29
Driver c:\windows\system32\drivers\symmpi.sys (1.08.18.00 (NT.021001-2000), 25.88 KB (26,496 bytes), 3/29/2003 12:00 AM)

[IDE]

Item Value
Name Standard Dual Channel PCI IDE Controller
Manufacturer (Standard IDE ATA/ATAPI controllers)
Status OK
PNP Device ID PCI\VEN_1166&DEV_0212&SUBSYS_41351028&REV_93\3&13C0B0C5&0&79
I/O Port 0x000008B0-0x000008BF
Driver c:\windows\system32\drivers\pciide.sys (5.2.3790.0 (srv03_rtm.030324-2048), 5.50 KB (5,632 bytes), 3/29/2003 12:00 AM)

Name Primary IDE Channel
Manufacturer (Standard IDE ATA/ATAPI controllers)
Status OK
PNP Device ID PCIIDE\IDECHANNEL\4&68D74DF&0&0
I/O Port 0x000001F0-0x000001F7
I/O Port 0x000003F6-0x000003F6
Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.0 (srv03_rtm.030324-2048), 89.00 KB (91,136 bytes), 3/29/2003 12:00 AM)

Name Secondary IDE Channel
Manufacturer (Standard IDE ATA/ATAPI controllers)
Status OK

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PNP Device ID PCIIDE\IDECHANNEL\4&68D74DF&0&1
I/O Port 0x00000170-0x00000177
I/O Port 0x00000376-0x00000376
IRQ Channel IRQ 15
Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.0 (srv03_rtm.030324-2048), 89.00 KB (91,136 bytes), 3/29/2003 12:00 AM)

[Printing]

Name Driver Port Name Server Name

[Problem Devices]

Device PNP Device ID Error Code

[USB]

Device PNP Device ID
ServerWorks (RCC) PCI to USB Open Host Controller
PCI\VEN_1166&DEV_0220&SUBSYS_02201166&REV_05\3&13C0B0C5&0&7A
USB Root Hub USB\ROOT_HUB\4&1A0F8909&0

[Software Environment]

[System Drivers]

Name Description File Type Started Start Mode State Status Error Control
Accept Pause Accept Stop
abiosdsk Abiosdsk Not Available Kernel Driver No Disabled Stopped OK Ignore
No No
acpi Microsoft ACPI Driver c:\windows\system32\drivers\acpi.sys Kernel Driver Yes
Boot Running OK Normal No Yes
acpiec ACPIEC c:\windows\system32\drivers\acpiec.sys Kernel Driver No Disabled Stopped
OK Normal No No
adpu160m adpu160m Not Available Kernel Driver No Disabled Stopped OK
Normal No No
adpu320 adpu320 Not Available Kernel Driver No Disabled Stopped OK Normal No
No
afcnt afcnt Not Available Kernel Driver No Disabled Stopped OK Normal No
No
afd AFD Networking Support Environment c:\windows\system32\drivers\afd.sys Kernel
Driver Yes Auto Running OK Normal No Yes
aha154x Aha154x Not Available Kernel Driver No Disabled Stopped OK Normal
No No
aic78u2 aic78u2 Not Available Kernel Driver No Disabled Stopped OK Normal No
No
aic78xx aic78xx Not Available Kernel Driver No Disabled Stopped OK Normal No
No
aliide AliIde Not Available Kernel Driver No Disabled Stopped OK Normal No
No
asyncmac RAS Asynchronous Media Driver c:\windows\system32\drivers\asyncmac.sys Kernel
Driver No Manual Stopped OK Normal No No

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atapi Standard IDE/ESDI Hard Disk Controller c:\windows\system32\drivers\atapi.sys Kernel Driver Yes Boot Running OK Normal No Yes
atdisk Atdisk Not Available Kernel Driver No DisabledStopped OK Ignore No No
ati2mpad ati2mpad c:\windows\system32\drivers\ati2mpad.sys Kernel Driver Yes Manual Running OK Ignore No Yes
atmarpc ATM ARP Client Protocolc:\windows\system32\drivers\atmarpc.sys Kernel Driver No Manual Stopped OK Normal No No
audstub Audio Stub Driver c:\windows\system32\drivers\audstub.sys Kernel Driver Yes Manual Running OK Normal No Yes
beep Beep c:\windows\system32\drivers\beep.sys Kernel Driver Yes System Running OK Normal No Yes
cbidf2k cbidf2k c:\windows\system32\drivers\cbidf2k.sys Kernel Driver No DisabledStopped OK Normal No No
cd20xrntcd20xrntNot Available Kernel Driver No DisabledStopped OK Normal No No
cdfs Cdfs c:\windows\system32\drivers\cdfs.sys File System Driver Yes Disabled Running OK Normal No Yes
cdrom CD-ROM Driver c:\windows\system32\drivers\cdrom.sys Kernel Driver Yes System Running OK Normal No Yes
changer Changer Not Available Kernel Driver No System Stopped OK Ignore No No
clusdisk Cluster Disk Driver c:\windows\system32\drivers\clusdisk.sys Kernel Driver No DisabledStopped OK Normal No No
cmdide CmdIde Not Available Kernel Driver No DisabledStopped OK Normal No No
cpqarray Cpqarray Not Available Kernel Driver No DisabledStopped OK Normal No No
cpqarry2cpqarry2Not Available Kernel Driver No DisabledStopped OK Normal No No
cpqcissm cpqcissm Not Available Kernel Driver No DisabledStopped OK Normal No No
cpqfcalm cpqfcalm Not Available Kernel Driver No DisabledStopped OK Normal No No
crcdisk CRC Disk Filter Driver c:\windows\system32\drivers\crcdisk.sys Kernel Driver Yes Boot Running OK Normal No Yes
dac960nt dac960nt Not Available Kernel Driver No DisabledStopped OK Normal No No
dellcerc dellcerc Not Available Kernel Driver No DisabledStopped OK Normal No No
dfsdriver DfsDriver c:\windows\system32\drivers\dfs.sys File System Driver Yes Boot Running OK Normal No Yes
disk Disk Driver c:\windows\system32\drivers\disk.sys Kernel Driver Yes Boot Running OK Normal No Yes
dmboot dmboot c:\windows\system32\drivers\dmboot.sys Kernel Driver No DisabledStopped OK Normal No No
dmio Logical Disk Manager Driver c:\windows\system32\drivers\dmio.sys Kernel Driver Yes Boot Running OK Normal No Yes
dmload dmload c:\windows\system32\drivers\dmload.sys Kernel Driver Yes Boot Running OK Normal No Yes
dpti2o dpti2o Not Available Kernel Driver No DisabledStopped OK Normal No No
e1000 Intel(R) PRO/1000 Device Driver c:\windows\system32\drivers\e1000325.sys Kernel Driver Yes Manual Running OK Normal No Yes

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e100b Intel(R) PRO Adapter Driver c:\windows\system32\drivers\e100b325.sys Kernel Driver
Yes Manual Running OK Normal No Yes
fastfat Fastfat c:\windows\system32\drivers\fastfat.sys File System Driver No Disabled
Stopped OK Normal No No
fdc Floppy Disk Controller Driver c:\windows\system32\drivers\fdc.sys Kernel Driver
Yes Manual Running OK Normal No Yes
fips Fips c:\windows\system32\drivers\fips.sys Kernel Driver Yes System Running
OK Normal No Yes
flpydisk Floppy Disk Driver c:\windows\system32\drivers\flpydisk.sys Kernel Driver Yes
Manual Running OK Normal No Yes
ftdisk Volume Manager Driver c:\windows\system32\drivers\ftdisk.sys Kernel Driver Yes
Boot Running OK Normal No Yes
gpc Generic Packet Classifier c:\windows\system32\drivers\msgpc.sys Kernel Driver Yes
Manual Running OK Normal No Yes
hpn hpn Not Available Kernel Driver No DisabledStopped OK Normal No
No
hpt3xx hpt3xx Not Available Kernel Driver No DisabledStopped OK Normal No
No
http HTTP c:\windows\system32\drivers\http.sys Kernel Driver Yes Manual Running
OK Normal No Yes
i2omgmt i2omgmt Not Available Kernel Driver No System Stopped OK
Normal No No
i2omp i2omp Not Available Kernel Driver No DisabledStopped OK Normal No
No
i8042prt i8042 Keyboard and PS/2 Mouse Port Driver c:\windows\system32\drivers\i8042prt.sys
Kernel Driver Yes System Running OK Normal No Yes
iirsp iirsp Not Available Kernel Driver No DisabledStopped OK Normal No
No
imapi CD-Burning Filter Driver c:\windows\system32\drivers\imapi.sys Kernel Driver No
System Stopped OK Normal No No
intelide IntelIde Not Available Kernel Driver No DisabledStopped OK Normal No
No
ipfilterdriver IP Traffic Filter Driver c:\windows\system32\drivers\ipfltdrv.sys Kernel Driver
No Manual Stopped OK Normal No No
ipinip IP in IP Tunnel Driver c:\windows\system32\drivers\ipinip.sys Kernel Driver No
Manual Stopped OK Normal No No
ipnat IP Network Address Translator c:\windows\system32\drivers\ipnat.sys Kernel Driver
No Manual Stopped OK Normal No No
ipsec IPSEC driver c:\windows\system32\drivers\ipsec.sys Kernel Driver Yes System
Running OK Normal No Yes
ipsraidn ipsraidn Not Available Kernel Driver No DisabledStopped OK Normal No
No
irenum IR Enumerator Service c:\windows\system32\drivers\irenum.sys Kernel Driver No
Manual Stopped OK Normal No No
isapnp PnP ISA/EISA Bus Driver c:\windows\system32\drivers\isapnp.sys Kernel Driver Yes
Boot Running OK Critical No Yes
kbdclass Keyboard Class Driver c:\windows\system32\drivers\kbdclass.sys Kernel Driver Yes
System Running OK Normal No Yes
ksecdd KSecDD c:\windows\system32\drivers\ksecdd.sys Kernel Driver Yes Boot
Running OK Normal No Yes
lp6nds35 lp6nds35 Not Available Kernel Driver No DisabledStopped OK
Normal No No
mnmdd mnmdd c:\windows\system32\drivers\mnmdd.sys Kernel Driver Yes System Running
OK Ignore No Yes

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modem Modem c:\windows\system32\drivers\modem.sys Kernel Driver No Manual Stopped
OK Ignore No No
mouclass Mouse Class Driver c:\windows\system32\drivers\mouclass.sys Kernel Driver
Yes System Running OK Normal No Yes
mountmgr Mount Point Manager c:\windows\system32\drivers\mountmgr.sys Kernel Driver
Yes Boot Running OK Normal No Yes
mraid35x mraid35x Not Available Kernel Driver No DisabledStopped OK
Normal No No
mrxdav WebDav Client Redirector c:\windows\system32\drivers\mrxdav.sys File System Driver
No Manual Stopped OK Normal No No
mrxsmb MRXSMB c:\windows\system32\drivers\mrxsmb.sys File System Driver Yes
System Running OK Normal No Yes
msfs Msfs c:\windows\system32\drivers\msfs.sys File System Driver Yes System
Running OK Normal No Yes
mup Mup c:\windows\system32\drivers\mup.sys File System Driver Yes Boot
Running OK Normal No Yes
ndis NDIS System Driver c:\windows\system32\drivers\ndis.sys Kernel Driver Yes
Boot Running OK Normal No Yes
ndistapi Remote Access NDIS TAPI Driver c:\windows\system32\drivers\ndistapi.sys Kernel Driver
Yes Manual Running OK Normal No Yes
ndisuio NDIS Usermode I/O Protocol c:\windows\system32\drivers\ndisuio.sys Kernel Driver
Yes Manual Running OK Normal No Yes
ndiswan Remote Access NDIS WAN Driver c:\windows\system32\drivers\ndiswan.sys Kernel Driver
Yes Manual Running OK Normal No Yes
ndproxy NDIS Proxy c:\windows\system32\drivers\ndproxy.sys Kernel Driver Yes Manual
Running OK Normal No Yes
netbios NetBIOS Interface c:\windows\system32\drivers\netbios.sys File System Driver
Yes System Running OK Normal No Yes
netbt NetBios over Tcpip c:\windows\system32\drivers\netbt.sys Kernel Driver Yes
System Running OK Normal No Yes
nfrd960 nfrd960 Not Available Kernel Driver No DisabledStopped OK Normal No
No
npfs Npfs c:\windows\system32\drivers\npfs.sys File System Driver Yes System
Running OK Normal No Yes
ntfs Ntfs c:\windows\system32\drivers\ntfs.sys File System Driver Yes Disabled
Running OK Normal No Yes
null Null c:\windows\system32\drivers\null.sys Kernel Driver Yes System Running
OK Normal No Yes
parport Parallel port driver c:\windows\system32\drivers\parport.sys Kernel Driver Yes
Manual Running OK Normal No Yes
partmgr Partition Manager c:\windows\system32\drivers\partmgr.sys Kernel Driver Yes
Boot Running OK Normal No Yes
parvdm Parvdm c:\windows\system32\drivers\parvdm.sys Kernel Driver Yes Auto Running
OK Ignore No Yes
pci PCI Bus Driver c:\windows\system32\drivers\pci.sys Kernel Driver Yes Boot
Running OK Critical No Yes
pciide PCIIde c:\windows\system32\drivers\pciide.sys Kernel Driver Yes Boot Running
OK Normal No Yes
pcmcia Pcmcia c:\windows\system32\drivers\pcmcia.sys Kernel Driver No DisabledStopped
OK Normal No No
pdcomp PDCOMP Not Available Kernel Driver No Manual Stopped OK Ignore
No No
pdframe PDFRAME Not Available Kernel Driver No Manual Stopped OK Ignore
No No

