



**TPC Benchmark™ C
Full Disclosure
Report**

**Unisys Corporation
Enterprise Systems**

Aquanta QR/2V Server

using

**Microsoft NT Server Enterprise Edition 4.0
and**

Microsoft SQL Server Enterprise Edition 7.0

**First Edition
December 2nd 1998**

Unisys Part Number 4494 8917-000

First Edition – December 1998

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All performance data contained in this report was obtained in a rigorously controlled environment, and therefore results obtained in other operating environments may vary significantly. Unisys Corporation and Microsoft Corporation do not warrant or represent that a user can or will achieve similar performance expressed in transactions per minute (tpmC) or normalized price/performance (\$/tpmC). No warranty of system performance or price/performance is expressed or implied in this report.

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Overview

This report documents the methodology and results of the TPC Benchmark C (TPC-C) conducted on the Unisys Corporation Aquanta QR/2V server. The operating system on the server was Microsoft Windows NT Server Enterprise Edition 4.0. The DBMS used was Microsoft SQL Server Enterprise Edition 7.0. The operating system on the clients was Microsoft Windows NT Server 4.0. The clients ran Microsoft's Internet Information Server 3.0 and Tuxedo 6.3 CFS for NT.

TPC Benchmark Metrics

The standard TPC Benchmark C metrics, ipmC (transactions per minute), price per ipmC (five year capital cost per measured ipmC), and the availability date are reported as required by the benchmark specification.

Executive Summary

The following pages contain the executive summary results of the benchmark.

Auditor

The benchmark configuration, environment, and methodology used to produce and validate the test results, along with the pricing model used to calculate the cost per ipmC, were audited by Richard Gimarc of Performance Metrics, Inc. to verify compliance with the relevant TPC specification.



Aquanta QR/2V Server C/S

TPC-C Rev. 3.4

Report Date:
02-Dec-1998

Total System Cost

TPC-C Throughput

Price/Performance

Availability Date

\$424,297

19,118.37 tpmC

\$22.19 per tpmC

29-Dec-1998

Processors

Database Manager

Operating System

Other Software

Number of Users

4 Pentium® II Xeon
400 MHz
1MB L2 cache

Microsoft SQL
Server Enterprise
Edition 7.0

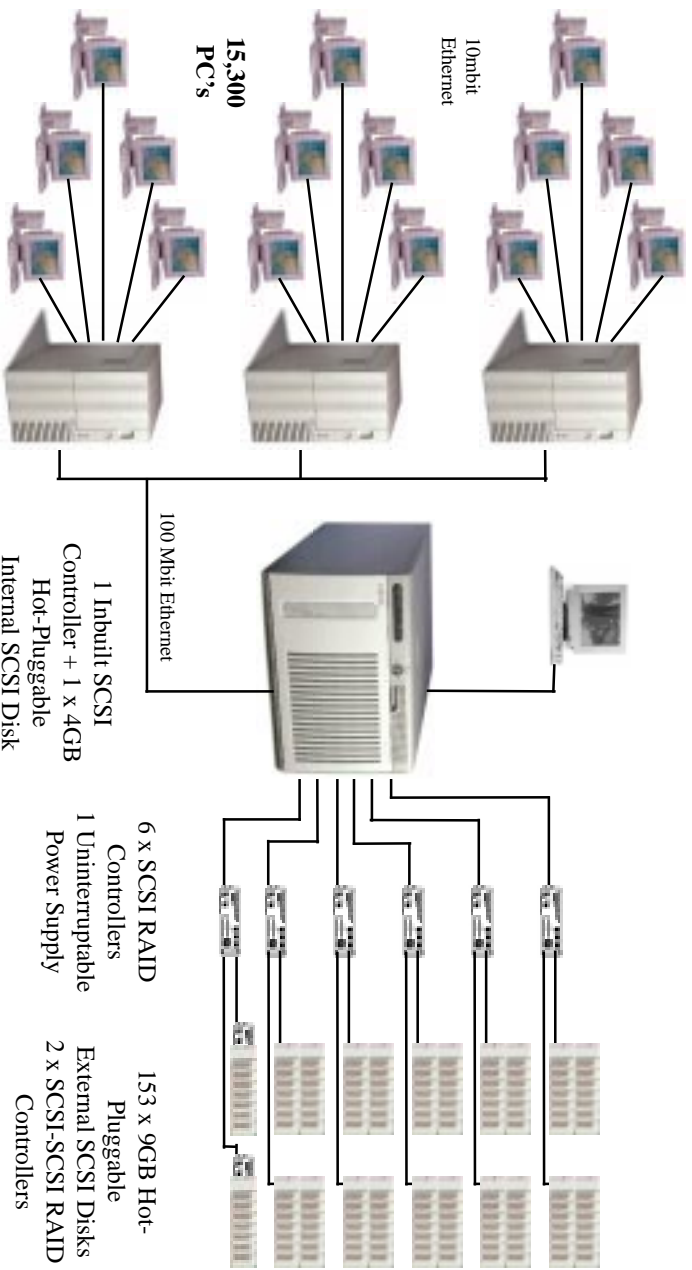
Microsoft NT
Server 4.0
Enterprise Edition

Microsoft IIS 3.0
Tuxedo 6.3 CFS

15,300

3 x Aquanta GPS Clients

Aquanta QR/2V Server



System Components	Server		Clients	
	Quantity	Type	Quantity	Type
Processors	4	400 MHz Pentium® II Xeon with 1MB Level 2 Cache	3	2 x 300MHz Pentium® II with 512KB Level 2 Cache
Memory	1	4096MB	3	256MB
Disk Controllers	6 + 2	SCSI RAID Inbuilt SCSI	3	Inbuilt SCSI
Disk Drives	153	8.48 GB 4.24 GB	3	2.02 GB
Total Storage		1301.60 GB		6.06 GB
CD-ROM / Tape	1	CD-ROM Drive	3	CD-ROM Drive

Unisys Corporation

**Aquantia QR2V Server
C/S**

TPC-C Rev 3.4
02-Dec-1998

Description	Style	Third Party	Brand Pricing	Unit Price	Qty.	Extended Price	5 Years Maint.
Server Hardware							
SYS: Aquanta QR2V, w/ CDROM, 0 Proc, 0MB Mem	Q/R200071-BBS	1		\$5,327	4	\$5,327	\$1,836
PROC: 1x400MHz Pentium II /1MB Cache	XE2400-1MB	1		\$3,627	1	\$3,627	\$14,508
ACC: Voltage Regulator Module, Processor	XE024001-VRM	1		\$46	6	\$276	\$4,992
MEM: 256 MB Memory Upgrade	DM5072-256	1		\$963	16	\$15,408	\$5,568
DISK: 4GB Drive, Ultra SCSI SCA	HDS417-CX1	1		\$746	1	\$746	\$264
ETHERNET: 100Mbit/sec, PCI 32-bit	ETH1010051-PCI	1		\$117	1	\$117	
CDROM: 14-32x Speed, SCSI	CDR1432-SI	1		\$161	1	\$161	\$48
MONITOR: 15-inch Color	EVG2100-P	1		\$320	1	\$320	
KEYBD: 104 Key Spacesaver	PCK104-SKB	1		\$31	1	\$31	
MOUSE: 2 Button PS2	PMM1-PS2	1		\$23	1	\$23	
CTLU: RAID 3-Ch PCI w/ 32MB Mem&Bat.BU+10% spares	DACT164PVX	Mylex	2	\$2,838	8	\$22,704	\$400
CAB: Rack Cabinet, w/ fill pnls, 19U	CAB191-SXR	1		\$1,165	1	\$1,165	
CAB: Bezel kit 19U	BEZ1911-CAB	1		\$165	1	\$165	
PNL: L&R side panels 19U	PAN1921-SXR	1		\$162	1	\$162	
Subtotal						\$61,113	\$13,108
Storage Hardware							
CBL: SCSI 68-pin HD->VHD Conn's	CBL2210-OSM	1		\$90	12	\$1,080	
DISK: 9GB Drive, 10K, SCA + 10% Spares	OSD9203-W45	1		\$930	169	\$157,170	spared
CAB: Disk, 7 SCA w/ 050 I/F & Cat-Chl, 0 Disks, 3U	OSM310050-U05	1		\$1,345	10	\$13,450	\$7,680
CAB: Disk, 7 SCA w/ 057 I/F, 0 Disks, 3U	OSM310057-U05	1		\$1,350	10	\$13,500	\$7,680
CAB: Disk, 7 SCA w/ 100 I/F, 0MB, 0 Disks, 3U	OSM310100-U05	1		\$2,727	2	\$5,454	\$3,456
MEM: 32MB OSM cache	OSM1000-C32	1		\$150	2	\$300	\$216
CAB: Rackmount Kit for Disk Cages	OSM3000-RMK	1		\$84	22	\$1,848	
PWR: 2nd Power Supply Upgrade, OSM Cabinet	OSM3000-APM	1		\$261	2	\$522	\$264
PWR:3000 VA UPS, 3U	UPD30001-SXR	1		\$2,239	1	\$2,239	\$936
CAB: Rack Cabinet, w/ fill pnls, 36U	CAB361-SXR	1		\$1,394	2	\$2,788	
CAB: Bezel kit 36U	BEZ3611-CAB	1		\$206	2	\$412	
CAB: Stabilizer kit 0U	WGT39581-SXR	1		\$110	2	\$220	
PNL: L&R side panels 36U	PAN3621-SXR	1		\$192	2	\$384	
Subtotal						\$199,347	\$20,232
Server Software							
Microsoft NT Server Enterprise Edition 4.0, incl 25 CALs	Microsoft	3		\$3,999	1	\$3,999	\$0
Microsoft SQL Server Enterprise Edition 7.0, unlimited user license	Microsoft	3		\$28,999	1	\$28,999	\$10,475
Subtotal						\$32,998	\$10,475
Client Hardware							
SYS: Aquanta GPS, 0 Proc, 0MB Mem	GPS600071-BAS	1		\$945	3	\$2,835	\$1,368
PROC:1x300MHz Pentium II/512KB Cache	GPS2300-512	1		\$863	6	\$5,178	\$2,736
UPGRD: GPS P-II 2nd CPU Supl.	GPS600071-P2U	1		\$32	3	\$96	\$144
MEM: 128 MB Memory Upgrade	DM672-128	1		\$741	6	\$4,446	\$1,584
DISK: 2GB Ultra SCSI 3.5 Internal	HDS2000-SW7	1		\$573	3	\$1,719	\$1,584
CDROM: 14-32x Speed, SCSI	CDR1432-SI	1		\$161	3	\$483	\$144
ETHERNET: 100Mbit/sec, PCI 32-bit	ETH101007-PCI	1		\$101	6	\$606	
ETHERNET: 100Mbit/sec, PCI 32-bit, Quad	SF1001-ET4	1		\$1,212	3	\$3,636	\$1,188
MONITOR: 15-inch Color	EVG2100-P	1		\$320	3	\$960	
KEYBD: 104 Key Spacesaver	PCK104-SKB	1		\$31	3	\$93	
MOUSE: 2 Button PS2	PMM1-PS2	1		\$23	3	\$69	
Subtotal						\$20,121	\$8,748
Client Software							
Microsoft Windows NT Server 4.0, incl 5 CALs	Microsoft	3		\$809	3	\$2,427	\$0
Microsoft Visual C++ Professional 5.0	Microsoft	3		\$499	1	\$499	\$0
TUXEDO Core Functional Services 6.3 for NT	BEA	4		\$3,000	3	\$9,000	\$6,750
Subtotal						\$11,926	\$6,750
User Connectivity							
Ethernet Hub, 8-Port 100TX TrueFast + 10% spares	NX-HRTX	5	Netlux	\$205	3	\$615	spared
Ethernet Hub, 8-Port 10Base-T + 1-Port BNC + 10% spares	DEH2924	6	DataComm	\$33	2106	\$69,498	spared
Subtotal						\$70,113	\$0
Total						\$395,618	\$59,313
						(\$25,789)	(\$4,846)

Notes:

1. HW Maintenance - First 36 months that are included in Unisys warranty are upgraded to service level: Standard Performance-Gold. Last 24 months are also at service level: Standard Performance-Gold.
2. All Microsoft maintenance is covered by the maintenance cost of Microsoft SQL Server.
3. 10% or minimum 2 spares are added in place of onsite service (products have a five year return-to-vendor warranty)
4. Pricing: 1 = Western Micro, 2 = Mylex, 3 = Microsoft, 4 = BEA, 5 = Netlux, 6 = DataComm/Whse

The benchmark results and test methodology were audited by Richard Gimarc of Performance Metrics, Inc.

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

Five Year Cost of Ownership **\$424,297**
TPC-C Throughput **19,118.37**
\$/ipmc **\$22.19**

NUMERICAL QUANTITIES SUMMARY

Unisys Aquanta QR/2 Server
Microsoft SQL Server Enterprise Edition 7.0

MQTh, Computed Maximum Qualified Throughput: **19118.37**
 % throughput difference, reported & reproducibility runs: 0.08%

Transaction Mix

New Order	44.82%
Payment	43.14%
Delivery	4.02%
Stock-Level	4.01%
Order-Status	4.00%

Response Times

Transaction	Average	Maximum	90th %ile
New-Order	0.41	5.90	0.55
Payment	0.24	4.83	0.34
Delivery	0.13	1.91	0.14
Stock-Level	2.34	7.79	3.19
Order Status	0.30	4.88	0.41
Menu	0.12	3.21	0.13
Delivery (Deferred)	0.56	4.73	0.84

Response time delay added for emulated components (seconds)

RT Response time	0.1
Menu Response time	0.1

Keying/Think Time Times (seconds)

Transaction	Minimum	Average	Maximum
New-Order	18.00/0	18.01/12.03	18.09/120.31
Payment	3.00/0	3/12.03	3.09/120.31
Delivery	2.00/0	2/5.07	2.06/50.6
Stock-Level	2.00/0	2/5.09	2.08/50.6
Order-Status	2.00/0	2/10.06	2.05/100.72

Test Duration

Ramp up time	47 minutes
Measurement interval (M)	30 minutes
Transactions (all types) completed during measurement interval	1279540
Ramp-down time	47 minutes

Checkpointing:

Number of checkpoints	1
Checkpoint interval	30 minutes

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Document Structure

The TPC Benchmark C Standard Specification requires test sponsors to publish, submit to the TPC, and make available to the public, a full disclosure report for any result to be considered compliant with the specification. The required contents of the full disclosure report are specified in Clause 8.

This report is submitted to satisfy the specification's requirement for full disclosure. It documents the compliance of the benchmark implementation and execution reported for the Unisys Corporation Aquanta QR/2V Server using Microsoft Windows NT 4.0 Enterprise Edition and Microsoft SQL Server Enterprise Edition 7.0.

TPC Benchmark C Overview

The TPC Benchmark™ C Standard Specification Revision 3.4 was developed by the Transaction Processing Council (TPC). It is the intent of the TPC to develop a suite of benchmarks to measure the performance of computer systems executing a wide range of applications. Unisys and Microsoft Corporations are active participants in the TPC to define and develop such a suite of benchmarks.

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.

Despite the fact that this benchmark offers a rich environment that emulates many OLTP environments, this benchmark does not reflect the entire range of OLTP requirements. In addition, the extent to which a customer can achieve the results reported by a vendor is highly dependent on how closely TPC-C approximates the customer application. The relative performance of systems derived from this benchmark does not necessarily hold for other workloads or environments. Extrapolations to any other environment are not recommended.

0.

General Items

0.1. Order and Titles

The order and titles of sections in the Test Sponsor's Full Disclosure report must correspond with the order and titles of sections from the TPC-C standard specification (i.e., this document). The intent is to make it as easy as possible for readers to compare and contrast material in different Full Disclosure reports.

The order and titles of the sections in this report correspond with those from the TPC-C standard specification.

0.2. Executive Summary Statement

The TPC Executive Summary Statement must be included near the beginning of the Full Disclosure report.

The TPC Executive Summary Statement is included near the beginning of this report.

0.3. Numerical Quantities Summary

The numerical quantities listed below must be summarized near the beginning of the Full Disclosure Report :

- *measurement interval in minutes,*
- *number of checkpoints in the measurement interval,*
- *checkpoint interval in minutes,*
- *number of transactions (all types) completed within the measurement interval,*
- *computed Maximum Qualified Throughput in tpmC,*
- *percentage difference between reported throughput and throughput obtained in reproducibility run,*
- *ninetieth percentile, average and maximum response times for the New-Order, Payment, Order-Status, Stock-Level, Delivery (deferred and interactive) and Menu transactions,*
- *time in seconds added to response time to compensate for delays associated with emulated components,*
- *percentage of transaction mix for each transaction type.*

These numerical quantities are summarized near the beginning of this report.

0.4. Application Code Disclosure

The applicable program (as defined in Clause 2.1.7) must be disclosed. This includes, but is not limited to, the code implementing the five transactions and the terminal input and output functions.

Appendix A contains the client application code used in this TPC-C benchmark. Appendix B contains the SQL stored procedures which implement the TPC-C transactions.

0.5. Benchmark Sponsor

A statement identifying the benchmark sponsor(s) and other participating companies must be provided.

This TPC benchmark C was sponsored by Unisys Corporation. The benchmark test was developed by Microsoft and Unisys. The benchmark was conducted at Unisys, Mission Viejo, California.

0.6. Parameter Settings

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

- *Data Base tuning options*
- *Recovery/commit options*
- *Consistency/locking options*
- *Operating system and application configuration parameters*

Appendix C contains the configuration and system parameters used in running these TPC-C tests. It also contains all the client and server OS, and SQL Server tunable parameters.

0.7. Configuration Diagrams

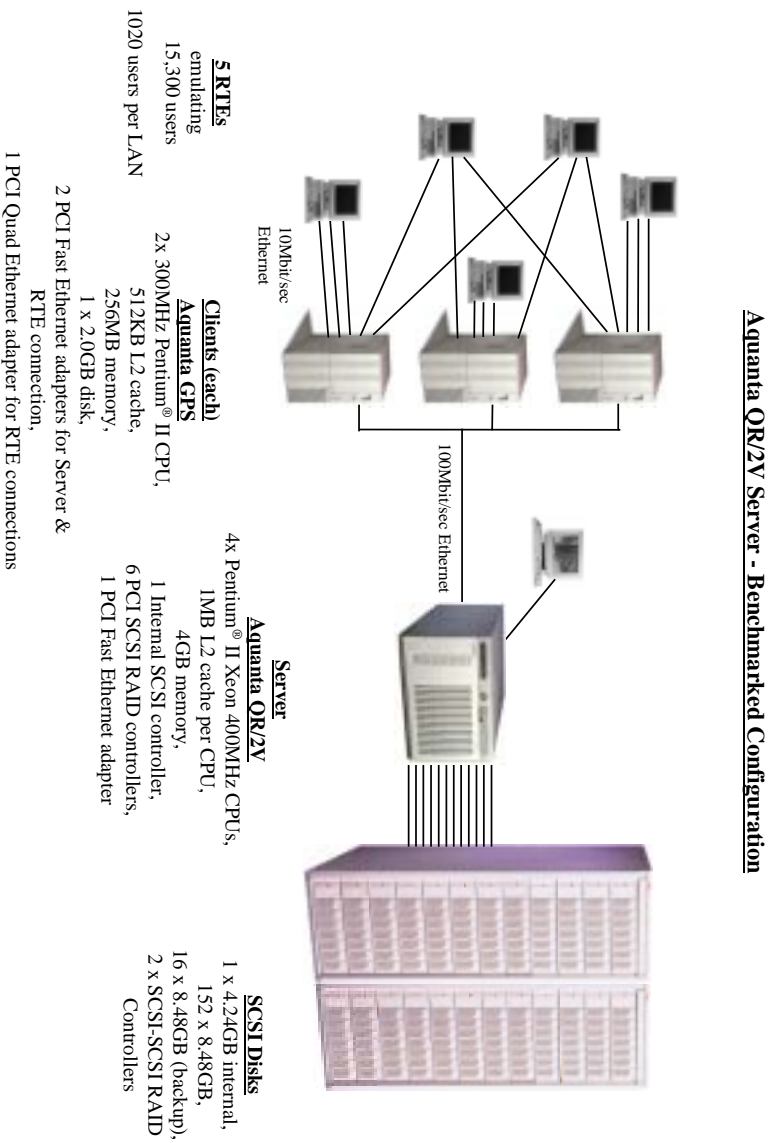
Diagrams of both measured and priced configurations must be provided, accompanied by a description of the differences. This includes, but is not limited to:

- *Number and type of processors.*
- *Size of allocated memory, and any specific mapping/partitioning of memory unique to the test.*
- *Number and type of disk units (and controllers, if applicable).*
- *Number of channels or bus connections to disk units, including their protocol type.*
- *Number of LAN (e.g., Ethernet) connections, including routers, workstations, terminals, etc., that were physically used in the test or are incorporated into the pricing structure (see Clause 8.1.8).*
- *Type and the run-time execution location of software components (e.g., DBMS, client processes, transaction monitors, software drivers, etc.).*

The Remote Terminal Emulator (RTE) software used for these TPC-C tests is proprietary to Unisys. The benchmarked configuration of the RTE and Aquanta QR/2V server is illustrated in Figure 0.1. Tables 4.3, 4.4 and 4.5 contain a detailed explanation of the disk configuration.

The priced configuration for the Aquanta QR/2V server is shown in Figure 0.2.

Figure 0.1: Benchmarked Configuration



Aquanta OR/2V Server - Benchmarked Configuration

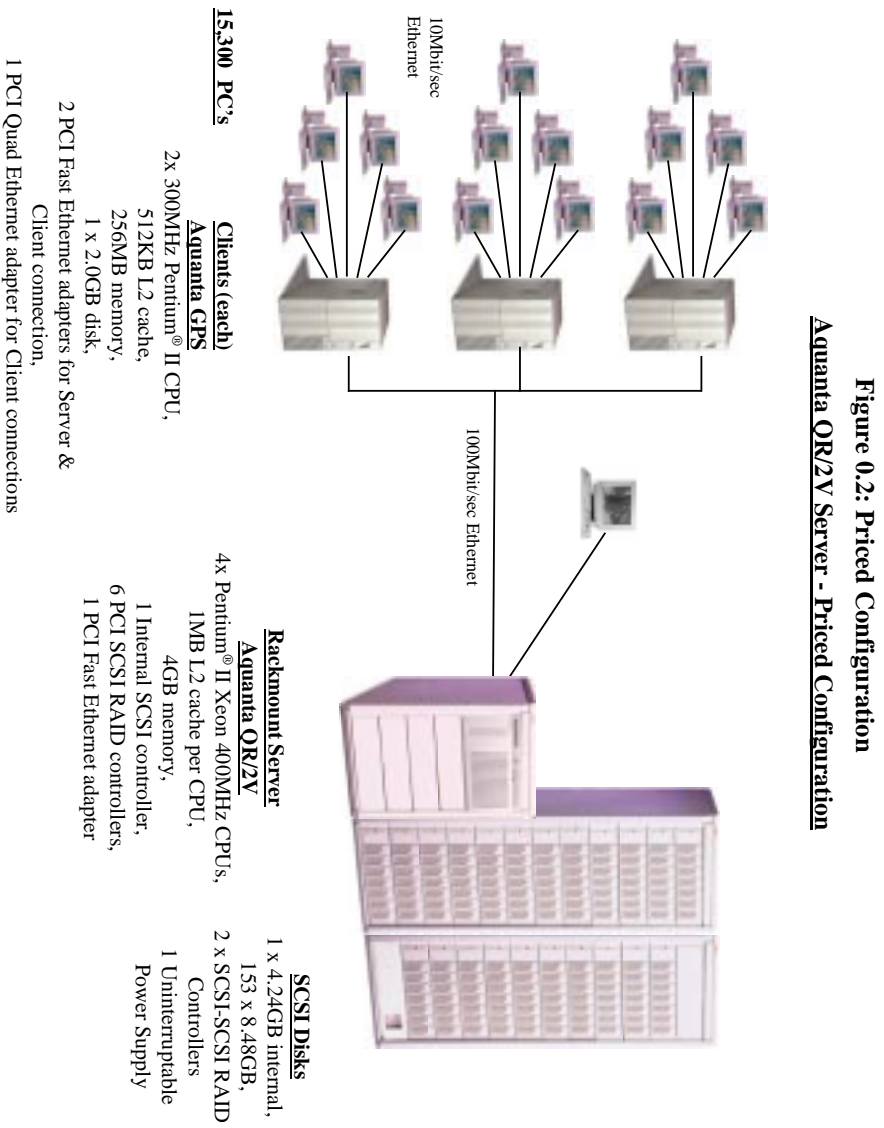


Figure 0.2: Priced Configuration

Aquanta OR/2V Server - Priced Configuration

1.

Clause 1: Logical Database Design

1.1. Table Definitions

Listings must be provided for all table definition statements and all other statements used to setup the data base.

Appendix B contains the SQL definitions of all the required database files, filegroups, tables, indexes and stored procedures, plus a listing of the program used to load the database and establish the required initial populations of each table.

1.2. Physical Organization of the Database

The physical organization of tables and indices, within the data base, must be disclosed.

The disk space was allocated to SQL Server according to the data in Table 4.4. The SQL definitions are contained in Appendix B.

1.3. Insert and/or 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 data base 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.

There were no restrictions on insert and/or delete operations to any of the tables.

1.4. Partitioning

While there are few restrictions placed upon horizontal or vertical partitioning of tables and rows in the TPC-C benchmark, any such partitioning must be disclosed.

Partitioning was not used for any table in this implementation.

1.5. Replication, Duplication or Additions

Replication of tables, if used, must be disclosed.

Additional and/or duplicate attributes in any table must be disclosed along with a statement on the impact on performance.

No replications, duplications or additional attributes were used in this implementation.

2. Clause 2: Transaction & Terminal Profiles

2.1. Random Number Generation

The method of verification for the random number generation must be disclosed.

The drivers used the Unisys RTE program, which was independently audited. The initial population of the database was performed by the loader program from V4.01 of the Microsoft TPC-C toolkit, which was also independently audited. Furthermore, the auditor sampled various initial and runtime distributions produced by this implementation to verify correctness.

2.2. Input/Output Screen Layout

The actual layout of the terminal input/output screens must be disclosed.

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 Benchmark C Standard Specification. There are some minor differences in appearance due to the use of a web client implementation.

2.3. Priced Terminal Feature 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).

This was verified by the auditor.

2.4. Presentation Managers or Intelligent Terminal

Any usage of presentation managers or intelligent terminals must be explained.

Application code running on the client implemented the TPC-C user interface. A listing of this code is included in Appendix A. No presentation manager was used on the client, as screen manipulation and data input/output was handled for each user by the Microsoft Internet Explorer web browser running on each user PC.

2.5. Transaction Statistics

The percentage of New-Order transactions that were rolled back as a result of an unused item number must be disclosed.

The number of items per order entered by New-Order transactions must be disclosed.

The percentage of home and remote Payment transactions must be disclosed.

The percentage of Payment and Order-Status transactions that used non-primary key (C_LAST) access to the database must be disclosed.

The percentage of Delivery transactions that were skipped as a result of an insufficient number of rows in the NEW-ORDER table must be disclosed.

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

Table 5.4 in Section 5 contains all these statistics.

2.6. Queuing Mechanism of Delivery

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

Tuxedo provides the queue for delivery servers. The client application process posts delivery transactions to the delivery queue using a Tuxedo asynchronous call with the TPNNoReply option. Upon return from this call, the client application provides a 'delivery queued' response to the user. Delivery servers independently retrieve messages from their queue, submit them to the data base for processing, and log the result to a file upon completion. The source code for this delivery process is included in Appendix A.

3. Clause 3: Transaction & System Properties

3.1. Transaction System Properties (ACID)

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.

The TPC Benchmark C Standard Specification defines a set of transaction processing system properties that a system under test (SUT) must support during the execution of the benchmark. Those properties are Atomicity, Consistency, Isolation, and Durability (ACID).

This section defines each of these properties, describes the steps taken to ensure that they were present during the test and describes a series of tests done to demonstrate compliance with the specification. All ACID property tests were executed successfully.

3.2. Atomicity

The system under test must guarantee that data base 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.

3.2.1. Completed Transaction

Perform the Payment transaction for a randomly selected warehouse, district, and customer (by customer number) and verify that the records in the CUSTOMER, DISTRICT, and WAREHOUSE tables have been changed appropriately.

The balances from a randomly selected warehouse, district, and customer row were retrieved by customer number from a script. A Payment transaction was submitted with the same warehouse, district and customer identifiers for a known amount. After completion of the Payment transaction, the balances of the selected warehouse, district, and customer were again retrieved to verify that the changes had been made correctly.

3.2.2. Aborted Transactions

Perform the Payment transaction for a randomly selected warehouse, district, and customer (by customer number) and substitute a ROLLBACK of the transaction for the COMMIT of the transaction. Verify that the records in the CUSTOMER, DISTRICT, and WAREHOUSE tables have NOT been changed.

The balances from a randomly selected warehouse, district, and customer row were retrieved by customer number from a script. A Payment transaction was submitted with the same warehouse, district and customer identifiers that issued a ROLLBACK command rather than a COMMIT. After the transaction completed, the balances of the selected warehouse, district, and customer were again retrieved to verify that no changes had been made to the database.

3.3. Consistency

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

The benchmark specification requires explicit demonstration of the following four consistency conditions:

1. The sum of the district balances in a warehouse is equal to the warehouse balance;
 2. For each district, the next order id minus one is equal to maximum order id in the ORDER table and equal to the maximum new order id in the NEW ORDER table;
 3. For each district, the maximum order id minus minimum order id in the ORDER table plus one equals the number of rows in the NEW-ORDER table for that district;
 4. For each district, the sum of the order line counts in the ORDER table equals the number of rows in the ORDER-LINE table for that district;
- In order to demonstrate this consistency, the following steps were taken:
1. Prior to the start of a benchmark run, the consistency of the database was verified by testing successfully conditions 1-4 described above with a script.
 2. A run under full user load was executed for over 10 minutes with a checkpoint during the run.
 3. After completion of that test, the consistency of the database was again verified by successfully testing using the same consistency script as in step 1.

3.4. 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.

The benchmark specification defines seven required tests to be performed to demonstrate that required levels of transaction isolation are met. These tests, described in Clauses 3.4.2.1 - 3.4.2.7, were all performed from a script and verified by the auditor. In Isolation Test 7, Case A was observed. In addition, the phantom tests and stock level tests were executed and verified to be successful.

3.5. Durability

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

Three durability tests were executed to satisfy the requirements of the specification. The test for loss of memory and instantaneous interruption was combined and performed with a fully scaled database with 15,300 emulated users. The loss of log and loss of data tests were performed on the same system, using a ten warehouse database with 100 emulated users. To the best of our knowledge, these tests prove that the fully scaled configuration used for the throughput test would also meet all durability tests.

3.5.1. Loss of Log Disk and Loss of Data Disk

The following steps were taken (using a ten warehouse database on the same system) to demonstrate durability in the case of loss of a log disk and of data disk. The same log disks and controllers were used for the log as for the fully scaled database. Two separate data disks were on each of two existing controllers.

1. The database was backed up to extra disks on a dump device.
2. The D_NEXT_O_ID fields for all rows in the district table were summed up to determine the initial count of orders present in the database.
3. The RTE was started with 100 users. On the driver systems, committed and rolled back New-Order transactions were recorded in a “success” file.
4. After ten minutes of running at steady state, a hot-pluggable log disk was removed from the disk cabinet, with no effect on NT or SQL server.

5. After 5 additional minutes of operation, a hot-pluggable data disk was removed from the disk cabinet.
6. NT and SQL Server encountered IO errors due to the missing disk and recorded these errors in the NT event log and SQL Server error log, respectively. Two RTEs also recorded errors.
7. First, the RTEs and clients were stopped, then SQL Server was used to take a dump of the transaction log to the dump device.
8. Next, SQL server was shutdown, then restarted, and scripts were executed to drop the database and all its devices. Then, SQL Server was shutdown again and the SUT shutdown.
9. A data disk was inserted in the disk cabinet to replace the one removed. The RAID controller was used to recreate the stripe set containing the new data disk. (The missing log drive was not replaced.)
10. The SUT was restarted, and Disk Administrator was used to assign the proper drive letter to the new volume. SQL Server was then restarted and a new (empty) database created as part of the restore database process. That process loaded the initial database into the new database, but did not perform any recovery. Next the transaction log was restored, followed by transaction recovery. The latter step restored all committed transactions to the database.
11. Consistency condition 3 of Clause 3.3.2.3 was executed to verify database consistency.
12. Step 2 was repeated to determine the total number of orders. This number was subtracted from the count obtained previously in Step 2 to determine the number of additional orders added to the database.
13. The contents of the “success” files on the drivers were sampled to verify that the records in the “success” file for committed New-Order transactions had corresponding records in the ORDER table and no entries existed for rolled back transactions. Moreover, the counts were matched with those obtained in step 12.

3.5.2. Instantaneous Interruption and Loss of Memory

Instantaneous interruption and loss of memory tests were combined because the loss of power erased the contents of memory. This failure was induced by removing the primary power to the System Under Test while the benchmark was executing.

1. The D_NEXT_O_ID fields for all rows in the district table were summed up to determine the initial count of orders present in the database (count1).
2. On the driver systems, committed and rolled back New-Order transaction were recorded in a “success” file.
3. The benchmark was executed at full load with 15,300 emulated users for a minimum of 10 minutes.
4. Shortly after execution of a checkpoint completed, the system’s primary power was turned off.
5. After transaction failures were noted by the RTEs, the RTEs and clients were shutdown.
6. Power was restored to the SUT, the system rebooted, SQL Server was restarted, and automatic database recovery was performed. The database recovery used the transaction log to reapply all committed transactions and rollback any (in progress) uncommitted transactions, so that the database disks were correct.
7. After recovery finished, Consistency Condition of Clause 3.3.2.3 (no gaps in NO_O_ID) was executed to verify that the database was consistent..
8. Next, samples of the contents of the “success” file on the driver were compared against corresponding rows of the ORDER table to verify that records in the “success” file for committed New-Order transactions had corresponding records in the ORDER table and no entries existed for rolled back transactions.
9. Finally, step 1 was repeated to determine the total number of orders (count2). Count2 minus count1 was not less than the number of committed New-Order records in the “success” file.

4.

Clause 4: Scaling & Database Population

4.1. Initial Cardinality of Tables

The Cardinality (e.g., the number of rows) of each table, as it existed at the start of the benchmark run, must be disclosed. If the database was over-scaled and inactive rows of the WAREHOUSE table were deleted (see Clause 4.2.2 and the Auditor's attestation letter) the cardinality of the WAREHOUSE table as initially configured and the number of rows deleted must be disclosed.

The TPC-C database for this test was configured with 1,530 warehouses. The cardinality of each table in the database is listed in Table 4.1

Table 4.1: Initial Cardinality of Database Table

Table	Occurrences
Warehouse	1,530
District	15,300
Customer	45,900,000
History	45,900,000
Order	45,900,000
New-Order	13,770,000
Order Line	459,001,971
Stock	15,300,000
Item	100,000

No rows were deleted from the warehouse table before executing the measurement runs.

4.2. Constant Values

The following values were used as the constant C input values to the NURand function during Build and Run time for this implementation.