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pdreli PDRELI Not Available Kernel Driver No Manual Stopped OK Ignore No
No
pdrframe PDRFRAME Not Available Kernel Driver No Manual Stopped OK
Ignore No No
perc2 perc2 Not Available Kernel Driver No Disabled Stopped OK Normal No
No
perc2hib perc2hib Not Available Kernel Driver No Disabled Stopped OK Normal No
No
pptpminiport WAN Miniport (PPTP) c:\windows\system32\drivers\raspptp.sys Kernel Driver
Yes Manual Running OK Normal No Yes
processor Processor Driver c:\windows\system32\drivers\processr.sys Kernel Driver Yes
Manual Running OK Normal No Yes
ptilink Direct Parallel Link Driver c:\windows\system32\drivers\ptilink.sys Kernel Driver
Yes Manual Running OK Normal No Yes
ql1080 ql1080 Not Available Kernel Driver No Disabled Stopped OK Normal No
No
ql10wnt Ql10wnt Not Available Kernel Driver No Disabled Stopped OK Normal No
No
ql12160 ql12160 Not Available Kernel Driver No Disabled Stopped OK Normal No
No
ql1240 ql1240 Not Available Kernel Driver No Disabled Stopped OK Normal No
No
ql1280 ql1280 Not Available Kernel Driver No Disabled Stopped OK Normal No
No
ql2100 ql2100 Not Available Kernel Driver No Disabled Stopped OK Normal No
No
ql2200 ql2200 Not Available Kernel Driver No Disabled Stopped OK Normal No
No
ql2300 ql2300 Not Available Kernel Driver No Disabled Stopped OK Normal No
No
rasacd Remote Access Auto Connection Driver c:\windows\system32\drivers\rasacd.sys Kernel
Driver Yes System Running OK Normal No Yes
rasl2tp WAN Miniport (L2TP) c:\windows\system32\drivers\rasl2tp.sys Kernel Driver Yes
Manual Running OK Normal No Yes
raspppoe Remote Access PPPOE Driver c:\windows\system32\drivers\raspppoe.sys Kernel
Driver Yes Manual Running OK Normal No Yes
raspti Direct Parallel c:\windows\system32\drivers\raspti.sys Kernel Driver Yes Manual
Running OK Normal No Yes
rdbss Rdbss c:\windows\system32\drivers\rdbss.sys File System Driver Yes System
Running OK Normal No Yes
rdpcdd RDPCDD c:\windows\system32\drivers\rdpcdd.sys Kernel Driver Yes System
Running OK Ignore No Yes
rdpdr Terminal Server Device Redirector Driver c:\windows\system32\drivers\rdpdr.sys Kernel
Driver Yes Manual Running OK Normal No Yes
rdpwd RDPWD c:\windows\system32\drivers\rdpwd.sys Kernel Driver Yes Manual
Running OK Ignore No Yes
redbook Digital CD Audio Playback Filter Driver c:\windows\system32\drivers\redbook.sys Kernel
Driver Yes System Running OK Normal No Yes
secdrv Secdrv c:\windows\system32\drivers\secdrv.sys Kernel Driver No Manual Stopped
OK Normal No No
serenum Serenum Filter Driver c:\windows\system32\drivers\serenum.sys Kernel Driver Yes
Manual Running OK Normal No Yes
serial Serial port driver c:\windows\system32\drivers\serial.sys Kernel Driver Yes System
Running OK Ignore No Yes

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sfloppy Sfloppy c:\windows\system32\drivers\sfloppy.sys Kernel Driver No System Stopped
OK Ignore No No
simbad Simbad Not Available Kernel Driver No DisabledStopped OK Normal No
No
sparrow Sparrow Not Available Kernel Driver No DisabledStopped OK Normal No
No
srv Srv c:\windows\system32\drivers\srv.sys File System Driver Yes Manual
Running OK Normal No Yes
swenum Software Bus Driver c:\windows\system32\drivers\swenum.sys Kernel Driver Yes
Manual Running OK Normal No Yes
symc810 symc810 Not Available Kernel Driver No DisabledStopped OK
Normal No No
symc8xx symc8xx Not Available Kernel Driver No DisabledStopped OK
Normal No No
symmpi symmpi c:\windows\system32\drivers\symmpi.sys Kernel Driver Yes Boot Running
OK Normal No Yes
sym_hi sym_hi Not Available Kernel Driver No DisabledStopped OK Normal No
No
sym_u3 sym_u3 Not Available Kernel Driver No DisabledStopped OK Normal No
No
tcpip TCP/IP Protocol Driver c:\windows\system32\drivers\tcpip.sys Kernel Driver Yes
System Running OK Normal No Yes
tdpipe TDPIPE c:\windows\system32\drivers\tdpipe.sys Kernel Driver No Manual Stopped
OK Ignore No No
tdtcp TDTCP c:\windows\system32\drivers\tdtcp.sys Kernel Driver Yes Manual Running
OK Ignore No Yes
termdd Terminal Device Driver c:\windows\system32\drivers\termdd.sys Kernel Driver Yes
System Running OK Normal No Yes
toside TosIde Not Available Kernel Driver No DisabledStopped OK Normal No
No
udfs Udfs c:\windows\system32\drivers\udfs.sys File System Driver No Disabled
Stopped OK Normal No No
ultra ultra Not Available Kernel Driver No DisabledStopped OK Normal No
No
update Microcode Update Driver c:\windows\system32\drivers\update.sys Kernel Driver Yes
Manual Running OK Normal No Yes
usbhub USB2 Enabled Hub c:\windows\system32\drivers\usbhub.sys Kernel Driver Yes
Manual Running OK Normal No Yes
usbohci Microsoft USB Open Host Controller Miniport Driver
c:\windows\system32\drivers\usbohci.sys Kernel Driver Yes Manual Running OK
Normal No Yes
vgasave VGA Display Controller. c:\windows\system32\drivers\vga.sys Kernel Driver Yes
System Running OK Ignore No Yes
viaide ViaIde Not Available Kernel Driver No DisabledStopped OK Normal No
No
volsnap Storage volumes c:\windows\system32\drivers\volsnap.sys Kernel Driver Yes Boot
Running OK Normal No Yes
wanarp Remote Access IP ARP Driver c:\windows\system32\drivers\wanarp.sys Kernel Driver
Yes Manual Running OK Normal No Yes
wdica WDICA Not Available Kernel Driver No Manual Stopped OK Ignore No
No
wlbs Network Load Balancing c:\windows\system32\drivers\wlbs.sys Kernel Driver No
Manual Stopped OK Normal No No

[Signed Drivers]

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Appendix C – Tunable Parameters

Device Name Signed Device Class Driver Version Driver Date Manufacturer INF Name Driver Name Device ID
Not Available Not Available Not Available Not Available Not Available Not Available Not Available Not Available HTREE\ROOT\0
ACPI Multiprocessor PC Yes COMPUTER 5.2.3790.0 10/1/2002 (Standard computers) hal.inf Not Available ROOT\ACPI_HAL\0000
Microsoft ACPI-Compliant System Yes SYSTEM 5.2.3790.0 10/1/2002 Microsoft acpi.inf Not Available ACPI_HAL\PNP0C08\0
Processor Yes PROCESSOR 5.2.3790.0 10/1/2002 (Standard processor types) cpu.inf Not Available ACPI\GENUINEINTEL_-_X86_FAMILY_15_MODEL_2_0
Processor Yes PROCESSOR 5.2.3790.0 10/1/2002 (Standard processor types) cpu.inf Not Available ACPI\GENUINEINTEL_-_X86_FAMILY_15_MODEL_2_1
Processor Yes PROCESSOR 5.2.3790.0 10/1/2002 (Standard processor types) cpu.inf Not Available ACPI\GENUINEINTEL_-_X86_FAMILY_15_MODEL_2_2
Processor Yes PROCESSOR 5.2.3790.0 10/1/2002 (Standard processor types) cpu.inf Not Available ACPI\GENUINEINTEL_-_X86_FAMILY_15_MODEL_2_3
PCI bus Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ACPI\PNP0A03\1
ServerWorks Grand Champion CMIC_SL - NorthBridge Super Lite Yes SYSTEM 5.2.3790.0 10/1/2002 ServerWorks (RCC) machine.inf Not Available PCI\VEN_1166&DEV_0017&SUBSYS_00000000&REV_32\3&13C0B0C5&0&00
ServerWorks Grand Champion CMIC_SL - NorthBridge Super Lite Yes SYSTEM 5.2.3790.0 10/1/2002 ServerWorks (RCC) machine.inf Not Available PCI\VEN_1166&DEV_0017&SUBSYS_00000000&REV_00\3&13C0B0C5&0&01
Intel(R) PRO/1000 MT Network ConnectionYes NET 6.3.6.31 10/1/2002 Intel nete1000.inf Not Available PCI\VEN_8086&DEV_100E&SUBSYS_01351028&REV_02\3&13C0B0C5&0&10
RAGE XL PCI Family (Microsoft Corporation) Yes DISPLAY 5.10.2600.6014 8/8/2001 ATI Technologies Inc. atiixpad.inf Not Available PCI\VEN_1002&DEV_4752&SUBSYS_01351028&REV_27\3&13C0B0C5&0&70
Default Monitor Yes MONITOR 5.1.2001.0 6/6/2001(Standard monitor types) monitor.inf Not Available DISPLAY\DEFAULT_MONITOR\4&38274D1&0&80000000&00&0E
ServerWorks Champion CSB5 - SouthBridge 5 Yes SYSTEM 5.2.3790.0 10/1/2002 ServerWorks (RCC) machine.inf Not Available PCI\VEN_1166&DEV_0201&SUBSYS_00000000&REV_93\3&13C0B0C5&0&78
Direct memory access controller Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ACPI\PNP0200\4&25F73A82&0
Numeric data processor Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ACPI\PNP0C04\4&25F73A82&0
Programmable interrupt controller Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ACPI\PNP0000\4&25F73A82&0
System speaker Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ACPI\PNP0800\4&25F73A82&0
System timer Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ACPI\PNP0100\4&25F73A82&0
Standard floppy disk controller Yes FDC 5.2.3790.0 10/1/2002 (Standard floppy disk controllers) fdc.inf Not Available ACPI\PNP0700\4&25F73A82&0
Floppy disk drive Yes FLOPPYDISK 5.2.3790.0 10/1/2002 (Standard floppy disk drives) flpydisk.inf Not Available FDC\GENERIC_FLOPPY_DRIVE\5&1AE2F47D&0&0
Standard 101/102-Key or Microsoft Natural PS/2 Keyboard Yes KEYBOARD 5.2.3790.0 10/1/2002 (Standard keyboards) keyboard.inf Not Available ACPI\PNP0303\4&25F73A82&0

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PS/2 Compatible Mouse Yes MOUSE 5.2.3790.0 10/1/2002 Microsoft
msmouse.inf Not Available ACPI\PNP0F13\4&25F73A82&0
Communications Port Yes PORTS 5.2.3790.0 10/1/2002 (Standard port types)
msports.inf Not Available ACPI\PNP0501\1
ECP Printer Port Yes PORTS 5.2.3790.0 10/1/2002 (Standard port types)
msports.inf Not Available ACPI\PNP0401\4&25F73A82&0
Printer Port Logical Interface Yes SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available
LPTENUM\MICROSOFTRAWPORT\5&39F3CAEA&0&LPT1
System CMOS/real time clock Yes SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available ACPI\PNP0B00\4&25F73A82&0
System board Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices)
machine.inf Not Available ACPI\PNP0C01\2
Standard Dual Channel PCI IDE Controller Yes HDC 5.2.3790.0 10/1/2002
(Standard IDE ATA/ATAPI controllers) mshdc.inf Not Available
PCI\VEN_1166&DEV_0212&SUBSYS_41351028&REV_93\3&13C0B0C5&0&79
Primary IDE Channel Yes HDC 5.2.3790.0 10/1/2002 (Standard IDE
ATA/ATAPI controllers) mshdc.inf Not Available
PCIIDE\IDECHANNEL\4&68D74DF&0&0
Secondary IDE Channel Yes HDC 5.2.3790.0 10/1/2002 (Standard IDE
ATA/ATAPI controllers) mshdc.inf Not Available
PCIIDE\IDECHANNEL\4&68D74DF&0&1
CD-ROM Drive Yes CDROM 5.2.3790.0 10/1/2002 (Standard CD-ROM
drives) cdrom.inf Not Available IDE\CDROMLITEON_DVD-
ROM_LTD163_____GDHB____\5&1A6C219A&0&0.0.0
ServerWorks (RCC) PCI to USB Open Host Controller Yes USB 5.2.3790.0
10/1/2002 ServerWorks (RCC) usbport.inf Not Available
PCI\VEN_1166&DEV_0220&SUBSYS_02201166&REV_05\3&13C0B0C5&0&7A
USB Root Hub Yes USB 5.2.3790.0 10/1/2002 (Standard USB Host Controller)
usbport.inf Not Available USB\ROOT_HUB\4&1A0F8909&0
Serverworks Champion CSB5 - SouthBridge 5 LPC Yes SYSTEM 5.2.3790.0
10/1/2002 ServerWorks (RCC) machine.inf Not Available
PCI\VEN_1166&DEV_0225&SUBSYS_00000000&REV_00\3&13C0B0C5&0&7B
ISAPNP Read Data Port Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system
devices) machine.inf Not Available ISAPNP\READDATAPORT\0
ServerWorks Grand Champion CIOB_X2 - I/O Bridge 133 Mhz Yes SYSTEM
5.2.3790.0 10/1/2002 ServerWorks (RCC) machine.inf Not Available
PCI\VEN_1166&DEV_0101&SUBSYS_00000000&REV_03\3&13C0B0C5&0&80
ServerWorks Grand Champion CIOB_X2 - I/O Bridge 133 Mhz Yes SYSTEM
5.2.3790.0 10/1/2002 ServerWorks (RCC) machine.inf Not Available
PCI\VEN_1166&DEV_0101&SUBSYS_00000000&REV_03\3&13C0B0C5&0&82
System board Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices)
machine.inf Not Available ACPI\PNP0C01\1
PCI bus Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices)
machine.inf Not Available ACPI\PNP0A03\2
LSI Logic PCI-X Ultra320 SCSI Host Adapter Yes SCSIADAPTER 5.2.3790.0
10/1/2002 LSI Logic Inc. pnpscsi.inf Not Available
PCI\VEN_1000&DEV_0030&SUBSYS_01351028&REV_07\3&1070020&0&20
Disk drive Yes DISKDRIVE 5.2.3790.0 10/1/2002 (Standard disk drives)
disk.inf Not Available
SCSI\DISK&VEN_SEAGATE&PROD_ST336752LW&REV_2212\4&1E63B2AC&0&000
PCI bus Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices)
machine.inf Not Available ACPI\PNP0A03\3

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Intel(R) PRO/100+ Server Adapter (PILA8470B) Yes NET 6.6.8.1 10/1/2002 Intel net557.inf Not Available PCI\VEN_8086&DEV_1229&SUBSYS_100C8086&REV_08\3&29E81982&0&20
ACPI Fixed Feature Button Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ACPI\FIXEDBUTTON\2&DABA3FF&0
Logical Disk Manager Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ROOT\DMIO\0000
Volume Manager Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ROOT\FTDISK\0000
Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft volume.inf Not Available STORAGE\VOLUME\1&30A96598&0&SIGNATUREA7EFA7EFOFFSET7E00LENGTH1F4117A00
Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft volume.inf Not Available STORAGE\VOLUME\1&30A96598&0&SIGNATUREA7EFA7EFOFFSET1F411F800LENGTH686551E00
AFD Networking Support Environment Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_AFD\0000
Beep Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_BEEP\0000
CRC Disk Filter Driver Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_CRCDISK\0000
dmboot Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_DMBOOT\0000
dmload Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_DMLOAD\0000
Fips Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_FIPS\0000
Generic Packet Classifier Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_GPC\0000
HTTP Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_HTTP\0000
IPSEC driver Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_IPSEC\0000
ksecdd Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_KSECDD\0000
mnmdd Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_MNMDD\0000
mountmgr Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_MOUNTMGR\0000
NDIS System Driver Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NDIS\0000
Remote Access NDIS TAPI Driver Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NDISTAPI\0000
NDIS Usermode I/O Protocol Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NDISUIO\0000
NDProxy Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NDPROXY\0000
NetBios over Tcpip Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NETBT\0000
Null Not Available LEGACYDRIVER Not Available Not Available Not Available Not Available Not Available ROOT\LEGACY_NULL\0000

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Partition Manager Not Available LEGACYDRIVER Not Available Not Available
Not Available Not Available Not Available ROOT\LEGACY_PARTMGR\0000
Parvdm Not Available LEGACYDRIVER Not Available Not Available Not Available
Not Available Not Available ROOT\LEGACY_PARVDM\0000
Remote Access Auto Connection Driver Not Available LEGACYDRIVER Not Available
Not Available Not Available Not Available Not Available
ROOT\LEGACY_RASACD\0000
RDPCDD Not Available LEGACYDRIVER Not Available Not Available Not
Available Not Available Not Available ROOT\LEGACY_RDPCDD\0000
RDPWD Not Available LEGACYDRIVER Not Available Not Available Not
Available Not Available Not Available ROOT\LEGACY_RDPWD\0000
TCP/IP Protocol Driver Not Available LEGACYDRIVER Not Available Not Available
Not Available Not Available Not Available ROOT\LEGACY_TCPIP\0000
TDTCP Not Available LEGACYDRIVER Not Available Not Available Not Available
Not Available Not Available ROOT\LEGACY_TDTCP\0000
VGA Display Controller. Not Available LEGACYDRIVER Not Available Not Available
Not Available Not Available Not Available ROOT\LEGACY_VGASAVE\0000
volsnap Not Available LEGACYDRIVER Not Available Not Available Not Available
Not Available Not Available ROOT\LEGACY_VOLSNAP\0000
Remote Access IP ARP Driver Not Available LEGACYDRIVER Not Available Not
Available Not Available Not Available Not Available ROOT\LEGACY_WANARP\0000
Audio Codecs Yes MEDIA 5.2.3790.0 10/1/2002 (Standard system devices) wave.inf
Not Available ROOT\MEDIA\MS_MMACM
Legacy Audio Drivers Yes MEDIA 5.2.3790.0 10/1/2002 (Standard system devices)
wave.inf Not Available ROOT\MEDIA\MS_MMDRV
Media Control Devices Yes MEDIA 5.2.3790.0 10/1/2002 (Standard system devices)
wave.inf Not Available ROOT\MEDIA\MS_MMMCI
Legacy Video Capture Devices Yes MEDIA 5.2.3790.0 10/1/2002 (Standard system
devices) wave.inf Not Available ROOT\MEDIA\MS_MMVCD
Video Codecs Yes MEDIA 5.2.3790.0 10/1/2002 (Standard system devices) wave.inf
Not Available ROOT\MEDIA\MS_MMVID
WAN Miniport (L2TP) Yes NET 5.2.3790.0 10/1/2002 Microsoft
netrasa.inf Not Available ROOT\MS_L2TPMINIPORT\0000
WAN Miniport (IP) Yes NET 5.2.3790.0 10/1/2002 Microsoft
netrasa.inf Not Available ROOT\MS_NDISWANIP\0000
WAN Miniport (PPPOE) Yes NET 5.2.3790.0 10/1/2002 Microsoft
netrasa.inf Not Available ROOT\MS_PPPOEMINIPORT\0000
WAN Miniport (PPTP) Yes NET 5.2.3790.0 10/1/2002 Microsoft
netrasa.inf Not Available ROOT\MS_PPTPMINIPORT\0000
Direct Parallel Yes NET 5.2.3790.0 10/1/2002 Microsoft netrasa.inf
Not Available ROOT\MS_PTIMINIPORT\0000
Terminal Server Device Redirector Yes SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available ROOT\RDPDR\0000
Terminal Server Keyboard Driver Yes SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available ROOT\RDP_KBD\0000
Terminal Server Mouse Driver Yes SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available ROOT\RDP_MOU\0000
Plug and Play Software Device Enumerator Yes SYSTEM 5.2.3790.0 10/1/2002
(Standard system devices) machine.inf Not Available ROOT\SYSTEM\0000
Microcode Update Device Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system
devices) machine.inf Not Available ROOT\SYSTEM\0001

[Environment Variables]

Variable Value User Name

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Appendix C – Tunable Parameters

ComSpec %SystemRoot%\system32\cmd.exe <SYSTEM>
Path
C:\mksnt;C:\WINDOWS\system32;C:\WINDOWS;C:\WINDOWS\System32\Wbem;C:\PROGR
A~1\MICROS~1\80\Tools\BINN; <SYSTEM>
windir %SystemRoot% <SYSTEM>
OS Windows_NT <SYSTEM>
PROCESSOR_ARCHITECTURE x86 <SYSTEM>
PROCESSOR_LEVEL 15 <SYSTEM>
PROCESSOR_IDENTIFIER x86 Family 15 Model 2 Stepping 7, GenuineIntel <SYSTEM>
PROCESSOR_REVISION 0207 <SYSTEM>
NUMBER_OF_PROCESSORS 4 <SYSTEM>
ClusterLog C:\WINDOWS\Cluster\cluster.log <SYSTEM>
PATHEXT .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.VBS <SYSTEM>
TEMP %SystemRoot%\TEMP <SYSTEM>
TMP %SystemRoot%\TEMP <SYSTEM>
ROOTDIR C:/ <SYSTEM>
SHELL C:/mksnt/sh.exe <SYSTEM>
HOME C:/Documents and Settings/Administrator <SYSTEM>
TMPDIR C:/WINDOWS/TEMP <SYSTEM>
TEMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\SYSTEM
TMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\SYSTEM
TEMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\LOCAL SERVICE
TMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\LOCAL SERVICE
TEMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\NETWORK SERVICE
TMP %USERPROFILE%\Local Settings\Temp NT AUTHORITY\NETWORK SERVICE
TEMP %USERPROFILE%\Local Settings\Temp CLIENT77\Administrator
TMP %USERPROFILE%\Local Settings\Temp CLIENT77\Administrator

[Print Jobs]

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

[Network Connections]

Local Name Remote Name Type Status User Name

[Running Tasks]

Name Path Process ID Priority Min Working Set Max Working SetStart Time Version
Size File Date
system idle process Not Available 0 0 Not Available Not Available Not
Available Not Available Not Available Not Available
system Not Available 4 8 0 1413120Not Available Not Available Not
Available Not Available
smss.exeNot Available 492 11 204800 1413120 1/14/2004 11:39 AM Not Available
Not Available Not Available
csrss.exeNot Available 540 13 Not Available Not Available 1/14/2004 11:39 AM
Not Available Not Available Not Available
winlogon.exe c:\windows\system32\winlogon.exe564 13 204800 1413120 1/14/2004 11:39
AM 5.2.3790.0 (srv03_rtm.030324-2048) 536.50 KB (549,376 bytes) 3/29/2003 12:00
AM

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services.exe c:\windows\system32\services.exe 616 9 204800 1413120 1/14/2004 11:39 AM 5.2.3790.0 (srv03_rtm.030324-2048) 102.00 KB (104,448 bytes) 3/29/2003 12:00 AM
lsass.exe c:\windows\system32\lsass.exe 628 9 204800 1413120 1/14/2004 11:39 AM 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 12:00 AM
svchost.exe c:\windows\system32\svchost.exe 788 8 204800 1413120 1/14/2004 11:39 AM 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 12:00 AM
svchost.exe c:\windows\system32\svchost.exe 844 8 204800 1413120 1/14/2004 11:39 AM 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 12:00 AM
svchost.exe Not Available 1004 8 Not Available Not Available 1/14/2004 11:39 AM Not Available Not Available Not Available
svchost.exe Not Available 1076 8 Not Available Not Available 1/14/2004 11:39 AM Not Available Not Available Not Available
svchost.exe c:\windows\system32\svchost.exe 1088 8 204800 1413120 1/14/2004 11:39 AM 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 12:00 AM
spoolsv.exe c:\windows\system32\spoolsv.exe 1312 8 204800 1413120 1/14/2004 11:40 AM 5.2.3790.0 (srv03_rtm.030324-2048) 55.00 KB (56,320 bytes) 3/29/2003 12:00 AM
msdtc.exe Not Available 1344 8 Not Available Not Available 1/14/2004 11:40 AM Not Available Not Available Not Available
svchost.exe c:\windows\system32\svchost.exe 1504 8 204800 1413120 1/14/2004 11:40 AM 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 12:00 AM
inetinfo.exe c:\windows\system32\inetsrv\inetinfo.exe 1572 8 204800 1413120 1/14/2004 11:40 AM 6.0.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 11/13/2003 2:13 PM
svchost.exe Not Available 1700 8 Not Available Not Available 1/14/2004 11:40 AM Not Available Not Available Not Available
dfssvc.exe c:\windows\system32\dfssvc.exe 2036 8 204800 1413120 1/14/2004 11:40 AM 5.2.3790.0 (srv03_rtm.030324-2048) 130.50 KB (133,632 bytes) 3/29/2003 12:00 AM
svchost.exe c:\windows\system32\svchost.exe 300 8 204800 1413120 1/14/2004 11:40 AM 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 12:00 AM
explorer.exe c:\windows\explorer.exe 536 8 204800 1413120 1/14/2004 11:40 AM 6.00.3790.0 (srv03_rtm.030324-2048) 1,008.50 KB (1,032,704 bytes) 3/29/2003 12:00 AM
helpctr.exe c:\windows\pchealth\helpctr\binaries\helpctr.exe 1728 8 204800 1413120 1/14/2004 11:40 AM 5.2.3790.0 (srv03_rtm.030324-2048) 764.00 KB (782,336 bytes) 11/13/2003 1:32 PM
helpsvc.exe c:\windows\pchealth\helpctr\binaries\helpsvc.exe 1928 8 204800 1413120 1/14/2004 11:40 AM 5.2.3790.0 (srv03_rtm.030324-2048) 720.00 KB (737,280 bytes) 11/13/2003 1:32 PM
helphost.exe c:\windows\pchealth\helpctr\binaries\helphost.exe 2000 8 204800 1413120 1/14/2004 11:40 AM 5.2.3790.0 (srv03_rtm.030324-2048) 106.00 KB (108,544 bytes) 11/13/2003 1:32 PM
helpctr.exe c:\windows\pchealth\helpctr\binaries\helpctr.exe 440 8 204800 1413120 1/14/2004 11:40 AM 5.2.3790.0 (srv03_rtm.030324-2048) 764.00 KB (782,336 bytes) 11/13/2003 1:32 PM
wmiprvse.exe Not Available 480 8 Not Available Not Available 1/14/2004 11:40 AM Not Available Not Available Not Available