Table 4.2: Constant C for NURand

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

4.3. Database Layout

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

Tables 4.3, 4.4 and 4.5 list the distribution of the database over 140 disks and the transaction log over six mirrored pairs of disks for the benchmark configuration. In addition, there was one disk containing Windows NT Enterprise Edition and SQL Server Enterprise Edition code and the Master database plus the paging file. Database backup used 16 extra disks. These 16 backup disks were unused during in the benchmark and were excluded from the priced configuration. The priced configuration included one extra 9GB disk.

4.4. DBMS: Data Model and DBMS Interface/Access Language

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, DLI, 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 Enterprise Edition 7.0 is a relational DBMS.

The client software interfaced to SQL Server through Stored Procedures invoked through Remote Procedure Calls embedded in the C application code. Specifically, DBLIB and TCP/IP sockets were used.

4.5. DBMS Partitions/Replications

The mapping of database partitions/replications must be explicitly described.

No table partitioning or replication was done.

4.6. DBMS Space Requirements

Details of the 180 day space computation along with proof that the database is configured to sustain 8 hours of growth for dynamic tables (Order, Order-line, and History) must be disclosed (see Clause 4.2.3).

Appendix E lists the space requirements for the 180-day space as well as the logical log space for eight hours.

Table 4.3: Disk Cage Configuration

Disk Cage Configuration															
Adapter	Channel	Id	Id	Id	Id	Id	Id	Id	Id	Id	Id	Id	Rack #		
1	0	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	empty	1	
		0	1	2	3	4	5	6	empty	2					
	1	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	empty	2
		0	1	2	3	4	5	6	empty	2					
		0	1	2	3	4	5	6	empty	2					
		8	9	10	11	12	13	14	empty	2					
2	0	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	3	
		8	9	10	11	12	13	14	empty	3					
		9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	4	
		0	1	2	3	4	5	6	empty	4					
		0	1	2	3	4	5	6	empty	4					
		8	9	10	11	12	13	14	empty	4					
	1	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	5	
		0	1	2	3	4	5	6	empty	5					
		8	9	10	11	12	13	14	empty	5					
		9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	6	
		0	1	2	3	4	5	6	empty	6					
		8	9	10	11	12	13	14	empty	6					
3	0	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	7	
		8	9	10	11	12	13	14	empty	7					
		9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	8	
		0	1	2	3	4	5	6	empty	8					
		0	1	2	3	4	5	6	empty	8					
		8	9	10	11	12	13	14	empty	8					
	1	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9	
		8	9	10	11	12	13	14	empty	9					
		9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	10	
		0	1	2	3	4	5	6	empty	10					
		0	1	2	3	4	5	6	empty	10					
		8	9	10	11	12	13	14	empty	10					
4	0	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	11	
		8	9	10	11	12	13	14	empty	11					
		9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	12	
		0	1	2	3	4	5	6	empty	12					
		0	1	2	3	4	5	6	empty	12					
		8	9	10	11	12	13	14	empty	12					
	1	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	13	
		8	9	10	11	12	13	14	empty	13					
		9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	14	
		0	1	2	3	4	5	6	empty	14					
		0	1	2	3	4	5	6	empty	14					
		8	9	10	11	12	13	14	empty	14					
5	0	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	15	
		8	9	10	11	12	13	14	empty	15					
		9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	16	
		0	1	2	3	4	5	6	empty	16					
		0	1	2	3	4	5	6	empty	16					
		8	9	10	11	12	13	14	empty	16					
	1	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	17	
		8	9	10	11	12	13	14	empty	17					
		9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	18	
		0	1	2	3	4	5	6	empty	18					
		0	1	2	3	4	5	6	empty	18					
		8	9	10	11	12	13	14	empty	18					

Disk Cage Configuration

Adapter	Channel	Id	Id	Id	Id	Id	Id	Id	Id	Id	Rack #
6	0	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	19
		8	9	10	11	12	13	14			
	1	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	20
		0	1	2	3	4	5	6			
		9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	21
		8	9	10	11	12	13	14			
	2	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	22
		0	1	2	3	4	5	6			
		9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	9GB	*
		8	9	10	11	12	13	14			
			9GB	empty	empty	empty	empty	empty	empty	empty	*

Table 4.4: RAID Adapter Disk Configuration

RAID Adapter Disk Configuration						
Adapter	ID	Channel 0	Channel 1	Channel 2	RAID Configuration	Drive Letters
1	0	A0	A1		Arrange Pack A as RAID 1 (log)	L:
	1					
	2					
	3					
	4					
	5					
2	0	A0	C0		Arrange Packs A - D as RAID 0	E: and Q:
	1	A1	C1			
	2	A2	C2			
	3	A3	C3			
	4	A4	C4			
	5	A5	C5			
	6	A6	C6			
	8	B0	D0			
	9	B1	D1			
	10	B2	D2			
	11	B3	D3			
	12	B4	D4			
	13	B5	D5			
	14	B6	D6			
3	0	A0	C0	E0	Arrange Packs A - D as RAID 0	F: and P:
	1	A1	C1	E1		
	2	A2	C2	E2		
	3	A3	C3	E3		
	4	A4	C4	E4		
	5	A5	C5	E5		
	6	A6	C6	E6		
	8	B0	D0	E7		
	9	B1	D1			
	10	B2	D2			
	11	B3	D3			
	12	B4	D4			
	13	B5	D5			
	14	B6	D6			
4	0	A0	C0		Arrange Packs A - D as RAID 0	G: and O:
	1	A1	C1			
	2	A2	C2			
	3	A3	C3			
	4	A4	C4			
	5	A5	C5			
	6	A6	C6			
	8	B0	D0			
	9	B1	D1			
	10	B2	D2			
	11	B3	D3			
	12	B4	D4			
	13	B5	D5			
	14	B6	D6			

RAID Adapter Disk Configuration

Adapter	ID	Channel 0	Channel 1	Channel 2	RAID Configuration	Drive Letters
5	0	A0	C0		Arrange Packs A - D as RAID 0	H: and N:
	1	A1	C1			
	2	A2	C2			
	3	A3	C3			
	4	A4	C4			
	5	A5	C5			
	6	A6	C6			
	8	B0	D0			
	9	B1	D1			
	10	B2	D2			
	11	B3	D3			
	12	B4	D4			
	13	B5	D5			
	14	B6	D6			
	6	0	A0	C0			E0	Arrange Packs A - D as RAID 0	I: and M:
1		A1	C1	E1		
2		A2	C2	E2		
3		A3	C3	E3		
4		A4	C4	E4		
5		A5	C5	E5		
6		A6	C6	E6		
8		B0	D0	E7		
9		B1	D1			
10		B2	D2			
11		B3	D3			
12		B4	D4			
13		B5	D5			
14		B6	D6			

Arrange Pack E as RAID 5 (backup)

S:

Table 4.5: Disk Administrator Configuration

Disk Administrator Configuration			
Disk 0 4338 MB	C: SYSTEM FAT	Z: testfiles NTFS	unused 0 MB
Disk 1 52097 MB	L: unknown		unused 2097 MB
Disk 2 243124 MB	E: unknown	Q: 8805 MB	unused 215914 MB
Disk 3 243124 MB	F: unknown	P: 8805 MB	unused 215914 MB
Disk 4 60781 MB	R: BACK1 NTFS		unused 0 MB
Disk 5 243124 MB	G: unknown	O: 8805 MB	unused 215914 MB
Disk 6 243124 MB	H: unknown	N: 8805 MB	unused 215914 MB
Disk 7 243124 MB	I: unknown	M: 8805 MB	unused 215914 MB
Disk 8 60781 MB	S: BACK2 NTFS		unused 0 MB
CD-ROM 0	D:		

5. Clause 5: Performance Metrics & Response Time

5.1. Measured Throughput (tpmC)

Measured tpmC must be reported.

The measured tpmC was 19118.37.

5.2. Response Times

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

Table 5.1: Response Time Data

Transaction	Average	Maximum	90th %ile
New-Order	0.41	5.90	0.55
Payment	0.24	4.83	0.34
Delivery	0.13	1.91	0.14
Stock-Level	2.34	7.79	3.19
Order Status	0.30	4.88	0.41
Menu	0.12	3.21	0.13
Delivery (Deferred)	0.56	4.73	0.84

5.3. Keying and Think Times

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

Table 5.2: Keying Times

Transaction	Minimum	Average	Maximum
New-Order	18.00	18.01	18.09
Payment	3.00	3.00	3.09
Delivery	2.00	2.00	2.06
Stock-Level	2.00	2.00	2.08
Order Status	2.00	2.00	2.05

Table 5.3: Think Times

Transaction	Minimum	Average	Maximum
New-Order	0.00	12.03	120.31
Payment	0.00	12.03	120.31
Delivery	0.00	5.07	50.60
Stock-Level	0.00	5.09	50.60
Order Status	0.00	10.06	100.72

5.4. Response Time Frequency Distribution Curves

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

Figure 5.1: New Order Response Time Distribution

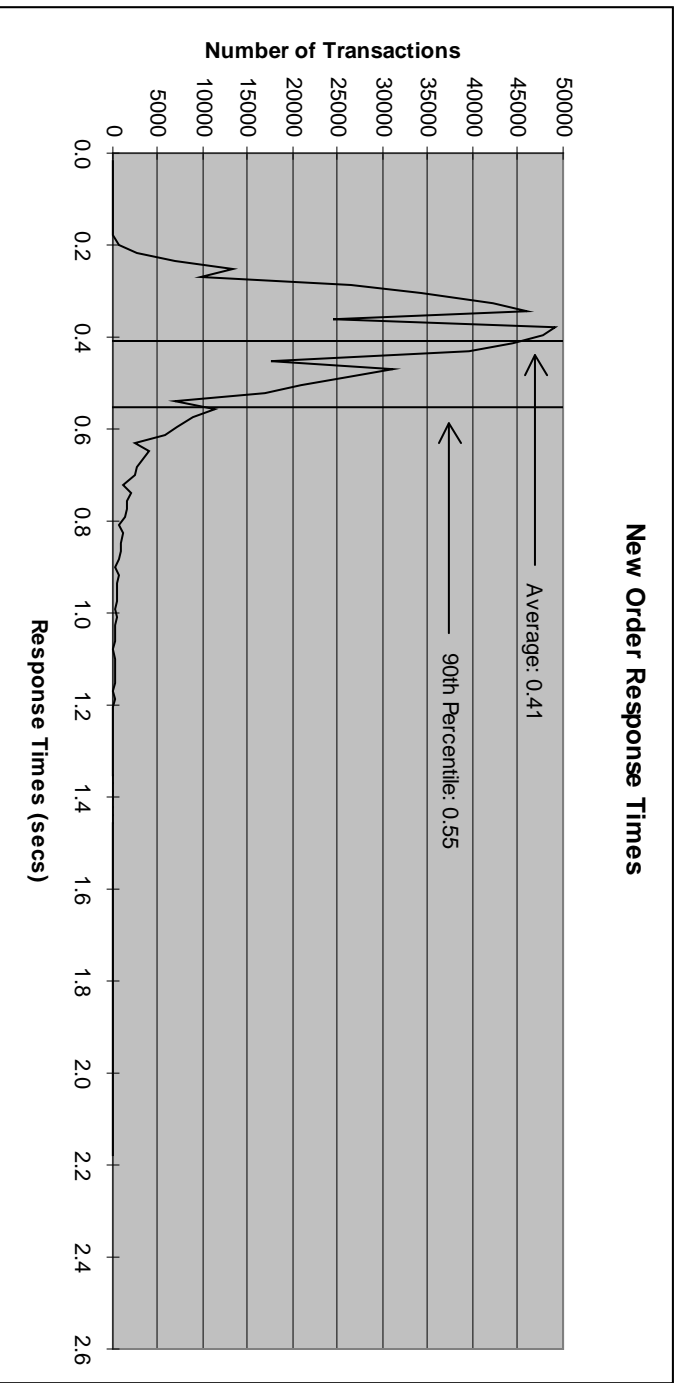


Figure 5.2: Payment Response Time Distribution

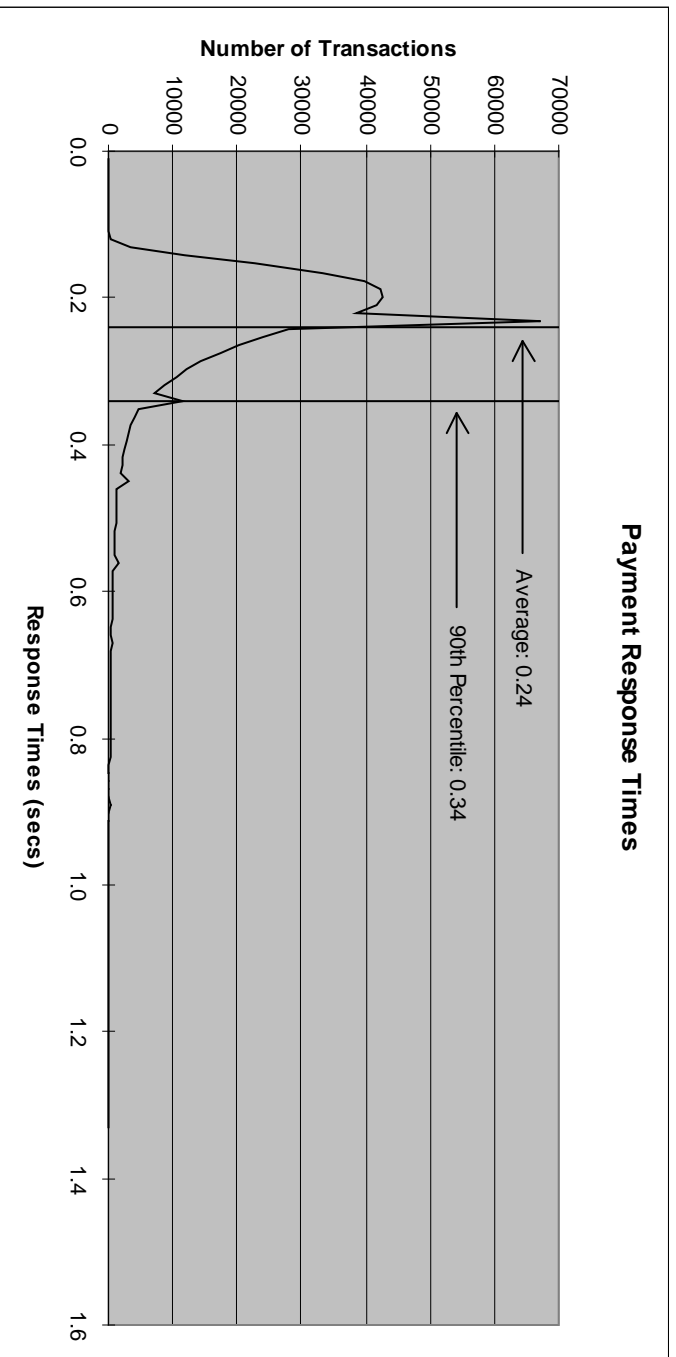


Figure 5.3: Order Status Response Time Distribution

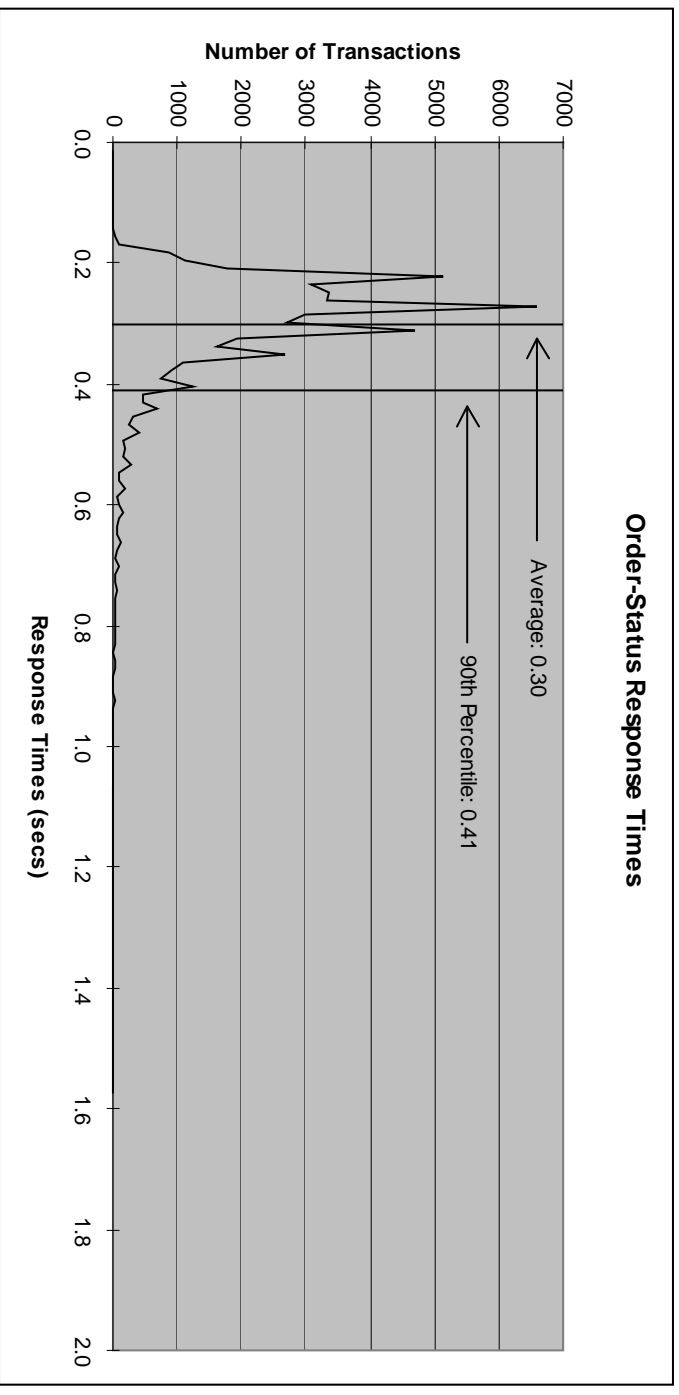


Figure 5.4: Delivery Response Time Distribution

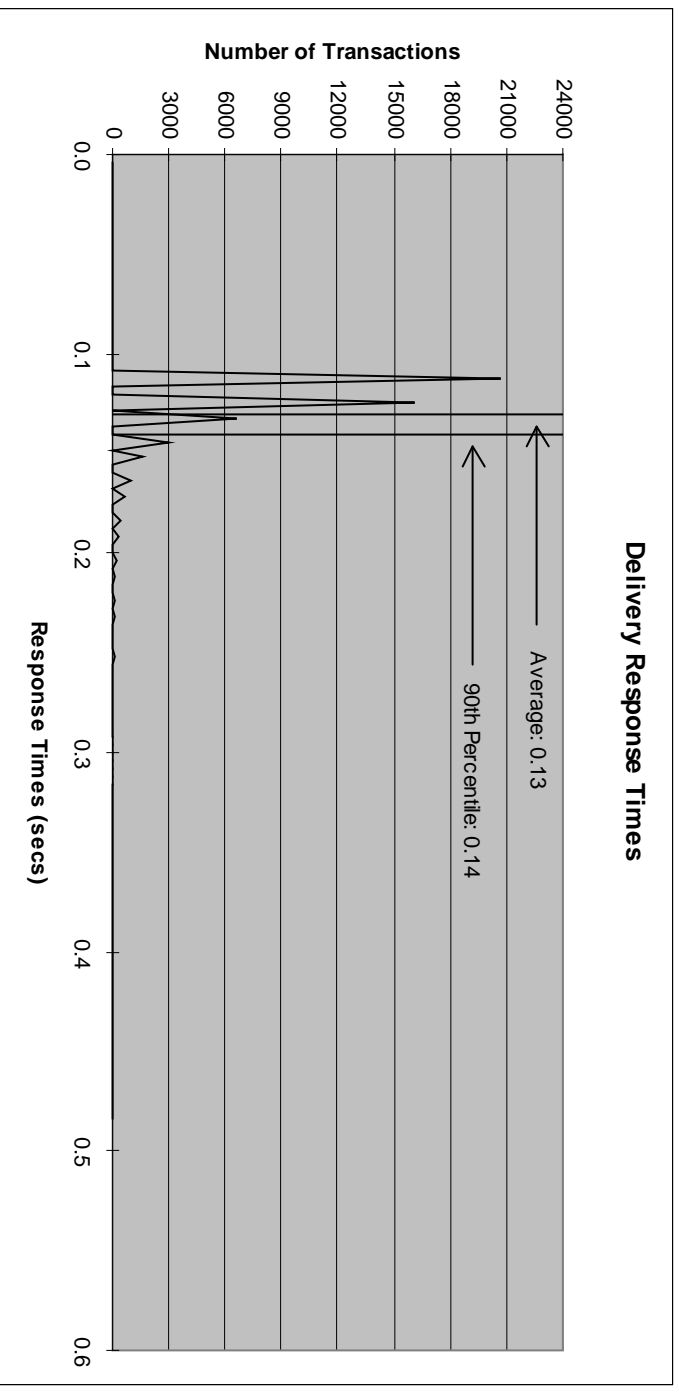
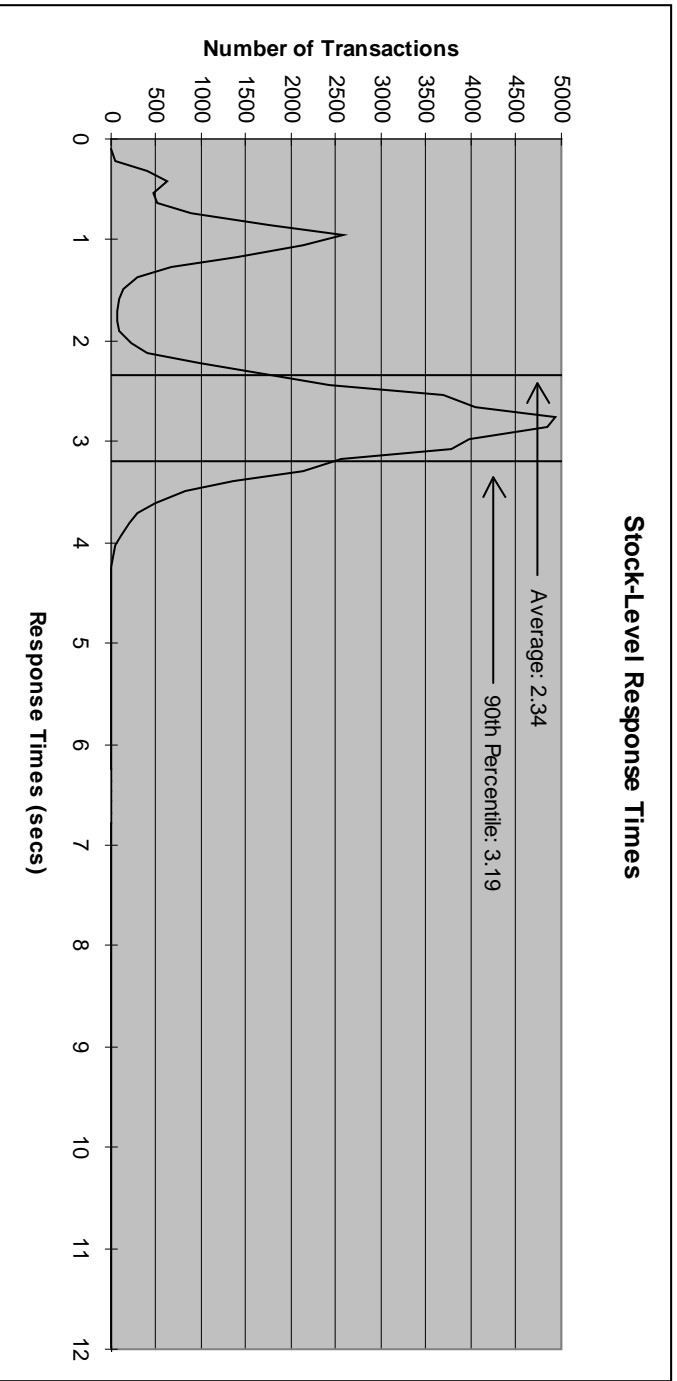


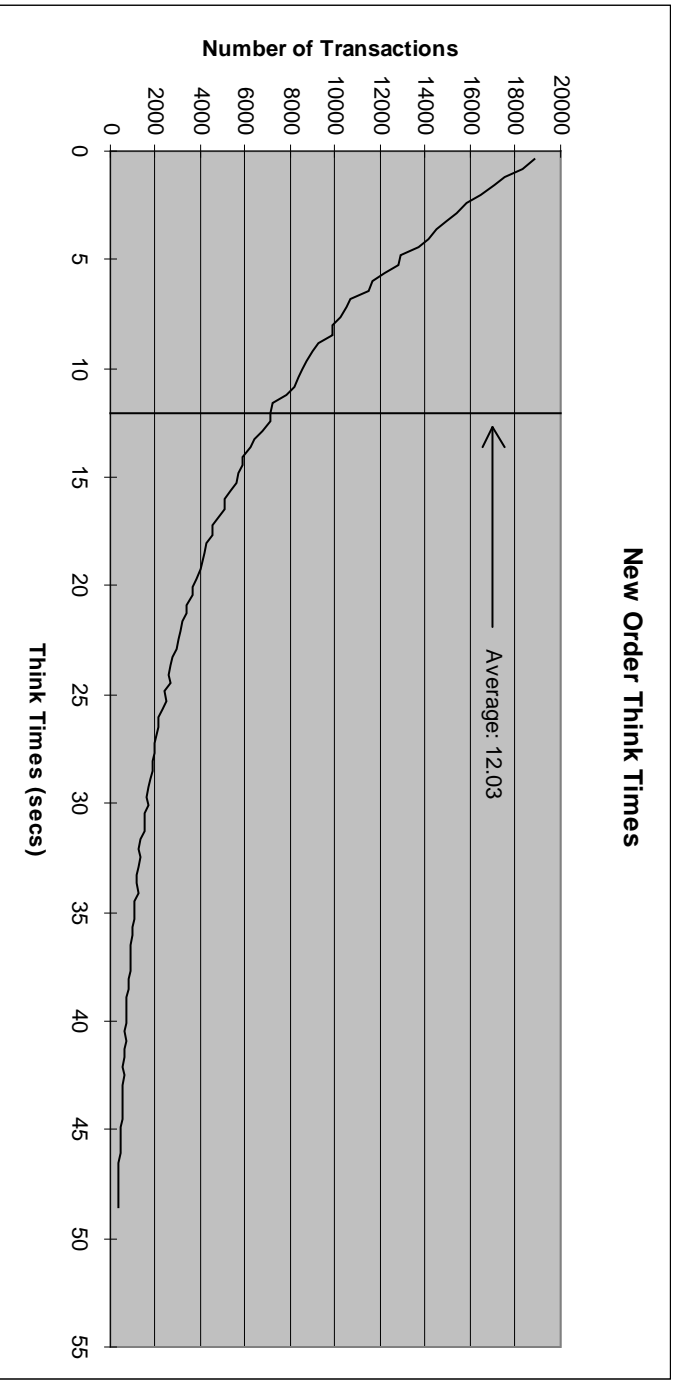
Figure 5.5: Stock Level Response Time Distribution



5.5. New Order Think Time Frequency Distribution Curve

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

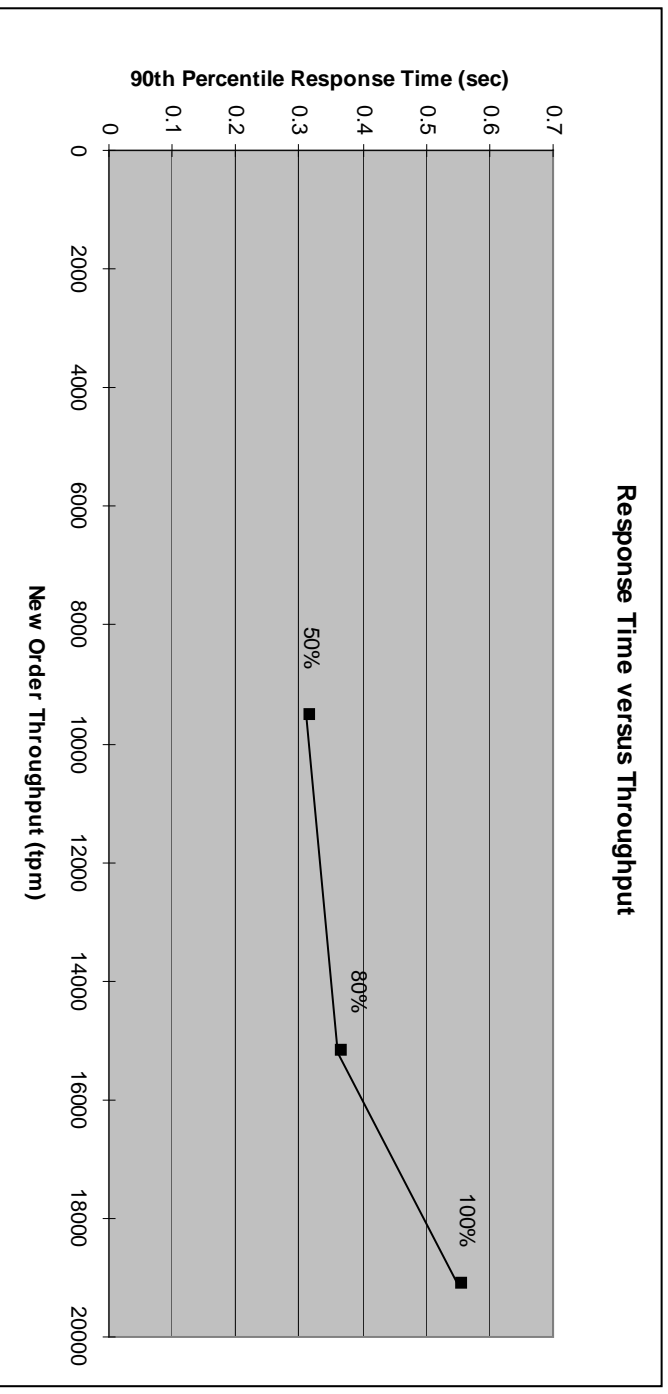
Figure 5.6: New Order Think Time Distribution



5.6. Response Time versus Throughput Performance Curve

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

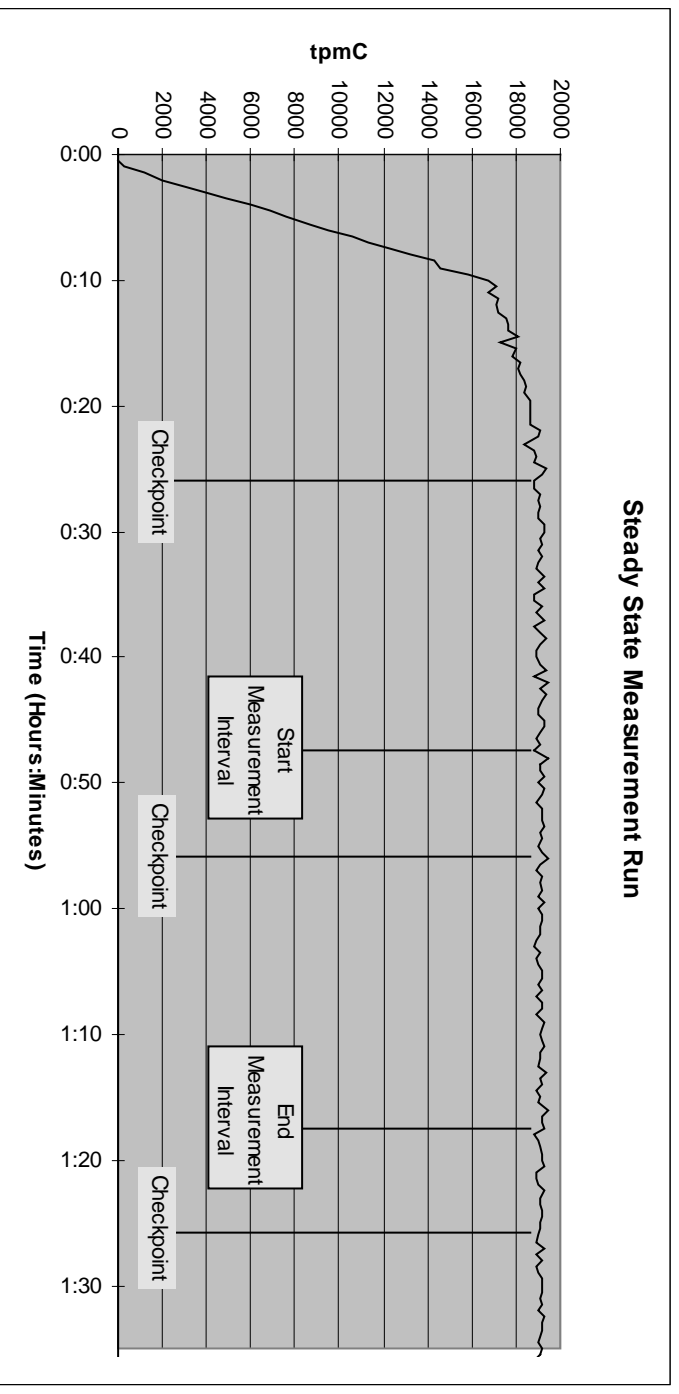
Figure 5.7: Response Time versus Throughput



5.7. New-Order Throughput vs. Time

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

Figure 5.8: Throughput (tpmC) versus Time



5.8. Determination of ‘Steady State’

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.

The transaction throughput rate (tpmC) and response time were relatively constant after the initial ‘ramp up’ period. The throughput and response time behavior were determined by examining data reported for each 30-second interval over the duration of the benchmark. Ramp-up, steady state, and ramp-down regions are discernible in the graph presented in Figure 5.8.

5.9. 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.

The RTE selects a transaction type from the menu and prepares to request the appropriate blank form. A timestamp is taken before the form request is sent and after the response is returned. The difference between the two is saved off as the menu response time. The RTE then generates input data for the transaction to create a completed form and waits the appropriate key time. A timestamp is taken before the completed form is sent and after the response is returned. The difference between these two is saved off as the transaction response time. Both response times are padded with a 0.1 second delay per spec to account for the web browser delay. The appropriate transaction data and response times are logged and the RTE waits the required think time interval before repeating the process. Each RTE driver maintains its own log file. Log file contents are consolidated for the reports.

The RTE emulates web browsers (not terminals) in this client-server implementation. The RTE sends and receives HTML formatted data using HTTP through Ethernet LANs to a client application running on the client machine. The client application processes the request, sends the transaction to a Tuxedo TPC-C application server queue, waits for the transaction response (except for delivery), and returns an appropriately formatted HTML form back to the (emulated) web browser (RTE). The Tuxedo TPC-C application server retrieves a message from its queue, invokes request processing via a stored procedure on the database server using Microsoft SQL Server DDLIB and RPC through sockets over another Ethernet LAN, accepts the response, and returns a result to the client application (via Tuxedo). For delivery transactions, the client application does not wait for the Tuxedo TPC-C delivery server to respond. Each delivery server logs its results to its own file. The delivery report files are consolidated for reports.

To perform checkpoints at specific intervals, SQL Server’s checkpoint interval was set to the maximum allowable value and a utility was written to schedule checkpoints at 30 minute intervals and record the start and end time of each checkpoint. The checkpoint script was started manually on one of the client machines after the RTE had all users logged in and sending transactions and a steady state had been achieved. Using this information, the positioning of the checkpoint within the measurement interval was verified to be clear of the guard zones.

At each checkpoint, SQL Server wrote to disk all database pages in memory that had been updated but not yet physically written to the disk. Upon completion of the checkpoint, SQL Server also wrote records to the transaction log indicating that a checkpoint had completed.

5.10. Reproducibility

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

In a repeat test, carried out in the same manner as the primary test, a throughput of 19,102.63 tpmC was achieved on the same database during a 30-minute, steady state run. All required transaction statistics were met. See the Auditor's attestation letter for details.

5.11. Measurement Interval Duration

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

The measurement interval was 30 minutes.

5.12. Regulation of Transaction Mix

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

The RTE was given a weighed random distribution which could not be adjusted during the run.

5.13. Transaction Statistics

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

The percentage of New-Order transactions rolled back as a result of invalid item number must be disclosed.

The average number of order-lines entered per New-Order transaction must be disclosed.

The percentage of remote order-lines entered per New-Order transaction must be disclosed.

The percentage of remote Payment transactions must be disclosed.

The percentage of customer selections by customer last name in the Payment and Order-Status transactions must be disclosed.

The percentage of Delivery transactions skipped due to there being fewer than necessary orders in the New-Order table must be disclosed.

Table 5.4 shows this information.

Table 5.4: Transaction Statistics

Transaction Type	Statistics	Value
New Order	Rollback transactions	1.00%
	Home warehouse	99.00%
	Remote warehouse	1.00%
	Average Items per Order	9.99
Payment	Home warehouse	85.09%
	Remote warehouse	14.91%
	Non-primary key access	60.06%
Order Status	Non-primary key access	60.23%
Delivery	Skipped transactions (Interactive)	0
	Skipped transaction counts (Deferred)	0
Transaction Mix	Skipped District counts (Deferred)	0
	New Order	44.82%
	Payment	43.14%
	Delivery	4.02%
	Stock-Level	4.01%
	Order-Status	4.00%

5.14. Checkpoint Statistics

The number of checkpoints in the measurement interval, the time in seconds from the start of the measurement interval to the first checkpoint, and the Checkpoint Interval must be disclosed.

There is one checkpoint in the measurement interval. The checkpoint starts 501 seconds into the measurement interval. The checkpoint interval is 30 minutes (from the start of one to the start of the next) and a checkpoint lasts approximately 6 minutes. In conformance with Clause 5.2.2 there is no checkpoint within a span of 7.5 minutes before or after the beginning or end of the measurement interval.

6. Clause 6: SUT, Driver & Communications Definition

6.1. Remote Terminal Emulator (RTE) Description

The RTE input parameters, code fragments, functions, etc. used to generate each transaction input field must be disclosed.

The RTE used is proprietary to Unisys. Appendix D contains the profile used as input to this RTE.

6.2. 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.

There were no emulated components in the benchmark configuration other than the emulated web browsers on the users' PCs.

6.3. Functional Diagrams

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

Section 0.7 describes and shows functional diagrams of the benchmarked and priced systems.

6.4. Network Configuration

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

Figures 0.1 and 0.2 in Section 0.7 also diagram the network configurations of the benchmark and configured systems and represent the RTEs connected via LAN replacing the user PCs that are directly connected via LAN.

6.5. Network Bandwidth

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

Ethernet local area networks (LAN) are used in the priced and tested configurations. The database server (SUT) contains a single 10/100 megabit per second LAN adapter connecting it to the client systems. This LAN segment is run at 100 megabits per second in both the priced and tested configuration.

Each client contains two 10/100 megabit per second LAN adapters and one quad LAN adapter that supports four 10/100 megabit per second LAN segments. One 10/100 megabit per second LAN adapter connects to a LAN segment that communicates with the SUT at 100 megabits per second in both the priced and tested configuration. All other

LAN adapters are connected to LAN segments running at 10 megabits per second in both the priced and tested configurations.

In the priced configuration, each client is connected to workstations (PCs running web browsers) spread over five 10 megabit per second LAN segments.

In the tested configuration, each client is connected to RTE driver systems emulating web browsers spread over five 10 megabit per second LAN segments.

6.6. Operator Intervention

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

No operator intervention was required to sustain eight hours of operation at the reported throughput.

7.

Clause 7: Pricing

7.1. Pricing

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) must also be reported.

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.

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.

System pricing must include line item indication where non-sponsoring companies' brands are used. System pricing must also include line item indication of third party pricing.

A detailed list of hardware and software components along with their part numbers and prices are given in the Executive Summary near the beginning of this document.

7.1.1. System Pricing

Each priced configuration consists of an integrated system package, additional options, and components. Prices for all products are US list prices. A three year warranty is standard with this class of Unisys server products.

7.1.2. Maintenance Pricing

The five year support pricing for Unisys Corporation Open Business Server products is based on a 36-month warranty on hardware, upgraded to service level Performance-Gold, plus an additional 24 months of support at service level Performance-Gold. Microsoft and BEA support pricing is based on 60 months of monthly support costs.

Unisys Corporation Standard Performance-Gold Support: four hour maximum response, onsite support for hardware provides service from 8:00 A.M. to 5:00 P.M., Monday through Friday. Service requests made as late as 5:00 P.M. will receive a response the same day.

Netlux and Data Comm Warehouse provide return-to-factory replacement within seven days. Server disks are covered by Western Micro's seven day return-to-factory warranty. Appropriate spares are included in the priced configuration.

7.1.3. Discounts

Unisys provides a standard pre-pay discount for maintenance service of the client, server and storage components of the priced configuration.

Western Micro provides a standard dollar-volume discount to the client, server and storage components of the priced configuration.

7.2. Availability

The committed delivery date for general availability (availability date) of products used in the price calculation 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.

The hardware, software and support/maintenance products priced in this benchmark are detailed on page vi.

Microsoft SQL Server Enterprise Edition 7.0 will be available by December 29, 1998. All other components are available.

7.3. Measured tpmC, Price/Performance, and Availability Date

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

Unisys Corporation Aquanta QR2V Server, with Microsoft Windows NT Server Enterprise Edition 4.0 and SQL Server Enterprise Edition 7.0, achieved 19,118.37 tpmC at \$22.19 per tpmC. All components will be available by December 29, 1998.

7.4. 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.

None.

7.5. Usage Pricing

For any usage pricing, the sponsor must disclose:

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

The component pricing based on usage is shown below:

- One (1) Microsoft Windows NT Server Enterprise Edition 4.0 license
- One (1) Microsoft SQL 7.0 Server Enterprise Edition license
- Three (3) Microsoft Windows NT Server 4.0 Licenses
- One (1) Microsoft Visual C++ Professional 5.0
- Three (3) BEA Tuxedo 6.3 CFS for NT licenses

Microsoft SQL Server & Internet Information Server and BEA Tuxedo were priced for an unlimited number of users.

8.

Clause 8 : Full Disclosure Availability

8.1. Availability

The Full Disclosure Report must be readily available to the public at a reasonable charge, similar to charges for similar documents by that test sponsor.

Copies of this Full Disclosure Report may be obtained by contacting:

TPC Benchmark Administrator
Systems Analysis, Modeling & Measurement Group
Unisys Corporation, M/S 262
25725 Jeronimo Road
Mission Viejo, CA 92691
USA

9.

Clause 9 : Audit

9.1. Auditor's Report

The auditor's name, address, phone number and a copy of the auditor's attestation letter indicating compliance must be included in the Full Disclosure Report.

This implementation of the TPC Benchmark C on the Unisys Aquanta QR/2V Server was audited by Richard Gimarc, a TPC certified auditor of:

Performance Metrics Inc.,
2229 Benita Drive, Suite 101,
Rancho Cordova, CA 95670.

(916) 635-2822 Fax: (916) 858-0109
e-mail: Richard@PerfMetrics.com

The attestation letter is shown on the next page.

PERFORMANCE METRICS INC.

TPC Certified Auditors

Jerrold Buggert

December 2, 1998

Director of Modeling and Measurement

Unisys Corporation

25725 Jeronimo Road

Mission Viejo, CA 92691

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

Platform: Unisys Aquanta QS/2V Server

Database Manager: Microsoft SQL Server Enterprise Edition 7.0

Operating System: Microsoft Windows NT Server Enterprise Edition 4.0 (SP4)

Transaction Manager: BEA TUXEDO CFS 6.3 for NT

CPU's	Memory	Disks	New-Order Response Time @ 90%	tpmC
Server: Unisys Aquanta QS/2V Server				
4 Pentium II Xeon @ 400 MHz	Main: 4 GB L2 Cache: 1 MB	5 @ 4.23 GB 168 @ 8.48 GB	0.55 sec.	19,118.37
3 Clients: Unisys Aquanta GPS				
2 Pentium II @ 300 MHz	Main: 256 MB L2 Cache: 512 KB	1 @ 2.02 GB	n/a	n/a

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 was properly sized and populated.
- The database was properly scaled with 1,530 warehouses.
- The ACID properties were met.
- The durability data loss and log loss tests were performed on a 10-warehouse database.
- Input data was generated according to the specified percentages.

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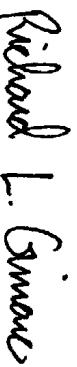
PERFORMANCE METRICS INC.
TPC Certified Auditors

- Eight hours of mirrored log space was configured on the priced system.
- Eight hours of dynamic table growth space was configured on the measured system.
- The following server disks contained backup and other data and were not active during measurement: four 4.23 GB disks and sixteen 8.48 GB disks. These 20 disks were not included in the priced configuration.
- The 180-day space calculation was verified. One 8.48 GB disk was added to the priced configuration to satisfy this requirement.
- Measurement cycle times included a 01 second menu and a 0.1 second response time delay for an emulated Web browser.
- The steady state portion of the test was 30 minutes.
- One checkpoint was taken during the steady state portion of the test.
- Checkpoints were verified to be clear of the guard zones.
- There were 15,300 user contexts present on the system.
- Each emulated user started with a different random number seed.
- The NURand constants used for database load and at run time were verified.
- System pricing was checked for major components and maintenance.

Additional Audit Notes:

This benchmark measurement was performed on an Aquanta QS/2V Server, but both an Aquanta QS/2V and an Aquanta QR/2V configuration were priced. It is my opinion that all active components in both of these priced configurations are identical.

Regards,



Richard L. Gimarc
Auditor

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(916) 635-2822 Fax: (916) 858-0109 e-mail: Richard@PerfMetrics.com

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Appendix A - Client/Server Source

CLIENT MAKEFILE

```
# Microsoft Developer Studio Generated NMAKE File, Format Version 4.20
# ** DO NOT EDIT **

# TARGETTYPE "Win32 (x86) Dynamic-Link Library" 0x0102

!IF "$(CFG)" == ""
CFG=tpcc - Win32 Debug
!MESSAGE No configuration specified. Defaulting to tpcc - Win32 Debug.
!ENDIF

!IF "$(CFG)" != "tpcc - Win32 Release" && "$(CFG)" != "tpcc - Win32 Debug"
!MESSAGE Invalid configuration "$(CFG)" specified.
!MESSAGE You can specify a configuration when running NMAKE on this
makefile
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "tpcc.mak" CFG="tpcc - Win32 Debug"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "tpcc - Win32 Release" (based on "Win32 (x86) Dynamic-Link
Library")
!MESSAGE "tpcc - Win32 Debug" (based on "Win32 (x86) Dynamic-Link
Library")
!MESSAGE
!ERROR An invalid configuration is specified.
!ENDIF

!IF "$(OS)" == "Windows_NT"
NULL=
!ELSE
NULL=nul
!ENDIF
#####
#####
# Begin Project
# PROP Target_Last_Scanned "tpcc - Win32 Release"
CPP=cl.exe
RSC=rc.exe
MTL=mktyplib.exe

!IF "$(CFG)" == "tpcc - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir "Release"
# PROP BASE Intermediate_Dir "Release"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir "Release"
```

```
# PROP Intermediate_Dir "Release"
# PROP Target_Dir ""
OUTDIR=.\Release
INTDIR=.\Release

ALL : "$(OUTDIR)\tpcc.dll"

CLEAN :
    -@erase "$(INTDIR)\diagio.obj"
    -@erase "$(INTDIR)\term.obj"
    -@erase "$(INTDIR)\timesupp.obj"
    -@erase "$(INTDIR)\tmon.obj"
    -@erase "$(INTDIR)\TPCC.OBJ"
    -@erase "$(INTDIR)\tpcchandler.obj"
    -@erase "$(OUTDIR)\tpcc.dll"
    -@erase "$(OUTDIR)\tpcc.exp"
    -@erase "$(OUTDIR)\tpcc.lib"

"$ (OUTDIR)" :
    if not exist "$(OUTDIR)/$(NULL)" mkdir "$(OUTDIR)"

# ADD BASE CPP /nologo /MT /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D
" _WINDOWS" /YX /c
# ADD CPP /nologo /MT /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" /YX
/c
CPP_PROJ=/nologo /MT /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_WINDOWS" \
/Fp"$(INTDIR)/tpcc.pch" /YX /Fo"$(INTDIR)/" /c
CPP_OBJS=.\Release/
CPP_SBRS=.\.
# ADD BASE MTL /nologo /D "NDEBUG" /win32
# ADD MTL /nologo /D "NDEBUG" /win32
MTL_PROJ=/nologo /D "NDEBUG" /win32
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
BSC32_FLAGS=/nologo /o"$(OUTDIR)/tpcc.bsc"
BSC32_SBRS= \

LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib
odbc32.lib odbccp32.lib /nologo /subsystem:windows /dll /machine:I386
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib
odbccp32.lib libtux.lib libbuft.lib libtux2.lib libfml.lib libfml32.lib
libgp.lib /nologo /subsystem:windows /dll /machine:I386
# SUBTRACT LINK32 /verbose /nodefaultlib
LINK32_FLAGS=kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib \
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib \
odbccp32.lib libtux.lib libbuft.lib libtux2.lib libfml.lib libfml32.lib \
libgp.lib /nologo /subsystem:windows /dll /incremental:no \
/pdb:"$(OUTDIR)/tpcc.pdb" /machine:I386 /def:". \tpcc.def" \
/out:"$(OUTDIR)/tpcc.dll" /implib:"$(OUTDIR)/tpcc.lib"
DEF_FILE= \
```

```

        ".\tpcc.def"
LINK32_OBJS= \
    "$ (INTDIR)\diagio.obj" \
    "$ (INTDIR)\term.obj" \
    "$ (INTDIR)\timesupp.obj" \
    "$ (INTDIR)\tmon.obj" \
    "$ (INTDIR)\TPCC.OBJ" \
    "$ (INTDIR)\tpcchandler.obj"

"$ (OUTDIR)\tpcc.dll" : "$ (OUTDIR)" $(DEF_FILE) $(LINK32_OBJS)
    $(LINK32) @<<
    $(LINK32_FLAGS) $(LINK32_OBJS)
<<

!ELSEIF "$(CFG)" == "tpcc - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "Debug"
# PROP BASE Intermediate_Dir "Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir "Debug"
# PROP Intermediate_Dir "Debug"
# PROP Target_Dir ""
OUTDIR=.\Debug
INTDIR=.\Debug

ALL : "$ (OUTDIR)\tpcc.dll"

CLEAN :
    -@erase "$(INTDIR)\diagio.obj"
    -@erase "$(INTDIR)\term.obj"
    -@erase "$(INTDIR)\timesupp.obj"
    -@erase "$(INTDIR)\tmon.obj"
    -@erase "$(INTDIR)\TPCC.OBJ"
    -@erase "$(INTDIR)\tpcchandler.obj"
    -@erase "$(INTDIR)\vc40.idb"
    -@erase "$(INTDIR)\vc40.pdb"
    -@erase "$(OUTDIR)\tpcc.dll"
    -@erase "$(OUTDIR)\tpcc.exp"
    -@erase "$(OUTDIR)\tpcc.ilk"
    -@erase "$(OUTDIR)\tpcc.lib"
    -@erase "$(OUTDIR)\tpcc.pdb"

"$ (OUTDIR)" :
    if not exist "$(OUTDIR)/$(NULL)" mkdir "$(OUTDIR)"

# ADD BASE CPP /nologo /MTd /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D
" _WINDOWS" /YX /c
# ADD CPP /nologo /MT /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D
" _WINDOWS" /YX /c
CPP_PROJ=/nologo /MT /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D
" _WINDOWS" \
    /Fp"$ (INTDIR)\tpcc.pch" /YX /Fo"$ (INTDIR)\" /Fd"$ (INTDIR)\" /c
CPP_OBJS=.\Debug\
CPP_SBRS=.\.
# ADD BASE MTL /nologo /D "_DEBUG" /win32
# ADD MTL /nologo /D "_DEBUG" /win32
MTL_PROJ=/nologo /D "_DEBUG" /win32

```

```

# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
BSC32_FLAGS=/nologo /o"$ (OUTDIR)\tpcc.bsc"
BSC32_SBRS= \

LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib
comdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib
odbc32.lib odbccp32.lib /nologo /subsystem:windows /dll /debug
/machine:I386
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib
odbccp32.lib libtux.lib libbuft.lib libtux2.lib libfml.lib libfml32.lib
libgp.lib /nologo /subsystem:windows /dll /debug /machine:I386
# SUBTRACT LINK32 /verbose /nodefaultlib
LINK32_FLAGS=kernel32.lib user32.lib gdi32.lib winspool.lib comdlg32.lib\
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib\
odbccp32.lib libtux.lib libbuft.lib libtux2.lib libfml.lib libfml32.lib\
libgp.lib /nologo /subsystem:windows /dll /incremental:yes\
/pdb:"$ (OUTDIR)\tpcc.pdb" /debug /machine:I386 /def:".\tpcc.def" \
/out:"$ (OUTDIR)\tpcc.dll" /implib:"$ (OUTDIR)\tpcc.lib"
DEF_FILE= \
    ".\tpcc.def"
LINK32_OBJS= \
    "$ (INTDIR)\diagio.obj" \
    "$ (INTDIR)\term.obj" \
    "$ (INTDIR)\timesupp.obj" \
    "$ (INTDIR)\tmon.obj" \
    "$ (INTDIR)\TPCC.OBJ" \
    "$ (INTDIR)\tpcchandler.obj"

"$ (OUTDIR)\tpcc.dll" : "$ (OUTDIR)" $(DEF_FILE) $(LINK32_OBJS)
    $(LINK32) @<<
    $(LINK32_FLAGS) $(LINK32_OBJS)
<<

!ENDIF

.c{$ (CPP_OBJS)}.obj:
    $(CPP) $(CPP_PROJ) $<

.cpp{$ (CPP_OBJS)}.obj:
    $(CPP) $(CPP_PROJ) $<

.cxx{$ (CPP_OBJS)}.obj:
    $(CPP) $(CPP_PROJ) $<

.c{$ (CPP_SBRS)}.sbr:
    $(CPP) $(CPP_PROJ) $<

.cpp{$ (CPP_SBRS)}.sbr:
    $(CPP) $(CPP_PROJ) $<

.cxx{$ (CPP_SBRS)}.sbr:
    $(CPP) $(CPP_PROJ) $<

#####
#####

```

```

# Begin Target

# Name "tpcc - Win32 Release"
# Name "tpcc - Win32 Debug"

!IF "$(CFG)" == "tpcc - Win32 Release"

!ELSEIF "$(CFG)" == "tpcc - Win32 Debug"

!ENDIF

#####
#####
# Begin Source File

SOURCE=.\term.c
DEP_CPP_TERM=\
    ".\diagio.h"\
    ".\term.h"\
    ".\timesupp.h"\

"$ (INTDIR)\term.obj" : $(SOURCE) $(DEP_CPP_TERM_) "$ (INTDIR) "

# End Source File
#####
#####
# Begin Source File

SOURCE=.\timesupp.c
DEP_CPP_TIMES=\
    ".\timesupp.h"\

"$ (INTDIR)\timesupp.obj" : $(SOURCE) $(DEP_CPP_TIMES) "$ (INTDIR) "

# End Source File
#####
#####
# Begin Source File

SOURCE=.\TPCC.C
DEP_CPP_TPCC=\
    ".\diagio.h"\
    ".\term.h"\
    ".\tmon.h"\
    ".\tpcc.h"\
    ".\tpcchandler.h"\

"$ (INTDIR)\TPCC.OBJ" : $(SOURCE) $(DEP_CPP_TPCC_) "$ (INTDIR) "

# End Source File
#####
#####
# Begin Source File

SOURCE=.\tpcchandler.c

```

```

DEP_CPP_TPCCCH=\
    ".\diagio.h"\
    ".\term.h"\
    ".\tmon.h"\
    ".\tpcc.h"\
    ".\tpcchandler.h"\

"$ (INTDIR)\tpcchandler.obj" : $(SOURCE) $(DEP_CPP_TPCCCH) "$ (INTDIR) "

# End Source File
#####
#####
# Begin Source File

SOURCE=.\tpcc.def

!IF "$(CFG)" == "tpcc - Win32 Release"

!ELSEIF "$(CFG)" == "tpcc - Win32 Debug"

!ENDIF

# End Source File
#####
#####
# Begin Source File

SOURCE=.\tmon.c
DEP_CPP_TMON=\
    ".\tmon.h"\
    {$ (INCLUDE) }\atmi.h"\
    {$ (INCLUDE) }\sys\types.h"\
    {$ (INCLUDE) }\tmenv.h"\

"$ (INTDIR)\tmon.obj" : $(SOURCE) $(DEP_CPP_TMON_) "$ (INTDIR) "

# End Source File
#####
#####
# Begin Source File

SOURCE=.\diagio.c
DEP_CPP_DIAGI=\
    ".\diagio.h"\

"$ (INTDIR)\diagio.obj" : $(SOURCE) $(DEP_CPP_DIAGI) "$ (INTDIR) "

# End Source File
# End Target
# End Project
#####
#####

```

tpcc.def

```
EXPORTS
  GetExtensionVersion
  HttpExtensionProc
```

tpcc.h

```
// tpcc.h

#include <time.h>

// TPCCHandler return codes
#define TPCCSEND 1
#define TPCCSENDEND 2
#define TPCCENDNOW 3

// TPCC Service return codes
#define SVC_BADITEMID 1
#define SVC_NOERROR 0
#define SVCERR_DEADLOCK -1
#define SVCERR_NOCUSTOMER -2
#define SVCERR_NOORDERS -3
#define SVCERR_DBLIB -4

// Min/Max transaction data definitions
#define MIN_DID 1
#define MAX_DID 10
#define MIN_OL 5
#define MAX_OL 15
#define MIN_QUANTITY 1
#define MAX_QUANTITY 10
#define MIN_ITEM_ID 1
#define MAX_ITEM_ID 10000
#define MIN_CUST_ID 1
#define MAX_CUST_ID 3000
#define MIN_CARRIER 1
#define MAX_CARRIER 10
#define MIN_THRESHOLD 10
#define MAX_THRESHOLD 20

// pTPCC->iStatusId codes
#define INVALID_IID 1
#define STATUS_OK 0
#define ERR_CMD_UNKNOWN -10
#define ERRTXT_CMD_UNKNOWN "Unrecognized Command"
#define ERR_ALREADY_LOGGEDIN -11
#define ERRTXT_ALREADY_LOGGEDIN "Already Logged In"
#define ERR_TERMID -12
#define ERRTXT_TERMID "TermId or SyncId in Error"
#define ERR_FORM_UNKNOWN -13
#define ERRTXT_FORM_UNKNOWN "Unrecognized FormId"
#define ERR_WID_INVALID -14
#define ERR_DID_INVALID -15
#define ERR_MISSING_KEY -16
#define ERR_NOT_NUMERIC -17
#define ERR_THRESHOLD_RANGE -18
#define ERR_EMBEDDED_EMPTY_OL -19
#define ERR_QUANTITY_INVALID -20
#define ERR_OL_INVALID -21
```

```
#define ERR_OL_COUNT -22
#define ERR_TM_INTERFACE -23
#define ERR_SERVICE_RSLT -24
#define ERR_INPUT_TOOLONG -25
#define ERR_IDANDNAME_EMPTY -26
#define ERR_IDANDNAME_ENTERED -27
#define ERR_AMOUNT_BADFORM -28
#define ERR_AMOUNT_INVALID -29
#define ERR_CARRIER_INVALID -30
#define ERR_TERM_ALLOC -31

#define STATUS_LEN 200
#define NAME_LEN 16
#define ADDR_LEN 20
#define STATE_LEN 2
#define ZIP_LEN 9

#define MAX_MSG_SZ 5000
#define CTEXT "Content-length: "
#define HTTPHDR "Connection: keep-alive\r\nContent-type: text/html\r\n" \
               "Content-length: \r\n\r\n"

typedef struct
{
  int year;
  int quarter;
  int month;
  int dayofyear;
  int day;
  int week;
  int weekday;
  int hour;
  int minute;
  int second;
  int millisecond;
} DBDATEREC;

typedef struct
{
  short ol_supply_w_id;
  long ol_i_id;
  char ol_i_name[25];
  short ol_quantity;
  char ol_brand_generic[2];
  double ol_i_price;
  double ol_amount;
  short ol_stock;
} OL_NEW_ORDER_DATA;

typedef struct
{
  short w_id;
  short d_id;
  long c_id;
  short o_ol_cnt;
  char c_last[NAME_LEN + 1];
  char c_credit[3];
  double c_discount;
  double w_tax;
  double d_tax;
  long o_id;
```

```

short o_commit_flag;
DBDATEREC o_entry_d;
short o_all_local;
double total_amount;
char execution_status[STATUS_LEN];
OL_NEW_ORDER_DATA Ol[MAX_OL];
} NEW_ORDER_DATA;

```

```
typedef struct
```

```

{
short w_id;
short d_id;
long c_id;
short c_d_id;
short c_w_id;
double h_amount;
DBDATEREC h_date;
char w_street_1[ADDR_LEN + 1];
char w_street_2[ADDR_LEN + 1];
char w_city[ADDR_LEN + 1];
char w_state[STATE_LEN + 1];
char w_zip[ZIP_LEN + 1];
char d_street_1[ADDR_LEN + 1];
char d_street_2[ADDR_LEN + 1];
char d_city[ADDR_LEN + 1];
char d_state[STATE_LEN + 1];
char d_zip[ZIP_LEN + 1];
char c_first[NAME_LEN + 1];
char c_middle[3];
char c_last[NAME_LEN + 1];
char c_street_1[ADDR_LEN + 1];
char c_street_2[ADDR_LEN + 1];
char c_city[ADDR_LEN + 1];
char c_state[STATE_LEN + 1];
char c_zip[ZIP_LEN + 1];
char c_phone[16];
DBDATEREC c_since;
char c_credit[3];
double c_credit_lim;
double c_discount;
double c_balance;
char c_data[200+1];
char execution_status[STATUS_LEN];
} PAYMENT_DATA;

```

```
typedef struct
```

```

{
long ol_i_id;
short ol_supply_w_id;
short ol_quantity;
double ol_amount;
DBDATEREC ol_delivery_d;
} OL_ORDER_STATUS_DATA;

```

```
typedef struct
```

```

{
short w_id;
short d_id;
long c_id;
char c_first[NAME_LEN + 1];
char c_middle[3];

```

```

char c_last[NAME_LEN + 1];
double c_balance;
long o_id;
DBDATEREC o_entry_d;
short o_carrier_id;
OL_ORDER_STATUS_DATA OlOrderStatusData[MAX_OL];
short o_ol_cnt;
char execution_status[STATUS_LEN];
} ORDER_STATUS_DATA;

```

```
typedef struct
```

```

{
short w_id;
short o_carrier_id;
long o_id[10];
int iComplete;
SYSTEMTIME QTime; // time delivery was queued
SYSTEMTIME EndTime; // time delivery completed
char execution_status[STATUS_LEN];
} DELIVERY_DATA;

```

```
typedef struct
```

```

{
short w_id;
short d_id;
short thresh_hold;
long low_stock;
char execution_status[STATUS_LEN];
} STOCK_LEVEL_DATA;

```

```
typedef struct
```

```

{
LPVOID ConnID; // Active Connection Id
SHORT sWId; // TPCC Warehouse Id
SHORT sDId; // TPCC District Id
INT iSyncId; // TPCC Sync Id
INT iTermId; // TPCC Term Id
UINT uFormId; // TPCC Form Id
INT iStatusId; // TPCC Status Id
CHAR ErrTxt[500]; // Error text
CHAR szWork[200]; // Thread work area
CHAR szHeader[100]; // HTTP work area
CHAR * RecvMsg; // HTML message from ECB
CHAR SendMsg[MAX_MSG_SZ]; // HTML work area
TMON_STATE tsTMon; // TMon Interface
} TPCC_STATE;

```

tpcc.c

```

// tpcc.c
//
// Copyright Unisys, 1997
//
#include <windows.h>
#include <stdio.h>
#include <malloc.h>
#include <stdlib.h>
#include <string.h>
#include <winreg.h>
#include <httplib.h>

```

```

#include "tmon.h"
#include "diagio.h"
#include "term.h"
#include "tpcchandler.h"

#define EXTN_VERSION MAKELONG(HSE_VERSION_MINOR,HSE_VERSION_MAJOR)
#define TLS_NULL 0xFFFFFFFF
DWORD dwTlsInx;
CHAR * pTitle = "IIS TPCC DLL";
CRITICAL_SECTION csDllMain;

// Diagnostic logging settings
BOOL bEventLog = TRUE;
BOOL bConsole = FALSE;
UINT uDiagLevel = DIAG_INFO;

// TMon Interface Settings
INT iTMMaxMsg = 0;

// Term Interface Settings
INT iMaxTerms = 3000;

static CHAR * szTPCCError =
    HTTPHdr "<HTML>"
    "<HEAD><TITLE>Welcome To TPC-C</TITLE></HEAD><BODY>"
    "<B>TPCC Extension Error (TPCC Array Not Allocated)</B><BR>"
    "</BODY></HTML>";

static CHAR * szTMinInitError =
    HTTPHdr "<HTML>"
    "<HEAD><TITLE>Welcome To TPC-C</TITLE></HEAD><BODY>"
    "<B>TPCC Extension Error (TMinInit Failed)</B><BR>"
    "</BODY></HTML>";
INT ihHdrLen = 0;
INT icTextLen = 0;

BOOL ThreadAttach(TPCC_STATE * pTPCC,CHAR * pDiag);
VOID ThreadDetach(TPCC_STATE * pTPCC);
VOID SendResponse(EXTENSION_CONTROL_BLOCK * pECB,CHAR * pMsg,CHAR *
pWork);
BOOL ReadRegistry(VOID);

//=====
//
// Function name: DllMain
//
//=====
BOOL WINAPI DllMain(HANDLE hInst, ULONG ul_reason_for_call,
LPVOID lpReserved)
{
    TPCC_STATE * pTPCC = NULL;
    CHAR szDiag[MAX_DIAG_SZ];
    UINT iTMMaxSz = 0;
    switch(ul_reason_for_call)
    {
        case DLL_PROCESS_ATTACH:
            // Process initialization

            InitializeCriticalSection(&csDllMain);
            ReadRegistry();

```

```

DiagIoInit(pTitle,bConsole,bEventLog,uDiagLevel);
sprintf(szDiag,
    "EventLog = %d, Console = %d, DiagLevel = %d\n"
    "MaxTerms = %d\n",
    bEventLog,bConsole,uDiagLevel,iMaxTerms);
DiagIoWrite(szDiag,DIAG_FORCE);
dwTlsInx = TlsAlloc();
if (dwTlsInx == TLS_NULL)
{
    sprintf(szDiag,"PAttach(%ld): Tls Alloc Failed (%ld)\n",
        GetCurrentThreadId(),GetLastError());
    DiagIoWrite(szDiag,DIAG_ERROR);
    return(FALSE);
};
if (TermInit(iMaxTerms))
    return(FALSE);
iTMMMaxSz = max(iTMMMaxSz,sizeof(NEW_ORDER_DATA));
iTMMMaxSz = max(iTMMMaxSz,sizeof(PAYMENT_DATA));
iTMMMaxSz = max(iTMMMaxSz,sizeof(ORDER_STATUS_DATA));
iTMMMaxSz = max(iTMMMaxSz,sizeof(DELIVERY_DATA));
iTMMMaxSz = max(iTMMMaxSz,sizeof(STOCK_LEVEL_DATA));
iTMMMaxSz += 10;
TMonInit(iTMMMaxSz);
ihHdrLen = strlen(HTTPHdr);
icTextLen = strlen(CTEXT);
break;
case DLL_THREAD_ATTACH:
    // Move ThreadAttach call to HttpExt since the DllMain call
    // for Thread Attach did not reliably come before the first
    // call to HttpExtProc.
    break;
    case DLL_THREAD_DETACH:
        ThreadDetach(pTPCC);
        break;
    case DLL_PROCESS_DETACH:
        ThreadDetach(pTPCC);
        DeleteCriticalSection(&csDllMain);
        TMonTerm();
        TermTerm();
        TlsFree(dwTlsInx);
        dwTlsInx = TLS_NULL;
        DiagIoTerm();
        break;
};
return TRUE;
}; // DllMain

//=====
//
// Function name: ThreadAttach
//
// Result:
// FALSE Thread state structure initialized
// TRUE Thread state structure initialization failure
//
//=====
BOOL ThreadAttach(TPCC_STATE * pTPCC,CHAR * pDiag)
{
    BOOL bRslt;
    UINT uLabelNoOp;
    EnterCriticalSection(&csDllMain);

```



```

try
{
    pTPCC = (TPCC_STATE *) calloc(1, sizeof(TPCC_STATE));
    if (pTPCC == NULL)
    {
        sprintf(pDiag, "ThrAtt(%ld): pTPCC Alloc Failed (%ld)\n",
            GetCurrentThreadId(), GetLastError());
        DiagIoWrite(pDiag, DIAG_ERROR);
        bRslt = TRUE;
        goto TAttachXit;
    };
    TlsSetValue(dwTlsInx, pTPCC);
    pTPCC->tsTMon.pTMDData = NULL;
    pTPCC->tsTMon.pszErrTxt = pTPCC->ErrTxt;
    if (TMinInit(&pTPCC->tsTMon))
    {
        sprintf(pDiag, "ThrAtt(%ld): TMinInit %s\n",
            GetCurrentThreadId(), pTPCC->ErrTxt);
        DiagIoWrite(pDiag, DIAG_ERROR);
        bRslt = TRUE;
        goto TAttachXit;
    };
    bRslt = FALSE;
TAttachXit:
    uLabelNoOp = 0;
}
finally
{
    LeaveCriticalSection(&csDllMain);
};

return(bRslt);
}; // ThreadAttach

//=====
//
// Function name: ThreadDetach
//
//=====
VOID ThreadDetach(TPCC_STATE * pTPCC)
{
    EnterCriticalSection(&csDllMain);
    try
    {
        pTPCC = TlsGetValue(dwTlsInx);
        if (pTPCC != NULL)
        {
            TMDone(&pTPCC->tsTMon);
            free(pTPCC);
            pTPCC = NULL;
            TlsSetValue(dwTlsInx, pTPCC);
        };
    }
    finally
    {
        LeaveCriticalSection(&csDllMain);
    };
}; // ThreadDetach

//=====