[Loaded Modules]

Name Version Size File Date Manufacturer Path
winlogon 5.2.3790.0 (srv03_rtm.030324-2048) 536.50 KB (549,376 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\winlogon.exe

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ntdll 5.2.3790.0 (srv03_rtm.030324-2048) 722.50 KB (739,840 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\ntdll.dll
kernel32 5.2.3790.0 (srv03_rtm.030324-2048) 965.00 KB (988,160 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\kernel32.dll
msvcrt 7.0.3790.0 (srv03_rtm.030324-2048) 319.50 KB (327,168 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msvcrt.dll
advapi32 5.2.3790.0 (srv03_rtm.030324-2048) 559.50 KB (572,928 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\advapi32.dll
rpcrt4 5.2.3790.0 (srv03_rtm.030324-2048) 643.50 KB (658,944 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rpcrt4.dll
user32 5.2.3790.0 (srv03_rtm.030324-2048) 562.00 KB (575,488 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\user32.dll
gdi32 5.2.3790.0 (srv03_rtm.030324-2048) 263.00 KB (269,312 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\gdi32.dll
userenv 5.2.3790.0 (srv03_rtm.030324-2048) 732.50 KB (750,080 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\userenv.dll
nddeapi 5.2.3790.0 (srv03_rtm.030324-2048) 16.00 KB (16,384 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\nddeapi.dll
crypt32 5.131.3790.0 (srv03_rtm.030324-2048) 598.00 KB (612,352 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\crypt32.dll
msasn1 5.2.3790.0 (srv03_rtm.030324-2048) 58.00 KB (59,392 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msasn1.dll
secur32 5.2.3790.0 (srv03_rtm.030324-2048) 63.00 KB (64,512 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\secur32.dll
winsta 5.2.3790.0 (srv03_rtm.030324-2048) 51.00 KB (52,224 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\winsta.dll
netapi32 5.2.3790.0 (srv03_rtm.030324-2048) 317.00 KB (324,608 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\netapi32.dll
profmap 5.2.3790.0 (srv03_rtm.030324-2048) 22.00 KB (22,528 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\profmap.dll
regapi 5.2.3790.0 (srv03_rtm.030324-2048) 48.50 KB (49,664 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\regapi.dll
ws2_32 5.2.3790.0 (srv03_rtm.030324-2048) 87.50 KB (89,600 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\ws2_32.dll
ws2help 5.2.3790.0 (srv03_rtm.030324-2048) 19.50 KB (19,968 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\ws2help.dll
psapi 5.2.3790.0 (srv03_rtm.030324-2048) 21.50 KB (22,016 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\psapi.dll
version 5.2.3790.0 (srv03_rtm.030324-2048) 17.00 KB (17,408 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\version.dll
setupapi 5.2.3790.0 (srv03_rtm.030324-2048) 1,014.50 KB (1,038,848 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\setupapi.dll
msgina 5.2.3790.0 (srv03_rtm.030324-2048) 1.14 MB (1,191,936 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msgina.dll
shsvcs 6.00.3790.0 (srv03_rtm.030324-2048) 121.50 KB (124,416 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\shsvcs.dll
shlwapi 6.00.3790.0 (srv03_rtm.030324-2048) 281.00 KB (287,744 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\shlwapi.dll
sfc 5.2.3790.0 (srv03_rtm.030324-2048) 4.50 KB (4,608 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\sfc.dll
sfc_os 5.2.3790.0 (srv03_rtm.030324-2048) 133.00 KB (136,192 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\sfc_os.dll
wintrust 5.131.3790.0 (srv03_rtm.030324-2048) 161.50 KB (165,376 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wintrust.dll

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ole32 5.2.3790.0 (srv03_rtm.030324-2048) 1.13 MB (1,187,328 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\ole32.dll
imagehlp 5.2.3790.0 (srv03_rtm.030324-2048) 142.50 KB (145,920 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\imagehlp.dll
comctl32 6.0 (srv03_rtm.030324-2048) 907.00 KB (928,768 bytes) 11/13/2003 7:16 AM Microsoft Corporation c:\windows\winsxs\x86_microsoft.windows.common-controls_6595b64144ccf1df_6.0.100.0_x-ww_8417450b\comctl32.dll
winscard 5.2.3790.0 (srv03_rtm.030324-2048) 98.50 KB (100,864 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\winscard.dll
wtsapi32 5.2.3790.0 (srv03_rtm.030324-2048) 17.50 KB (17,920 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wtsapi32.dll
sxs 5.2.3790.0 (srv03_rtm.030324-2048) 733.00 KB (750,592 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\sxs.dll
winmm 5.2.3790.0 (srv03_rtm.030324-2048) 166.00 KB (169,984 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\winmm.dll
shell32 6.00.3790.0 (srv03_rtm.030324-2048) 7.79 MB (8,166,400 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\shell32.dll
wldap32 5.2.3790.0 (srv03_rtm.030324-2048) 158.00 KB (161,792 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wldap32.dll
rsaenh 5.2.3790.0 (srv03_rtm.030324-2048) 176.83 KB (181,072 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rsaenh.dll
cscdll 5.2.3790.0 (srv03_rtm.030324-2048) 99.00 KB (101,376 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\cscdll.dll
wlnotify 5.2.3790.0 (srv03_rtm.030324-2048) 87.50 KB (89,600 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wlnotify.dll
winspool 5.2.3790.0 (srv03_rtm.030324-2048) 140.00 KB (143,360 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\winspool.drv
mpr 5.2.3790.0 (srv03_rtm.030324-2048) 56.00 KB (57,344 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mpr.dll
comctl32 5.82 (srv03_rtm.030324-2048) 561.00 KB (574,464 bytes) 11/13/2003 7:16 AM Microsoft Corporation c:\windows\winsxs\x86_microsoft.windows.common-controls_6595b64144ccf1df_5.82.0.0_x-ww_8a69ba05\comctl32.dll
uxtheme 6.00.3790.0 (srv03_rtm.030324-2048) 196.00 KB (200,704 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\uxtheme.dll
samlib 5.2.3790.0 (srv03_rtm.030324-2048) 49.00 KB (50,176 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\samlib.dll
cscui 5.2.3790.0 (srv03_rtm.030324-2048) 305.00 KB (312,320 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\cscui.dll
oleaut32 5.2.3790.0 486.00 KB (497,664 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\oleaut32.dll
clbcatq 2001.12.4720.0 (srv03_rtm.030324-2048) 481.00 KB (492,544 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\clbcatq.dll
comres 2001.12.4720.0 (srv03_rtm.030324-2048) 778.00 KB (796,672 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\comres.dll
ntmarta 5.2.3790.0 (srv03_rtm.030324-2048) 114.00 KB (116,736 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\ntmarta.dll
services 5.2.3790.0 (srv03_rtm.030324-2048) 102.00 KB (104,448 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\services.exe
scesrv 5.2.3790.0 (srv03_rtm.030324-2048) 316.50 KB (324,096 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\scesrv.dll
authz 5.2.3790.0 (srv03_rtm.030324-2048) 67.00 KB (68,608 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\authz.dll
umpnpmgr 5.2.3790.0 (srv03_rtm.030324-2048) 121.50 KB (124,416 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\umpnpmgr.dll

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ncobjapi 5.2.3790.0 (srv03_rtm.030324-2048) 34.50 KB (35,328 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\ncobjapi.dll
msvcp60 6.05.2144.0 388.00 KB (397,312 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\msvcp60.dll
eventlog 5.2.3790.0 (srv03_rtm.030324-2048) 60.50 KB (61,952 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\eventlog.dll
lsass 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\lsass.exe
lsasrv 5.2.3790.0 (srv03_rtm.030324-2048) 780.50 KB (799,232 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\lsasrv.dll
samsrv 5.2.3790.0 (srv03_rtm.030324-2048) 452.00 KB (462,848 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\samsrv.dll
cryptdll 5.2.3790.0 (srv03_rtm.030324-2048) 34.00 KB (34,816 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\cryptdll.dll
dnsapi 5.2.3790.0 (srv03_rtm.030324-2048) 147.50 KB (151,040 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\dnsapi.dll
ntdsapi 5.2.3790.0 (srv03_rtm.030324-2048) 76.00 KB (77,824 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\ntdsapi.dll
msprivs 5.2.3790.0 (srv03_rtm.030324-2048) 46.50 KB (47,616 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\msprivs.dll
kerberos 5.2.3790.0 (srv03_rtm.030324-2048) 332.50 KB (340,480 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\kerberos.dll
msv1_0 5.2.3790.0 (srv03_rtm.030324-2048) 127.00 KB (130,048 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\msv1_0.dll
netlogon 5.2.3790.0 (srv03_rtm.030324-2048) 409.00 KB (418,816 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\netlogon.dll
w32time 5.2.3790.0 (srv03_rtm.030324-2048) 216.00 KB (221,184 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\w32time.dll
iphlpapi 5.2.3790.0 (srv03_rtm.030324-2048) 82.50 KB (84,480 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\iphlpapi.dll
schannel 5.2.3790.0 (srv03_rtm.030324-2048) 149.50 KB (153,088 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\schannel.dll
wdigest 5.2.3790.0 (srv03_rtm.030324-2048) 61.00 KB (62,464 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\wdigest.dll
rassfm 5.2.3790.0 (srv03_rtm.030324-2048) 20.50 KB (20,992 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\rassfm.dll
kdcsvc 5.2.3790.0 (srv03_rtm.030324-2048) 221.00 KB (226,304 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\kdcsvc.dll
ntdsa 5.2.3790.0 (srv03_rtm.030324-2048) 1.45 MB (1,520,640 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\ntdsa.dll
ntdsatq 5.2.3790.0 (srv03_rtm.030324-2048) 32.00 KB (32,768 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\ntdsatq.dll
mswsock 5.2.3790.0 (srv03_rtm.030324-2048) 254.00 KB (260,096 bytes)
3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mswsock.dll
esent 5.2.3790.0 (srv03_rtm.030324-2048) 1.01 MB (1,056,256 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\esent.dll
scecli 5.2.3790.0 (srv03_rtm.030324-2048) 179.50 KB (183,808 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\scecli.dll
wshtcpip 5.2.3790.0 (srv03_rtm.030324-2048) 18.00 KB (18,432 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\wshtcpip.dll
ipsecsvc 5.2.3790.0 (srv03_rtm.030324-2048) 162.50 KB (166,400 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\ipsecsvc.dll
oakley 5.2.3790.0 (srv03_rtm.030324-2048) 325.50 KB (333,312 bytes) 3/29/2003 12:00
AM Microsoft Corporation c:\windows\system32\oakley.dll

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winipsec 5.2.3790.0 (srv03_rtm.030324-2048) 34.50 KB (35,328 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\winipsec.dll
pstorsvc 5.2.3790.0 (srv03_rtm.030324-2048) 24.00 KB (24,576 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\pstorsvc.dll
psbase 5.2.3790.0 (srv03_rtm.030324-2048) 81.00 KB (82,944 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\psbase.dll
dssenh 5.2.3790.0 (srv03_rtm.030324-2048) 131.33 KB (134,480 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\dssenh.dll
wlbsctrl 5.2.3790.0 (srv03_rtm.030324-2048) 78.00 KB (79,872 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wlbsctrl.dll
w3ssl 6.0.3790.0 (srv03_rtm.030324-2048) 15.00 KB (15,360 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\w3ssl.dll
strmfilt 6.0.3790.0 (srv03_rtm.030324-2048) 70.50 KB (72,192 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\strmfilt.dll
httpapi 5.2.3790.0 (srv03_rtm.030324-2048) 26.50 KB (27,136 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\httpapi.dll
svchost 5.2.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\svchost.exe
rpcss 5.2.3790.0 (srv03_rtm.030324-2048) 276.50 KB (283,136 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rpcss.dll
termsrv 5.2.3790.0 (srv03_rtm.030324-2048) 216.50 KB (221,696 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\termsrv.dll
icaapi 5.2.3790.0 (srv03_rtm.030324-2048) 10.50 KB (10,752 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\icaapi.dll
mstlsapi 5.2.3790.0 (srv03_rtm.030324-2048) 104.50 KB (107,008 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mstlsapi.dll
activeds 5.2.3790.0 (srv03_rtm.030324-2048) 189.00 KB (193,536 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\activeds.dll
adsldpc 5.2.3790.0 (srv03_rtm.030324-2048) 142.50 KB (145,920 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\adsldpc.dll
credui 5.2.3790.0 (srv03_rtm.030324-2048) 159.00 KB (162,816 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\credui.dll
atl 3.05.2283 83.00 KB (84,992 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\atl.dll
rdpwsx 5.2.3790.0 (srv03_rtm.030324-2048) 80.13 KB (82,056 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\rdpwsx.dll
wzcsvc 5.2.3790.0 (srv03_rtm.030324-2048) 272.50 KB (279,040 bytes) 3/25/2003 6:15 AM Microsoft Corporation c:\windows\system32\wzcsvc.dll
rtutils 5.2.3790.0 (srv03_rtm.030324-2048) 32.00 KB (32,768 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rtutils.dll
wmi 5.2.3790.0 (srv03_rtm.030324-2048) 6.50 KB (6,656 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wmi.dll
dhcpcsvc 5.2.3790.0 (srv03_rtm.030324-2048) 101.50 KB (103,936 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\dhcpcsvc.dll
rastls 5.2.3790.0 (srv03_rtm.030324-2048) 155.00 KB (158,720 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rastls.dll
cryptui 5.131.3790.0 (srv03_rtm.030324-2048) 473.50 KB (484,864 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\cryptui.dll
mprapi 5.2.3790.0 (srv03_rtm.030324-2048) 81.00 KB (82,944 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mprapi.dll
rasapi32 5.2.3790.0 (srv03_rtm.030324-2048) 227.50 KB (232,960 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rasapi32.dll
rasman 5.2.3790.0 (srv03_rtm.030324-2048) 56.50 KB (57,856 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rasman.dll