```

```

//
// Function name: GetExtensionVersion
//
//=====
BOOL WINAPI GetExtensionVersion(HSE_VERSION_INFO *pVersion)
{
    pVersion->dwExtensionVersion = EXTN_VERSION;
    strncpy(pVersion->lpszExtensionDesc, pTitle, HSE_MAX_EXT_DLL_NAME_LEN);
    return TRUE;
}; // GetExtensionVersion

//=====
//
// Function name: HttpExtensionProc
//
// Returns:
// HSE_STATUS_SUCCESS          send msg, drop connection
// HSE_STATUS_SUCCESS_AND_KEEP_CONN  send msg, keep connection
//
//=====
DWORD WINAPI HttpExtensionProc(EXTENSION_CONTROL_BLOCK * pECB)
{
    TPCC_STATE * pTPCC;
    DWORD dwRslt = HSE_STATUS_SUCCESS;
    UINT uRslt;

    pTPCC = TlsGetValue(dwTlsInx);
    if (pTPCC == NULL)
    {
        CHAR szWork[200];
        ThreadAttach(pTPCC, szWork);
        pTPCC = TlsGetValue(dwTlsInx);
        if (pTPCC == NULL)
        {
            SendResponse(pECB, szTPCCError, szWork);
            goto HttpXit;
        };
    };
    if (pTPCC->tsTMon.pTMDData == NULL)
        SendResponse(pECB, szTMinInitError, pTPCC->szHeader);
    TPCCclear(pTPCC);
    pTPCC->ConnID = pECB->ConnID;
    pTPCC->RecvMsg = pECB->lpszQueryString;
    uRslt = TPCCHandler(pTPCC);
    switch (uRslt)
    {
        case TPCCSEND:
            SendResponse(pECB, pTPCC->SendMsg, pTPCC->szHeader);
            dwRslt = HSE_STATUS_SUCCESS_AND_KEEP_CONN;
            break;
        case TPCCSENDEND:
            SendResponse(pECB, pTPCC->SendMsg, pTPCC->szHeader);
            break;
        case TPCCENDNOW:
        default:
            break;
    }; // switch (TPCCHandler result)

HttpXit:

```

```

        return(dwRslt);
}; // HttpExtensionProc

//=====
//
// Function name: SendResponse
//
//=====
VOID SendResponse(EXTENSION_CONTROL_BLOCK * pECB, CHAR * pMsg, CHAR * pWork)
{
    DWORD dwMsgBytes;
    CHAR * pCL;
    dwMsgBytes = strlen(pMsg);
    pCL=strstr(pMsg, CTEXT);
    dwMsgBytes -= iHHdrLen;
    sprintf(pWork, "%4ld", dwMsgBytes);
    pCL += iCTextLen;
    strncpy(pCL, pWork, 4);
    (*pECB->ServerSupportFunction)
        (pECB->ConnID,
         HSE_REQ_SEND_RESPONSE_HEADER,
         NULL,
         &dwMsgBytes,
         (LPDWORD)pMsg);
}; // SendResponse

//=====
//
// Function name: ReadRegistry
//
// Sets global operational parameters from registry if they exist.
// Otherwise, compiled in defaults apply.
//
// Result:
// FALSE Registry entry found
// TRUE Registry entry does not exist
//
//=====
BOOL ReadRegistry(VOID)
{
    HKEY hkTPCC;
    DWORD dwMax;
    DWORD dwRT;
    INT i;
    CHAR szValue[100];
    if (RegOpenKeyEx(HKEY_LOCAL_MACHINE, "SOFTWARE\\Unisys\\TPCC", 0,
        KEY_READ, &hkTPCC) != ERROR_SUCCESS )
        return(TRUE);
    dwMax = sizeof(szValue);
    if (RegQueryValueEx(hkTPCC, "EVENTLOG", 0, &dwRT, szValue, &dwMax)
        == ERROR_SUCCESS)
    {
        if (abs(atoi(szValue) == 0))
            bEventLog = FALSE;
        else
            bEventLog = TRUE;
    };
    dwMax = sizeof(szValue);
    if (RegQueryValueEx(hkTPCC, "CONSOLE", 0, &dwRT, szValue, &dwMax)
        == ERROR_SUCCESS )

```

```

    {
        if (abs(atoi(szValue) == 0))
            bConsole = FALSE;
        else
            bConsole = TRUE;
    };
    dwMax = sizeof(szValue);
    if (RegQueryValueEx(hkTPCC, "DIAGLEVEL", 0, &dwRT, szValue, &dwMax)
        == ERROR_SUCCESS )
    {
        i = atoi(szValue);
        if (i < DIAG_FORCE)
            i = DIAG_FORCE;
        else
            if (i > DIAG_INFO)
                i = DIAG_INFO;
        uDiagLevel = i;
    };
    dwMax = sizeof(szValue);
    if (RegQueryValueEx(hkTPCC, "MAXTERMS", 0, &dwRT, szValue, &dwMax)
        == ERROR_SUCCESS )
    {
        iMaxTerms = abs(atoi(szValue));
    };
    RegCloseKey(hkTPCC);
    return(FALSE);
}; // ReadRegistry

```

tpcchandler.h

```

// tpcchandler.h

#include "tpcc.h"

BOOL TPCCclear(TPCC_STATE * pTPCC);
UINT TPCCHandler(TPCC_STATE * pTPCC);

```

tpcchandler.c

```

// tpcchandler.c
//
// Copyright Unisys, 1997
//
#include <windows.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

#include "tmon.h"
#include "diagio.h"
#include "tpcchandler.h"
#include "term.h"

// pTPCC->iFormId - TPCC forms enumeration.
#define FORM_NULL 0
#define FORM_LOGON 1
#define FORM_MENU 2
#define FORM_NEWORDER 3

```

```

#define FORM_PAYMENT      4
#define FORM_DELIVERY    5
#define FORM_ORDERSTATUS 6
#define FORM_STOCKLEVEL  7
#define FORM_EXIT        8
#define FORM_MAX         9

```

```

// CMD= HTML Command Enumeration and Name
#define CMD_NULL          0
#define CMD_PROCESS      1
#define CMD_NEWORDER_FORM 2
#define CMD_PAYMENT_FORM 3
#define CMD_DELIVERY_FORM 4
#define CMD_ORDERSTATUS_FORM 5
#define CMD_STOCKLEVEL_FORM 6
#define CMD_EXIT         7
#define CMD_SUBMIT       8
#define CMD_MENU_FORM    9
#define CMD_MAX          10

```

```

static CHAR * szCmds[] =
{
    "Unknown",
    "Process",
    "..NewOrder..",
    "..Payment..",
    "..Delivery..",
    "..Order-Status..",
    "..Stock-Level..",
    "..Exit..",
    "Submit",
    "Menu"
};

```

```

static CHAR * szFormLogin =
HTTPHdr "<HTML>"
"<HEAD><TITLE>Welcome To TPC-C</TITLE></HEAD><BODY>"
"Please Identify your Warehouse and District for this session.<BR>"
"<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
"<INPUT TYPE=\"hidden\" NAME=\"STATUSID\" VALUE=\"0\">"
"<INPUT TYPE=\"hidden\" NAME=\"FORMID\" VALUE=\"1\">"
"<INPUT TYPE=\"hidden\" NAME=\"TERMIN\" VALUE=\"-2\">"
"<INPUT TYPE=\"hidden\" NAME=\"SYCID\" VALUE=\"0\">"
"Warehouse ID <INPUT NAME=\"w_id\" SIZE=4><BR>"
"District ID <INPUT NAME=\"d_id\" SIZE=2><BR>"
"<HR>"
"<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Submit\">"
"</FORM>";

```

```

static CHAR * szMenuList =
"<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..\">";

```

```

static CHAR * HTMLTrailer =
"</BODY></HTML>";

```

```

static CHAR * TERMINDTOKEN = "TERMIN=";

```

```

static CHAR * SYNCIDTOKEN = "SYCID=";
static CHAR * FORMIDTOKEN = "FORMID=";
static CHAR * STATUSIDTOKEN = "STATUSID=";
static CHAR * CMDTOKEN = "CMD=";
static CHAR * NEWORDER_SERVICE = "NEWORDER";
static CHAR * PAYMENT_SERVICE = "PAYMENT";
static CHAR * ORDERSTATUS_SERVICE = "ORDERSTS";
static CHAR * DELIVERY_SERVICE = "DELIVERY";
static CHAR * STOCKLEVEL_SERVICE = "STOCKLVL";
static CHAR * ZIPPIC = "XXXXX-XXXX";

```

```

BOOL ProcessLogin(CHAR * pIn, CHAR * pOut, TPCC_STATE * pTPCC);
BOOL ProcessForm(CHAR * pIn, CHAR * pOut, TPCC_STATE * pTPCC);
BOOL ProcessNewOrder(CHAR * pIn, CHAR * pOut, TPCC_STATE * pTPCC);
BOOL ProcessPayment(CHAR * pIn, CHAR * pOut, TPCC_STATE * pTPCC);
BOOL ProcessDelivery(CHAR * pIn, CHAR * pOut, TPCC_STATE * pTPCC);
BOOL ProcessOrderStatus(CHAR * pIn, CHAR * pOut, TPCC_STATE * pTPCC);
BOOL ProcessStockLevel(CHAR * pIn, CHAR * pOut, TPCC_STATE * pTPCC);
VOID FormatLogin(CHAR * pMsg, CHAR * pAddText);
BOOL GetHidden(CHAR * pMsg, UINT * uFormId, INT * iSyncId, INT * iTermId);
BOOL GetCmd(CHAR * pMsg, CHAR * pWork, UINT uLen);
BOOL GetLongKey(LONG * lRslt, CHAR * pHTML, CHAR * pKey, TPCC_STATE * pTPCC);
BOOL GetIntKey(INT * iRslt, CHAR * pHTML, CHAR * pKey, TPCC_STATE * pTPCC);
BOOL GetShortKey(SHORT * sRslt, CHAR * pHTML, CHAR * pKey, TPCC_STATE * pTPCC);
BOOL GetStringKey(CHAR * szRslt, CHAR * pHTML, CHAR * pKey,
                  TPCC_STATE * pTPCC, UINT uMax);
BOOL GetAmountKey(DOUBLE * dRslt, CHAR * pHTML, CHAR * pKey,
                  TPCC_STATE * pTPCC);
BOOL GetKeyValue(CHAR * pHTML, CHAR * pKey, CHAR * pValue, UINT uMax);
VOID FormatLogin(CHAR * pOut, CHAR * pAddText);
VOID FormatMenu(CHAR * pOut, TPCC_STATE * pTPCC);
VOID FormatNewOrder(CHAR * pOut, TPCC_STATE * pTPCC);
VOID FormatPayment(CHAR * pOut, TPCC_STATE * pTPCC);
VOID FormatDelivery(CHAR * pOut, TPCC_STATE * pTPCC);
VOID FormatOrderStatus(CHAR * pOut, TPCC_STATE * pTPCC);
VOID FormatStockLevel(CHAR * pOut, TPCC_STATE * pTPCC);
VOID FormatFormHdr(CHAR * pOut, CHAR * pTitle, TPCC_STATE * pTPCC);
VOID FormatRespHdr(CHAR * pOut, CHAR * pTitle, TPCC_STATE * pTPCC);
VOID FormatHTMLString(CHAR * pOut, CHAR * pIn, UINT uLen);
VOID FormatString(CHAR * pOut, CHAR * pPic, CHAR * pIn);
VOID UtilStrCpy(CHAR * pDest, CHAR * pSrc, INT n);
BOOL CheckNumeric(CHAR * pNum);

```

```

//=====
//
// Function name: TPCCclear
//
//=====
BOOL TPCCclear(TPCC_STATE * pTPCC)
{
    pTPCC->ConnID = 0;
    pTPCC->sWid = 0;
    pTPCC->sDId = 0;
    pTPCC->iSyncId = 0;
    pTPCC->iTermId = -2;
    pTPCC->uFormId = FORM_NULL;
    pTPCC->iStatusId = 0;
    pTPCC->tsTMon.lTMDDataLen = 0;
    strcpy(pTPCC->ErrTxt, "");
    return (FALSE);
}

```

```

}; // TPCCClear

//=====
//
// Function name: TPCCHandler
//
//=====
UINT TPCCHandler(TPCC_STATE * pTPCC)
{
    INT iSyncId;
    INT iTermId;
    UINT uCmdId;
    UINT uRslt = TPCCSENDEND; // default error handling
    TERM_STATE * pTerm;

    pTPCC->iStatusId = STATUS_OK;
    if (GetHidden(pTPCC->RecvMsg, &pTPCC->uFormId, &iSyncId, &iTermId))
    {
        uRslt = TPCCSEND;
        FormatLogin(pTPCC->SendMsg, pTPCC->ErrTxt);
        goto HdlrXit;
    };
    if (iTermId > 0)
    {
        pTerm = TermGet(iTermId);
        if (pTerm == NULL)
        {
            uRslt = TPCCSEND;
            strcpy(pTPCC->ErrTxt, "Invalid Term Id");
            FormatLogin(pTPCC->SendMsg, pTPCC->ErrTxt);
            goto HdlrXit;
        };
        if (pTerm->ConnID != pTPCC->ConnID)
        {
            uRslt = TPCCSEND;
            strcpy(pTPCC->ErrTxt, "TermId vs ConnId Mismatch");
            FormatLogin(pTPCC->SendMsg, pTPCC->ErrTxt);
            goto HdlrXit;
        };
        pTPCC->sWid = pTerm->sWid;
        pTPCC->sDId = pTerm->sDId;
        pTPCC->iSyncId = pTerm->iSyncId;
        pTPCC->iTermId = pTerm->iTermId;
    };
    uCmdId = GetCmd(pTPCC->RecvMsg, pTPCC->szWork, sizeof(pTPCC->szWork));
    // Except for Submit(log in), sWid must already be set
    if (pTPCC->sWid == 0 && uCmdId != CMD_SUBMIT)
    {
        strcpy(pTPCC->ErrTxt, "Must log in first!");
        FormatLogin(pTPCC->SendMsg, pTPCC->ErrTxt);
        uRslt = TPCCSEND;
        goto HdlrXit;
    };
    // Check for multiple log in attempts
    if (pTPCC->sWid != 0 && uCmdId == CMD_SUBMIT)
    {
        strcpy(pTPCC->ErrTxt, ERRTXT_ALREADY_LOGGEDIN);
        pTPCC->iStatusId = ERR_ALREADY_LOGGEDIN;
        FormatMenu(pTPCC->SendMsg, pTPCC);
        uRslt = TPCCSEND;
        goto HdlrXit;
    };
};

```

```

};
// If not logging in, validate hidden fields
if (uCmdId != CMD_SUBMIT)
{
    if (iTermId != pTPCC->iTermId || iTermId != iSyncId)
    {
        sprintf(pTPCC->ErrTxt, "%s: Received %ld, %ld (%ld)",
            ERRTXT_TERMID, iTermId, iSyncId, pTPCC->iTermId);
        pTPCC->iStatusId = ERR_TERMID;
        FormatMenu(pTPCC->SendMsg, pTPCC);
        goto HdlrXit;
    };
};
// Process the command
switch (uCmdId)
{
    case CMD_SUBMIT:
        ProcessLogin(pTPCC->RecvMsg, pTPCC->SendMsg, pTPCC);
        break;
    case CMD_MENU_FORM:
        FormatMenu(pTPCC->SendMsg, pTPCC);
        break;
    case CMD_PROCESS:
        ProcessForm(pTPCC->RecvMsg, pTPCC->SendMsg, pTPCC);
        break;
    case CMD_NEWORDER_FORM:
        FormatNewOrder(pTPCC->SendMsg, pTPCC);
        break;
    case CMD_PAYMENT_FORM:
        FormatPayment(pTPCC->SendMsg, pTPCC);
        break;
    case CMD_DELIVERY_FORM:
        FormatDelivery(pTPCC->SendMsg, pTPCC);
        break;
    case CMD_ORDERSTATUS_FORM:
        FormatOrderStatus(pTPCC->SendMsg, pTPCC);
        break;
    case CMD_STOCKLEVEL_FORM:
        FormatStockLevel(pTPCC->SendMsg, pTPCC);
        break;
    case CMD_EXIT:
        TermFree(pTPCC->iTermId);
        strcpy(pTPCC->ErrTxt, "Logged Off");
        FormatLogin(pTPCC->SendMsg, pTPCC->ErrTxt);
        goto HdlrXit;
    default:
        strcpy(pTPCC->ErrTxt, ERRTXT_CMD_UNKNOWN);
        pTPCC->iStatusId = ERR_CMD_UNKNOWN;
        if (pTPCC->sWid == 0)
            FormatLogin(pTPCC->SendMsg, pTPCC->ErrTxt);
        else
            FormatMenu(pTPCC->SendMsg, pTPCC);
        break;
}; // switch (uCmdId)

uRslt = TPCCSEND;

HdlrXit:

return(uRslt);

```

```

}; // TPCCHandler

//=====
//
// Function name: ProcessLogin
//
// ProcessLogin extracts WId and DId from the incoming form. Assumes
// log in has not previously completed (sWId == 0 already verified).
//
// Result:
// FALSE - log in successful, sWId and sDId set in pTPCC,
//         pOut contains menu.
// TRUE - log in failed, pOut contains log in form with
//        error message.
//
//=====
BOOL ProcessLogin(CHAR * pIn, CHAR * pOut, TPCC_STATE * pTPCC)
{
    SHORT sWId;
    SHORT sDId;
    TERM_STATE * pTerm;

    if (GetShortKey(&sWId, pIn, "w_id", pTPCC))
    {
        FormatLogin(pOut, pTPCC->ErrTxt);
        return(TRUE);
    };
    if (sWId < 1)
    {
        sprintf(pTPCC->ErrTxt, "Warehouse Id (%d) Invalid", sWId);
        pTPCC->iStatusId = ERR_WID_INVALID;
        FormatLogin(pOut, pTPCC->ErrTxt);
        return(TRUE);
    };
    if (GetShortKey(&sDId, pIn, "d_id", pTPCC))
    {
        FormatLogin(pOut, pTPCC->ErrTxt);
        return(TRUE);
    };
    if (sDId < MIN_DId || sDId > MAX_DId)
    {
        sprintf(pTPCC->ErrTxt, "DId Out of Range(%ld,%ld) - %ld",
            MIN_DId, MAX_DId, sDId);
        pTPCC->iStatusId = ERR_DID_INVALID;
        FormatLogin(pOut, pTPCC->ErrTxt);
        return(TRUE);
    };
    pTerm = TermAlloc();
    if (pTerm == NULL)
    {
        sprintf(pTPCC->ErrTxt, "Unable to Allocate Terminal Entry");
        pTPCC->iStatusId = ERR_TERM_ALLOC;
        FormatLogin(pOut, pTPCC->ErrTxt);
        return(TRUE);
    };
    pTerm->ConnID = pTPCC->ConnID;
    pTerm->iSyncId = pTerm->iTermId;
    pTerm->sWId = abs(sWId);
    pTerm->sDId = abs(sDId);
    pTPCC->iTermId = pTerm->iTermId;
    pTPCC->iSyncId = pTerm->iSyncId;

```

```

    pTPCC->sWId = pTerm->sWId;
    pTPCC->sDId = pTerm->sDId;
    FormatMenu(pOut, pTPCC);
    return(FALSE);
}; // ProcessLogin

//=====
//
// Function name: ProcessForm
//
// ProcessForm uses pTPCC->uFormId to determine which form input is
// present and ready for processing. Actual processing is done by
// the form specific routine.
//
// Result:
// FALSE - form processed, pOut contains response.
// TRUE - error processing form input, pOut contains reason.
//
//=====
BOOL ProcessForm(CHAR * pIn, CHAR * pOut, TPCC_STATE * pTPCC)
{
    switch (pTPCC->uFormId )
    {
        case FORM_NEWORDER:
            return(ProcessNewOrder(pIn, pOut, pTPCC));
        case FORM_PAYMENT:
            return(ProcessPayment(pIn, pOut, pTPCC));
        case FORM_DELIVERY:
            return(ProcessDelivery(pIn, pOut, pTPCC));
        case FORM_ORDERSTATUS:
            return(ProcessOrderStatus(pIn, pOut, pTPCC));
        case FORM_STOCKLEVEL:
            return(ProcessStockLevel(pIn, pOut, pTPCC));
        default:
            sprintf(pTPCC->ErrTxt, "%s (%ld)",
                ERRTXT_FORM_UNKNOWN, pTPCC->uFormId);
            pTPCC->iStatusId = ERR_FORM_UNKNOWN;
            FormatMenu(pOut, pTPCC);
            break;
    }
    return(TRUE);
}; // ProcessForm

//=====
//
// Function name: ProcessNewOrder
//
// ProcessNewOrder extracts the input data fields from pIn, processes
// the data, and returns a response in pOut.
//
// Result:
// FALSE - NewOrder processed successfully.
// TRUE - NewOrder processing failed.
//
//=====
BOOL ProcessNewOrder(CHAR * pIn, CHAR * pOut, TPCC_STATE * pTPCC)
{
    NEW_ORDER_DATA * pnod;
    TMON_STATE * pTMon;
    CHAR szKey[20];
    CHAR szCredit[14];

```

```

CHAR * ptr;
UINT u;
BOOL bDone = FALSE;
BOOL bTMRslt;
BOOL bTPRslt;
INT iTPRslt;

pTMon = &pTPCC->tsTMon;
pTMon->lTMDDataLen = sizeof(NEW_ORDER_DATA);
memset(pTMon->pTMDData, 0, pTMon->lTMDDataLen);
pnod = (NEW_ORDER_DATA *) pTMon->pTMDData;
pnod->w_id = pTPCC->sWid;
if (GetShortKey(&pnod->d_id, pIn, "DID*", pTPCC))
{
    FormatMenu(pOut, pTPCC);
    return(TRUE);
};
if (pnod->d_id < MIN_Did || pnod->d_id > MAX_Did)
{
    sprintf(pTPCC->ErrTxt, "DID Out of Range(%ld,%ld) - %ld",
        MIN_Did, MAX_Did, pnod->d_id);
    pTPCC->iStatusId = ERR_DID_INVALID;
    FormatMenu(pOut, pTPCC);
    return(TRUE);
};
if (GetLongKey(&pnod->c_id, pIn, "CID*", pTPCC))
{
    FormatMenu(pOut, pTPCC);
    return(TRUE);
};
pnod->o_ol_cnt = 0;
ptr = pIn;
for(u=0; u < MAX_OL; u++)
{
    sprintf(szKey, "SP%2.2d*", u);
    ptr = strstr(ptr, szKey);
    if (GetShortKey(&pnod->Ol[u].ol_supply_w_id, ptr, szKey, pTPCC))
    {
        FormatMenu(pOut, pTPCC);
        return(TRUE);
    };
    sprintf(szKey, "IID%2.2d*", u);
    if (GetLongKey(&pnod->Ol[u].ol_i_id, ptr, szKey, pTPCC))
    {
        FormatMenu(pOut, pTPCC);
        return(TRUE);
    };
    sprintf(szKey, "Qty%2.2d*", u);
    if (GetShortKey(&pnod->Ol[u].ol_quantity, ptr, szKey, pTPCC))
    {
        FormatMenu(pOut, pTPCC);
        return(TRUE);
    };
    if (pnod->Ol[u].ol_i_id != 0)
    {
        // Check for prior blank lines
        if (bDone)
        {
            strcat(pTPCC->ErrTxt, "Embedded Empty Order Lines");
            pTPCC->iStatusId = ERR_EMBEDDED_EMPTY_OL;
            FormatMenu(pOut, pTPCC);

```

```

        return(TRUE);
    };
    if (pnod->Ol[u].ol_supply_w_id < 1)
    {
        sprintf(pTPCC->ErrTxt,
            "Order Line %ld Contains Invalid Wid %d",
            u, pnod->Ol[u].ol_supply_w_id);
        pTPCC->iStatusId = ERR_WID_INVALID;
        FormatMenu(pOut, pTPCC);
        return(TRUE);
    };
    if (pnod->Ol[u].ol_quantity < MIN_QUANTITY ||
        pnod->Ol[u].ol_quantity > MAX_QUANTITY)
    {
        sprintf(pTPCC->ErrTxt,
            "Order Line %ld Contains Invalid Qty %d",
            u, pnod->Ol[u].ol_quantity);
        pTPCC->iStatusId = ERR_QUANTITY_INVALID;
        FormatMenu(pOut, pTPCC);
        return(TRUE);
    };
    pnod->o_ol_cnt++;
} // if (ol_i_id !=0)
else
{
    if (pnod->Ol[u].ol_supply_w_id != 0)
    {
        sprintf(pTPCC->ErrTxt,
            "Order Line %ld WID Supplied with No Item", u);
        pTPCC->iStatusId = ERR_OL_INVALID;
        FormatMenu(pOut, pTPCC);
        return(TRUE);
    };
    if (pnod->Ol[u].ol_quantity != 0)
    {
        sprintf(pTPCC->ErrTxt,
            "Order Line %ld Qty Supplied with No Item", u);
        pTPCC->iStatusId = ERR_OL_INVALID;
        FormatMenu(pOut, pTPCC);
        return(TRUE);
    };
    bDone = TRUE;
}; // empty order line
}; // for (u < MAX_OL)

if (pnod->o_ol_cnt < MIN_OL)
{
    sprintf(pTPCC->ErrTxt, "Too Few Order Lines %d", pnod->o_ol_cnt);
    pTPCC->iStatusId = ERR_OL_COUNT;
    FormatMenu(pOut, pTPCC);
    return(TRUE);
};
bTMRslt = TMTran(NEWORDER_SERVICE, pTMon, &bTPRslt, &iTPRslt);
pnod = (NEW_ORDER_DATA *) pTMon->pTMDData;
if (bTMRslt)
{
    pTPCC->iStatusId = ERR_TM_INTERFACE;
    FormatMenu(pOut, pTPCC);
    return(TRUE);
};
// Exclude invalid item id case

```

```

if (bTPRslt && iTPRslt < SVC_NOERROR)
{
    sprintf(pTPCC->ErrTxt,
        "New Order Service Returned Error(%ld): %s",
        iTPRslt,pnod->execution_status);
    pTPCC->iStatusId = ERR_SERVICE_RSLT;
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};
if (iTPRslt == SVC_BADITEMID)
    pTPCC->iStatusId = INVALID_IID;

FormatRespHdr(pOut,"TPC-C New Order",pTPCC);
sprintf(pOut + strlen(pOut),
    "<PRE>                New Order<BR>"
    "Warehouse: %4.4d  District: %2.2d          ",
    pnod->w_id,pnod->d_id);
if (!bTPRslt)
{
    sprintf(pOut + strlen(pOut),
        "Date: %2.2d-%2.2d-%4.4d %2.2d:%2.2d:%2.2d <BR>",
        pnod->o_entry_d.day,pnod->o_entry_d.month,
        pnod->o_entry_d.year,pnod->o_entry_d.hour,
        pnod->o_entry_d.minute,pnod->o_entry_d.second);
}
else
{
    sprintf(pOut + strlen(pOut), "Date:<BR>");
};
FormatHTMLString(pTPCC->szWork,pnod->c_last,NAME_LEN);
FormatHTMLString(szCredit,pnod->c_credit,2);
sprintf(pOut + strlen(pOut),
    "Customer: %4.4d  Name: %s  Credit: %s  ",
    pnod->c_id,pTPCC->szWork,szCredit);
if (!bTPRslt)
{
    sprintf(pOut + strlen(pOut),
        "%%Disc: %5.2f          <BR>",pnod->c_discount * 100);
    sprintf(pOut + strlen(pOut),
        "Order Number: %8.8d  Number of Lines: %2.2d          W_tax: %5.2f
D_tax: %5.2f  <BR><BR>",
        pnod->o_id,pnod->o_ol_cnt,pnod->w_tax * 100,pnod->d_tax * 100);
    strcat(pOut," Supp_W  Item_Id  Item Name          Qty  Stock
B/G Price  Amount<BR>");
    for (u = 0; u < (UINT) pnod->o_ol_cnt; u++)
    {
        FormatHTMLString(pTPCC->szWork,pnod->Ol[u].ol_i_name,24);
        sprintf(pOut + strlen(pOut),
            " %4.4d %6.6d %s %2.2d %3.3d %1.1s  $%6.2f
$%7.2f  <BR>",
            pnod->Ol[u].ol_supply_w_id,pnod->Ol[u].ol_i_id,
            pTPCC->szWork,pnod->Ol[u].ol_quantity,pnod->Ol[u].ol_stock,
            pnod->Ol[u].ol_brand_generic,pnod->Ol[u].ol_i_price,
            pnod->Ol[u].ol_amount );
    }
} // if (!bTPRslt)
else
{
    strcat(pOut,"%Disc:<BR>");
    sprintf(pOut + strlen(pOut),

```

```

        "Order Number: %8.8d  Number of Lines:          W_tax:
D_tax:<BR><BR>",
        pnod->o_id);
    strcat(pOut,
        " Supp_W  Item_Id  Item Name          Qty  Stock  B/G
Price  Amount<BR>");
    u = 0;
};
for(; u < MAX_OL; u++)
    strcat(pOut,"<BR>");
if (!bTPRslt)
{
    sprintf(pOut + strlen(pOut),
        "Execution Status: %24.24s          Total: $%8.2f  ",
        pnod->execution_status,pnod->total_amount);
}
else
{
    sprintf(pOut + strlen(pOut),
        "Execution Status: %24.24s          Total:",
        pnod->execution_status);
};
sprintf(pOut + strlen(pOut),
    "</PRE><HR><BR>%s</FORM>%s",szMenuList,HTMLTrailer);

return(FALSE);
}; // ProcessNewOrder

//=====
//
// Function name: ProcessPayment
//
// ProcessPayment extracts the input data fields from pIn, processes
// the data, and returns a response in pOut.
//
// Result:
// FALSE - Payment processed successfully.
// TRUE - Payment processing failed.
//=====
BOOL ProcessPayment(CHAR * pIn,CHAR * pOut,TPCC_STATE * pTPCC)
{
    PAYMENT_DATA * ppd;
    TMON_STATE * pTMon;
    BOOL bTMRslt;
    BOOL bTPRslt;
    INT iTPRslt;
    CHAR * pCredit;
    INT icDLines;
    CHAR szWork2[60];
    CHAR szWork3[60];
    CHAR szWork4[60];
    CHAR szZip1[20];
    CHAR szZip2[20];
    INT i;

    pTMon = &pTPCC->tsTMon;
    pTMon->lTMDDataLen = sizeof(PAYMENT_DATA);
    memset(pTMon->pTMDData,0,pTMon->lTMDDataLen);
    ppd = (PAYMENT_DATA *) pTMon->pTMDData;

```

```

ppd->w_id = pTPCC->SWid;
// Get and validate DID
if (GetShortKey(&ppd->d_id,pIn, "DID*",pTPCC)
{
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};
if (ppd->d_id < MIN_DID || ppd->d_id > MAX_DID)
{
    sprintf(pTPCC->ErrTxt,"DID Out of Range(%ld,%ld) - %ld",
        MIN_DID,MAX_DID,ppd->d_id);
    pTPCC->iStatusId = ERR_DID_INVALID;
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};
// Get and validate customer Id and name
if (GetLongKey(&ppd->c_id,pIn, "CID*",pTPCC)
{
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};
if (GetStringKey(ppd->c_last,pIn, "CLT*",pTPCC,NAME_LEN)
{
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};
if (ppd->c_id == 0 && ppd->c_last[0] == 0)
{
    strcpy(pTPCC->ErrTxt,"Error - Customer Id and Name Empty");
    pTPCC->iStatusId = ERR_IDANDNAME_EMPTY;
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};
if (ppd->c_id != 0 && ppd->c_last[0] != 0)
{
    strcpy(pTPCC->ErrTxt,
        "Error - Specify Customer Id or Name, not Both");
    pTPCC->iStatusId = ERR_IDANDNAME_ENTERED;
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};
// Get and validate customer DID
if (GetShortKey(&ppd->c_d_id,pIn, "CDI*",pTPCC)
{
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};
if (ppd->c_d_id < MIN_DID || ppd->c_d_id > MAX_DID)
{
    sprintf(pTPCC->ErrTxt,"Cust DID Out of Range(%ld,%ld) - %ld",
        MIN_DID,MAX_DID,ppd->d_id);
    pTPCC->iStatusId = ERR_DID_INVALID;
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};
// Get and validate customer WId
if (GetShortKey(&ppd->c_w_id,pIn, "CWI*",pTPCC)
{
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};

```

```

if (ppd->c_w_id < 1)
{
    sprintf(pTPCC->ErrTxt,
        "Payment Contains Invalid Customer WId %d",
        ppd->c_w_id);
    pTPCC->iStatusId = ERR_WID_INVALID;
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};
// Get and validate amount
if (GetAmountKey(&ppd->h_amount,pIn, "HAM*",pTPCC)
{
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};
if (ppd->h_amount <= 0)
{
    sprintf(pTPCC->ErrTxt,
        "Payment Amount Negative or Missing");
    pTPCC->iStatusId = ERR_AMOUNT_INVALID;
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};
bTMRslt = TMTran(PAYMENT_SERVICE,pTMon,&bTPRslt,&iTPRslt);
ppd = (PAYMENT_DATA *) pTMon->pTMDData;
if (bTMRslt)
{
    pTPCC->iStatusId = ERR_TM_INTERFACE;
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};
if (bTPRslt)
{
    sprintf(pTPCC->ErrTxt,
        "Payment Service Returned Error(%ld): %s",
        iTPRslt,ppd->execution_status);
    pTPCC->iStatusId = ERR_SERVICE_RSLT;
    FormatMenu(pOut,pTPCC);
    return(TRUE);
};
FormatRespHdr(pOut, "TPC-C Payment",pTPCC);
sprintf(pOut + strlen(pOut),
    "<PRE>
    Date: %2.2d-%2.2d-%4.4d %2.2d:%2.2d:%2.2d <BR><BR>"
    "Warehouse: %4.4d
    District: %2.2d<BR>",
    ppd->h_date.day,ppd->h_date.month,
    ppd->h_date.year,ppd->h_date.hour,
    ppd->h_date.minute,ppd->h_date.second,
    ppd->w_id,ppd->d_id);
FormatHTMLString(szWork2,ppd->w_street_1,ADDR_LEN);
FormatHTMLString(szWork3,ppd->d_street_1,ADDR_LEN);
sprintf(pOut + strlen(pOut),
    "%s
    %s<BR>",szWork2,szWork3);
FormatHTMLString(szWork2,ppd->w_street_2,ADDR_LEN);
FormatHTMLString(szWork3,ppd->d_street_2,ADDR_LEN);
sprintf(pOut + strlen(pOut),
    "%s
    %s<BR>",szWork2,szWork3);
FormatHTMLString(pTPCC->szWork,ppd->w_city,ADDR_LEN);
FormatHTMLString(szWork2,ppd->d_city,ADDR_LEN);

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FormatHTMLString (szWork3,ppd->w_state,STATE_LEN);
FormatHTMLString (szWork4,ppd->d_state,STATE_LEN);
FormatString (szZip1,ZIPPIC,ppd->w_zip);
FormatString (szZip2,ZIPPIC,ppd->d_zip);
sprintf (pOut + strlen(pOut),
"%s %s %10.10s %s %s %10.10s<BR><BR>",
pTPCC->szWork,szWork3,szZip1,szWork2,szWork4,szZip2);
FormatHTMLString (szWork2,ppd->c_first,NAME_LEN);
FormatHTMLString (szWork3,ppd->c_middle,2);
FormatHTMLString (szWork4,ppd->c_last,NAME_LEN);
sprintf (pOut + strlen(pOut),
"Customer: %4.4d Cust-Warehouse: %4.4d Cust-District: %2.2d<BR>"
"Name: %s %s %s Since: %2.2d-%2.2d-%4.4d<BR>",
ppd->c_id,ppd->c_w_id,ppd->c_d_id,
szWork2,szWork3,szWork4,
ppd->c_since.day,ppd->c_since.month,ppd->c_since.year);
FormatHTMLString (pTPCC->szWork,ppd->c_street_1,ADDR_LEN);
FormatHTMLString (szWork2,ppd->c_credit,2);
FormatHTMLString (szWork3,ppd->d_street_2,ADDR_LEN);
sprintf (pOut + strlen(pOut),
" %s Credit: %s<BR>"
"%s %s %%Disc: %5.2f<BR>",
pTPCC->szWork,szWork2,szWork3,ppd->c_discount * 100);
FormatHTMLString (szWork2,ppd->c_city,ADDR_LEN);
FormatHTMLString (szWork3,ppd->c_state,STATE_LEN);
FormatString (szZip1,ZIPPIC,ppd->c_zip);
FormatString (szWork4,"XXXXXX-XXX-XXX-XXXX",ppd->c_phone);
sprintf (pOut + strlen(pOut),
" %s %s %10.10s Phone: %-19.19s<BR><BR>"
"Amount Paid: $%7.2f New Cust Balance: $%14.2f<BR>"
"Credit Limit: $%13.2f<BR><BR>",
szWork2,szWork3,szZip1,szWork4,
ppd->h_amount,ppd->c_balance,ppd->c_credit_lim);
pCredit = ppd->c_credit;
if (*pCredit == 'B' && *(pCredit + 1) == 'C')
{
pCredit = ppd->c_data;
iCDLines = strlen(pCredit) / 50;
for(i = 0; i < 4; i++, pCredit += 50)
{
if (i <= iCDLines)
UtilStrCpy (szWork2,pCredit,50);
else
szWork2[0] = 0;
FormatHTMLString (szWork3,szWork2,50);
if (!i)
sprintf (pOut + strlen(pOut),
"Cust-Data: %s<BR>",szWork3);
else
sprintf (pOut + strlen(pOut),
"%s<BR>",szWork3);
};
}
else
strcat (pOut,"Cust-Data: <BR><BR><BR><BR>");
sprintf (pOut + strlen(pOut),
"</PRE><HR><BR>%s</FORM>%s",szMenuList,HTMLTrailer);

return (FALSE);
}; // ProcessPayment

```

```

//=====
//
// Function name: ProcessDelivery
//
// ProcessDelivery extracts the input data fields from pIn, processes
// the data, and returns a response in pOut.
//
// Result:
// FALSE - Delivery processed successfully.
// TRUE - Delivery processing failed.
//=====
BOOL ProcessDelivery (CHAR * pIn,CHAR * pOut,TPCC_STATE * pTPCC)
{
DELIVERY_DATA * pdd;
TMON_STATE * pTMon;
BOOL bTMRslt;

pTMon = &pTPCC->tsTMon;
pTMon->lTMDDataLen = sizeof (DELIVERY_DATA);
memset (pTMon->pTMDData,0,pTMon->lTMDDataLen);
pdd = (DELIVERY_DATA *) pTMon->pTMDData;
pdd->w_id = pTPCC->swId;
// Get and validate carrier id
if (GetShortKey (&pdd->o_carrier_id,pIn,"OCD*",pTPCC)
{
FormatMenu (pOut,pTPCC);
return (TRUE);
};
if (pdd->o_carrier_id < MIN_CARRIER ||
pdd->o_carrier_id > MAX_CARRIER)
{
sprintf (pTPCC->ErrTxt,"Carrier Id Out of Range(%ld,%ld) - %ld",
MIN_CARRIER,MAX_CARRIER,pdd->o_carrier_id);
pTPCC->iStatusId = ERR_CARRIER_INVALID;
FormatMenu (pOut,pTPCC);
return (TRUE);
};
GetLocalTime (&pdd->QTime);
bTMRslt = TMPost (DELIVERY_SERVICE,pTMon);
if (bTMRslt)
{
pTPCC->iStatusId = ERR_TM_INTERFACE;
FormatMenu (pOut,pTPCC);
return (TRUE);
};
strcpy (pdd->execution_status,"Delivery has been queued.");
FormatRespHdr (pOut,"TPC-C Delivery",pTPCC);
sprintf (pOut + strlen(pOut),
"<PRE> Delivery<BR>"
"Warehouse: %4.4d<BR><BR>"
"Carrier Number: %2.2d<BR><BR>"
"Execution Status: %25.25s<BR>",
pdd->w_id,pdd->o_carrier_id,pdd->execution_status);
sprintf (pOut + strlen(pOut),
"</PRE><HR><BR>%s</FORM>%s",szMenuList,HTMLTrailer);

return (FALSE);
}; // ProcessDelivery

```

```

//=====
//
// Function name: ProcessOrderStatus
//
// ProcessOrderStatus extracts the input data fields from pIn,
// processes the data, and returns a response in pOut.
//
// Result:
// FALSE - OrderStatus processed successfully.
// TRUE - OrderStatus processing failed.
//=====
BOOL ProcessOrderStatus(CHAR * pIn,CHAR * pOut,TPCC_STATE * pTPCC)
{
    ORDER_STATUS_DATA * posd;
    TMON_STATE * pTMon;
    INT i;
    CHAR szWork2[50];
    CHAR szWork3[50];
    BOOL bTMRslt;
    BOOL bTPRslt;
    INT iTPRslt;

    pTMon = &pTPCC->tsTMon;
    pTMon->lTMDDataLen = sizeof(ORDER_STATUS_DATA);
    memset(pTMon->pTMDData,0,pTMon->lTMDDataLen);
    posd = (ORDER_STATUS_DATA *) pTMon->pTMDData;
    posd->w_id = pTPCC->sWID;
    if (GetShortKey(&posd->d_id,pIn,"DID*",pTPCC))
    {
        FormatMenu(pOut,pTPCC);
        return(TRUE);
    };
    if (posd->d_id < MIN_DID || posd->d_id > MAX_DID)
    {
        sprintf(pTPCC->ErrTxt,"DID Out of Range(%ld,%ld) - %ld",
            MIN_DID,MAX_DID,posd->d_id);
        pTPCC->iStatusId = ERR_DID_INVALID;
        FormatMenu(pOut,pTPCC);
        return(TRUE);
    };
    if (GetLongKey(&posd->c_id,pIn,"CID*",pTPCC))
    {
        FormatMenu(pOut,pTPCC);
        return(TRUE);
    };
    if (GetStringKey(posd->c_last,pIn,"CLT*",pTPCC,NAME_LEN))
    {
        FormatMenu(pOut,pTPCC);
        return(TRUE);
    };
    if (posd->c_id == 0 && posd->c_last[0] == 0)
    {
        strcpy(pTPCC->ErrTxt,"Error - Customer Id and Name Empty");
        pTPCC->iStatusId = ERR_IDANDNAME_EMPTY;
        FormatMenu(pOut,pTPCC);
        return(TRUE);
    };
    if (posd->c_id != 0 && posd->c_last[0] != 0)
    {

```

```

        strcpy(pTPCC->ErrTxt,
            "Error - Specify Customer Id or Name, not Both");
        pTPCC->iStatusId = ERR_IDANDNAME_ENTERED;
        FormatMenu(pOut,pTPCC);
        return(TRUE);
    };
    bTMRslt = TMTran(ORDERSTATUS_SERVICE,pTMon,&bTPRslt,&iTPRslt);
    posd = (ORDER_STATUS_DATA *) pTMon->pTMDData;
    if (bTMRslt)
    {
        pTPCC->iStatusId = ERR_TM_INTERFACE;
        FormatMenu(pOut,pTPCC);
        return(TRUE);
    };
    if (bTPRslt)
    {
        sprintf(pTPCC->ErrTxt,
            "Order Status Service Returned Error(%ld): %s",
            iTPRslt,posd->execution_status);
        pTPCC->iStatusId = ERR_SERVICE_RSLT;
        FormatMenu(pOut,pTPCC);
        return(TRUE);
    };
    FormatRespHdr(pOut,"TPC-C Order-Status",pTPCC);
    sprintf(pOut + strlen(pOut),
        "<PRE>                                Order-Status<BR>"
        "Warehouse: %4.4d  District: %2.2d<BR>",
        posd->w_id,posd->d_id);
    FormatHTMLString(pTPCC->szWork,posd->c_first,NAME_LEN);
    FormatHTMLString(szWork2,posd->c_middle,2);
    FormatHTMLString(szWork3,posd->c_last,NAME_LEN);
    sprintf(pOut + strlen(pOut),
        "Customer: %4.4d  Name: %s %s %s<BR>"
        "Cust-Balance: $%9.2f<BR><BR>",
        posd->c_id,pTPCC->szWork,szWork2,szWork3,posd->c_balance);
    sprintf(pOut + strlen(pOut),
        "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>",
        posd->o_id,posd->o_entry_d.day,posd->o_entry_d.month,
        posd->o_entry_d.year,posd->o_entry_d.hour,
        posd->o_entry_d.minute,posd->o_entry_d.second,
        posd->o_carrier_id);
    for(i = 0; i < posd->o_ol_cnt; i++)
    {
        sprintf(pOut + strlen(pOut),
            " %4.4d      %6.6d      %2.2d      %$8.2f      %2.2d-%2.2d-
%4.4d<BR>",
            posd->OlOrderStatusData[i].ol_supply_w_id,
            posd->OlOrderStatusData[i].ol_i_id,
            posd->OlOrderStatusData[i].ol_quantity,
            posd->OlOrderStatusData[i].ol_amount,
            posd->OlOrderStatusData[i].ol_delivery_d.day,
            posd->OlOrderStatusData[i].ol_delivery_d.month,
            posd->OlOrderStatusData[i].ol_delivery_d.year);
    };
    sprintf(pOut + strlen(pOut),
        "<BR></PRE><HR><BR>%s</FORM>%s",szMenuList,HTMLTrailer);

    return(FALSE);
}

```

```

}; // ProcessOrderStatus

//=====
//
// Function name: ProcessStockLevel
//
// ProcessStockLevel extracts the input data fields from pIn,
// processes the data, and returns a response in pOut.
//
// Result:
// FALSE - StockLevel processed successfully.
// TRUE - StockLevel processing failed.
//
//=====
BOOL ProcessStockLevel (CHAR * pIn, CHAR * pOut, TPCC_STATE * pTPCC)
{
    STOCK_LEVEL_DATA * psld;
    TMON_STATE * pTMon;
    BOOL bTMRslt;
    BOOL bTPRslt;
    INT iTPRslt;

    pTMon = &pTPCC->tsTMon;
    pTMon->lTMDDataLen = sizeof(STOCK_LEVEL_DATA);
    memset(pTMon->pTMDData, 0, pTMon->lTMDDataLen);
    psld = (STOCK_LEVEL_DATA *) pTMon->pTMDData;
    psld->w_id = pTPCC->sWId;
    psld->d_id = pTPCC->sDId;
    psld->low_stock = 0;
    psld->execution_status[0] = 0;
    if (GetShortKey(&psld->thresh_hold, pIn, "TT*", pTPCC))
    {
        FormatMenu(pOut, pTPCC);
        return(TRUE);
    };
    if (psld->thresh_hold < MIN_THRESHOLD ||
        psld->thresh_hold > MAX_THRESHOLD)
    {
        sprintf(pTPCC->ErrTxt, "Threshold Out of Range(%ld,%ld) - %ld",
            MIN_THRESHOLD, MAX_THRESHOLD, psld->thresh_hold);
        pTPCC->iStatusId = ERR_THRESHOLD_RANGE;
        FormatMenu(pOut, pTPCC);
        return(TRUE);
    };
    bTMRslt = TMTran(STOCKLEVEL_SERVICE, pTMon, &bTPRslt, &iTPRslt);
    psld = (STOCK_LEVEL_DATA *) pTMon->pTMDData;
    if (bTMRslt)
    {
        pTPCC->iStatusId = ERR_TM_INTERFACE;
        FormatMenu(pOut, pTPCC);
        return(TRUE);
    };
    if (bTPRslt)
    {
        sprintf(pTPCC->ErrTxt,
            "Stock Level Service Returned Error(%ld): %s",
            iTPRslt, psld->execution_status);
        pTPCC->iStatusId = ERR_SERVICE_RSLT;
        FormatMenu(pOut, pTPCC);
        return(TRUE);
    };
};

```

```

};

FormatRespHdr(pOut, "TPC-C Stock Level", pTPCC);
sprintf(pOut + strlen(pOut),
    "<PRE>
    Stock-Level<BR><BR>"
    "Warehouse: %4.4d District: %2.2d<BR><BR>"
    "Stock Level Threshold: %2.2d<BR><BR>"
    "low stock: %3.3ld</PRE><BR><HR>"
    "%s</FORM>%s",
    pTPCC->sWId, pTPCC->sDId, psld->thresh_hold, psld->low_stock,
    szMenuList, HTMLTrailer);

return(FALSE);
}; // ProcessStockLevel

//=====
//
// Function name: GetHidden
//
//=====
BOOL GetHidden(CHAR * pMsg, UINT * uFormId, INT * iSyncId, INT * iTermId)
{
    CHAR * pPtr;
    BOOL bRslt = TRUE;

    // Extract TERMID
    pPtr = strstr(pMsg, TERMIDTOKEN);
    if (pPtr == NULL)
        goto xit;
    pPtr += strlen(TERMIDTOKEN);
    *iTermId = atoi(pPtr);

    // Extract SYNCID
    pPtr = strstr(pMsg, SYNCIDTOKEN);
    if (pPtr == NULL)
        goto xit;
    pPtr += strlen(SYNCIDTOKEN);
    *iSyncId = atoi(pPtr);

    // Extract FORMID
    pPtr = strstr(pMsg, FORMIDTOKEN);
    if (pPtr == NULL)
        goto xit;
    pPtr += strlen(FORMIDTOKEN);
    *uFormId = abs(atoi(pPtr));

    bRslt = FALSE;

xit:
    return(bRslt);
}; // GetHidden

//=====
//
// Function name: GetCmd
//
//=====
BOOL GetCmd(CHAR * pMsg, CHAR * pWork, UINT uLen)

```

```

{
    UINT u;
    CHAR * ptr;
    CHAR * pUpd;

    // Check for CMD key
    if (!(ptr = strstr(pMsg,CMDTOKEN)))
        return(CMD_NULL);
    ptr += sizeof(CMDTOKEN);
    pUpd = pWork;
    while (*ptr && *ptr != '&')
        *pUpd++ = *ptr++;
    *pUpd = 0;

    // Convert command name into command index
    for(u=0; u < CMD_MAX; u++)
    {
        if (!strcmp(szCmds[u],pWork))
            return(u);
    };

    // Command string not found
    return(CMD_NULL);
}; // GetCmd

//=====
//
// Function name: GetLongKey
//
//=====
BOOL GetLongKey(LONG * lRslt,CHAR * pHTML,CHAR * pKey,TPCC_STATE * pTPCC)
{
    if (GetKeyValue(pHTML,pKey,pTPCC->szWork,sizeof(pTPCC->szWork)))
    {
        sprintf(pTPCC->ErrTxt,"Error - Missing %s Key",pKey);
        pTPCC->iStatusId = ERR_MISSING_KEY;
        return(TRUE);
    };
    if (pTPCC->szWork[0] != 0 )
    {
        if (CheckNumeric(pTPCC->szWork))
        {
            sprintf(pTPCC->ErrTxt,"Error - %s Value Not Numeric",pKey);
            pTPCC->iStatusId = ERR_NOT_NUMERIC;
            return(TRUE);
        };
    };
    *lRslt = atol(pTPCC->szWork);
    return(FALSE);
}; // GetLongKey

//=====
//
// Function name: GetIntKey
//
//=====
BOOL GetIntKey(INT * iRslt,CHAR * pHTML,CHAR * pKey,TPCC_STATE * pTPCC)
{
    if (GetKeyValue(pHTML,pKey,pTPCC->szWork,sizeof(pTPCC->szWork)))
    {

```

```

        sprintf(pTPCC->ErrTxt,"Error - Missing %s Key",pKey);
        pTPCC->iStatusId = ERR_MISSING_KEY;
        return(TRUE);
    };
    if (pTPCC->szWork[0] != 0 )
    {
        if (CheckNumeric(pTPCC->szWork))
        {
            sprintf(pTPCC->ErrTxt,"Error - %s Value Not Numeric",pKey);
            pTPCC->iStatusId = ERR_NOT_NUMERIC;
            return(TRUE);
        };
    };
    *iRslt = atoi(pTPCC->szWork);
    return(FALSE);
}; // GetIntKey

//=====
//
// Function name: GetShortKey
//
//=====
BOOL GetShortKey(SHORT * sRslt,CHAR * pHTML,CHAR * pKey,TPCC_STATE *
pTPCC)
{
    if (GetKeyValue(pHTML,pKey,pTPCC->szWork,sizeof(pTPCC->szWork)))
    {
        sprintf(pTPCC->ErrTxt,"Error - Missing %s Key",pKey);
        pTPCC->iStatusId = ERR_MISSING_KEY;
        return(TRUE);
    };
    if (pTPCC->szWork[0] != 0 )
    {
        if (CheckNumeric(pTPCC->szWork))
        {
            sprintf(pTPCC->ErrTxt,"Error - %s Value Not Numeric",pKey);
            pTPCC->iStatusId = ERR_NOT_NUMERIC;
            return(TRUE);
        };
    };
    *sRslt = (SHORT) atoi(pTPCC->szWork);
    return(FALSE);
}; // GetShortKey

//=====
//
// Function name: GetStringKey
//
//=====
BOOL GetStringKey(CHAR * szRslt,CHAR * pHTML,CHAR * pKey,
TPCC_STATE * pTPCC,UINT uMax)
{
    UINT uLen;
    if (GetKeyValue(pHTML,pKey,pTPCC->szWork,sizeof(pTPCC->szWork)))
    {
        sprintf(pTPCC->ErrTxt,"Error - Missing %s Key",pKey);
        pTPCC->iStatusId = ERR_MISSING_KEY;
        return(TRUE);
    };
    uLen = strlen(pTPCC->szWork);
    if (uLen > uMax)

```

```

{
    sprintf(pTPCC->ErrTxt,
        "Error - %s Key Input (%ld) Too Long (%ld)"
        ,pKey,uLen,uMax);
    pTPCC->iStatusId = ERR_INPUT_TOOLONG;
    return(TRUE);
};
_strupr(pTPCC->szWork);
strcpy(szRslt,pTPCC->szWork);
return(FALSE);
}; // GetStringKey

//=====
//
// Function name: GetAmountKey
//
//=====
BOOL GetAmountKey(DOUBLE * dRslt,CHAR * pHTML,CHAR * pKey,
                  TPCC_STATE * pTPCC)
{
    CHAR * ptr;
    BOOL bInvalid = FALSE;

    if (GetKeyValue(pHTML,pKey,pTPCC->szWork,sizeof(pTPCC->szWork)))
    {
        sprintf(pTPCC->ErrTxt,"Error - Missing %s Key",pKey);
        pTPCC->iStatusId = ERR_MISSING_KEY;
        return(TRUE);
    };
    ptr = pTPCC->szWork;
    while(*ptr)
    {
        if (*ptr == '.')
        {
            ptr++;
            if (!*ptr)
                break;
            if (*ptr < '0' || *ptr > '9')
            {
                bInvalid = TRUE;
                break;
            };
            ptr++;
            if (!*ptr)
                break;
            if (*ptr < '0' || *ptr > '9')
            {
                bInvalid = TRUE;
                break;
            };
            ptr++;
            if (*ptr)
            {
                bInvalid = TRUE;
                break;
            };
            break;
        }
        else
            if (*ptr < '0' || *ptr > '9')
            {

```

```

                bInvalid = TRUE;
                break;
            };
            ptr++;
        }; // while(!*ptr)

    if (!bInvalid)
        *dRslt = atof(pTPCC->szWork);
    else
    {
        sprintf(pTPCC->ErrTxt,
            "Error - Invalid Amount Format (%s)",pTPCC->szWork);
        pTPCC->iStatusId = ERR_AMOUNT_BADFORM;
    };

    return(bInvalid);
}; // GetAmountKey

//=====
//
// Function name: GetKeyValue
// This function parses an HTTP formatted string for specific key
// values. HTTP keys terminate with '='. HTTP values terminate
// with an '&' or '\0'.
//
// Result:
// FALSE - Key found, string value return in pValue
// TRUE - Key not found
//
//=====
BOOL GetKeyValue(CHAR * pHTML,CHAR * pKey,CHAR * pValue,UINT uMax)
{
    CHAR * ptr;
    if (!(ptr=strstr(pHTML,pKey)))
        return(TRUE);
    if (!(ptr=strchr(ptr,'=')))
        return(TRUE);
    ptr++;
    uMax--;
    while (*ptr && *ptr != '&' && uMax)
    {
        *pValue++ = *ptr++;
        uMax--;
    };
    *pValue = 0;
    return(FALSE);
}; // GetKeyValue

//=====
//
// Function name: FormatLogin
//
//=====
VOID FormatLogin(CHAR * pOut,CHAR * pAddText)
{
    sprintf(pOut,"%s<BR>%s<BR>%s",szFormLogin,pAddText,HTMLTrailer);
}; // FormatLogin

//=====
//

```

```

// Function name: FormatMenu
//
//=====
VOID FormatMenu(CHAR * pOut,TPCC_STATE * pTPCC)
{
    sprintf(pOut,
        "%s<HTML><HEAD><TITLE>TPC-C MainMenu</TITLE></HEAD><BODY>"
        "Select Desired Transaction.<BR><HR>"
        "<FORM ACTION=\"tpcc.dll\"METHOD=\"GET\">"
        "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\" VALUE=\"%d\">"
        "<INPUT TYPE=\"hidden\" NAME=\"TERMINID\" VALUE=\"%d\">"
        "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\" VALUE=\"%d\">"
        "<INPUT TYPE=\"hidden\" NAME=\"FORMID\" VALUE=\"%d\">"
        "%s</FORM><BR>%s",
        HTTPHdr,pTPCC->iStatusId,pTPCC->iTermId,pTPCC->iSyncId,FORM_MENU,
        szMenuList,pTPCC->ErrTxt,HTMLTrailer);
}; // FormatMenu

//=====
//
// Function name: FormatNewOrder
//
//=====
VOID FormatNewOrder(CHAR * pOut,TPCC_STATE * pTPCC)
{
    pTPCC->uFormId = FORM_NEWORDER;
    FormatFormHdr(pOut,"TPC-C New Order",pTPCC);
    sprintf(pOut + strlen(pOut),
        "<PRE>
        New Order<BR>"
        "Warehouse: %4.4d 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>"

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```

        "<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><HR>"
        "<INPUT TYPE=\"submit\"NAME=\"CMD\" VALUE=\"Process\">"
        "<INPUT TYPE=\"submit\"NAME=\"CMD\" VALUE=\"Menu\">"
        "</FORM>%s",
        pTPCC->sWId,HTMLTrailer);
}; // FormatNewOrder

//=====
//
// Function name: FormatPayment
//
//=====
VOID FormatPayment(CHAR * pOut,TPCC_STATE * pTPCC)
{
    pTPCC->uFormId = FORM_PAYMENT;
    FormatFormHdr(pOut,"TPC-C Payment",pTPCC);
    sprintf(pOut + strlen(pOut),
        "<PRE>
        Payment<BR>"
        "Date:<BR><BR>"
        "Warehouse: %4.4d
        District: <INPUT NAME=\"DID*\"
        SIZE=1><BR><BR><BR><BR><BR>"
        "Customer: <INPUT NAME=\"CID*\" SIZE=4>"
        "Cust-Warehouse: <INPUT NAME=\"CWI*\" SIZE=4> "
        "Cust-District: <INPUT NAME=\"CDI*\" SIZE=1><BR>"
        "Name: <INPUT NAME=\"CLT*\" SIZE=16>"
        "Since:<BR>"
        " Credit:<BR>"
        " Disc:<BR>"
        " Phone:<BR><BR>"
        "Amount Paid: $<INPUT NAME=\"HAM*\" SIZE=7> New Cust
        Balance:<BR>"
        "Credit Limit:<BR><BR>Cust-Data: <BR><BR><BR><BR></PRE><HR>"
        "<INPUT TYPE=\"submit\"NAME=\"CMD\" VALUE=\"Process\">"
        "<INPUT TYPE=\"submit\"NAME=\"CMD\" VALUE=\"Menu\">"
        "</FORM>%s",
        pTPCC->sWId,HTMLTrailer);
}; // FormatPayment

//=====
//
// Function name: FormatDelivery
//
//=====
VOID FormatDelivery(CHAR * pOut,TPCC_STATE * pTPCC)
{
    pTPCC->uFormId = FORM_DELIVERY;
    FormatFormHdr(pOut,"TPC-C Delivery",pTPCC);
    sprintf(pOut + strlen(pOut),
        "<PRE>
        Delivery<BR>"
        "Warehouse: %4.4d<BR><BR>"
        "Carrier Number: <INPUT NAME=\"OCD*\" SIZE=1><BR><BR>"
        "Execution Status:<BR></PRE><HR>"
        "<INPUT TYPE=\"submit\"NAME=\"CMD\" VALUE=\"Process\">"

```

```

        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Menu\">"
        "</FORM>%s",
        pTPCC->sWId,HTMLTrailer);
}; // FormatDelivery

//=====
//
// Function name: FormatOrderStatus
//
//=====
VOID FormatOrderStatus (CHAR * pOut,TPCC_STATE * pTPCC)
{
    pTPCC->uFormId = FORM_ORDERSTATUS;
    FormatFormHdr (pOut,"TPC-C Order-Status",pTPCC);
    sprintf (pOut + strlen (pOut),
        "<PRE>                                Order-Status<BR>"
        "Warehouse: %4.4d   "
        "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></PRE><HR>"
        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Process\">"
        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Menu\">"
        "</FORM>%s",
        pTPCC->sWId,HTMLTrailer);
}; // FormatOrderStatus

//=====
//
// Function name: FormatStockLevel
//
//=====
VOID FormatStockLevel (CHAR * pOut,TPCC_STATE * pTPCC)
{
    pTPCC->uFormId = FORM_STOCKLEVEL;
    FormatFormHdr (pOut,"TPC-C Stock Level",pTPCC);
    sprintf (pOut + strlen (pOut),
        "<PRE>                                Stock-Level<BR>"
        "Warehouse: %4.4d   District: %2.2d<BR><BR>"
        "Stock Level Threshold: <INPUT NAME=\"TT*\" SIZE=2><BR><BR>"
        "low stock:      <BR><HR>"
        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Process\">"
        "<INPUT TYPE=\"submit\" NAME=\"CMD\" VALUE=\"Menu\">"
        "</FORM>%s",
        pTPCC->sWId,pTPCC->sDId,HTMLTrailer);
}; // FormatStockLevel

//=====
//
// Function name: FormatFormHdr
//
//=====
VOID FormatFormHdr (CHAR * pOut,CHAR * pTitle,TPCC_STATE * pTPCC)
{
    sprintf (pOut,
        "%s<HTML><HEAD><TITLE>%s</TITLE></HEAD>"
        "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"

```

```

        "<INPUT TYPE=\"hidden\" NAME=\"PI*\" VALUE=\"\">"
        "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\" VALUE=\"0\">"
        "<INPUT TYPE=\"hidden\" NAME=\"FORMID\" VALUE=\"%d\">"
        "<INPUT TYPE=\"hidden\" NAME=\"TERMIN\" VALUE=\"%d\">"
        "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\" VALUE=\"%d\">",
        HTTPHdr,pTitle,pTPCC->uFormId,pTPCC->iTermId,pTPCC->iSyncId);
}; // FormatFormHdr

//=====
//
// Function name: FormatRespHdr
//
//=====
VOID FormatRespHdr (CHAR * pOut,CHAR * pTitle,TPCC_STATE * pTPCC)
{
    sprintf (pOut,
        "%s<HTML><HEAD><TITLE>%s</TITLE></HEAD>"
        "<FORM ACTION=\"tpcc.dll\" METHOD=\"GET\">"
        "<INPUT TYPE=\"hidden\" NAME=\"STATUSID\" VALUE=\"%d\">"
        "<INPUT TYPE=\"hidden\" NAME=\"FORMID\" VALUE=\"%d\">"
        "<INPUT TYPE=\"hidden\" NAME=\"TERMIN\" VALUE=\"%d\">"
        "<INPUT TYPE=\"hidden\" NAME=\"SYNCID\" VALUE=\"%d\">",
        HTTPHdr,pTitle,pTPCC->iStatusId,pTPCC->uFormId,
        pTPCC->iTermId,pTPCC->iSyncId);
}; // FormatRespHdr

//=====
//
// Function name: FormatHTMLString
//
// Encodes HTML special characters.  If necessary, space fills
// to pOut to total uLen characters.
//
//=====
VOID FormatHTMLString (CHAR * pOut,CHAR * pIn,UINT uLen)
{
    while (uLen && *pIn)
    {
        *pOut++ = *pIn++;
        uLen--;
    }; // while (uLen && *pIn)
    while (uLen-- > 0)
        *pOut++ = ' ';
}; // FormatHTMLString

//=====
//
// Function name: FormatString
//
// Encodes formatted string for HTML transmission.
//
//=====
VOID FormatString (CHAR * pOut,CHAR * pPic,CHAR * pIn)
{
    while (*pPic)
    {
        if (*pPic == 'X' )
        {
            if (*pIn)
                *pOut++ = *pIn++;

```

```

        else
            *pOut++ = ' ';
    }
    else
        *pOut++ = *pPic;
        pPic++;
    };
    *pOut = 0;
}; // FormatString

```

```

//=====
// FUNCTION: UtilStrCpy
//
// Copies n characters from string pSrc to pDst and places a null
// null character at the end of the destination string. Unlike
// strncpy this function ensures that the result string is always
// null terminated.
//
//=====
VOID UtilStrCpy(CHAR * pDest,CHAR * pSrc,INT n)
{
    strncpy(pDest,pSrc,n);
    pDest[n] = '\0';
    return;
}; // UtilStrCpy

```

```

//=====
//
// Function name: CheckNumeric
//
// Result
// FALSE - string is all numeric
// TRUE - sting contains non-numeric characters
//
//=====
BOOL CheckNumeric(CHAR * pNum)
{
    if (*pNum == 0 )
        return(TRUE);
    while (*pNum && isdigit(*pNum))
        pNum++;
    return(*pNum);
}; // CheckNumeric

```

term.h

```

// term.h

#include <sys\timeb.h>

#define TMILLI_TIMEOUT 3600000 // One hour

typedef struct
{
    BOOL bInUse; // In use flag
    INT iTermId; // TermId
    LPVOID ConnID; // Connection Id
    INT iSyncId; // Sync Id

```

```

    SHORT sWId; // TPC WareHouse Id
    SHORT sDId; // TPC District Id
    struct _timeb tbLastAccess; // Last activity timestamp
} TERM_STATE;

```

```

BOOL TermInit(INT iSetMaxTerm);
VOID TermTerm(VOID);
TERM_STATE * TermAlloc(VOID);
TERM_STATE * TermGet(INT iTermId);
BOOL TermFree(INT iTermId);

```

term.c

```

// term.c
//
// Copyright Unisys, 1997
//
#include <windows.h>
#include <stdio.h>
#include "diagio.h"
#include "timesupp.h"
#include "term.h"

TERM_STATE * pTArray;
INT iNextTerm = 0;
INT iMaxTerm = 0;
CRITICAL_SECTION csTerm;

VOID TermMaint(VOID);

//=====
//
// Function name: TermInit
// Creates and initializes the first TERMINITIAL TArray entries.
// Initializes critical section to control access to TArray. Assumes
// access to function is single threaded, no other threads will start
// until this function completes and that function is called once
// (DLL_PROCESS_ATTACH).
//
// Returns:
// FALSE TArray allocated and initialized
// TRUE TArray allocation failure
//
//=====
BOOL TermInit(INT iSetMaxTerm)
{
    INT iTermId;
    CHAR szDiag[MAX_DIAG_SZ];
    if (pTArray != NULL)
    {
        sprintf(szDiag,"TermInit(%ld): TArray Already Initialized\n",
            GetCurrentThreadId());
        DiagIoWrite(szDiag,DIAG_ERROR);
        return(TRUE);
    };
    InitializeCriticalSection(&csTerm);
    iMaxTerm = iSetMaxTerm;
    pTArray = (TERM_STATE *) malloc(sizeof(TERM_STATE) * (iMaxTerm + 1));
    if (pTArray == NULL)
    {

```



```

    sprintf(szDiag,"TermInit(%ld): malloc failed (%ld)\n",
        GetCurrentThreadId(),GetLastError());
    DiagIoWrite(szDiag,DIAG_ERROR);
    return(TRUE);
}
for (iTermId = 1; iTermId <= iMaxTerm; iTermId++)
    TermFree(iTermId);
iNextTerm = 1;
return(FALSE);
}; // TermInit

//=====
//
// Function name: TermTerm
// Frees TArray and deletes csTerm critical section. Assumes access
// to function is single threaded and no other threads are actively
// accessing TArray entries (DLL_PROCESS_DETACH).
//
//=====
VOID TermTerm(VOID)
{
    DeleteCriticalSection(&csTerm);
    if (pTArray != NULL)
        free(pTArray);
    iNextTerm = 0;
    iMaxTerm = 0;
}; // TermTerm

//=====
//
// Function name: TermAlloc
// Allocates empty TArray. Uses iNextTerm to start search.
//
// Returns:
// > 0 TArray entry index (iTermId)
// < 0 Empty TArray entry not available
//
//=====
TERM_STATE * TermAlloc(VOID)
{
    INT iTermId = -1;
    if (pTArray == NULL)
    {
        CHAR szDiag[MAX_DIAG_SZ];
        sprintf(szDiag,"TermAlloc(%ld): Term Array Not Allocated\n",
            GetCurrentThreadId());
        DiagIoWrite(szDiag,DIAG_ERROR);
        return(NULL);
    };
    EnterCriticalSection(&csTerm);
    _try
    {
        while(iNextTerm <= iMaxTerm)
        {
            if (!pTArray[iNextTerm].bInUse)
            {
                pTArray[iNextTerm].bInUse = TRUE;
                _ftime(&pTArray[iNextTerm].tbLastAccess);
                iTermId = iNextTerm;
                iNextTerm++;
                break;
            }
        }
    }
}