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tapi32 5.2.3790.0 (srv03_rtm.030324-2048) 175.00 KB (179,200 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\tapi32.dll
raschap 5.2.3790.0 (srv03_rtm.030324-2048) 106.00 KB (108,544 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\raschap.dll
schedsvc 5.2.3790.0 (srv03_rtm.030324-2048) 176.00 KB (180,224 bytes) 11/13/2003 1:32 PM Microsoft Corporation c:\windows\system32\schedsvc.dll
wiarpc 5.2.3790.0 (srv03_rtm.030324-2048) 30.00 KB (30,720 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wiarpc.dll
msidle 6.00.3790.0 (srv03_rtm.030324-2048) 5.50 KB (5,632 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msidle.dll
audiosrv 5.2.3790.0 (srv03_rtm.030324-2048) 38.00 KB (38,912 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\audiosrv.dll
wkssvc 5.2.3790.0 (srv03_rtm.030324-2048) 125.00 KB (128,000 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wkssvc.dll
cryptsvc 5.2.3790.0 (srv03_rtm.030324-2048) 51.00 KB (52,224 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\cryptsvc.dll
certcli 5.2.3790.0 (srv03_rtm.030324-2048) 228.00 KB (233,472 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\certcli.dll
vssapi 5.2.3790.0 (srv03_rtm.030324-2048) 528.00 KB (540,672 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\vssapi.dll
dmserver 5.2.3790.0 (srv03_rtm.030324-2048) 24.00 KB (24,576 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\dmserver.dll
es 2001.12.4720.0 (srv03_rtm.030324-2048) 221.50 KB (226,816 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\es.dll
pchsvc 5.2.3790.0 (srv03_rtm.030324-2048) 31.50 KB (32,256 bytes) 11/13/2003 1:32 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\pchsvc.dll
srvsvc 5.2.3790.0 (srv03_rtm.030324-2048) 89.00 KB (91,136 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\srvsvc.dll
seclogon 5.2.3790.0 (srv03_rtm.030324-2048) 16.50 KB (16,896 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\seclogon.dll
sens 5.2.3790.0 (srv03_rtm.030324-2048) 35.50 KB (36,352 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\sens.dll
trkwks 5.2.3790.0 (srv03_rtm.030324-2048) 85.00 KB (87,040 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\trkwks.dll
wmisvc 5.2.3790.0 (srv03_rtm.030324-2048) 131.00 KB (134,144 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\wbem\wmisvc.dll
wuauserv 5.4.3790.0 (srv03_rtm.030324-2048) 10.50 KB (10,752 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\wuauserv.dll
wuaueng 5.4.3790.0 (srv03_rtm.030324-2048) 188.50 KB (193,024 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\wuaueng.dll
advpack 6.00.3790.0 (srv03_rtm.030324-2048) 93.50 KB (95,744 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\advpack.dll
wininet 6.00.3790.0 (srv03_rtm.030324-2048) 609.00 KB (623,616 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wininet.dll
winrnr 5.2.3790.0 (srv03_rtm.030324-2048) 15.00 KB (15,360 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\winrnr.dll
comsvcs 2001.12.4720.0 (srv03_rtm.030324-2048) 1.14 MB (1,199,616 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\comsvcs.dll
browser 5.2.3790.0 (srv03_rtm.030324-2048) 70.50 KB (72,192 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\browser.dll
actxprxy 6.00.3790.0 (srv03_rtm.030324-2048) 95.00 KB (97,280 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\actxprxy.dll
netrap 5.2.3790.0 (srv03_rtm.030324-2048) 11.50 KB (11,776 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\netrap.dll

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rasadhlp 5.2.3790.0 (srv03_rtm.030324-2048) 6.50 KB (6,656 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rasadhlp.dll
netman 5.2.3790.0 (srv03_rtm.030324-2048) 209.00 KB (214,016 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\netman.dll
wzcsapi 5.2.3790.0 (srv03_rtm.030324-2048) 24.50 KB (25,088 bytes) 3/25/2003 6:15 AM Microsoft Corporation c:\windows\system32\wzcsapi.dll
netshell 5.2.3790.0 (srv03_rtm.030324-2048) 1.67 MB (1,747,456 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\netshell.dll
clusapi 5.2.3790.0 (srv03_rtm.030324-2048) 56.00 KB (57,344 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\clusapi.dll
netcfgx 5.2.3790.0 (srv03_rtm.030324-2048) 726.00 KB (743,424 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\netcfgx.dll
hnetcfg 5.2.3790.0 (srv03_rtm.030324-2048) 243.50 KB (249,344 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\hnetcfg.dll
wbemprox 5.2.3790.0 (srv03_rtm.030324-2048) 17.50 KB (17,920 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\wbem\wbemprox.dll
wbemcomn 5.2.3790.0 (srv03_rtm.030324-2048) 211.50 KB (216,576 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wbem\wbemcomn.dll
wbemcore 5.2.3790.0 (srv03_rtm.030324-2048) 457.00 KB (467,968 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\wbem\wbemcore.dll
esscli 5.2.3790.0 (srv03_rtm.030324-2048) 235.50 KB (241,152 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\wbem\esscli.dll
fastprox 5.2.3790.0 (srv03_rtm.030324-2048) 443.00 KB (453,632 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\wbem\fastprox.dll
wbemsvc 5.2.3790.0 (srv03_rtm.030324-2048) 42.50 KB (43,520 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\wbem\wbemsvc.dll
wmiutils 5.2.3790.0 (srv03_rtm.030324-2048) 90.50 KB (92,672 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\wbem\wmiutils.dll
repdrvfs 5.2.3790.0 (srv03_rtm.030324-2048) 165.00 KB (168,960 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\wbem\repdrvfs.dll
wmiprvsd 5.2.3790.0 (srv03_rtm.030324-2048) 405.50 KB (415,232 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\wbem\wmiprvsd.dll
wbemess 5.2.3790.0 (srv03_rtm.030324-2048) 256.50 KB (262,656 bytes) 11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\wbem\wbemess.dll
rasdlg 5.2.3790.0 (srv03_rtm.030324-2048) 642.00 KB (657,408 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\rasdlg.dll
spoolsv 5.2.3790.0 (srv03_rtm.030324-2048) 55.00 KB (56,320 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\spoolsv.exe
spoolss 5.2.3790.0 (srv03_rtm.030324-2048) 79.00 KB (80,896 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\spoolss.dll
localspl 5.2.3790.0 (srv03_rtm.030324-2048) 304.50 KB (311,808 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\localspl.dll
cnbjmon 5.2.3680.0 (Lab03_dev(skatari).020509-1043) 45.50 KB (46,592 bytes) 3/24/2003 7:48 PM Microsoft Corporation c:\windows\system32\cnbjmon.dll
pjlmon 5.2.3790.0 (srv03_rtm.030324-2048) 15.00 KB (15,360 bytes) 3/24/2003 7:49 PM Microsoft Corporation c:\windows\system32\pjlmon.dll
tcpmon 5.2.3790.0 (srv03_rtm.030324-2048) 44.00 KB (45,056 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\tcpmon.dll
mgmtapi 5.2.3790.0 (srv03_rtm.030324-2048) 14.00 KB (14,336 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mgmtapi.dll
snmpapi 5.2.3790.0 (srv03_rtm.030324-2048) 17.50 KB (17,920 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\snmpapi.dll
wsnmp32 5.2.3790.0 (srv03_rtm.030324-2048) 39.50 KB (40,448 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wsnmp32.dll

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usbmon 5.2.3790.0 (srv03_rtm.030324-2048) 17.00 KB (17,408 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\usbmon.dll
win32spl 5.2.3790.0 (srv03_rtm.030324-2048) 94.50 KB (96,768 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\win32spl.dll
inetpp 5.2.3790.0 (srv03_rtm.030324-2048) 71.50 KB (73,216 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\inetpp.dll
icmp 5.2.3790.0 (srv03_rtm.030324-2048) 4.50 KB (4,608 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\icmp.dll
ersvc 5.2.3790.0 (srv03_rtm.030324-2048) 22.00 KB (22,528 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\ersvc.dll
inetinfo 6.0.3790.0 (srv03_rtm.030324-2048) 13.00 KB (13,312 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\inetsrv\inetinfo.exe
iisutil 6.0.3790.0 (srv03_rtm.030324-2048) 177.00 KB (181,248 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\inetsrv\iisutil.dll
rpcref 6.0.3790.0 (srv03_rtm.030324-2048) 4.00 KB (4,096 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\inetsrv\rpcref.dll
iisrtl 6.0.3790.0 (srv03_rtm.030324-2048) 129.00 KB (132,096 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\iisrtl.dll
iisadmin 6.0.3790.0 (srv03_rtm.030324-2048) 18.50 KB (18,944 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\inetsrv\iisadmin.dll
coadmin 6.0.3790.0 (srv03_rtm.030324-2048) 48.50 KB (49,664 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\inetsrv\coadmin.dll
admwprox 6.0.3790.0 (srv03_rtm.030324-2048) 44.00 KB (45,056 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\admwprox.dll
iiscfg 6.0.3790.0 (srv03_rtm.030324-2048) 1.06 MB (1,116,160 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\inetsrv\iiscfg.dll
metadata 6.0.3790.0 (srv03_rtm.030324-2048) 218.50 KB (223,744 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\inetsrv\metadata.dll
msxml3 8.40.9419.0 1.28 MB (1,337,344 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msxml3.dll
svcext 6.0.3790.0 (srv03_rtm.030324-2048) 41.50 KB (42,496 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\inetsrv\svcext.dll
security 5.2.3790.0 (srv03_rtm.030324-2048) 5.50 KB (5,632 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\security.dll
iismap 6.0.3790.0 (srv03_rtm.030324-2048) 55.00 KB (56,320 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\iismap.dll
wamreg 6.0.3790.0 (srv03_rtm.030324-2048) 52.00 KB (53,248 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\inetsrv\wamreg.dll
dfssvc 5.2.3790.0 (srv03_rtm.030324-2048) 130.50 KB (133,632 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\dfssvc.exe
resutils 5.2.3790.0 (srv03_rtm.030324-2048) 59.00 KB (60,416 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\resutils.dll
mfc42u 6.05.3014.0 960.00 KB (983,040 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mfc42u.dll
wsock32 5.2.3790.0 (srv03_rtm.030324-2048) 22.00 KB (22,528 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\wsock32.dll
iisw3adm 6.0.3790.0 (srv03_rtm.030324-2048) 199.50 KB (204,288 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\inetsrv\iisw3adm.dll
w3cache 6.0.3790.0 (srv03_rtm.030324-2048) 21.00 KB (21,504 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\inetsrv\w3cache.dll
w3tp 6.0.3790.0 (srv03_rtm.030324-2048) 12.50 KB (12,800 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\inetsrv\w3tp.dll
lonsint 6.0.3790.0 (srv03_rtm.030324-2048) 11.50 KB (11,776 bytes) 11/13/2003 2:13 PM Microsoft Corporation c:\windows\system32\inetsrv\lonsint.dll

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explorer 6.00.3790.0 (srv03_rtm.030324-2048) 1,008.50 KB (1,032,704 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\explorer.exe
browseui 6.00.3790.0 (srv03_rtm.030324-2048) 1.01 MB (1,057,280 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\browseui.dll
shdocvw 6.00.3790.0 (srv03_rtm.030324-2048) 1.33 MB (1,393,664 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\shdocvw.dll
apphelp 5.2.3790.0 (srv03_rtm.030324-2048) 122.00 KB (124,928 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\apphelp.dll
themeui 6.00.3790.0 (srv03_rtm.030324-2048) 360.50 KB (369,152 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\themeui.dll
msimg32 5.2.3790.0 (srv03_rtm.030324-2048) 4.50 KB (4,608 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msimg32.dll
linkinfo 5.2.3790.0 (srv03_rtm.030324-2048) 16.50 KB (16,896 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\linkinfo.dll
ntshrui 6.00.3790.0 (srv03_rtm.030324-2048) 136.00 KB (139,264 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\ntshrui.dll
webcheck 6.00.3790.0 (srv03_rtm.030324-2048) 261.50 KB (267,776 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\webcheck.dll
stobject 5.2.3790.0 (srv03_rtm.030324-2048) 117.50 KB (120,320 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\stobject.dll
batmeter 6.00.3790.0 (srv03_rtm.030324-2048) 28.50 KB (29,184 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\batmeter.dll
powrprof 6.00.3790.0 (srv03_rtm.030324-2048) 14.50 KB (14,848 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\powrprof.dll
printui 5.2.3790.0 (srv03_rtm.030324-2048) 536.50 KB (549,376 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\printui.dll
cfgmgr32 5.2.3790.0 (srv03_rtm.030324-2048) 17.50 KB (17,920 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\cfgmgr32.dll
urlmon 6.00.3790.0 (srv03_rtm.030324-2048) 501.50 KB (513,536 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\urlmon.dll
helpctr 5.2.3790.0 (srv03_rtm.030324-2048) 764.00 KB (782,336 bytes) 11/13/2003 1:32 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\helpctr.exe
hcappres 5.2.3790.0 (srv03_rtm.030324-2048) 6.50 KB (6,656 bytes) 11/13/2003 1:32 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\hcappres.dll
itss 5.2.3790.0 (srv03_rtm.030324-2048) 119.50 KB (122,368 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\itss.dll
pchshell 5.2.3790.0 (srv03_rtm.030324-2048) 100.50 KB (102,912 bytes) 11/13/2003 1:32 PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\pchshell.dll
mlang 6.00.3790.0 (srv03_rtm.030324-2048) 570.00 KB (583,680 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mlang.dll
mshtml 6.00.3790.0 (srv03_rtm.030324-2048) 2.78 MB (2,916,352 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mshtml.dll
msimtf 5.2.3790.0 (srv03_rtm.030324-2048) 149.00 KB (152,576 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msimtf.dll
msctf 5.2.3790.0 (srv03_rtm.030324-2048) 287.00 KB (293,888 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msctf.dll
shdoclc 6.00.3790.0 (srv03_rtm.030324-2048) 588.50 KB (602,624 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\shdoclc.dll
jscript 5.6.0.8515 436.00 KB (446,464 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\jscript.dll
msls31 3.10.349.0 147.00 KB (150,528 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\msls31.dll
imm32 5.2.3790.0 (srv03_rtm.030324-2048) 105.50 KB (108,032 bytes) 3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\imm32.dll

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mshtmled 6.00.3790.0 (srv03_rtm.030324-2048) 443.50 KB (454,144 bytes)
3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\mshtmled.dll
imgutil 5.2.3790.0 (srv03_rtm.030324-2048) 35.00 KB (35,840 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\imgutil.dll
wbemdisp 5.2.3790.0 (srv03_rtm.030324-2048) 165.50 KB (169,472 bytes)
11/13/2003 1:29 PM Microsoft Corporation c:\windows\system32\wbem\wbemdisp.dll
wshom 5.6.0.8515 92.00 KB (94,208 bytes) 3/29/2003 12:00 AM Microsoft Corporation
c:\windows\system32\wshom.ocx
scrrun 5.6.0.8515 148.00 KB (151,552 bytes) 3/29/2003 12:00 AM Microsoft
Corporation c:\windows\system32\scrrun.dll
mfc42 6.05.3014.0 960.00 KB (983,040 bytes) 3/29/2003 12:00 AM Microsoft
Corporation c:\windows\system32\mfc42.dll
helpsvc 5.2.3790.0 (srv03_rtm.030324-2048) 720.00 KB (737,280 bytes) 11/13/2003 1:32
PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\helpsvc.exe
helphost 5.2.3790.0 (srv03_rtm.030324-2048) 106.00 KB (108,544 bytes) 11/13/2003 1:32
PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\helphost.exe
sensapi 5.2.3790.0 (srv03_rtm.030324-2048) 6.00 KB (6,144 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\sensapi.dll
vbscript 5.6.0.8515 404.00 KB (413,696 bytes) 3/29/2003 12:00 AM Microsoft
Corporation c:\windows\system32\vbscript.dll
msinfo 5.2.3790.0 (srv03_rtm.030324-2048) 358.50 KB (367,104 bytes) 11/13/2003 1:32
PM Microsoft Corporation c:\windows\pchealth\helpctr\binaries\msinfo.dll
comdlg32 6.00.3790.0 (srv03_rtm.030324-2048) 261.00 KB (267,264 bytes)
3/29/2003 12:00 AM Microsoft Corporation c:\windows\system32\comdlg32.dll
riched32 5.2.3790.0 (srv03_rtm.030324-2048) 3.50 KB (3,584 bytes) 3/29/2003 12:00 AM
Microsoft Corporation c:\windows\system32\riched32.dll
riched20 5.31.23.1218 406.00 KB (415,744 bytes) 3/29/2003 12:00 AM Microsoft
Corporation c:\windows\system32\riched20.dll

[Services]

Display Name Name State Start Mode Service Type Path Error Control Start
Name Tag ID
Alerter Alerter Stopped DisabledShare Process c:\windows\system32\svchost.exe -k localservice
Normal NT AUTHORITY\LocalService 0
Application Layer Gateway ServiceALG Stopped Manual Own Process
c:\windows\system32\alg.exe Normal NT AUTHORITY\LocalService 0
Application Management AppMgmt Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Windows Audio AudioSrv Running Auto Share Process c:\windows\system32\svchost.exe -
k netsvcs Normal LocalSystem 0
Background Intelligent Transfer Service BITS Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Computer Browser Browser Running Auto Share Process c:\windows\system32\svchost.exe -
k netsvcs Normal LocalSystem 0
Indexing Service CiSvc Stopped DisabledShare Process c:\windows\system32\cisvc.exe Normal
LocalSystem 0
ClipBook ClipSrv Stopped DisabledOwn Process c:\windows\system32\clipsrv.exe Normal
LocalSystem 0
COM+ System Application COMSysApp Stopped Manual Own Process
c:\windows\system32\dllhost.exe /processid:{02d4b3f1-fd88-11d1-960d-00805fc79235} Normal
LocalSystem 0
Cryptographic Services CryptSvc Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0

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Appendix C – Tunable Parameters

Distributed File System Dfs Running Auto Own Process c:\windows\system32\dfssvc.exe
Normal LocalSystem 0
DHCP Client Dhcp Running Auto Share Process c:\windows\system32\svchost.exe -k
networkservice Normal NT AUTHORITY\NetworkService 0
Logical Disk Manager Administrative Service dmadmin Stopped Manual Share Process
c:\windows\system32\dmadmin.exe /com Normal LocalSystem 0
Logical Disk Manager dmserver Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
DNS Client Dnscache Running Auto Share Process c:\windows\system32\svchost.exe -
k networkservice Normal NT AUTHORITY\NetworkService 0
Error Reporting Service ERSvc Running Auto Share Process c:\windows\system32\svchost.exe -
k winerr Ignore LocalSystem 0
Event Log Eventlog Running Auto Share Process c:\windows\system32\services.exe
Normal LocalSystem 0
COM+ Event System EventSystem Running Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Help and Support helpsvc Running Auto Share Process c:\windows\system32\svchost.exe -k netsvcs
Normal LocalSystem 0
Human Interface Device Access HidServ Stopped Disabled Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
HTTP SSL HTTPFilter Running Manual Share Process c:\windows\system32\lsass.exe
Normal LocalSystem 0
IIS Admin Service IISADMIN Running Auto Share Process
c:\windows\system32\inetsrv\inetinfo.exe Normal LocalSystem 0
IMAPI CD-Burning COM Service ImapiService Stopped Disabled Own Process
c:\windows\system32\imapi.exe Normal LocalSystem 0
Intersite Messaging IsmServ Stopped Disabled Own Process c:\windows\system32\ismserv.exe
Normal LocalSystem 0
Kerberos Key Distribution Center kdc Stopped Disabled Share Process
c:\windows\system32\lsass.exe Normal LocalSystem 0
Server lanmanserver Running Auto Share Process c:\windows\system32\svchost.exe -k netsvcs
Normal LocalSystem 0
Workstation lanmanworkstation Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
License Logging LicenseService Stopped Disabled Own Process c:\windows\system32\llssrv.exe
Normal NT AUTHORITY\NetworkService 0
TCP/IP NetBIOS Helper LmHosts Running Auto Share Process
c:\windows\system32\svchost.exe -k localservice Normal NT AUTHORITY\LocalService
0
Messenger Messenger Stopped Disabled Share Process c:\windows\system32\svchost.exe -
k netsvcs Normal LocalSystem 0
NetMeeting Remote Desktop Sharing mnmsrvc Stopped Disabled Own Process
c:\windows\system32\mnmsrvc.exe Normal LocalSystem 0
Distributed Transaction Coordinator MSDTC Running Auto Own Process
c:\windows\system32\msdtc.exe Normal NT AUTHORITY\NetworkService 0
Windows Installer MSIServer Stopped Manual Share Process
c:\windows\system32\msiexec.exe /v Normal LocalSystem 0
Network DDE NetDDE Stopped Disabled Share Process c:\windows\system32\netdde.exe Normal
LocalSystem 0
Network DDE DSDM NetDDEdsdm Stopped Disabled Share Process
c:\windows\system32\netdde.exe Normal LocalSystem 0
Net Logon Netlogon Stopped Manual Share Process c:\windows\system32\lsass.exe
Normal LocalSystem 0
Network Connections Netman Running Manual Share Process c:\windows\system32\svchost.exe -
k netsvcs Normal LocalSystem 0

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Network Location Awareness (NLA) Nla Running Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
File Replication NtFrs Stopped Manual Own Process c:\windows\system32\ntfrs.exe Ignore
LocalSystem 0
NT LM Security Support Provider NtLmSsp Stopped Manual Share Process
c:\windows\system32\lsass.exe Normal LocalSystem 0
Removable Storage NtmsSvc Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Plug and Play PlugPlay Running Auto Share Process c:\windows\system32\services.exe
Normal LocalSystem 0
IPSEC Services PolicyAgent Running Auto Share Process c:\windows\system32\lsass.exe
Normal LocalSystem 0
Protected Storage ProtectedStorage Running Auto Share Process c:\windows\system32\lsass.exe
Normal LocalSystem 0
Remote Access Auto Connection Manager RasAuto Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Remote Access Connection Manager RasMan Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Remote Desktop Help Session Manager RDSessMgr Stopped Manual Own Process
c:\windows\system32\sessmgr.exe Normal LocalSystem 0
Routing and Remote Access RemoteAccess Stopped Disabled Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Remote Registry RemoteRegistry Running Auto Share Process c:\windows\system32\svchost.exe -
k regsvc Normal NT AUTHORITY\LocalService 0
Remote Procedure Call (RPC) Locator RpcLocator Stopped Manual Own Process
c:\windows\system32\locator.exe Normal NT AUTHORITY\NetworkService 0
Remote Procedure Call (RPC) RpcSs Running Auto Share Process
c:\windows\system32\svchost -k rpcss Normal LocalSystem 0
Resultant Set of Policy Provider RSoPProv Stopped Manual Share Process
c:\windows\system32\rsopprov.exe Normal LocalSystem 0
Special Administration Console Helper sacsvr Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Security Accounts Manager SamSs Running Auto Share Process
c:\windows\system32\lsass.exe Normal LocalSystem 0
Smart Card SCardSvr Stopped Manual Share Process c:\windows\system32\scardsvr.exe
Ignore NT AUTHORITY\LocalService 0
Task Scheduler Schedule Running Auto Share Process c:\windows\system32\svchost.exe -
k netsvcs Normal LocalSystem 0
Secondary Logon seclogon Running Auto Share Process c:\windows\system32\svchost.exe -k netsvcs
Ignore LocalSystem 0
System Event Notification SENS Running Auto Share Process c:\windows\system32\svchost.exe -
k netsvcs Normal LocalSystem 0
Internet Connection Firewall (ICF) / Internet Connection Sharing (ICS) SharedAccess Stopped Disabled
Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Shell Hardware Detection ShellHWDetection Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Ignore LocalSystem 0
Print Spooler Spooler Running Auto Own Process c:\windows\system32\spoolsv.exe Normal
LocalSystem 0
Windows Image Acquisition (WIA) stisvc Stopped Disabled Share Process
c:\windows\system32\svchost.exe -k imgsvc Normal NT AUTHORITY\LocalService 0
Microsoft Software Shadow Copy Provider swprv Stopped Manual Own Process
c:\windows\system32\svchost.exe -k swprv Normal LocalSystem 0
Performance Logs and Alerts SysmonLog Stopped Manual Own Process
c:\windows\system32\smlogsvc.exe Normal NT Authority\NetworkService 0