```

```

};
iNextTerm++;
}; // while(iNextTerm <= iMaxTerm) (1st Try)
if (iTermId <= 0)
{
    // No entry found. Perform maint and try again
    TermMaint();
    iNextTerm = 1;
    while(iNextTerm <= iMaxTerm)
    {
        if (!pTArray[iNextTerm].bInUse)
        {
            pTArray[iNextTerm].bInUse = TRUE;
            _ftime(&pTArray[iNextTerm].tbLastAccess);
            iTermId = iNextTerm;
            iNextTerm++;
            break;
        };
        iNextTerm++;
    }; // while(iNextTerm <= iMaxTerm) (2nd Try)
}; // if (iTermId <= 0)
if (iTermId <= 0)
    iNextTerm = 1;
}
finally
{
    LeaveCriticalSection(&csTerm);
};

if (iTermId > 0)
    return(&pTArray[iTermId]);
else
    return(NULL);
}; // TermAlloc

//=====
//
// Function name: TermMaint
// Clears entries whose last access time exceeds TMILLI_TIMEOUT.
// Assumes caller has entered csTerm.
//
//=====
VOID TermMaint(VOID)
{
    INT iTermId;
    TMILLI tmElapsed;
    // Free entries that have timed out
    for (iTermId = 1; iTermId <= iMaxTerm; iTermId++)
    {
        if (pTArray[iTermId].bInUse)
        {
            tmElapsed = TimebElapsed(&pTArray[iTermId].tbLastAccess);
            if (tmElapsed > TMILLI_TIMEOUT)
                TermFree(iTermId);
        };
    };
}; // TermMaint

//=====

```

```

//
// Function name: TermGet
// Returns pointer to TArray slot at iTermId.
//
// Returns:
// FALSE TArray entry made available
// TRUE iTermId invalid.
//
//=====
TERM_STATE * TermGet(INT iTermId)
{
    TERM_STATE * pTerm;
    TMILLI tmElapsed;
    if (iTermId <= 0 || iTermId > iMaxTerm)
    {
        CHAR szDiag[MAX_DIAG_SZ];
        sprintf(szDiag, "TermGet(%ld): Invalid TermId (%ld)\n",
            GetCurrentThreadId(), iTermId);
        DiagIoWrite(szDiag, DIAG_ERROR);
        return(NULL);
    };
    pTerm = &pTArray[iTermId];
    if (!pTerm->bInUse)
        return(NULL);
    tmElapsed = TimebElapsed(&pTerm->tbLastAccess);
    if (tmElapsed > TMILLI_TIMEOUT)
        return(NULL); // Entry destined to be freed by maint
    _ftime(&pTArray[iTermId].tbLastAccess);
    return(&pTArray[iTermId]);
}; // TermGet

//=====
//
// Function name: TermFree
// Initializes contents of TArray slot at iTermId.
//
// Returns:
// FALSE TArray entry made available
// TRUE iTermId invalid.
//
//=====
BOOL TermFree(INT iTermId)
{
    TERM_STATE * pTerm;
    if (iTermId <= 0 || iTermId > iMaxTerm)
    {
        CHAR szDiag[MAX_DIAG_SZ];
        sprintf(szDiag, "TermFree(%ld): Invalid TermId (%ld)\n",
            GetCurrentThreadId(), iTermId);
        DiagIoWrite(szDiag, DIAG_ERROR);
        return(TRUE);
    };
    pTerm = &pTArray[iTermId];
    pTerm->ConnID = 0;
    pTerm->SWID = 0;
    pTerm->SDID = 0;
    pTerm->iSyncId = 0;
    pTerm->iTermId = iTermId;
    TimebClear(&pTerm->tbLastAccess);
    pTerm->bInUse = FALSE;
}; // TermFree

```

tmon.h

```

// tmon.h
typedef struct
{
    CHAR * pszErrTxt; // Error text
    CHAR * pTMDData; // TM buffer area
    LONG lTMDDataLen; // TM buffer len
} TMON_STATE;

VOID TMonInit(INT iSetMaxMsg);
VOID TMonTerm(VOID);
BOOL TMinit(TMON_STATE * pTMon);
VOID TMDone(TMON_STATE * pTMon);
BOOL TMTran(CHAR * pService, TMON_STATE * pTMon,
            BOOL * bTPRsult, INT * iTPRsult);
BOOL TMPost(CHAR * pService, TMON_STATE * pTMon);

```

tmon.c

```

// tmon.c
//
// Copyright Unisys, 1997
//
#include <windows.h>
#include <stdio.h>
#include <atmi.h>
#include "tmon.h"

INT iTMMaxSz;

//=====
//
// Function name: TMonInit
//
//=====
VOID TMonInit(INT iSetMaxMsg)
{
    iTMMaxSz = iSetMaxMsg;
}; // TMonInit

//=====
//
// Function name: TMonTerm
//
//=====
VOID TMonTerm(VOID)
{
}; // TMonTerm

//=====
//
// Function name: TMinit
//
// Result:
// FALSE Initialization completed successfully
// TRUE Initialization failed
//

```

```

//=====
BOOL TMinit(TMON_STATE * pTMon)
{
    BOOL bRslt = FALSE;
    TPINIT * tpinfo;

    // Must have ErrTxt message area set before init
    if (pTMon->pszErrTxt == NULL)
        return(TRUE);
    tpinfo = (TPINIT *) tmalloc("TPINIT",NULL,TPINITNEED(20));
    memset(tpinfo,0,sizeof(TPINIT));
    tpinfo->flags=TPMULTICONTEXTS;
    sprintf(tpinfo->cltname,"tpcc%d",GetCurrentThreadId());

    if (tpinit(tpinfo) == -1)
    {
        sprintf(pTMon->pszErrTxt,"TMinit Failed(%ld)",tperrno);
        bRslt = TRUE;
    }
    else
    {
        pTMon->pTMDData = tmalloc("CARRAY",NULL,iTMMMaxSz);
        if (pTMon->pTMDData == NULL)
        {
            sprintf(pTMon->pszErrTxt,"TMinit Failed(%ld)",tperrno);
            bRslt = TRUE;
        };
    };

    return(bRslt);
}; // TMinit

//=====
//
// Function name: TMDone
//
//=====
VOID TMDone(TMON_STATE * pTMon)
{
    tpmfree(pTMon->pTMDData);
    tpterm();
}; // TMDone

//=====
//
// Function name: TMTran
//
// Result:
// FALSE    call completed. bTPRslt contains outcome (FALSE tran
//           success). iTPRslt contains application returned
//           result code.
// TRUE     TM interface error, ErrTxt has diagnostic.
//
//=====
BOOL TMTran(CHAR * pService,TMON_STATE * pTMon,
            BOOL * bTPRslt,INT * iTPRslt)
{
    BOOL bRslt = FALSE;
    INT iGRply;

```

```

    iGRply = tpcall(pService,pTMon->pTMDData,iTMMMaxSz,
        &pTMon->pTMDData,&pTMon->lTMDDataLen,TPNOTIME | TPSIGRSTRT);
    if (iGRply != -1)
    {
        *iTPRslt = tpurcode;
        *bTPRslt = FALSE;
    }
    else
    if (tperrno == TPESVCFAIL)
    {
        *iTPRslt = tpurcode;
        *bTPRslt = TRUE;
    }
    else
    {
        sprintf(pTMon->pszErrTxt,"TPCall Failed (%ld)",tperrno);
        bRslt = TRUE;
    };
    return(bRslt);
}; // TMTran

//=====
//
// Function name: TMPost
//
// Result:
// FALSE    transaction submitted with no response expected
// TRUE     tpacall failed, ErrTxt has diagnostic
//
//=====
BOOL TMPost(CHAR * pService,TMON_STATE * pTMon)
{
    BOOL bRslt = FALSE;
    INT iCD;

    iCD = tpacall(pService,pTMon->pTMDData,iTMMMaxSz,TPNOREPLY);
    if (iCD == -1)
    {
        sprintf(pTMon->pszErrTxt,"TPACall Failed (%ld)",tperrno);
        bRslt = TRUE;
    };
    return(bRslt);
}; // TMPost

```

timesupp.h

```

// timesupp.h
#include <windows.h>
#include <time.h>
#include <sys\timeb.h>

#define TIMEBSEED_MOD 10000
#define TIMEBSEED_SHIFT 1000
#define TIMEB_STRING_SZ 23
#define TIMEB_STRING_DATESZ 10
#define TIMEB_STRING_TIMEOFFSET 11
#define TIMEB_STRING_TIMESZ 12

typedef ULONG TMILLI;

```

```

TMILLI TimebDiff(struct _timeb * p_tb1, struct _timeb * p_tb2);
VOID TimebCopy(struct _timeb * p_tbDest, struct _timeb * p_tbSource);
TMILLI TimebElapsed(struct _timeb * p_tb1);
VOID TimebClear(struct _timeb * p_tb1);
CHAR * TimebToString(struct _timeb * p_tb1, CHAR * psz, BOOL bMillis);
BOOL TimebFromString(struct _timeb * p_tb1, CHAR * psz);
VOID TimebAddSecs(struct _timeb * p_tb1, INT iSeconds);
ULONG TimebSeed(VOID);

```

timesupp.c

```

// timesupp.c
//
// Copyright Unisys, 1997
//

#include <stdio.h>
#include "timesupp.h"

//=====
//
// Function name: TimebCopy
// Structure contents copy of _timeb source to _timeb dest.
//
//=====
VOID TimebCopy(struct _timeb * p_tbDest, struct _timeb * p_tbSource)
{
    p_tbDest->time = p_tbSource->time;
    p_tbDest->millitm = p_tbSource->millitm;
    p_tbDest->dstflag = p_tbSource->dstflag;
    p_tbDest->timezone = p_tbSource->timezone;
}; // TimebCopy

//=====
//
// Function name: TimebDiff
// Time difference in milliseconds between _timeb_t1 and _timeb_t2.
//
//=====
TMILLI TimebDiff(struct _timeb * p_tb1, struct _timeb * p_tb2)
{
    LONG lRslt;
    lRslt = ((p_tb2->time - p_tb1->time) * 1000) +
            (p_tb2->millitm - p_tb1->millitm);
    if (lRslt < 0)
        return(0);
    else
        return((TMILLI) lRslt);
}; // TimebDiff

//=====
//
// Function name: TimebElapsed
//
//=====
TMILLI TimebElapsed(struct _timeb * p_tb1)
{

```

```

    struct _timeb _tb2;
    _ftime(&_tb2);
    return (TimebDiff(p_tb1, &_tb2));
}; // TimebElapsed

//=====
//
// Function name: TimebClear
//
//=====
VOID TimebClear(struct _timeb * p_tb1)
{
    p_tb1->time = 0;
    p_tb1->millitm = 0;
}; // TimebClear

//=====
//
// Function name: TimebToString
// Converts timeb to yyyy:mm:dd,hh:mm:ss.sss format
//
//=====
CHAR * TimebToString(struct _timeb * p_tb1, CHAR * psz, BOOL bMillis)
{
    struct tm * ptm;
    ptm = localtime(&p_tb1->time);
    sprintf(psz, "%4.4d/%2.2d/%2.2d,%2.2d:%2.2d:%2.2d",
            ptm->tm_year + 1900, ptm->tm_mon + 1, ptm->tm_mday,
            ptm->tm_hour, ptm->tm_min, ptm->tm_sec);
    if (bMillis)
        sprintf(psz + strlen(psz), ".%3.3d", p_tb1->millitm);
    return(psz);
}; // TimebToString

//=====
//
// Function name: TimebFromString
// Converts yyyy:mm:dd,hh:mm:ss.sss (TimebToString) format to timeb
//
//=====
BOOL TimebFromString(struct _timeb * p_tb1, CHAR * psz)
{
    struct tm tmTime;
    struct tm * ptm;
    UINT uLen;

    ptm = &tmTime;
    uLen = strlen(psz);
    if (uLen < (TIMEB_STRING_SZ - 4)) // millis are optional
    {
        p_tb1->time = 0;
        p_tb1->millitm = 0;
        return (TRUE);
    };
    // Clear fields that won't be set
    ptm->tm_wday = 0;
    ptm->tm_yday = 0;
    ptm->tm_isdst = -1;
    // Set tm struct fields from string

```

```

ptm->tm_year = (atoi(psz)) - 1900;
psz += 5;
ptm->tm_mon = (atoi(psz)) - 1;
psz += 3;
ptm->tm_mday = atoi(psz);
psz += 3;
ptm->tm_hour = atoi(psz);
psz += 3;
ptm->tm_min = atoi(psz);
psz +=3;
ptm->tm_sec = atoi(psz);
if (uLen >= TIMEB_STRING_SZ) // Millis present
{
    psz += 3;
    p_tbl->millitm = atoi(psz);
};
p_tbl->time = mktime(ptm);
return (FALSE);
}; // TimebFromString

//=====
//
// Function name: TimebAddSecs
//
//=====
VOID TimebAddSecs(struct _timeb * p_tbl,INT iSeconds)
{
    p_tbl->time += iSeconds;
}; // TimebAddSecs

```

diagio.h

```

// diagio.h

// Environment variable defaults
#define DEFAULTDIAGLEVEL DIAG_INFO
#define DEFAULTTEVENTLOG 0

#define DIAGNOSTICS TRUE
#define MAX_DIAG_SZ 2000

// Severity level of diagnostic report
#define DIAG_FORCE 1
#define DIAG_ERROR 2
#define DIAG_STATE 3
#define DIAG_INFO 4

VOID DiagIoInit (CHAR * pDiagId,BOOL bConsole,BOOL bEvent,UINT uLevel);
VOID DiagIoTerm (VOID);
VOID DiagIoWrite (CHAR * pDiagBuffer, UINT uSeverity);

```

diagio.c

```

// diagio.c
//
// Copyright Unisys, 1997
//
#include <windows.h>
#include <stdio.h>

```

```

#include "diagio.h"

CRITICAL_SECTION csDiagIo;
HANDLE hEventLog = NULL;
UINT uDiagLevel;
BOOL bEventLog;
BOOL bConsoleLog;
CHAR * pDiagHdr;
CHAR * pEventHost;
CHAR * pErrHdr =
    {"*** ERROR *** ERROR *** ERROR *** ERROR *** ERROR ***"};

INT WriteEventLog (CHAR * pDMsgs[],UINT uMsgCnt,UINT uSeverity);

//=====
//
// Function name: DiagIoInit
//
//=====
VOID DiagIoInit (CHAR * pDiagId,BOOL bConsole,BOOL bEvent,UINT uLevel)
{
    if (DIAGNOSTICS)
    {
        InitializeCriticalSection (&csDiagIo);

        uDiagLevel = uLevel;
        bEventLog = bEvent;
        bConsoleLog = bConsole;
        pEventHost = (CHAR *) malloc(10);
        strcpy(pEventHost,""); // local host
        pDiagHdr = (CHAR *) malloc(strlen(pDiagId) + 1);
        strcpy(pDiagHdr,pDiagId);
        if (bEventLog)
        {
            hEventLog = RegisterEventSource (pEventHost,pDiagId);
            if (hEventLog == NULL)
            {
                bEventLog = FALSE;
                if (bConsoleLog)
                    fprintf(stdout,
                        "%s: Event Log Register Failed (%ld)\n"
                        "Event Log Will NOT be Used\n",
                        pDiagHdr,GetLastError());
            }
            else
            {
                if (bConsoleLog)
                    fprintf(stdout,"%s: Event Logging to LocalHost as %s\n",
                        pDiagHdr,pDiagHdr);
            }
        }; // if bEventLog
    }; // if Diagnostics
}; // DiagIoInit

//=====
//
// Function name: DiagIoTerm
//
//=====
VOID DiagIoTerm (VOID)

```

```

{
    if (DIAGNOSTICS)
    {
        DeleteCriticalSection(&csDiagIo);
        if (hEventLog != NULL)
            DeregisterEventSource(hEventLog);
        free(pDiagHdr);
        free(pEventHost);
    };
}; // DiagIoTerm

//=====
//
// Function name: DiagIoWrite
//
//=====
VOID DiagIoWrite(CHAR * pDiagBuffer, UINT uSeverity)
{
    CHAR * pDMsgs[3];
    UINT uMsgCnt = 0;
    INT iERslt = 0;
    if (DIAGNOSTICS)
    {
        if (uDiagLevel >= uSeverity)
        {
            EnterCriticalSection(&csDiagIo);
            try
            {
                if (uSeverity == DIAG_ERROR)
                {
                    pDMsgs[0] = pDiagHdr;
                    pDMsgs[1] = pErrHdr;
                    pDMsgs[2] = pDiagBuffer;
                    uMsgCnt = 3;
                }
                else
                {
                    pDMsgs[0] = pDiagHdr;
                    pDMsgs[1] = pDiagBuffer;
                    uMsgCnt = 2;
                };
                if (bEventLog)
                    iERslt = WriteEventLog(pDMsgs, uMsgCnt, uSeverity);
                if (bConsoleLog)
                {
                    if (uMsgCnt == 3)
                        fprintf(stdout, "\n%s:
%s\n%s", pDMsgs[0], pDMsgs[1], pDMsgs[2]);
                    else
                        fprintf(stdout, "\n%s: %s", pDMsgs[0], pDMsgs[1]);
                    if (iERslt != 0)
                        fprintf(stdout,
                            "EventLog Write Failed (%ld), No Longer in Use\n",
                            iERslt);
                };
            }
            finally
            {
                LeaveCriticalSection(&csDiagIo);
            };
        }; // if uDiagLevel >= uSeverity
    }
};

```

```

}; // if Diagnostics
}; // DiagIoWrite

INT WriteEventLog(CHAR * pDMsgs[], UINT uMsgCnt, UINT uSeverity)
{
    WORD wType;
    WORD wCount;
    wCount = uMsgCnt;
    switch (uSeverity)
    {
        case DIAG_ERROR:
            wType = EVENTLOG_ERROR_TYPE;
            break;
        default:
            wType = EVENTLOG_INFORMATION_TYPE;
            break;
    };
    if (wType != 0)
    {
        if (!ReportEvent(hEventLog, // event log handle
            wType, // event type
            0, // category zero
            uSeverity, // no event identifier
            NULL, // no user security identifier
            wCount, // # of substitution strings
            0, // no binary data
            (LPCTSTR *) pDMsgs, // address of string array
            NULL)) // address of binary
        {
            DeregisterEventSource(hEventLog);
            hEventLog = NULL;
            bEventLog = FALSE;
            return(GetLastError());
        }; // ReportEvent failed
    }; // if wType != 0
    return(0);
}; // WriteEventLog

```

SERVER MAKEFILES

```

SVR = tpccsvr
SRC = \webrte\tpcctux\tpccsvr.c
DBG = /f "/Zi"
$(SVR).exe: $(SRC)
    erase $(SVR).exe
    $(TUXDIR)\bin\buildserver /f "$(SRC)" /o $(SVR).exe /s
NEWORDER:NEWORDER /s PAYMENT:PAYMENT /s ORDERSTS:ORDERSTS /s
STOCKLVL:STOCKLVL -l i:\mssql7\devtools\lib\ntwdblib.lib
    copy $(SVR).exe $(APPDIR)

```

```

SVR = tpccdelv
SRC = \webrte\tpcctux\tpccdelv.c
DBG = /f "/Zi"
$(SVR).exe: $(SRC)
    erase $(SVR).exe
    $(TUXDIR)\bin\buildserver /f "$(SRC)" /o $(SVR).exe /s
DELIVERY:DELIVERY -l i:\mssql7\devtools\lib\ntwdblib.lib

```

```
copy $(SVR).exe $(APPDIR)
```

tpccsvr.h

```
// tpccsvr.h
//
// Copyright Unisys, 1997
// Copyright Microsoft, 1996
```

```
#include "tpcc.h"
```

```
#define DEFCLPACKSIZE      2000
#define DEADLOCKWAIT      10
#define LOGFILE_NAME      "delilog"
```

```
// 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
```

tpcc.h

```
// tpcc.h
```

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

```
// TPCCHandler return codes
```

```
#define TPCCSEND 1
#define TPCCSENDEND 2
#define TPCCENDNOW 3
```

```
// TPC Service return codes
```

```
#define SVC_BADITEMID 1
#define SVC_NOERROR 0
#define SVCERR_DEADLOCK -1
#define SVCERR_NOCUSTOMER -2
#define SVCERR_NOORDERS -3
#define SVCERR_DBLIB -4
```

```
// Min/Max transaction data definitions
```

```
#define MIN_DID 1
#define MAX_DID 10
#define MIN_OL 5
#define MAX_OL 15
#define MIN_QUANTITY 1
#define MAX_QUANTITY 10
#define MIN_ITEM_ID 1
#define MAX_ITEM_ID 100000
#define MIN_CUST_ID 1
#define MAX_CUST_ID 3000
#define MIN_CARRIER 1
#define MAX_CARRIER 10
#define MIN_THRESHOLD 10
```

```
#define MAX_THRESHOLD 20
```

```
// pTPCC->iStatusId codes
```

```
#define INVALID_IID      1
#define STATUS_OK       0
#define ERR_CMD_UNKNOWN -10
#define ERRRTXT_CMD_UNKNOWN "Unrecognized Command"
#define ERR_ALREADY_LOGGEDIN -11
#define ERRRTXT_ALREADY_LOGGEDIN "Already Logged In"
#define ERR_TERMID      -12
#define ERRRTXT_TERMID "TermId or SyncId in Error"
#define ERR_FORM_UNKNOWN -13
#define ERRRTXT_FORM_UNKNOWN "Unrecognized FormId"
#define ERR_WID_INVALID -14
#define ERR_DID_INVALID -15
#define ERR_MISSING_KEY -16
#define ERR_NOT_NUMERIC -17
#define ERR_THRESHOLD_RANGE -18
#define ERR_EMBEDDED_EMPTY_OL -19
#define ERR_QUANTITY_INVALID -20
#define ERR_OL_INVALID -21
#define ERR_OL_COUNT -22
#define ERR_TM_INTERFACE -23
#define ERR_SERVICE_RSLT -24
#define ERR_INPUT_TOOLONG -25
#define ERR_IDANDNAME_EMPTY -26
#define ERR_IDANDNAME_ENTERED -27
#define ERR_AMOUNT_BADFORM -28
#define ERR_AMOUNT_INVALID -29
#define ERR_CARRIER_INVALID -30
#define ERR_TERM_ALLOC -31
```

```
#define STATUS_LEN 200
```

```
#define NAME_LEN 16
```

```
#define ADDR_LEN 20
```

```
#define STATE_LEN 2
```

```
#define ZIP_LEN 9
```

```
#define MAX_MSG_SZ 5000
```

```
typedef struct
```

```
{
    short ol_supply_w_id;
    long ol_i_id;
    char ol_i_name[25];
    short ol_quantity;
    char ol_brand_generic[2];
    double ol_i_price;
    double ol_amount;
    short ol_stock;
} OL_NEW_ORDER_DATA;
```

```
typedef struct
```

```
{
    short w_id;
    short d_id;
    long c_id;
    short o_ol_cnt;
    char c_last[NAME_LEN + 1];
    char c_credit[3];
    double c_discount;
```

```

double w_tax;
double d_tax;
long o_id;
short o_commit_flag;
DBDATEREC o_entry_d;
short o_all_local;
double total_amount;
char execution_status[STATUS_LEN];
OL_NEW_ORDER_DATA Ol[MAX_OL];
} NEW_ORDER_DATA;

```

```
typedef struct
```

```

{
    short w_id;
    short d_id;
    long c_id;
    short c_d_id;
    short c_w_id;
    double h_amount;
    DBDATEREC h_date;
    char w_street_1[ADDR_LEN + 1];
    char w_street_2[ADDR_LEN + 1];
    char w_city[ADDR_LEN + 1];
    char w_state[STATE_LEN + 1];
    char w_zip[ZIP_LEN + 1];
    char d_street_1[ADDR_LEN + 1];
    char d_street_2[ADDR_LEN + 1];
    char d_city[ADDR_LEN + 1];
    char d_state[STATE_LEN + 1];
    char d_zip[ZIP_LEN + 1];
    char c_first[NAME_LEN + 1];
    char c_middle[3];
    char c_last[NAME_LEN + 1];
    char c_street_1[ADDR_LEN + 1];
    char c_street_2[ADDR_LEN + 1];
    char c_city[ADDR_LEN + 1];
    char c_state[STATE_LEN + 1];
    char c_zip[ZIP_LEN + 1];
    char c_phone[16];
    DBDATEREC c_since;
    char c_credit[3];
    double c_credit_lim;
    double c_discount;
    double c_balance;
    char c_data[200+1];
    char execution_status[STATUS_LEN];
} PAYMENT_DATA;

```

```
typedef struct
```

```

{
    long ol_i_id;
    short ol_supply_w_id;
    short ol_quantity;
    double ol_amount;
    DBDATEREC ol_delivery_d;
} OL_ORDER_STATUS_DATA;

```

```
typedef struct
```

```

{
    short w_id;
    short d_id;

```

```

    long c_id;
    char c_first[NAME_LEN + 1];
    char c_middle[3];
    char c_last[NAME_LEN + 1];
    double c_balance;
    long o_id;
    DBDATEREC o_entry_d;
    short o_carrier_id;
    OL_ORDER_STATUS_DATA OlOrderStatusData[MAX_OL];
    short o_ol_cnt;
    char execution_status[STATUS_LEN];
} ORDER_STATUS_DATA;

```

```
typedef struct
```

```

{
    short w_id;
    short o_carrier_id;
    long o_id[10];
    int iComplete;
    SYSTEMTIME QTime; // time delivery was queued
    SYSTEMTIME EndTime; // time delivery completed
    char execution_status[STATUS_LEN];
} DELIVERY_DATA;

```

```
typedef struct
```

```

{
    short w_id;
    short d_id;
    short thresh_hold;
    long low_stock;
    char execution_status[STATUS_LEN];
} STOCK_LEVEL_DATA;

```

tpccsvr.c

```
// tpccsvr.c
```

```
//
```

```
// Copyright Unisys, 1997
```

```
// Copyright Microsoft, 1996
```

```

#include <windows.h>
#include <malloc.h>
#include <stdarg.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include <sys\timeb.h>

```

```

#include <atmi.h>
#include <userlog.h>

#include "tpccsvr.h"

```

```

char    szServer[32]    = "tpccserver";
char    szUser[32]     = { 0 };
char    szPassword[32] = { 0 };
char    szDatabase[32] = "tpcc";
char    szService[16]  = "tpccsvr";
char    szWork[200];

```



```

PDBPROCESS    dbproc;
int    spid;                // spid assigned from dblib
BOOL   bFailed;
BOOL   bDeadlock;
short  DeadlockRetry = (short)3;

int err_handler(DBPROCESS *dbproc, int severity, int dberr, int oserr,
char *dberrstr, char *oserrstr);
int msg_handler(DBPROCESS *dbproc, DBINT msgno, int msgstate, int
severity, char *msgtext);
int SQLStockLevel(STOCK_LEVEL_DATA *psld);
int SQLNewOrder(NEW_ORDER_DATA * pnod);
int SQLPayment(PAYMENT_DATA *ppd);
int SQLOrderStatus(ORDER_STATUS_DATA * pOrderStatus);
void UtilStrCpy(char * pDest, char * pSrc, int n);
VOID GetArgs(INT argc, CHAR **argv);

//=====
//
// Function name: tpsvrinit
//
//=====
tpsvrinit(int argc, char *argv[])
{
    GetArgs(argc, argv);
    sprintf(szWork, "%s Started, DBServer=%s, DB=%s",
            szService, szServer, szDatabase);
    userlog(szWork);
    if (SQLInit(szServer, szDatabase, szUser, szPassword))
        return(-1);
    userlog("Database open, initialization complete");
    return(0);
}; // tpsvrinit

//=====
//
// Function name: tpsvrdone
//
//=====
void tpsvrdone()
{
    userlog("Shutdown request for tpcctux server");
    dbclose(dbproc);
    dbexit();
}; // tpsvrdone

//=====
//
// Function name: NEWORDER
//
// Entry point called by tuxedo for NEWORDER service requests.
//
//=====
void NEWORDER(TPSVCINFO * svcinfo)
{
    int iRslt;
    NEW_ORDER_DATA * pnod;

    pnod = (NEW_ORDER_DATA *) svcinfo->data;
    iRslt = SQLNewOrder(pnod);

```

```

// Check for DBLib termination error
if (bFailed)
{
    strcpy(pnod->execution_status, szWork);
    tpreturn(TPFAIL, SVCERR_DBLIB, svcinfo->data, svcinfo->len, 0);
}
else
if (iRslt == 0)
    tpreturn(TPSUCCESS, 0, svcinfo->data, svcinfo->len, 0);
else
    tpreturn(TPFAIL, iRslt, svcinfo->data, svcinfo->len, 0);
}; // NEWORDER

//=====
//
// Function name: PAYMENT
//
// Entry point called by tuxedo for PAYMENT service requests.
//
//=====
void PAYMENT(TPSVCINFO * svcinfo)
{
    int iRslt;
    PAYMENT_DATA * ppd;

    ppd = (PAYMENT_DATA *) svcinfo->data;

    iRslt = SQLPayment(ppd);

    if (bFailed)
    {
        strcpy(ppd->execution_status, szWork);
        tpreturn(TPFAIL, SVCERR_DBLIB, svcinfo->data, svcinfo->len, 0);
    }
    else
    if (iRslt == 0)
        tpreturn(TPSUCCESS, 0, svcinfo->data, svcinfo->len, 0);
    else
        tpreturn(TPFAIL, iRslt, svcinfo->data, svcinfo->len, 0);
}; // PAYMENT

//=====
//
// Function name: ORDERSTS
//
// Entry point called by tuxedo for ORDERSTS service requests.
//
//=====
void ORDERSTS(TPSVCINFO * svcinfo)
{
    int iRslt;
    ORDER_STATUS_DATA * posd;

    posd = (ORDER_STATUS_DATA *) svcinfo->data;
    iRslt = SQLOrderStatus(posd);

    // Check for DBLib termination error
    if (bFailed)
    {
        strcpy(posd->execution_status, szWork);
        tpreturn(TPFAIL, SVCERR_DBLIB, svcinfo->data, svcinfo->len, 0);
    }

```

```

}
else
if (iRslt == 0)
    tpreturn(TPSUCCESS,0,svcinfn->data,svcinfn->len,0);
else
    tpreturn(TPFAIL,iRslt,svcinfn->data,svcinfn->len,0);
}; // ORDERSTS

//=====
//
// Function name: STOCKLVL
//
// Entry point called by tuxedo for STOCKLVL service requests.
//
//=====
void STOCKLVL(TPSVCINFO * svcinfn)
{
    int iRslt;
    STOCK_LEVEL_DATA * psld;

    psld = (STOCK_LEVEL_DATA *) svcinfn->data;
    iRslt = SQLStockLevel(psld);

    // Check for DBLib termination error
    if (bFailed)
    {
        strcpy(psld->execution_status,szWork);
        tpreturn(TPFAIL,SVCERR_DBLIB,svcinfn->data,svcinfn->len,0);
    }
    else
    if (iRslt == 0)
        tpreturn(TPSUCCESS,0,svcinfn->data,svcinfn->len,0);
    else
        tpreturn(TPFAIL,iRslt,svcinfn->data,svcinfn->len,0);
}; // STOCKLVL

//=====
//
// Function name: SQLInit
//
// Set global dbproc and spid.
//
// Result:
// FALSE - database open, dbproc valid
// TRUE - database open failed
//
//=====
BOOL SQLInit(CHAR * pSvr,CHAR * pDB,CHAR * pUsr,CHAR * pPW,CHAR * pSvc)
{
    char szApp[32];
    char server[256];
    char database[256];
    char user[256];
    char password[256];
    LOGINREC *login;

    dbinit();
    // install error and message handlers
    dbmsghandle((DBMSGHANDLE_PROC)msg_handler);
    dberrhandle((DBERRHANDLE_PROC)err_handler);

```

```

dbproc = NULL;
strcpy(server,pSvr);
strcpy(database,pDB);
strcpy(user,pUsr);
strcpy(password,pPW);
sprintf(szApp,"%s%d",pSvc,_getpid());

login = dblogin();
if (!*user)
    DBSETLUSER(login,"sa");
else
    DBSETLUSER(login,user);
DBSETLPWD(login,password);
DBSETLHOST(login,szApp);
DBSETLVERSION(login,DBVER60);
// DBSETLPACKET(login,(unsigned short)DEFCLPACKSIZE);

if ((dbproc = dbopen(login,server)) == NULL)
{
    userlog("dbopen failed");
    return TRUE;
};
// Use the the right database
dbuse(dbproc,database);
dbcmd(dbproc,"select @@spid");
dbsqlxexec(dbproc);
while (dbresults(dbproc) != NO_MORE_RESULTS)
{
    dbbind(dbproc,1,SMALLBIND,(DBINT) 0,(BYTE *) spid);
    while (dbnextrow(dbproc) != NO_MORE_ROWS)
        ;
};

dbcmd(dbproc,"set nocount on");
dbsqlxexec(dbproc);
while (dbresults(dbproc) != NO_MORE_RESULTS)
{
    while (dbnextrow(dbproc) != NO_MORE_ROWS)
        ;
};

//rollback transaction on abort
dbcmd(dbproc,"set XACT_ABORT ON");
dbsqlxexec(dbproc);
while (dbresults(dbproc) != NO_MORE_RESULTS)
{
    while (dbnextrow(dbproc) != NO_MORE_ROWS)
        ;
};

return(FALSE);
}; // SQLInit

//=====
// FUNCTION: err_handler
//
// Handles DB-Library errors
//
// ARGUMENTS:

```

```

// DBPROCESS *dbproc DBPROCESS id pointer
// int severity severity of error
// int dberr error id
// int oserr operating system specific error code
// char *dberrstr printable error description of dberr
// char *oserrstr printable error description of oserr
//
// RETURNS:
// int INT_CANCEL
//
// COMMENTS: None
//
//=====
int err_handler(DBPROCESS *dbproc, int severity, int dberr, int oserr,
char *dberrstr, char *oserrstr)
{
    if ((dbproc == NULL) || (DBDEAD(dbproc)))
    {
        userlog("ErrHandler: DBPROC is invalid");
        return INT_CANCEL;
    };
    if (bFailed)
        return INT_CANCEL;
    if (oserr != DBNOERR)
    {
        sprintf(szWork, "ErrHandler: OSErr(%ld) - %s", oserr, oserrstr);
        userlog(szWork);
        bFailed = TRUE;
    };

    return INT_CANCEL;
}; // err_handler

//=====
// FUNCTION: msg_handler
//
// 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 operation
// INT_CANCEL cancel operation
//
// COMMENTS: This function also sets the dead lock dbproc
// variable if necessary.
//
//=====
int msg_handler(DBPROCESS *dbproc, DBINT msgno, int msgstate, int
severity, char *msgtext)
{
    if ((msgno == 5701) || (msgno == 2528) ||
        (msgno == 5703) || (msgno == 6006))
        return INT_CONTINUE;

```

```

// deadlock message
if (msgno == 1205)
{
    // set the deadlock indicator
    bDeadlock = TRUE;
    return INT_CONTINUE;
};

if (bFailed)
    return INT_CANCEL;

if (msgno == 0)
    return INT_CONTINUE;
else
{
    sprintf(szWork, "MsgHandler: MsgNo(%ld) - %s", msgno, msgtext);
    userlog(szWork);
    bFailed = TRUE;
};

return INT_CANCEL;
}; // msg_handler

//=====
// FUNCTION: SQLStockLevel
//
// Handles the stock level transaction.
//
// ARGUMENTS:
// STOCK_LEVEL_DATA StockLevel input / output data structure
// dbdata (global)
// bDeadlock (global)
//
// RETURNS:
// SVC_NOERROR success
// !SVC_NOERROR failure
//
// COMMENTS: None
//
//=====
int SQLStockLevel(STOCK_LEVEL_DATA * psld)
{
    int tryit;
    short num_deadlocks = 0;
    RETCODE rc;
    BYTE * pData;

    bFailed = FALSE;
    bDeadlock = FALSE;

    for (tryit=0; tryit < DeadlockRetry; tryit++)
    {
        if (dbrpcinit(dbproc, "tpcc_stocklevel", 0) == SUCCEEDED)
        {
            dbrpcparam(dbproc, NULL, 0, SQLINT2, -1, -1,
                (BYTE *) &psld->w_id);
            dbrpcparam(dbproc, NULL, 0, SQLINT1, -1, -1,
                (BYTE *) &psld->d_id);
            dbrpcparam(dbproc, NULL, 0, SQLINT2, -1, -1,
                (BYTE *) &psld->thresh_hold);