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Telephony TapiSrv Stopped Manual Share Process c:\windows\system32\svchost.exe -k tapisrv Normal LocalSystem 0
Terminal Services TermService Running Manual Share Process c:\windows\system32\svchost.exe -k termsvcs Normal LocalSystem 0
Themes Themes Stopped Disabled Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Telnet TlntSvr Stopped Disabled Own Process c:\windows\system32\tlntsvr.exe Normal NT AUTHORITY\LocalService 0
Distributed Link Tracking Server TrkSvr Stopped Disabled Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Distributed Link Tracking Client TrkWks Running Auto Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Terminal Services Session Directory Tssdis Stopped Disabled Own Process c:\windows\system32\tssdis.exe Normal LocalSystem 0
Upload Manager uploadmgr Stopped Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Uninterruptible Power Supply UPS Stopped Manual Own Process c:\windows\system32\ups.exe Normal NT AUTHORITY\LocalService 0
Virtual Disk Service vds Stopped Manual Own Process c:\windows\system32\vds.exe Normal LocalSystem 0
Volume Shadow Copy VSS Stopped Manual Own Process c:\windows\system32\vssvc.exe Normal LocalSystem 0
Windows Time W32Time Running Auto Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
World Wide Web Publishing Service W3SVC Running Auto Share Process c:\windows\system32\svchost.exe -k iissvcs Normal LocalSystem 0
WebClient WebClient Stopped Disabled Share Process c:\windows\system32\svchost.exe -k localservice Normal NT AUTHORITY\LocalService 0
WinHTTP Web Proxy Auto-Discovery Service WinHttpAutoProxySvc Stopped Manual Share Process c:\windows\system32\svchost.exe -k localservice Normal NT AUTHORITY\LocalService 0
Windows Management Instrumentation winmgmt Running Auto Share Process c:\windows\system32\svchost.exe -k netsvcs Ignore LocalSystem 0
Portable Media Serial Number Service WmdmPmSN Stopped Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Windows Management Instrumentation Driver Extensions Wmi Stopped Manual Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
WMI Performance Adapter WmiApSrv Stopped Manual Own Process c:\windows\system32\wbem\wmiapsrv.exe Normal LocalSystem 0
Automatic Updates wuauserv Running Auto Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0
Wireless Configuration WZCSVC Running Auto Share Process c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem 0

[Program Groups]

Group Name Name User Name
Accessories Default User:Accessories Default User
Accessories\Accessibility Default User:Accessories\Accessibility Default User
Accessories\Entertainment Default User:Accessories\Entertainment Default User
Startup Default User:Startup Default User
Accessories All Users:Accessories All Users
Accessories\Accessibility All Users:Accessories\Accessibility All Users
Accessories\Communications All Users:Accessories\Communications All Users
Accessories\Entertainment All Users:Accessories\Entertainment All Users

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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 Toolkit All Users
Startup All Users:Startup All Users
Accessories NT AUTHORITY\SYSTEM:Accessories NT AUTHORITY\SYSTEM
Accessories\Accessibility NT AUTHORITY\SYSTEM:Accessories\Accessibility NT AUTHORITY\SYSTEM
Accessories\Entertainment NT AUTHORITY\SYSTEM:Accessories\Entertainment NT AUTHORITY\SYSTEM
Startup NT AUTHORITY\SYSTEM:Startup NT AUTHORITY\SYSTEM
Accessories CLIENT77\Administrator:Accessories CLIENT77\Administrator
Accessories\Accessibility CLIENT77\Administrator:Accessories\Accessibility CLIENT77\Administrator
Accessories\Entertainment CLIENT77\Administrator:Accessories\Entertainment CLIENT77\Administrator
Administrative Tools CLIENT77\Administrator:Administrative Tools CLIENT77\Administrator
Startup CLIENT77\Administrator:Startup CLIENT77\Administrator

[Startup Programs]

Program Command User Name Location
desktop desktop.ini NT AUTHORITY\SYSTEM Startup
desktop desktop.ini CLIENT77\Administrator Startup
desktop desktop.ini .DEFAULT Startup
desktop desktop.ini All Users Common Startup

[OLE Registration]

Object Local Server
Sound (OLE2) sndrec32.exe
Media Clip mplay32.exe
Video Clip mplay32.exe /avi
MIDI Sequence mplay32.exe /mid
Sound Not Available
Media Clip Not Available
WordPad Document "%programfiles%\windows nt\accessories\wordpad.exe"
Windows Media Services DRM Storage object Not Available
Bitmap Image mspaint.exe

[Windows Error Reporting]

Time Type Details

[Internet Settings]

[Internet Explorer]

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

Item Value
Version 6.0.3790.0
Build 63790
Application Path C:\Program Files\Internet Explorer

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Language English (United States)
Active Printer Not Available

Cipher Strength 128-bit
Content Advisor Disabled
IEAK Install No

[File Versions]

File	Version	Size	Date	Path	Company
actxprxy.dll	6.0.3790.0	95 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
advpack.dll	6.0.3790.0	94 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
asctrls.ocx	6.0.3790.0	90 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
browselc.dll	6.0.3790.0	62 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
browseui.dll	6.0.3790.0	1,033 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
cdfview.dll	6.0.3790.0	144 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
comctl32.dll	5.82.3790.0	561 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
dxtrans.dll	6.3.3790.0	198 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
dxtmsft.dll	6.3.3790.0	344 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
iecont.dll	<File Missing>	Not Available	Not Available	Not Available	Not Available
iecontlc.dll	<File Missing>	Not Available	Not Available	Not Available	Not Available
iedkcs32.dll	16.0.3790.0	300 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
iepeers.dll	6.0.3790.0	230 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
iesetup.dll	6.0.3790.0	59 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
ieuinit.inf	Not Available	20 KB	3/29/2003	C:\WINDOWS\system32	Not Available
iexplore.exe	6.0.3790.0	90 KB	3/29/2003	C:\Program Files\Internet Explorer	Microsoft Corporation
imgutil.dll	5.2.3790.0	35 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
inetcpl.cpl	6.0.3790.0	303 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
inetcplc.dll	6.0.3790.0	109 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
inseng.dll	6.0.3790.0	72 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
mlang.dll	6.0.3790.0	570 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
msencode.dll	2002.10.4.0	112 KB	3/29/2003	C:\WINDOWS\system32	Not Available
mshta.exe	6.0.3790.0	26 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation
mshtml.dll	6.0.3790.0	2,848 KB	3/29/2003	C:\WINDOWS\system32	Microsoft Corporation

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mshtml.tlb 6.0.3790.0 1,319 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
mshtmled.dll 6.0.3790.0 444 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
mshtmler.dll 6.0.3790.0 55 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
msident.dll 6.0.3790.0 47 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
msidntld.dll 6.0.3790.0 15 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
msieftp.dll 6.0.3790.0 230 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
msrating.dll 6.0.3790.0 132 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
mstime.dll 6.0.3790.0 491 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
occache.dll 6.0.3790.0 89 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
proctexe.ocx 6.3.3790.0 78 KB 3/29/2003 C:\WINDOWS\system32 Intel Corporation
sendmail.dll 6.0.3790.0 52 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
shdoclc.dll 6.0.3790.0 589 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
shdocvw.dll 6.0.3790.0 1,361 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
shfolder.dll 6.0.3790.0 23 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
shlwapi.dll 6.0.3790.0 281 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
tdc.ocx 1.3.0.3130 58 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
url.dll 6.0.3790.0 36 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
urlmon.dll 6.0.3790.0 502 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
webcheck.dll 6.0.3790.0 262 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation
wininet.dll 6.0.3790.0 609 KB 3/29/2003 C:\WINDOWS\system32 Microsoft Corporation

[Connectivity]

Item Value
Connection Preference Never dial

LAN Settings

AutoConfigProxyNot Available
AutoProxyDetectMode Disabled
AutoConfigURL
Proxy Disabled
ProxyServer
ProxyOverride

[Cache]

[Following are sub-categories of this main category]

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[Summary]

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

[List of Objects]

Program File Status CodeBase
No cached object information available

[Content]

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

Item Value
Content Advisor Disabled

[Personal Certificates]

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

[Other People Certificates]

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

[Publishers]

Name
No publisher information available

[Security]

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

COM+ Settings

TPCC.AllTxns:
Activation:
Enable Object Pooling selected

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Minimum Pool Size: 300
Maximum Pool Size: 300
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:0000004b

"MaxConnections"=dword:000061a8

"MaxPendingDeliveries"=dword:0000012c

"DB_Protocol"="ODBC"

"TxnMonitor"="COM"

"DbServer"="pe2650"

"DbName"="tpcc"

"DbUser"="sa"

"DbPassword"=""

"COM_SinglePool"="YES"
```

Microsoft Internet Information Server Registry Parameters

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```
[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

[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:de,fc,ed,18,0a,98,c0,01,10,25,00,00,00,00,00,00
"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):25,00,53,00,79,00,73,00,74,00,65,00,6d,00,52,00,6f,00,6f,00,\
  74,00,25,00,5c,00,53,00,79,00,73,00,74,00,65,00,6d,00,33,00,32,00,5c,00,73,\
  00,76,00,63,00,68,00,6f,00,73,00,74,00,2e,00,65,00,78,00,65,00,20,00,2d,00,\
  6b,00,20,00,69,00,69,00,73,00,73,00,76,00,63,00,73,00,00,00
"DisplayName"="World Wide Web Publishing Service"
"DependOnService"=hex(7):52,00,50,00,43,00,53,00,53,00,00,00,48,00,54,00,54,00,\
  50,00,46,00,69,00,6c,00,74,00,65,00,72,00,00,00,49,00,49,00,53,00,41,00,44,\
  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 Manager"
"FailureActions"=hex:80,51,01,00,01,00,00,00,00,00,00,00,03,00,00,00,53,00,65,\
  00,01,00,00,00,01,00,00,00,01,00,00,00,01,00,00,00,01,00,00,00,01,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters]
"MajorVersion"=dword:00000006
"MinorVersion"=dword:00000000
"InstallPath"="C:\\WINDOWS\\system32\\inetsrv"
"AccessDeniedMessage"="Error: Access is Denied."
"ServiceDll"=hex(2):43,00,3a,00,5c,00,57,00,49,00,4e,00,44,00,4f,00,57,00,53,\
  00,5c,00,73,00,79,00,73,00,74,00,65,00,6d,00,33,00,32,00,5c,00,69,00,6e,00,\
  65,00,74,00,73,00,72,00,76,00,5c,00,69,00,69,00,73,00,77,00,33,00,61,00,64,\
  00,6d,00,2e,00,64,00,6c,00,6c,00,00,00
"AcceptExOutstanding"=dword:00000028

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\ADCLaun
ch]
```


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```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\ADCLaun
ch\AdvancedDataFactory]

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

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\Virtual
Roots]
"/"="c:\\inetpub\\wwwroot,,205"
"/Scripts"="c:\\inetpub\\scripts,,204"
"/IISHelp"="c:\\winnt\\help\\iishelp,,201"
"/IISAdmin"="C:\\WINNT\\System32\\inetsrv\\iisadmin,,201"
"/IISSamples"="c:\\inetpub\\iissamples,,201"
"/MSADC"="c:\\program files\\common files\\system\\msadc,,205"
"/_vti_bin"="C:\\Program Files\\Common Files\\Microsoft Shared\\Web Server
Extensions\\40\\isapi,,205"
"/Printers"="C:\\WINNT\\web\\printers,,201"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Performance]
"Library"="C:\\WINDOWS\\system32\\inetsrv\\w3ctrs.dll"
"Open"="OpenW3PerformanceData"
"Close"="CloseW3PerformanceData"
"Collect"="CollectW3PerformanceData"
"PerfIniFile"="w3ctrs.ini"
"Last Counter"=dword:00000a9e
"Last Help"=dword:00000a9f
"First Counter"=dword:000009a8
"First Help"=dword:000009a9
"Object List"="2472 2646"
"Library Validation Code"=hex:00,07,89,ab,22,aa,c3,01,00,5e,00,00,00,00,00,00
"WbemAdapFileSignature"=hex:39,e3,6c,2c,b4,be,59,f5,17,7c,c4,d5,2f,dc,f7,1a
"WbemAdapFileTime"=hex:52,ba,5b,ab,22,aa,c3,01
"WbemAdapFileSize"=dword:00005e00
"WbemAdapStatus"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\Security]
"Security"=hex:01,00,14,80,90,00,00,00,9c,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,\
  00,00,02,00,60,00,04,00,00,00,00,00,14,00,fd,01,02,00,01,01,00,00,00,00,00,\
  05,12,00,00,00,00,00,18,00,ff,01,0f,00,01,02,00,00,00,00,00,05,20,00,00,00,\
  20,02,00,00,00,00,14,00,8d,01,02,00,01,01,00,00,00,00,00,05,0b,00,00,00,00,\
  00,18,00,fd,01,02,00,01,02,00,00,00,00,00,05,20,00,00,00,23,02,00,00,01,01,\
  00,00,00,00,00,05,12,00,00,00,01,01,00,00,00,00,00,05,12,00,00,00

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

RTE Input Parameters

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Appendix C – Tunable Parameters

BenchCraft Configuration File

Profile: 1800_6_1_01_2
File Path: C:\benchcrf\1800_6_1_01_2.pro
Version: 4

Number of Engines: 6

Name: DRIVER1
Description: rte6
Directory: c:\tpcclog\rte6.log
Machine: rte6
Parameter Set: PARAM2
Index: 0
Seed: 59915
Configured Users: 3400
Pipe Name: DRIVER1958504807
Connect Rate: 2000
Start Rate: 1000
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 0
Additional Options:

Name: DRIVER2
Description: rte2
Directory: c:\tpcclog\rte2.log
Machine: rte2
Parameter Set: PARAM2
Index: 100000000
Seed: 59915
Configured Users: 3400
Pipe Name: DRIVER2958566445
Connect Rate: 2000
Start Rate: 1000
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 0
Additional Options:

Name: DRIVER3
Description: rte3
Directory: c:\tpcclog\rte3.log
Machine: rte3
Parameter Set: PARAM2
Index: 200000000
Seed: 59915
Configured Users: 3400
Pipe Name: DRIVER3958590900
Connect Rate: 2000
Start Rate: 1000
Max. Concurrency: -1

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Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 0
Additional Options:

Name: DRIVER4
Description: rte4
Directory: c:\tpcclog\rte4.log
Machine: rte4
Parameter Set: PARAM2
Index: 300000000
Seed: 59915
Configured Users: 3400
Pipe Name: DRIVER41824367832
Connect Rate: 2000
Start Rate: 1000
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 0
Additional Options:

Name: DRIVER5
Description: rte5
Directory: c:\tpcclog\rte5.log
Machine: rte5
Parameter Set: PARAM2
Index: 400000000
Seed: 59915
Configured Users: 3400
Pipe Name: DRIVER52001196187
Connect Rate: 2000
Start Rate: 1000
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 0
Additional Options:

Name: DRIVER6
Description: rte7
Directory: c:\tpcclog\rte7.log
Machine: rte7
Parameter Set: PARAM2
Index: 500000000
Seed: 59915
Configured Users: 1000
Pipe Name: DRIVER6-339553843
Connect Rate: 2000
Start Rate: 1000
Max. Concurrency: -1
Concurrency Rate: 10
CLIENT_NURAND: 233
CPU: 0
Additional Options:

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Number of User groups: 11

Driver Engine: DRIVER1
IIS Server: client77
SQL Server: pe2650
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1 - 170
w_id Min Warehouse: 1
w_id Max Warehouse: 1800
Scale: Normal
User Count: 1700
District id: 1
Scale Down: No

Driver Engine: DRIVER1
IIS Server: client77
SQL Server: pe2650
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 171 - 340
w_id Min Warehouse: 1
w_id Max Warehouse: 1800
Scale: Normal
User Count: 1700
District id: 1
Scale Down: No

Driver Engine: DRIVER2
IIS Server: client77
SQL Server: pe2650
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 341 - 510
w_id Min Warehouse: 1
w_id Max Warehouse: 1800
Scale: Normal
User Count: 1700
District id: 1
Scale Down: No

Driver Engine: DRIVER2
IIS Server: client77
SQL Server: pe2650
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 511 - 680
w_id Min Warehouse: 1
w_id Max Warehouse: 1800
Scale: Normal

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User Count: 1700
District id: 1
Scale Down: No

Driver Engine: DRIVER3
IIS Server: client77
SQL Server: pe2650
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 681 - 850
w_id Min Warehouse: 1
w_id Max Warehouse: 1800
Scale: Normal
User Count: 1700
District id: 1
Scale Down: No

Driver Engine: DRIVER3
IIS Server: client77
SQL Server: pe2650
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 851 - 1020
w_id Min Warehouse: 1
w_id Max Warehouse: 1800
Scale: Normal
User Count: 1700
District id: 1
Scale Down: No

Driver Engine: DRIVER4
IIS Server: client77
SQL Server: pe2650
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1021 - 1190
w_id Min Warehouse: 1
w_id Max Warehouse: 1800
Scale: Normal
User Count: 1700
District id: 1
Scale Down: No

Driver Engine: DRIVER4
IIS Server: client77
SQL Server: pe2650
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1191 - 1360
w_id Min Warehouse: 1
w_id Max Warehouse: 1800

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Scale: Normal
User Count: 1700
District id: 1
Scale Down: No

Driver Engine: DRIVER5
IIS Server: client77
SQL Server: pe2650
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1361 - 1530
w_id Min Warehouse: 1
w_id Max Warehouse: 1800
Scale: Normal
User Count: 1700
District id: 1
Scale Down: No

Driver Engine: DRIVER5
IIS Server: client77
SQL Server: pe2650
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1531 - 1700
w_id Min Warehouse: 1
w_id Max Warehouse: 1800
Scale: Normal
User Count: 1700
District id: 1
Scale Down: No

Driver Engine: DRIVER6
IIS Server: client77
SQL Server: pe2650
Database: tpcc
User: sa
Protocol: HTML
w_id Range: 1701 - 1800
w_id Min Warehouse: 1
w_id Max Warehouse: 1800
Scale: Normal
User Count: 1000
District id: 1
Scale Down: No

Number of Parameter Sets: 5

~Default
Default Parameter Set

	Txn Weight	Think Time	Key Time	RT Delay	RT Fence	Menu Delay	
New Order	10.00	12.05	18.01	0.10	5.00	0.10	

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Payment	10.00	12.05	3.01	0.10	5.00	0.10
Delivery	1.00	5.05	2.01	0.10	5.00	0.10
Stock Level	1.00	5.05	2.01	0.10	20.00	0.10
Order Status	1.00	10.05	2.01	0.10	5.00	0.10

PARAM2

	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	4.05	5.04	2.02	0.10	5.00	0.10	
Stock Level	4.05	5.04	2.02	0.10	20.00	0.10	
Order Status	4.05	10.04	2.02	0.10	5.00	0.10	

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Appendix C – Tunable Parameters

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Appendix D – Disk Storage

TPC-C 60 Day Space Requirements						
Warehouses	**1900**				**TpmC**	**22,052.81**
Table	**Rows**	**Data KB**	**Index KB**	**Extra 5% KB**	**8hr Space**	**Total Space KB**
Warehouse	1900	208	24	12		244
District	19000	2112	24	107		2243
Customer	57000000	41454552	2471888	2,196,322		46122762
History	57000000	3166680	16		588,077	3166696
NewOrder	17100000	270360	632			270992
Orders	57000000	1747128	794488		324,455	2541616
OrderLine	570001928	35625128	75424		6,615,867	35700552
Item	100000	9528	40	478		10046
Stock	190000000	60800000	113576	3,045,679		63959255
Total		143,075,696	3,456,112	5,242,598	7,528,400	151,774,406

	MB	
Dynamic Space	39,589	Sum of Data for Order, Orderline and History
Static Space	108,628	Sum of Data+Index+5%-Dynamic Space
Free Space	na	Total Allocated Spac - (Dynamic + Static Space)
Daily Growth	7,352	(Dynamic Space/(W*62.5))*tpmc
Daily Spread	-	(Free Space -1.5*Daily Growth) Zero Assumed
60 Day Space MB	549,746	
60 Day Space GB	**536.86**	**GB**
Log Size	54,000	MB
KB Per New Order	4.9674	KB
8 hr log MB	51,349	MB
8 hr log GB	**50.1453**	**GB**

Space Usage	**GB Needed**	**Disks Measured**	**GB Priced**	**Disk Size**	**Formatted Size**	
60 Day Space DB	536.86	56	944.89	18GB	16.873	
Total DB		**56.00**	**944.89**	**9GB**		
8-hr log + mirror	100.2906	4	134.98	36GB	33.746	
OS, Swap	3	1	8.44	9GB	8.437	
Total Storage	**640.15**	**GB**	**1,088.31**	**GB**		

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Appendix E - Price Quotations

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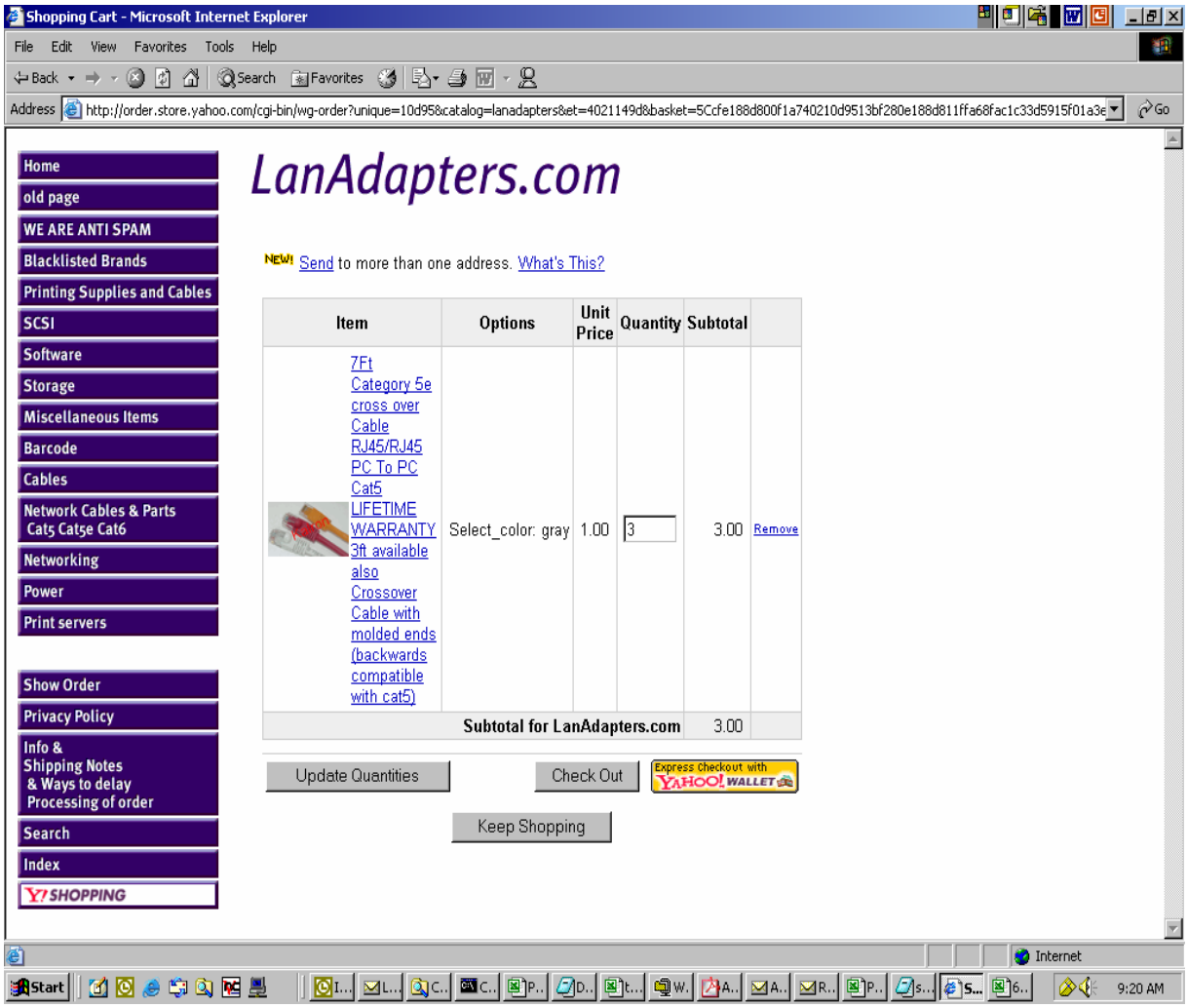
Shopping Cart - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://order.store.yahoo.com/cgi-bin/wg-order?unique=10d95&catalog=lanadapters&et=4021149d&basket=5Ccfe188d800f1a740210d9513bf280e188d811ffa68fac1c33d5915f01a3e
Go
Home
old page
WE ARE ANTI SPAM
Blacklisted Brands
Printing Supplies and Cables
SCSI
Software
Storage
Miscellaneous Items
Barcode
Cables
Network Cables & Parts Cat5 Cat5e Cat6
Networking
Power
Print servers
Show Order
Privacy Policy
Info & Shipping Notes & Ways to delay Processing of order
Search
Index
SHOPPING
LanAdapters.com
NEW! Send to more than one address. What's This?
Item
Options
Unit Price
Quantity
Subtotal
7Ft Category 5e cross over Cable RJ45/RJ45 PC To PC Cat5 LIFETIME WARRANTY 3ft available also Crossover Cable with molded ends (backwards compatible with cat5)
Select_color: gray
1.00
3
3.00
Remove
Subtotal for LanAdapters.com
3.00
Update Quantities
Check Out
Express Checkout with YAHOO! WALLET
Keep Shopping
Internet
Start
9:20 AM

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

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

Microsoft

March 5, 2004

Dell Computer
Corporation
Kong Yang
RR5
One Dell Way
Round Rock, TX 78682

Mr. Yang:

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

All pricing shown is in US Dollars ($).

Part Number	Description	Unit Price	Quantity	Price
228-01079	**SQL Server 2000 Standard Edition** *Per processor licensing* *No discounts applied*	$4,999	1	$4,999
P73-00295	**Windows Server 2003, Standard Edition** *Server license only - No CALs* *Discount Schedule: Open Program - No Level* *Unit Price reflects a 26% discount from the retail unit price of $999.*	$738	2	$1,476
254-00170	**Visual C++ Standard** *No discounts applied*	$109	1	$109
PRO-PRORS-16U-01	**Database Server Support Package** *1 Year Term*	$1,950	3	$5,850

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: PCkoya0405036456
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