```

```

if (dbrpcexec(dbproc) == SUCCEEDED)
{
    while (((rc = dbresults(dbproc)) != NO_MORE_RESULTS) &&
           (rc != FAIL))
    {
        if (DBROWS(dbproc))
        {
            while (((rc = dbnextrow(dbproc)) != NO_MORE_ROWS) &&
                   (rc != FAIL))
            {
                if(pData=dbdata(dbproc,1))
                    psld->low_stock = *((long *) pData);
            };
        }; // if (DBROWS(dbproc))
    }; // while (dbresults)
}; // if (dbrpcexec)
}; // if (dbrpcinit)
if (bDeadlock)
{
    num_deadlocks++;
    bDeadlock = FALSE;
    userlog("StockLevel Deadlock Retry (%d)",num_deadlocks);
    Sleep(10 * tryit);
}
else
{
    strcpy(psld->execution_status,"Transaction committed.");
    return(SVC_NOERROR);
};
}; // for (tryit)

// If we reached here, it means we quit after MAX_RETRY deadlocks
strcpy(psld->execution_status,"Hit deadlock max.");
userlog("StockLevel Deadlock Failure (%d)",num_deadlocks);
return(SVCERR_DEADLOCK);
}; // SQLStockLevel

//=====
// FUNCTION: SQLNewOrder
//
// Handles the new order transaction.
//
// ARGUMENTS:
// NEW_ORDER_DATA    NewOrder structure for input/output data
// dbdata (global)
// bDeadlock (global)
//
// RETURNS:
// SVC_NOERROR success
// !SVC_NOERROR failure
//
// COMMENTS: None
//
//=====
int SQLNewOrder(NEW_ORDER_DATA * pnod)
{
    RETCODE rc;
    int i;
    DBINT commit_flag;

```

```

short num_deadlocks = 0;
int tryit;
DBDATETIME datetime;
BYTE * pData;

bFailed = FALSE;
bDeadlock = FALSE;

for (tryit=0; tryit < DeadlockRetry; tryit++)
{
    if (dbrpcinit(dbproc,"tpcc_neworder",0) == SUCCEEDED)
    {
        dbrpcparam(dbproc, NULL, 0, SQLINT2, -1, -1,
                   (BYTE *) &pnod->w_id);
        dbrpcparam(dbproc, NULL, 0, SQLINT1, -1, -1,
                   (BYTE *) &pnod->d_id);
        dbrpcparam(dbproc, NULL, 0, SQLINT4, -1, -1,
                   (BYTE *) &pnod->c_id);
        dbrpcparam(dbproc, NULL, 0, SQLINT1, -1, -1,
                   (BYTE *) &pnod->o_ol_cnt);

        pnod->o_all_local = 1;
        for (i = 0; i < pnod->o_ol_cnt; i++)
        {
            if (pnod->o_all_local &&
                pnod->Ol[i].ol_supply_w_id != pnod->w_id )
                pnod->o_all_local = 0;
        };
        dbrpcparam(dbproc, NULL, 0, SQLINT1, -1, -1,
                   (BYTE *) &pnod->o_all_local);

        for (i = 0; i < pnod->o_ol_cnt; i++)
        {
            dbrpcparam(dbproc, NULL, 0, SQLINT4, -1, -1,
                       (BYTE *) &pnod->Ol[i].ol_i_id);
            dbrpcparam(dbproc, NULL, 0, SQLINT2, -1, -1,
                       (BYTE *) &pnod->Ol[i].ol_supply_w_id);
            dbrpcparam(dbproc, NULL, 0, SQLINT2, -1, -1,
                       (BYTE *) &pnod->Ol[i].ol_quantity);
        };

        if (dbrpcexec(dbproc) == SUCCEEDED)
        {
            pnod->total_amount=0;
            // Get results from order line
            for (i = 0; i<pnod->o_ol_cnt; i++)
            {
                if (((rc = dbresults(dbproc)) != NO_MORE_RESULTS) &&
                    (rc != FAIL))
                {
                    if (DBROWS(dbproc) && (dbnumcols(dbproc) == 5))
                    {
                        while (dbnextrow(dbproc) != NO_MORE_ROWS)
                        {
                            if(pData=dbdata(dbproc, 1))
                                UtilStrCpy(pnod->Ol[i].ol_i_name,pData,dbdatlen(dbproc, 1));
                            if(pData=dbdata(dbproc, 2))
                                pnod->Ol[i].ol_stock = *(DBSMALLINT *) pData);
                            if(pData=dbdata(dbproc, 3))

```

```

        UtilStrCpy(pnod-
>Ol[i].ol_brand_generic,pData,dbdatlen(dbproc, 3));
        if(pData=dbdata(dbproc, 4))
dbconvert (dbproc,SQLNUMERIC,pData,sizeof(DBNUMERIC),
        SQLFLTNT,(CHAR *) &pnod->Ol[i].ol_i_price,8);
        if(pData=dbdata(dbproc, 5))
dbconvert (dbproc,SQLNUMERIC,pData,sizeof(DBNUMERIC),
        SQLFLTNT,(CHAR *) &pnod->Ol[i].ol_amount,8);
        pnod->total_amount = pnod->total_amount + pnod-
>Ol[i].ol_amount;
    }; // while (dbnextrow)
}; // if (DBROWS && dbnumcols)
}; // if (dbresults)
}; // for (o_ol_cnt)
while ((rc = dbresults(dbproc)) != NO_MORE_RESULTS) &&
    (rc != FAIL)
{
    if (DBROWS(dbproc) && (dbnumcols(dbproc) == 8))
    {
        while ((rc = dbnextrow(dbproc)) != NO_MORE_ROWS) &&
            (rc != FAIL)
        {
            if(pData=dbdata(dbproc, 1))
            dbconvert (dbproc,SQLNUMERIC,pData,sizeof(DBNUMERIC),
                SQLFLTNT,(CHAR *) &pnod->w_tax,8);
            if(pData=dbdata(dbproc, 2))
            dbconvert (dbproc,SQLNUMERIC,pData,sizeof(DBNUMERIC),
                SQLFLTNT,(CHAR *) &pnod->d_tax,8);
            if(pData=dbdata(dbproc, 3))
                pnod->o_id = (*(DBINT *) pData);
            if(pData=dbdata(dbproc, 4))
                UtilStrCpy(pnod->c_last,pData,dbdatlen(dbproc,4));
            if(pData=dbdata(dbproc, 5))
            dbconvert (dbproc,SQLNUMERIC,pData,sizeof(DBNUMERIC),
                SQLFLTNT,(CHAR *) &pnod->c_discount,8);
            if(pData=dbdata(dbproc, 6))
                UtilStrCpy(pnod-
>c_credit,pData,dbdatlen(dbproc,6));
            if(pData=dbdata(dbproc, 7))
            {
                datetime = *((DBDATETIME *) pData);
                dbdatecrack(dbproc,&pnod->o_entry_d,&datetime);
            };
            if(pData=dbdata(dbproc, 8))
                commit_flag = (*(DBTINYINT *) pData);
        }; // while (dbnextrow)
    }; // if (DBROWS && dbnumcols)
}; // while (dbresults)
}; // if (dbrpcexec)
}; // if (dbrpcinit)
if (bDeadlock)
{
    num_deadlocks++;
    bDeadlock = FALSE;
    userlog("NewOrder Deadlock Retry (%d)",num_deadlocks);
    Sleep(10 * tryit);
}
else
{

```

```

        if (commit_flag == 1)
        {
            pnod->total_amount = pnod->total_amount *
                ((1 + pnod->w_tax + pnod->d_tax) * (1 - pnod->c_discount));
            strcpy(pnod->execution_status,"Transaction committed.");
            return(SVC_NOERROR);
        }
        else
        {
            strcpy(pnod->execution_status,"Item number is not valid.");
            return(SVC_BADITEMID);
        }
    }; // !bDeadlock
}; // for (tryit)

// If we reached here, it means we quit after MAX_RETRY deadlocks
strcpy(pnod->execution_status,"Hit deadlock max.");
userlog("NewOrder Deadlock Failure (%d)",num_deadlocks);
return(SVCERR_DEADLOCK);
}; // SQLNewOrder

//=====
// FUNCTION: SQLPayment
//
// Handles the payment transaction.
//
// ARGUMENTS:
// PAYMENT_DATA Payment input/output data structure
// dbdata (global)
// bDeadlock (global)
//
// RETURNS:
// SVC_NOERROR success
// !SVC_NOERROR failure
//
// COMMENTS: None
//
//=====
int SQLPayment(PAYMENT_DATA *ppd)
{
    RETCODE rc;
    int tryit;
    short num_deadlocks = 0;
    DBDATETIME datetime;
    BYTE * pData;

    bFailed = FALSE;
    bDeadlock = FALSE;

    for (tryit=0; tryit < DeadlockRetry; tryit++)
    {
        if (dbrpcinit(dbproc,"tpcc_payment",0) == SUCCEED)
        {
            dbrpcparam(dbproc,NULL,0,SQLINT2,-1,-1,(BYTE *) &ppd->w_id);
            dbrpcparam(dbproc,NULL,0,SQLINT2,-1,-1,(BYTE *) &ppd->c_w_id);
            dbrpcparam(dbproc,NULL,0,SQLFLT8,-1,-1,(BYTE *) &ppd->h_amount);
            dbrpcparam(dbproc,NULL,0,SQLINT1,-1,-1,(BYTE *) &ppd->d_id);
            dbrpcparam(dbproc,NULL,0,SQLINT1,-1,-1,(BYTE *) &ppd->c_d_id);
            dbrpcparam(dbproc,NULL,0,SQLINT4,-1,-1,(BYTE *) &ppd->c_id);
            if (ppd->c_id == 0)

```

```

    {
        dbrpcparam(dbproc, NULL, 0, SQLCHAR, -1, strlen(ppd->c_last), ppd-
>c_last);
    };
};
if (dbrpcexec(dbproc) == SUCCEED)
{
    while ((rc = dbresults(dbproc)) != NO_MORE_RESULTS) && (rc !=
FAIL))
    {
        if (DBROWS(dbproc) && (dbnumcols(dbproc) == 27))
        {
            while ((rc = dbnextrow(dbproc)) != NO_MORE_ROWS) && (rc !=
FAIL))
            {
                if (pData=dbdata(dbproc, 1))
                    ppd->c_id = *((DBINT *) pData);
                if (pData=dbdata(dbproc, 2))
                    UtilStrCpy(ppd->c_last, pData, dbdatlen(dbproc, 2));
                if (pData=dbdata(dbproc, 3))
                {
                    datetime = *((DBDATETIME *) pData);
                    dbdatecrack(dbproc, &ppd->h_date, &datetime);
                };
                if (pData=dbdata(dbproc, 4))
                    UtilStrCpy(ppd->w_street_1, pData, dbdatlen(dbproc, 4));
                if (pData=dbdata(dbproc, 5))
                    UtilStrCpy(ppd->w_street_2, pData, dbdatlen(dbproc, 5));
                if (pData=dbdata(dbproc, 6))
                    UtilStrCpy(ppd->w_city, pData, dbdatlen(dbproc, 6));
                if (pData=dbdata(dbproc, 7))
                    UtilStrCpy(ppd->w_state, pData, dbdatlen(dbproc, 7));
                if (pData=dbdata(dbproc, 8))
                    UtilStrCpy(ppd->w_zip, pData, dbdatlen(dbproc, 8));
                if (pData=dbdata(dbproc, 9))
                    UtilStrCpy(ppd->d_street_1, pData, dbdatlen(dbproc, 9));
                if (pData=dbdata(dbproc, 10))
                    UtilStrCpy(ppd-
>d_street_2, pData, dbdatlen(dbproc, 10));
                if (pData=dbdata(dbproc, 11))
                    UtilStrCpy(ppd->d_city, pData, dbdatlen(dbproc, 11));
                if (pData=dbdata(dbproc, 12))
                    UtilStrCpy(ppd->d_state, pData, dbdatlen(dbproc, 12));
                if (pData=dbdata(dbproc, 13))
                    UtilStrCpy(ppd->d_zip, pData, dbdatlen(dbproc, 13));
                if (pData=dbdata(dbproc, 14))
                    UtilStrCpy(ppd->c_first, pData, dbdatlen(dbproc, 14));
                if (pData=dbdata(dbproc, 15))
                    UtilStrCpy(ppd->c_middle, pData, dbdatlen(dbproc, 15));
                if (pData=dbdata(dbproc, 16))
                    UtilStrCpy(ppd-
>c_street_1, pData, dbdatlen(dbproc, 16));
                if (pData=dbdata(dbproc, 17))
                    UtilStrCpy(ppd-
>c_street_2, pData, dbdatlen(dbproc, 17));
                if (pData=dbdata(dbproc, 18))
                    UtilStrCpy(ppd->c_city, pData, dbdatlen(dbproc, 18));
                if (pData=dbdata(dbproc, 19))
                    UtilStrCpy(ppd->c_state, pData, dbdatlen(dbproc, 19));
                if (pData=dbdata(dbproc, 20))
                    UtilStrCpy(ppd->c_zip, pData, dbdatlen(dbproc, 20));

```

```

                if (pData=dbdata(dbproc, 21))
                    UtilStrCpy(ppd->c_phone, pData, dbdatlen(dbproc, 21));
                if (pData=dbdata(dbproc, 22))
                {
                    datetime = *((DBDATETIME *) pData);
                    dbdatecrack(dbproc, &ppd->c_since, &datetime);
                };
                if (pData=dbdata(dbproc, 23))
                    UtilStrCpy(ppd->c_credit, pData, dbdatlen(dbproc, 23));
                if (pData=dbdata(dbproc, 24))
                    dbconvert(dbproc, SQLNUMERIC, pData, sizeof(DBNUMERIC),
SQLFLTN, (CHAR *) &ppd->c_credit_lim, 8);
                if (pData=dbdata(dbproc, 25))
                    dbconvert(dbproc, SQLNUMERIC, pData, sizeof(DBNUMERIC),
SQLFLTN, (CHAR *) &ppd->c_discount, 8);
                if (pData=dbdata(dbproc, 26))
                    dbconvert(dbproc, SQLNUMERIC, pData, sizeof(DBNUMERIC),
SQLFLTN, (CHAR *) &ppd->c_balance, 8);
                if (pData=dbdata(dbproc, 27))
                    UtilStrCpy(ppd->c_data, pData, dbdatlen(dbproc, 27));
            }; // while (dbnextrow)
        }; // if (DBROWS && dbnumcols)
    }; // while (dbresults)
}; // if (dbrpcexe)
if (bDeadlock)
{
    num_deadlocks++;
    bDeadlock = FALSE;
    userlog("Payment Deadlock Retry (%d)", num_deadlocks);
    Sleep(10 * tryit);
}
else
{
    if (ppd->c_id == 0)
    {
        strcpy(ppd->execution_status, "Invalid Customer id, name.");
        return(SVCERR_NOCUSTOMER);
    }
    else
        strcpy(ppd->execution_status, "Transaction committed.");
    return(SVC_NOERROR);
}; // !bDeadlock
}; // for (tryit)

// If we reached here, it means we quit after MAX_RETRY deadlocks
strcpy(ppd->execution_status, "Hit deadlock max.");
userlog("Payment Deadlock Failure (%d)", num_deadlocks);
return(SVCERR_DEADLOCK);
}; // SQLPayment

//=====
// FUNCTION: SQLOrderStatus
//
// Handles the Order Status transaction.
//
// ARGUMENTS:
// ORDER_STATUS_DATA      Payment input/output data structure
// dbdata (global)
// bDeadlock (global)
//

```

```

// RETURNS:
//   SVC_NOERROR success
//   !SVC_NOERROR failure
//
// COMMENTS:   None
//
//=====
int SQLOrderStatus(ORDER_STATUS_DATA * posd)
{
    RETCODE rc;
    int tryit;
    short num_deadlocks = 0;
    int i;
    DBDATETIME datetime;
    BYTE * pData;

    bFailed = FALSE;
    bDeadlock = FALSE;

    for (tryit=0; tryit < DeadlockRetry; tryit++)
    {
        if (dbrpcinit(dbproc,"tpcc_orderstatus", 0) == SUCCEED)
        {
            dbrpcparam(dbproc,NULL,0,SQLINT2,-1,-1,(BYTE *) &posd->w_id);
            dbrpcparam(dbproc,NULL,0,SQLINT1,-1,-1,(BYTE *) &posd->d_id);
            dbrpcparam(dbproc,NULL,0,SQLINT4,-1,-1,(BYTE *) &posd->c_id);
            if (posd->c_id == 0)
            {
                dbrpcparam(dbproc,NULL,0,SQLCHAR,-1,strlen(posd->c_last),posd-
>c_last);
            };
        };
        if (dbrpcexec(dbproc) == SUCCEED)
        {
            while (((rc = dbresults(dbproc)) != NO_MORE_RESULTS) && (rc !=
FAIL))
            {
                if (DBROWS(dbproc) && (dbnumcols(dbproc) == 5))
                {
                    i = 0;
                    while (((rc = dbnextrow(dbproc)) != NO_MORE_ROWS) && (rc !=
FAIL))
                    {
                        if(pData=dbdata(dbproc,1))
                            posd->OlOrderStatusData[i].ol_supply_w_id =
(*DBSMALLINT *) pData);
                        if(pData=dbdata(dbproc,2))
                            posd->OlOrderStatusData[i].ol_i_id = (*DBINT *)
pData);
                        if(pData=dbdata(dbproc,3))
                            posd->OlOrderStatusData[i].ol_quantity =
(*DBSMALLINT *) pData);
                        if(pData=dbdata(dbproc,4))
                            dbconvert(dbproc,SQLNUMERIC,pData,sizeof(DBNUMERIC),
SQLFLTN,(CHAR *) &posd-
>OlOrderStatusData[i].ol_amount,8);
                        if(pData=dbdata(dbproc,5))
                        {
                            datetime = *((DBDATETIME *) pData);
                            dbdatecrack(dbproc,&posd-
>OlOrderStatusData[i].ol_delivery_d,&datetime);

```

```

};
        i++;
    }; // while (dbnextrow)
    posd->o_ol_cnt = i;
} // if (DBROWS && dbnumcols == 5)
else
if (DBROWS(dbproc) && (dbnumcols(dbproc) == 8))
{
    while (((rc = dbnextrow(dbproc)) != NO_MORE_ROWS) && (rc !=
FAIL))
    {
        if(pData=dbdata(dbproc,1))
            posd->c_id = (*(DBINT *) pData);
        if(pData=dbdata(dbproc,2))
            UtilStrCpy(posd->c_last,pData,dbdatlen(dbproc,2));
        if(pData=dbdata(dbproc,3))
            UtilStrCpy(posd->c_first,pData,dbdatlen(dbproc,3));
        if(pData=dbdata(dbproc,4))
            UtilStrCpy(posd->c_middle,pData,dbdatlen(dbproc,4));
        if(pData=dbdata(dbproc,5))
        {
            datetime = *((DBDATETIME *) pData);
            dbdatecrack(dbproc,&posd->o_entry_d,&datetime);
        };
        if(pData=dbdata(dbproc,6))
            posd->o_carrier_id = (*(DBSMALLINT *) pData);
        if(pData=dbdata(dbproc,7))
            dbconvert(dbproc,SQLNUMERIC,pData,sizeof(DBNUMERIC),
SQLFLTN,(CHAR *) &posd->c_balance,8);
        if(pData=dbdata(dbproc,8))
            posd->o_id = (*(DBINT *) pData);
    }; // while (dbnextrow)
}; // if (DBROWS && dbnumcols == 8)
if (i==0)
    return(SVCERR_NOORDERS); // "No orders found for customer"
}; // while (dbresults)
}; // if (dbrpcexec)
if (bDeadlock)
{
    num_deadlocks++;
    bDeadlock = FALSE;
    userlog("OrderStatus Deadlock Retry (%d)",num_deadlocks);
    Sleep(10 * tryit);
}
else
{
    if (posd->c_id == 0 && posd->c_last[0] == 0)
    {
        strcpy(posd->execution_status,"Invalid Customer id,name.");
        return(SVCERR_NOCUSTOMER);
    }
    else
        strcpy(posd->execution_status,"Transaction committed.");
    return(SVC_NOERROR);
}; // !bDeadlock
}; // for (tryit)

// If we reached here, it means we quit after MAX_RETRY deadlocks
strcpy(posd->execution_status,"Hit deadlock max.");
userlog("OrderStatus Deadlock Failure (%d)",num_deadlocks);
return(SVCERR_DEADLOCK);

```

```

}; // SQLOrderStatus

//=====
// FUNCTION: UtilStrCpy
//
// Copies n characters from string pSrc to pDst and places a null
// null character at the end of the destination string. Unlike
// strncpy this function ensures that the result string is always
// null terminated.
//
//=====
void UtilStrCpy(char * pDest, char * pSrc, int n)
{
    strncpy(pDest, pSrc, n);
    pDest[n] = '\0';
    return;
}; // UtilStrCpy

//=====
//
// Function name: GetArgs
//
//=====
VOID GetArgs(INT argc, CHAR **argv)
{
    INT j;
    CHAR * ptr;
    BOOL bRslt = TRUE;

    for (j = 1; j < argc; ++j)
    {
        ptr = argv[j];
        switch (ptr[1])
        {
            case 's':
            case 'S':
                strcpy(szServer,ptr+2);
                break;

            case 'd':
            case 'D':
                strcpy(szDatabase,ptr+2);
                break;

        }; // switch(ptr[1])
    }; // for (j = 1; j < argc; ++j)
}; // GetArgs

```

tpccdelv.c

```

// tpccdelv.// tpccdelv.c
//
// Copyright Unisys, 1997
// Copyright Microsoft, 1996

#include <windows.h>
#include <malloc.h>
#include <stdarg.h>
#include <stdio.h>

```

```

#include <stdlib.h>
#include <string.h>
#include <time.h>
#include <sys\timeb.h>

#include <atmi.h>
#include <userlog.h>

#include "tpccsvr.h"

int    iServerNo = 0;
char   szServer[32] = "tpccdelv";
char   szUser[32] = { 0 };
char   szPassword[32] = { 0 };
char   szDatabase[32] = "tpcc";
char   szService[16] = "tpccdelv";
char   szWork[200];

PDBPROCESS    dbproc;
int    spid; // spid assigned from dblib
BOOL    bFailed;
BOOL    bDeadlock;
short    DeadlockRetry = (short)10;

FILE *fpLog;
char   szLogTitle[32];
BOOL    bFlush = FALSE; // flush after every write

int err_handler(DBPROCESS *dbproc,int severity,int dberr,int oserr,
                char *dberrstr, char *oserrstr);
int msg_handler(DBPROCESS *dbproc,DBINT msgno,int msgstate,
                int severity,char *msgtext);
void WriteLog(DELIVERY_DATA * pdd);
BOOL OpenLogFile(void);
void CalculateElapsed(int * pElapsed,LPSYSTEMTIME lpBegin,
                    LPSYSTEMTIME lpEnd);
void UtilStrCpy(char * pDest, char * pSrc, int n);
void GetArgs(INT argc, CHAR **argv);

//=====
//
// Function name: tpsvrrinit
//
//=====
tpsvrrinit(int argc, char *argv[])
{
    GetArgs(argc,argv);
    iServerNo = _getpid();
    sprintf(szWork,"%s%d Started, DBServer=%s, DB=%s",
            szService,iServerNo,szServer,szDatabase);
    userlog(szWork);
    if (OpenLogFile())
        return(-1);
    if (SQLInit(szServer,szDatabase,szUser,szPassword))
        return(-1);
    userlog("Database open, initialization complete");
    return(0);
}; // tpsvrrinit

//=====
//

```



```

// Function name: tpsvrdone
//
//=====
void tpsvrdone()
{
    userlog("Shutdown request for tpccdelv server");
    if ( fpLog )
        fclose(fpLog);
    dbclose(dbproc);
    dbexit();
}; // tpsvrdone

//=====
//
// Function name: DELIVERY
//
// Entry point called by tuxedo for DELIVERY service requests.
//
//=====
void DELIVERY(TPSVCINFO * svcinfo)
{
    int iRslt;
    DELIVERY_DATA * pdd;

    pdd = (DELIVERY_DATA *) svcinfo->data;
    iRslt = SQLDelivery(pdd);
    WriteLog(pdd);

    // Check for DBLib termination error
    if (bFailed)
    {
        strcpy(pdd->execution_status,szWork);
        userlog(szWork);
        tpreturn(TPFAIL,SVCERR_DBLIB,svcinfo->data,svcinfo->len,0);
    }
    else
    if (iRslt == 0)
        tpreturn(TPSUCCESS,0,svcinfo->data,svcinfo->len,0);
    else
        tpreturn(TPFAIL,iRslt,svcinfo->data,svcinfo->len,0);
}; // DELIVERY

//=====
//
// Function name: SQLInit
//
// Set global dbproc and spid.
//
// Result:
// FALSE - database open, dbproc valid
// TRUE - database open failed
//
//=====
BOOL SQLInit(CHAR * pSvr,CHAR * pDB,CHAR * pUsr,CHAR * pPW,CHAR * pSvc)
{
    char szApp[32];
    char server[256];
    char database[256];
    char user[256];
    char password[256];

```

```

LOGINREC *login;

dbinit();
// install error and message handlers
dbmsghandle((DBMSGHANDLE_PROC)msg_handler);
dberrhandle((DBERRHANDLE_PROC)err_handler);

dbproc = NULL;
strcpy(server,pSvr);
strcpy(database,pDB);
strcpy(user,pUsr);
strcpy(password,pPW);
sprintf(szApp,"%s%d",pSvc,_getpid());

login = dblogin();
if (!*user )
    DBSETLUSER(login,"sa");
else
    DBSETLUSER(login,user);
DBSETLPWD(login,password);
DBSETLHOST(login,szApp);
DBSETLVERSION(login, DBVER60);
// DBSETLPACKET(login,(unsigned short)DEFCLPACKSIZE);

if ((dbproc = dbopen(login,server)) == NULL)
{
    userlog("dbopen failed");
    return TRUE;
};
// Use the the right database
dbuse(dbproc,database);
dbcmd(dbproc,"select @@spid");
dbsqlxexec(dbproc);
while (dbresults(dbproc) != NO_MORE_RESULTS)
{
    dbbind(dbproc,1,SMALLBIND,(DBINT) 0,(BYTE *) spid);
    while (dbnextrow(dbproc) != NO_MORE_ROWS)
        ;
};

dbcmd(dbproc,"set nocount on");
dbsqlxexec(dbproc);
while (dbresults(dbproc) != NO_MORE_RESULTS)
{
    while (dbnextrow(dbproc) != NO_MORE_ROWS)
        ;
};

//rollback transaction on abort
dbcmd(dbproc,"set XACT_ABORT ON");
dbsqlxexec(dbproc);
while (dbresults(dbproc) != NO_MORE_RESULTS)
{
    while (dbnextrow(dbproc) != NO_MORE_ROWS)
        ;
};

return(FALSE);
}; // SQLInit

```

```

//=====
// FUNCTION: err_handler
//
//   Handles DB-Library errors
//
// ARGUMENTS:
//   DBPROCESS *dbproc   DBPROCESS id pointer
//   int        severity severity of error
//   int        dberr     error id
//   int        oserr     operating system specific error code
//   char       *dberrstr printable error description of dberr
//   char       *oserrstr printable error description of oserr
//
// RETURNS:
//   int        INT_CANCEL
//
// COMMENTS:   None
//=====
int err_handler(DBPROCESS *dbproc, int severity, int dberr, int oserr,
char *dberrstr, char *oserrstr)
{
    if ((dbproc == NULL) || (DBDEAD(dbproc)))
    {
        userlog("ErrHandler: DBPROC is invalid");
        return INT_CANCEL;
    };
    if (bFailed)
        return INT_CANCEL;
    if (oserr != DBNOERR)
    {
        sprintf(szWork,"ErrHandler: OSErr(%ld) - %s",oserr,oserrstr);
        userlog(szWork);
        bFailed = TRUE;
    };

    return INT_CANCEL;
}; // err_handler

//=====
// FUNCTION: msg_handler
//
//   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 operation
//           INT_CANCEL    cancel operation
//
// COMMENTS:   This function also sets the dead lock dbproc
//           variable if necessary.
//=====
int msg_handler(DBPROCESS *dbproc, DBINT msgno, int msgstate, int
severity, char *msgtext)

```

```

{
    if ((msgno == 5701) || (msgno == 2528) ||
        (msgno == 5703) || (msgno == 6006))
        return INT_CONTINUE;

    // deadlock message
    if (msgno == 1205)
    {
        // set the deadlock indicator
        bDeadlock = TRUE;
        return INT_CONTINUE;
    };

    if (bFailed)
        return INT_CANCEL;

    if (msgno == 0)
        return INT_CONTINUE;
    else
    {
        sprintf(szWork,"MsgHandler: MsgNo(%ld) - %s",msgno,msgtext);
        userlog(szWork);
        bFailed = TRUE;
    };

    return INT_CANCEL;
}; // msg_handler

//=====
// FUNCTION: SQLDelivery
//
// ARGUMENTS:
//   pdd        delivery transaction structure
//   dbdata (global)
//   bDeadlock (global)
//
// RETURNS:
//   SVC_NOERROR success
//   !SVC_NOERROR failure
//
// COMMENTS:   None
//=====
int SQLDelivery(DELIVERY_DATA * pdd)
{
    RETCODE rc;
    int i;
    short num_deadlocks = 0;
    int tryit;
    DBDATETIME datetime;
    BYTE * pData;

    bFailed = FALSE;
    bDeadlock = FALSE;
    pdd->iComplete = 0;

    for (tryit=0; tryit < DeadlockRetry; tryit++)
    {
        if (dbrpcinit(dbproc,"tpcc_delivery",0) == SUCCEEDED)

```

```

    {
        dbrpcparam(dbproc,NULL,0,SQLINT2,-1,-1,(BYTE *) &pdd->w_id);
        dbrpcparam(dbproc,NULL,0,SQLINT1,-1,-1,(BYTE *) &pdd->o_carrier_id);

        if (dbrpcexec(dbproc) == SUCCEEDED)
        {
            while ((rc = dbresults(dbproc)) != NO_MORE_RESULTS) && (rc !=
FAIL))
            {
                while ((rc = dbnextrow(dbproc)) != NO_MORE_ROWS) && (rc !=
FAIL))
                {
                    for (i = 0; i < 10; i++)
                    {
                        if(pData = dbdata(dbproc,i + 1))
                            pdd->o_id[i] = *((DBINT *)pData);
                        else
                            pdd->o_id[i] = 0;
                    };
                }; // while (dbnextrow)
            }; // while (dbresults)
        }; // if (dbrpcexec)
    }; // if (dbrpcinit)
    if (bDeadlock)
    {
        num_deadlocks++;
        bDeadlock = FALSE;
        userlog("Delivery Deadlock Retry (%d)",num_deadlocks);
        Sleep(10 * tryit);
    }
    else
    {
        GetLocalTime(&pdd->EndTime);
        pdd->iComplete = 1;
        strcpy(pdd->execution_status,"Transaction committed.");
        return(SVC_NOERROR);
    };
}; // for (tryit)

// If we reached here, it means we quit after MAX_RETRY deadlocks
strcpy(pdd->execution_status,"Hit deadlock max.");
userlog("Delivery Deadlock Failure (%d)",num_deadlocks);
return(SVCERR_DEADLOCK);

}; // SQLDelivery

//=====
// FUNCTION: WriteLog
//
// Writes the delivery results to a log file.
//
// ARGUMENTS:
// pDelivery delivery information.
//
// RETURNS:
//
// COMMENTS:
// Record format:
// QTime,EndTime,Elapsed,w_id,o_carrier_id,o_id1, ... o_id10
//

```

```

//=====
void WriteLog(DELIVERY_DATA * pdd)
{
    int elapsed = 9999999;
    if (pdd->iComplete)
        CalculateElapsed(&elapsed,&pdd->QTime,&pdd->EndTime);
    fprintf(fpLog,
"%2.2d/%2.2d/%2.2d,%2.2d:%2.2d:%2.2d:%3.3d,%2.2d:%2.2d:%2.2d:%3.3d,"
"%d,%d,%d,%d,%d,%d,%d,%d,%d,%d,%d,%d,%d,%d,%d\r\n",
pdd->EndTime.wYear - 1900,pdd->EndTime.wMonth,pdd->EndTime.wDay,
pdd->QTime.wHour,pdd->QTime.wMinute,
pdd->QTime.wSecond,pdd->QTime.wMilliseconds,
pdd->EndTime.wHour,pdd->EndTime.wMinute,
pdd->EndTime.wSecond,pdd->EndTime.wMilliseconds,
elapsed,pdd->w_id,pdd->o_carrier_id,
pdd->o_id[0],pdd->o_id[1],pdd->o_id[2],pdd->o_id[3],pdd->o_id[4],
pdd->o_id[5],pdd->o_id[6],pdd->o_id[7],pdd->o_id[8],pdd->o_id[9] );
    if (bFlush)
        fflush(fpLog);
}; // WriteLog

//=====
// FUNCTION: OpenLogFile
//
// Opens the delivery log file.
//
// ARGUMENTS:
// None.
//
// RETURNS:
// FALSE Log file successfully opened
// TRUE Failed to open log file
//
// COMMENTS:
//
//=====
BOOL OpenLogFile(void)
{
    sprintf(szLogTitle,"%s%d",LOGFILE_NAME,iServerNo);
    fpLog = fopen(szLogTitle,"ab");
    if (!fpLog)
    {
        sprintf(szWork,"LogFile %s Open Failed (%d)",
szLogTitle,GetLastError());
        userlog(szWork);
        return(TRUE);
    };
    return(FALSE);
}; // OpenLogFile

//=====
// FUNCTION: CalculateElapsed
//
// Calculates the elapsed time of the delivery transaction.
//
// ARGUMENTS:
// lpBegin time delivery was queued
// lpEnd time delivery update completed
//
// RETURNS:
// int pElapsed elapsed time result (in milliseconds)

```

```

//
// COMMENTS:
// None
//
//=====
void CalculateElapsed(int * pElapsed,LPSYSTEMTIME lpBegin,
                    LPSYSTEMTIME lpEnd)
{
    int tmBegin;
    int tmEnd;

    tmBegin = (lpBegin->wHour * 3600000) + (lpBegin->wMinute * 60000) +
              (lpBegin->wSecond * 1000) + lpBegin->wMilliseconds;
    tmEnd = (lpEnd->wHour * 3600000) + (lpEnd->wMinute * 60000) +
           (lpEnd->wSecond * 1000) + lpEnd->wMilliseconds;
    *pElapsed = tmEnd - tmBegin;

    // Check for day boundry, this will function for 24 hour period but
    // will fail over a 48 hours period.
    if (*pElapsed < 0)
        *pElapsed = *pElapsed + (24 * 60 * 60 * 1000);
    return;
}; // CalculateElapsed

//=====
// FUNCTION: UtilStrCpy
//
// Copies n characters from string pSrc to pDst and places a null
// null character at the end of the destination string.
//
// ARGUMENTS:
// char *pDest destination string pointer
// char *pSrc source string pointer
// int n number of characters to copy
//
// RETURNS: None
//
// COMMENTS:
// Unlike strcpy this function ensures that the result string is
// always null terminated.
//
//=====
void UtilStrCpy(char * pDest, char * pSrc, int n)
{
    strcpy(pDest, pSrc, n);
    pDest[n] = '\0';
    return;
}; // UtilStrCpy

//=====
// Function name: GetArgs
//
//=====
void GetArgs(INT argc, CHAR **argv)
{
    INT j;
    CHAR * ptr;
    BOOL bRslt = TRUE;

    for (j = 1; j < argc; ++j)

```

```

{
    ptr = argv[j];
    switch (ptr[1])
    {
        case 's':
        case 'S':
            strcpy(szServer,ptr+2);
            break;

        case 'd':
        case 'D':
            strcpy(szDatabase,ptr+2);
            break;

        case 'F':
        case 'f':
            bFlush = TRUE; //turn on delilog flush when written.
            break;
    }; // switch(ptr[1])
}; // for (j = 1; j < argc; ++j)
}; // GetArgs

```

DELIVERY REPORT MAKEFILE

```

# Microsoft Developer Studio Generated NMAKE File, Format Version 4.20
# ** DO NOT EDIT **

# TARGETTYPE "Win32 (x86) Console Application" 0x0103

!IF "$(CFG)" == ""
CFG=delirpt - Win32 Debug
!MESSAGE No configuration specified. Defaulting to delirpt - Win32 Debug.
!ENDIF

!IF "$(CFG)" != "delirpt - Win32 Release" && "$(CFG)" !=\
"delirpt - Win32 Debug"
!MESSAGE Invalid configuration "$(CFG)" specified.
!MESSAGE You can specify a configuration when running NMAKE on this
makefile
!MESSAGE by defining the macro CFG on the command line. For example:
!MESSAGE
!MESSAGE NMAKE /f "delirpt.mak" CFG="delirpt - Win32 Debug"
!MESSAGE
!MESSAGE Possible choices for configuration are:
!MESSAGE
!MESSAGE "delirpt - Win32 Release" (based on "Win32 (x86) Console
Application")
!MESSAGE "delirpt - Win32 Debug" (based on "Win32 (x86) Console
Application")
!MESSAGE
!ERROR An invalid configuration is specified.
!ENDIF

!IF "$(OS)" == "Windows_NT"
NULL=
!ELSE
NULL=nul
!ENDIF

```

```
#####
#####
# Begin Project
CPP=cl.exe
RSC=rc.exe

!IF "$(CFG)" == "delirpt - Win32 Release"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 0
# PROP BASE Output_Dir "delirpt_"
# PROP BASE Intermediate_Dir "delirpt_"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 0
# PROP Output_Dir "delirpt_"
# PROP Intermediate_Dir "delirpt_"
# PROP Target_Dir ""
OUTDIR=.\delirpt_
INTDIR=.\delirpt_

ALL : "$(OUTDIR)\delirpt.exe"

CLEAN :
-@erase "$(INTDIR)\DELIRPT.OBJ"
-@erase "$(OUTDIR)\delirpt.exe"

"$(OUTDIR)" :
if not exist "$(OUTDIR)/$(NULL)" mkdir "$(OUTDIR)"

# ADD BASE CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_CONSOLE"
/YX /c
# ADD CPP /nologo /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_CONSOLE" /YX /c
CPP_PROJ=/nologo /ML /W3 /GX /O2 /D "WIN32" /D "NDEBUG" /D "_CONSOLE" \
/Fp"$(INTDIR)/delirpt.pch" /YX /Fo"$(INTDIR)/" /c
CPP_OBJS=.\delirpt_
CPP_SBRS=.\
# ADD BASE RSC /l 0x409 /d "NDEBUG"
# ADD RSC /l 0x409 /d "NDEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
BSC32_FLAGS=/nologo /o"$(OUTDIR)/delirpt.bsc"
BSC32_SBRS= \

LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib
cmdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib
odbc32.lib odbccp32.lib /nologo /subsystem:console /machine:I386
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib cmdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib
odbccp32.lib /nologo /subsystem:console /machine:I386
LINK32_FLAGS=kernel32.lib user32.lib gdi32.lib winspool.lib cmdlg32.lib \
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib \
odbccp32.lib /nologo /subsystem:console /incremental:no \
/pdb:"$(OUTDIR)/delirpt.pdb" /machine:I386 /out:"$(OUTDIR)/delirpt.exe"
LINK32_OBJS= \
-$(INTDIR)\DELIRPT.OBJ

"$(OUTDIR)\delirpt.exe" : "$(OUTDIR)" $(DEF_FILE) $(LINK32_OBJS)
$(LINK32) @<<
```

```
$(LINK32_FLAGS) $(LINK32_OBJS)
<<
!ELSEIF "$(CFG)" == "delirpt - Win32 Debug"

# PROP BASE Use_MFC 0
# PROP BASE Use_Debug_Libraries 1
# PROP BASE Output_Dir "Debug"
# PROP BASE Intermediate_Dir "Debug"
# PROP BASE Target_Dir ""
# PROP Use_MFC 0
# PROP Use_Debug_Libraries 1
# PROP Output_Dir "Debug"
# PROP Intermediate_Dir "Debug"
# PROP Target_Dir ""
OUTDIR=.\Debug
INTDIR=.\Debug

ALL : "$(OUTDIR)\delirpt.exe"

CLEAN :
-@erase "$(INTDIR)\DELIRPT.OBJ"
-@erase "$(INTDIR)\vc40.idb"
-@erase "$(INTDIR)\vc40.pdb"
-@erase "$(OUTDIR)\delirpt.exe"
-@erase "$(OUTDIR)\delirpt.ilc"
-@erase "$(OUTDIR)\delirpt.pdb"

"$(OUTDIR)" :
if not exist "$(OUTDIR)/$(NULL)" mkdir "$(OUTDIR)"

# ADD BASE CPP /nologo /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D
"_CONSOLE" /YX /c
# ADD CPP /nologo /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D "_CONSOLE"
/YX /c
CPP_PROJ=/nologo /MLd /W3 /Gm /GX /Zi /Od /D "WIN32" /D "_DEBUG" /D
"_CONSOLE" \
/Fp"$(INTDIR)/delirpt.pch" /YX /Fo"$(INTDIR)/" /Fd"$(INTDIR)/" /c
CPP_OBJS=.\Debug\
CPP_SBRS=.\
# ADD BASE RSC /l 0x409 /d "_DEBUG"
# ADD RSC /l 0x409 /d "_DEBUG"
BSC32=bscmake.exe
# ADD BASE BSC32 /nologo
# ADD BSC32 /nologo
BSC32_FLAGS=/nologo /o"$(OUTDIR)/delirpt.bsc"
BSC32_SBRS= \

LINK32=link.exe
# ADD BASE LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib
cmdlg32.lib advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib
odbc32.lib odbccp32.lib /nologo /subsystem:console /debug /machine:I386
# ADD LINK32 kernel32.lib user32.lib gdi32.lib winspool.lib cmdlg32.lib
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib
odbccp32.lib /nologo /subsystem:console /debug /machine:I386
LINK32_FLAGS=kernel32.lib user32.lib gdi32.lib winspool.lib cmdlg32.lib \
advapi32.lib shell32.lib ole32.lib oleaut32.lib uuid.lib odbc32.lib \
odbccp32.lib /nologo /subsystem:console /incremental:yes \
/pdb:"$(OUTDIR)/delirpt.pdb" /debug /machine:I386
/out:"$(OUTDIR)/delirpt.exe"
LINK32_OBJS= \
```

```

"$ (INTDIR)\DELIRPT.OBJ"

"$ (OUTDIR)\delirpt.exe" : "$ (OUTDIR)" $(DEF_FILE) $(LINK32_OBJS)
  $(LINK32) @<<
  $(LINK32_FLAGS) $(LINK32_OBJS)
<<

!ENDIF

.c{$ (CPP_OBJS)}.obj:
  $(CPP) $(CPP_PROJ) $<

.cpp{$ (CPP_OBJS)}.obj:
  $(CPP) $(CPP_PROJ) $<

.cxx{$ (CPP_OBJS)}.obj:
  $(CPP) $(CPP_PROJ) $<

.c{$ (CPP_SBRs)}.sbr:
  $(CPP) $(CPP_PROJ) $<

.cpp{$ (CPP_SBRs)}.sbr:
  $(CPP) $(CPP_PROJ) $<

.cxx{$ (CPP_SBRs)}.sbr:
  $(CPP) $(CPP_PROJ) $<

#####
#####
# Begin Target

# Name "delirpt - Win32 Release"
# Name "delirpt - Win32 Debug"

!IF "$ (CFG)" == "delirpt - Win32 Release"
!ELSEIF "$ (CFG)" == "delirpt - Win32 Debug"
!ENDIF

#####
#####
# Begin Source File

SOURCE=.\DELIRPT.C

"$ (INTDIR)\DELIRPT.OBJ" : $ (SOURCE) "$ (INTDIR)"

# End Source File
# End Target
# End Project
#####
#####

                delirpt.c

/*      FILE:      DELIRPT.C
*      Microsoft TPC-C Kit Ver. 3.00.000
*

```

```

*      Copyright Microsoft, 1996
*
*      PURPOSE:    Delivery report processing application
*      Author:     Philip Durr
*                  philipdu@Microsoft.com
*/

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

#define LOGFILE_READ_EOF      0
                                //check log file flag return current state
#define LOGFILE_CLEAR_EOF    1
                                //clear end of log file flag
#define LOGFILE_SET_EOF      2
                                //set flag end of log file reached

#define INTERVAL                .01
                                //90th percentile calculation bucket

interval

#define ERR_SUCCESS                1000
                                //success no error
#define ERR_READING_LOGFILE        1001
                                //io errors occured reading delivery log file
#define ERR_INSUFFICIENT_MEMORY    1002
                                //insufficient memory to process 90th percentile report
#define ERR_CANNOT_OPEN_RESULTS_FILE 1005
                                //Cannot open delivery results file delilog.

typedef struct _RPTLINE
{
    SYSTEMTIME    start;
                                //delilog report line start time
    SYSTEMTIME    end;
                                //delilog report line end time
    int           response;
                                //delilog report line time delivery
    took in milliseconds
    int           w_id;
                                //delilog report line warehouse id
    for delivery
    int           o_carrier_id;
                                //delilog report line carier id for delivery
    int           items[10];
                                //delilog report line delivery line
    items
} RPTLINE, *PRPTLINE;

//error message structure used in ErrorMessage API
typedef struct _SERRORMSG
{
    int           iError;
                                //error id of message
    char          szMsg[80];
                                //message to sent to browser
} SERRORMSG;

int             versionMS = 4;
                                //delirpt version
int             versionMM = 0;
int             versionLS = 0;

```

```

int             iReport;
                //delirpt report to process
int             iStartTime;
                //begin times to accept for report
int             iEndTime;
                //end times to accept for report
FILE            *fpLog;
                //log file stream
CHAR szLogFileTitle[100];
#define DEFAULTLOGTITLE "delilog."

//Local function prototypes
void            main(int argc, char *argv[]);
static int      Init(void);
static void      Restore(void);
static int      DoReport(void);
int             AverageResponse(void);
int             SkippedDelivery(void);
int             Percentile90th(void);
BOOL            CheckTimes(PRPTLINE pRptLine);
static int      OpenLogFile(void);
static void      CloseLogFile(void);
static void      ResetLogFile(void);
static BOOL      LogEOF(int iOperation);
static BOOL      ReadReportLine(char *szBuffer, PRPTLINE pRptLine);
static BOOL      ParseReportLine(char *szLine, PRPTLINE pRptLine);
static BOOL      ParseDate(char *szDate, LPSYSTEMTIME pTime);
static BOOL      ParseTime(char *szTime, LPSYSTEMTIME pTime);
static void      ErrorMessage(int iError);
static BOOL      GetParameters(int argc, char *argv[]);
static void      PrintParameters(void);
static void      PrintHeader(void);
static void      cls(void);
static BOOL      IsNumeric(char *ptr);

/* FUNCTION: int main(int argc, char *argv[])
 *
 * PURPOSE:      This function is the beginning execution point for the
delivery executable.
 *
 * ARGUMENTS:    int          argc    number of command line arguments
passed to delivery
 *              char        *argv[] array of command line
argument pointers
 *
 * RETURNS:      None
 *
 * COMMENTS:     None
 */

void main(int argc, char *argv[])
{
    int iError;

    PrintHeader();

    if ( GetParameters(argc, argv) )
    {
        PrintParameters();

```

```

                return;
    }

    if ( (iError=Init()) != ERR_SUCCESS )
    {
        ErrorMessage(iError);
        Restore();
        return;
    }

    if ( (iError = DoReport()) != ERR_SUCCESS )
        ErrorMessage(iError);

    Restore();

    return;
}

/* FUNCTION: static int Init(void)
 *
 * PURPOSE:      This function initializes the delirtp application.
 *
 * ARGUMENTS:    None
 *
 * RETURNS:      None
 *
 * COMMENTS:     None
 */

static int Init(void)
{
    int iError;

    if ( (iError = OpenLogFile()) )
        return iError;

    return TRUE;
}

/* FUNCTION: static void Restore(void)
 *
 * PURPOSE:      This function cleans up the delirtp application before
termination.
 *
 * ARGUMENTS:    None
 *
 * RETURNS:      None
 *
 * COMMENTS:     None
 */

static void Restore(void)
{
    CloseLogFile();
    return;
}

/* FUNCTION: static int DoReport(void)
 *
 * PURPOSE:      This function dispatches the requested report.

```

```

*
* ARGUMENTS:  None
*
* RETURNS:    ERR_SUCCESS if successfull or error code if an
error occurs.
*
* COMMENTS:   None
*
*/

static int DoReport(void)
{
    int iRc;

    switch(iReport)
    {
        case 1:
            iRc = AverageResponse();
            break;
        case 2:
            iRc = Percentile90th();
            break;
        case 3:
            iRc = SkippedDelivery();
            break;
        case 4:
            if ( (iRc = AverageResponse()) != ERR_SUCCESS )
                break;
            if ( (iRc = Percentile90th()) != ERR_SUCCESS )
                break;
            if ( (iRc = SkippedDelivery()) != ERR_SUCCESS )
                break;
            break;
    }
    return iRc;
}

/* FUNCTION: int AverageResponse(void)
*
* PURPOSE:   This function processes the AverageResponse report.
*
* ARGUMENTS: None
*
* RETURNS:   ERR_SUCCESS if successfull or error code if an
error occurs.
*
* COMMENTS:  None
*
*/

int AverageResponse(void)
{
    RPTLINE reportLine;
    int      iTotResponse;
    int      iLines;
    double  fAverage;
    char     szDelivery[128];

    ResetLogFile();

    iTotResponse = 0;

```

```

iLines = 0;
printf("\n\n***** Average Response Time Report *****\n");
while ( !LogEOF(LOGFILE_READ_EOF) )
{
    if ( ReadReportLine(szDelivery, &reportLine) )
        return ERR_READING_LOGFILE;
    if ( !LogEOF(LOGFILE_READ_EOF) )
    {
        if ( CheckTimes(&reportLine) )
            continue;
        iLines++;
        iTotResponse += reportLine.response;

        if ( iLines % 10 == 0 )
            printf("Reading Report Line:\t%d\r",
iLines);
    }
}
printf("                                \r");
if ( iLines == 0 )
{
    printf("No deliveries found.\n");
}
else
{
    fAverage = ((double)iTotResponse /
(double)iLines)/(double)1000;
    printf("Total Deliveries:      %10.0f\n", (float)iLines);
    printf("Total Response Times:    %10.3f\n",
((float)iTotResponse/(float)1000));
    printf("Average Response Time: %10.3f\n", fAverage);
}

return ERR_SUCCESS;
}

/* FUNCTION: int Percentile90th(void)
*
* PURPOSE:   This function processes the 90th percentile report.
*
* ARGUMENTS: None
*
* RETURNS:   ERR_SUCCESS if successfull or error code if an
error occurs.
*
* COMMENTS:  This function requires enough space to allocate needed
buckets which will be 2 * max response time
in
*
*           deci-seconds.
*
*/

int Percentile90th(void)
{
    RPTLINE reportLine;
    int      iBucketSize;
    int      i;
    int      iResponseSeconds;
    int      iMaxSeconds;
    int      iTotBuckets;
    double  iTot;

```



```

double i90thPercent;
short *psBuckets;
char szDelivery[128];

printf("\n\n***** 90th Percentile *****\n");
printf("Calculating Max Response Seconds...\n");

ResetLogFile();

iMaxSeconds = -1;
while ( !LogEOF(LOGFILE_READ_EOF) )
{
    if ( ReadReportLine(szDelivery, &reportLine) )
        return ERR_READING_LOGFILE;
    if ( szDelivery[0] == '*' )
        continue;
    if ( !LogEOF(LOGFILE_READ_EOF) )
    {
        if ( iMaxSeconds < reportLine.response )
            iMaxSeconds = reportLine.response;
    }
}

iTotalBuckets = iMaxSeconds + 1;

printf("Allocating Buckets...\n");

iBucketSize = iTotalBuckets * sizeof(short);

if ( !(psBuckets = (short *)malloc(iBucketSize)) )
    return ERR_INSUFFICIENT_MEMORY;

ZeroMemory(psBuckets, iBucketSize);

iTotal = 0;

ResetLogFile();
printf("Calculating Distribution...\n");

iMaxSeconds = -1;
while ( !LogEOF(LOGFILE_READ_EOF) )
{
    if ( ReadReportLine(szDelivery, &reportLine) )
        return ERR_READING_LOGFILE;
    if ( szDelivery[0] == '*' )
        continue;
    if ( !LogEOF(LOGFILE_READ_EOF) )
    {
        if ( CheckTimes(&reportLine) )
            continue;
        psBuckets[reportLine.response]++;
        iTotal++;
        if ( iMaxSeconds < reportLine.response )
            iMaxSeconds = reportLine.response;
    }
}

printf("Max Response Time = %d.%d\n",
(iMaxSeconds / 1000), (iMaxSeconds % 1000));

i90thPercent = iTotal * .9;

```

```

        for(i=0, iTotal = 0.0; iTotal < i90thPercent; iTotal +=
(double)psBuckets[i] )
            i++;

        printf("90th Percentile = %d.%d\n", i/1000, (i % 1000));

        free(psBuckets);

        return ERR_SUCCESS;
}

/* FUNCTION: int SkippedDelivery(void)
 *
 * PURPOSE:          This function processes the Skipped Deliveries
report.
 *
 * ARGUMENTS:  None
 *
 * RETURNS:      ERR_SUCCESS if successfull or error code if an
error occurs.
 *
 * COMMENTS:    None
 *
 */

int SkippedDelivery(void)
{
    RPTLINE reportLine;
    char szDelivery[128];
    int i;
    int items[10];

    ResetLogFile();

    printf("\n\n***** Skipped Delivery Report *****\n");
    memset(items, 0, sizeof(items));
    printf("Reading Delivery Log File...");

    while ( !LogEOF(LOGFILE_READ_EOF) )
    {
        if ( ReadReportLine(szDelivery, &reportLine) )
            return ERR_READING_LOGFILE;
        if ( !LogEOF(LOGFILE_READ_EOF) )
        {
            if ( CheckTimes(&reportLine) )
                continue;
            for(i=0; i<10; i++)
            {
                if ( !reportLine.items[i] )
                    items[i]++;
            }
        }
    }
    printf("\n");
    printf("Skipped delivery table.\n");
    printf(" 1   2   3   4   5   6   7   8   9   10 \n");
    printf("-----\n");
    for(i=0; i<10; i++)
        printf("%4.4d ", items[i]);
    printf("\n");

```

```

        return ERR_SUCCESS;
    }

/* FUNCTION: BOOL CheckTimes(PRPTLINE pRptLine)
 *
 * PURPOSE: This function checks to see if the delilog record falls
 *           within the
 *           begin and end time from the command line.
 *
 * ARGUMENTS: PRPTLINE      pRptLine      delilog processed report
 *           line.
 *
 * RETURNS:   BOOL      FALSE  if report line is not within the
 *           start and end times.
 *           TRUE      if the report line is
 *           within the
 *           start and end times.
 *
 * COMMENTS:  If startTime and endTime are both 0 then the user requested
 *           the default behavior which is all records in
 *           delilog are
 *           valid.
 */

BOOL CheckTimes(PRPTLINE pRptLine)
{
    int      iRptEndTime;
    int      iRptStartTime;

    iRptStartTime = (pRptLine->start.wHour * 3600000) + (pRptLine->start.wMinute * 60000) + (pRptLine->start.wSecond * 1000) + pRptLine->start.wMilliseconds;
    iRptEndTime = (pRptLine->end.wHour * 3600000) + (pRptLine->end.wMinute * 60000) + (pRptLine->end.wSecond * 1000) + pRptLine->end.wMilliseconds;

    if ( iStartTime == 0 && iEndTime == 0 )
        return FALSE;

    if ( iStartTime <= iRptStartTime && iEndTime >= iRptEndTime )
        return FALSE;

    return TRUE;
}

/* FUNCTION: int OpenLogFile(void)
 *
 * PURPOSE: This function opens the delivery log file for use.
 *
 * ARGUMENTS: None
 *
 * RETURNS:   int      ERR_CANNOT_OPEN_RESULTS_FILE  Cannot create
 *           results log file.
 *           ERR_SUCCESS
 *           Log file successfully opened
 *
 * COMMENTS:  None

```

```

 *
 */
static int OpenLogFile(void)
{
    fpLog = fopen(szLogFileTitle, "rb");

    if ( !fpLog )
        return ERR_CANNOT_OPEN_RESULTS_FILE;

    return ERR_SUCCESS;
}

/* FUNCTION: int CloseLogFile(void)
 *
 * PURPOSE: This function closes the delivery log file.
 *
 * ARGUMENTS: None
 *
 * RETURNS:   None
 *
 * COMMENTS:  None
 */

static void CloseLogFile(void)
{
    if ( fpLog )
        fclose(fpLog);

    return;
}

/* FUNCTION: static void ResetLogFile(void)
 *
 * PURPOSE: This function prepares the delilog. file for reading
 *
 * ARGUMENTS: None
 *
 * RETURNS:   None
 *
 * COMMENTS:  None
 */

static void ResetLogFile(void)
{
    fseek(fpLog, 0L, SEEK_SET);
    LogEOF(LOGFILE_CLEAR_EOF);

    return;
}

/* FUNCTION: static BOOL LogEOF(int iOperation)
 *
 * PURPOSE: This function tracks and reports the end of file condition
 *           on the delilog file.
 *
 * ARGUMENTS: int iOperation requested operation this can be:

```

```

*
* LOGFILE_READ_EOF      check log file flag return current state
*
* LOGFILE_CLEAR_EOF    clear end of log file flag
*
* LOGFILE_SET_EOF      set flag end of log file reached
*
*
* RETURNS:              None
*
* COMMENTS:            None
*
*/

static BOOL LogEOF(int iOperation)
{
    static BOOL bEOF;

    switch(iOperation)
    {
        case LOGFILE_READ_EOF:
            return bEOF;
            break;
        case LOGFILE_CLEAR_EOF:
            bEOF = FALSE;
            break;
        case LOGFILE_SET_EOF:
            bEOF = TRUE;
            break;
    }
    return FALSE;
}

/* FUNCTION: static BOOL ReadReportLine(char *szBuffer, PRPTLINE pRptLine)
*
* PURPOSE:      This function reads a text line from the delilog file.
*               on the delilog file.
*
* ARGUMENTS:   char          *szBuffer      buffer to placed read delilog
file line into.
*               PRPTLINE     pRptLine      returned
structure containing parsed delilog
*
*               report line.
*
* RETURNS:     FALSE if successfull or TRUE if an error occurs.
*
* COMMENTS:    None
*
*/

static BOOL ReadReportLine(char *szBuffer, PRPTLINE pRptLine)
{
    int i = 0;
    int ch;
    int iEof;

    while( i < 128 )
    {
        ch = fgetc(fpLog);
        if ( iEof = feof(fpLog) )

```

```

        break;
        if ( ch == '\r' )
        {
            if ( i )
                break;
            continue;
        }
        if ( ch == '\n' )
            continue;
        szBuffer[i++] = ch;
    }

    //delivery item format is to long cannot be a valid delivery item
    if ( i >= 128 )
        return TRUE;

    szBuffer[i] = 0;
    if ( iEof )
    {
        LogEOF(LOGFILE_SET_EOF);
        if ( i == 0 )
            return FALSE;
    }
    return ParseReportLine(szBuffer, pRptLine);
}

/* FUNCTION: static BOOL ParseReportLine(char *szLine, PRPTLINE pRptLine)
*
* PURPOSE:      This function reads a text line from the delilog file.
*               on the delilog file.
*
* ARGUMENTS:   char          *szLine      buffer containing the delilog
file line to be parsed.
*               PRPTLINE     pRptLine      returned
structure containing parsed delilog
*
*               report line values.
*
* RETURNS:     FALSE if successfull or TRUE if an error occurs.
*
* COMMENTS:    None
*
*/

static BOOL ParseReportLine(char *szLine, PRPTLINE pRptLine)
{
    int i;

    if ( ParseDate(szLine, &pRptLine->start) )
        return TRUE;

    pRptLine->end.wYear = pRptLine->start.wYear;
    pRptLine->end.wMonth = pRptLine->start.wMonth;
    pRptLine->end.wDay = pRptLine->start.wDay;

    if ( !(szLine = strchr(szLine, ',')) )
        return TRUE;
    szLine++;

    if ( ParseTime(szLine, &pRptLine->start) )

```

```

        return TRUE;

if ( !(szLine = strchr(szLine, ',')) )
    return TRUE;
szLine++;

if ( ParseTime(szLine, &pRptLine->end) )
    return TRUE;

if ( !(szLine = strchr(szLine, ',')) )
    return TRUE;
szLine++;

if ( !IsNumeric(szLine) )
    return TRUE;
pRptLine->response = atoi(szLine);

if ( !(szLine = strchr(szLine, ',')) )
    return TRUE;
szLine++;

if ( !IsNumeric(szLine) )
    return TRUE;
pRptLine->w_id = atoi(szLine);

if ( !(szLine = strchr(szLine, ',')) )
    return TRUE;
szLine++;

if ( !IsNumeric(szLine) )
    return TRUE;
pRptLine->o_carrier_id = atoi(szLine);

if ( !(szLine = strchr(szLine, ',')) )
    return TRUE;
szLine++;

for(i=0; i<10; i++)
{
    if ( !IsNumeric(szLine) )
        return TRUE;
    pRptLine->items[i] = atoi(szLine);

    if ( i<9 && !(szLine = strchr(szLine, ',')) )
        return TRUE;
    szLine++;
}

return FALSE;
}

/* FUNCTION: static BOOL ParseDate(char *szDate, LPSYSTEMTIME pTime)
*
* PURPOSE: This function validates and extracts a date string in the
format
*          yy/mm/dd into an SYSTEMTIME structure.
*
* ARGUMENTS: char          *szDate      buffer containing the
date to be parsed.
*          LPSYSTEMTIME    pTime        system time
structure where date will be placed.

```

```

*
* RETURNS: FALSE if successfull or TRUE if an error occurs.
*
* COMMENTS: None
*
*/

static BOOL ParseDate(char *szDate, LPSYSTEMTIME pTime)
{
    if ( !isdigit(*szDate) || !isdigit(*(szDate+1)) || *(szDate+2) !=
'/' ||
        !isdigit(*(szDate+3)) || !isdigit(*(szDate+4)) ||
*(szDate+5) != '/' ||
        !isdigit(*(szDate+6)) || !isdigit(*(szDate+7)) )
        return TRUE;

    pTime->wYear = atoi(szDate);

    pTime->wMonth = atoi(szDate+3);

    pTime->wDay = atoi(szDate+6);

    if ( pTime->wMonth > 12 || pTime->wMonth < 0 || pTime->wDay > 31
|| pTime->wDay < 0 )
        return TRUE;

    return FALSE;
}

/* FUNCTION: static BOOL ParseTime(char *szTime, LPSYSTEMTIME pTime)
*
* PURPOSE: This function validates and extracts a time string in the
format
*          hh:mm:ss:mmm into an SYSTEMTIME structure.
*
* ARGUMENTS: char          *szTime      buffer containing the
time to be parsed.
*          LPSYSTEMTIME    pTime        system time
structure where date will be placed.
*
* RETURNS: FALSE if successfull or TRUE if an error occurs.
*
* COMMENTS: None
*
*/

static BOOL ParseTime(char *szTime, LPSYSTEMTIME pTime)
{
    if ( !isdigit(*szTime) || !isdigit(*(szTime+1)) || *(szTime+2) !=
':' ||
        !isdigit(*(szTime+3)) || !isdigit(*(szTime+4)) ||
*(szTime+5) != ':' ||
        !isdigit(*(szTime+6)) || !isdigit(*(szTime+7)) ||
*(szTime+8) != ':' ||
        !isdigit(*(szTime+9)) || !isdigit(*(szTime+10)) ||
!isdigit(*(szTime+11)) )
        return TRUE;

    pTime->wHour = atoi(szTime);
    pTime->wMinute = atoi(szTime+3);
    pTime->wSecond = atoi(szTime+6);

```

```

pTime->wMilliseconds = atoi(szTime+9);

if ( pTime->wHour > 23 || pTime->wHour < 0 ||
    pTime->wMinute > 59 || pTime->wMinute < 0 ||
    pTime->wSecond > 59 || pTime->wSecond < 0 ||
    pTime->wMilliseconds < 0 )
    return TRUE;

if ( pTime->wMilliseconds > 999 )
{
    pTime->wSecond += (pTime->wMilliseconds/1000);
    pTime->wMilliseconds = pTime->wMilliseconds % 1000;
}

return FALSE;
}

/* FUNCTION: void ErrorMessage(int iError)
*
* PURPOSE: This function displays an error message in the delivery
executable's console window.
*
* ARGUMENTS: int iError error id to be displayed
*
* RETURNS: None
*
* COMMENTS: None
*/

static void ErrorMessage(int iError)
{
    int i;

    static SERRORMSG errorMsgs[] =
    {
        { ERR_SUCCESS,
          "Success, no error."
        },
        { ERR_CANNOT_OPEN_RESULTS_FILE,
          "Cannot open delivery results log file."
        },
        { ERR_READING_LOGFILE,
          "Reading delivery log file, Delivery item format incorrect."
        },
        { ERR_INSUFFICIENT_MEMORY,
          "insufficient memory to process 90th percentile report."
        },
        { 0, ""
        }
    };

    for(i=0; errorMsgs[i].szMsg[0]; i++)
    {
        if ( iError == errorMsgs[i].iError )
        {
            printf("\nError(%d): %s\n", iError,
errorMsgs[i].szMsg);
            return;
        }
    }
}

```

```

}
}
printf("Error(%d): %s", errorMsgs[0].szMsg);
return;
}

/* FUNCTION: BOOL GetParameters(int argc, char *argv[])
*
* PURPOSE: This function parses the command line passed in to the
delivery executable, initializing
* and filling in global variable parameters.
*
* ARGUMENTS: int argc number of command line arguments
passed to delivery
* char *argv[] array of command line
argument pointers
*
* RETURNS: BOOL FALSE parameter read successfull
TRUE user has requested
parameter information screen be displayed.
*
* COMMENTS: None
*/

static BOOL GetParameters(int argc, char *argv[])
{
    int i;
    SYSTEMTIME startTime;
    SYSTEMTIME endTime;
    UINT uLogTitleLen;

    iStartTime = 0;
    iEndTime = 0;
    iReport = 4;
    strcpy(szLogFileTitle,DEFAULTLOGTITLE);

    for(i=0; i<argc; i++)
    {
        if ( argv[i][0] == '-' || argv[i][0] == '/' )
        {
            switch(argv[i][1])
            {
                case 'S':
                case 's':
                    if ( ParseTime(argv[i]+2,
&startTime) )
                        return TRUE;
                    iStartTime = (startTime.wHour *
3600000) + (startTime.wMinute * 60000) + (startTime.wSecond * 1000) +
startTime.wMilliseconds;
                    break;
                case 'E':
                case 'e':
                    if ( ParseTime(argv[i]+2, &endTime) )
                        return TRUE;
                    iEndTime = (endTime.wHour * 3600000)
+ (endTime.wMinute * 60000) + (endTime.wSecond * 1000) +
endTime.wMilliseconds;
                    break;
            }
        }
    }
}

```

```

        case 'R':
        case 'r':
            iReport = atoi(argv[i]+2);
            if ( iReport > 4 || iReport < 1 )
                iReport = 4;
            break;
        case 'F':
        case 'f':
            uLogTitleLen = strlen(argv[i] - 2);
            if (uLogTitleLen > 0 && uLogTitleLen <
sizeof(szLogFileTitle))
            {
                strcpy(szLogFileTitle,argv[i]+2);
                printf("Log File Title set to %s",szLogFileTitle);
            };
            break;
        case '?':
            return TRUE;
    }
}
return FALSE;
}

/* FUNCTION: void PrintParameters(void)
*
* PURPOSE: This function displays the supported command line flags.
*
* ARGUMENTS: None
*
* RETURNS: None
*
* COMMENTS: None
*/

static void PrintParameters(void)
{
    PrintHeader();
    printf("DELIRPT:\n\n");
    printf("Parameter
Default\n");
    printf("-----\n");
    printf("-S Start Time HH:MM:SS:MMM
\n");
    printf("-E End Time HH:MM:SS:MMM
\n");
    printf("-R 1)Average Response, 2)90th 3) Skipped 4) All
\n");
    printf("-? This help screen\n\n");
    printf("Note: Command line switches are NOT case sensitive.\n");

    return;
}

/* FUNCTION: void PrintHeader(void)
*
* PURPOSE: This function displays the delivery report applications
banner information.
*/

```

```

* ARGUMENTS: None
*
* RETURNS: None
*
* COMMENTS: None
*/

static void PrintHeader(void)
{
    //cls();

    printf("*****\n");
    printf(" * \n");
    printf(" * Microsoft SQL Server 7.0 * \n");
    printf(" * \n");
    printf(" * HTML TPC-C BENCHMARK KIT: Delivery Report * \n");
    printf(" * Version %d.%2.2d.%3.3d * \n", versionMS, versionMM, versionLS);
    printf(" * \n");
    printf("*****\n\n");

    return;
}

/* FUNCTION: void cls(void)
*
* PURPOSE: This function clears the console window
*
* ARGUMENTS: None
*
* RETURNS: None
*
* COMMENTS: None
*/

static void cls(void)
{
    HANDLE hConsole;
    COORD coordScreen = { 0, 0 }; //here's where
we'll home the cursor
    DWORD cCharsWritten;
    CONSOLE_SCREEN_BUFFER_INFO csbi; //to get buffer info
    DWORD dwConSize; //number of character cells in the current buffer

    hConsole = GetStdHandle(STD_OUTPUT_HANDLE);

    //get the number of character cells in the current buffer

    GetConsoleScreenBufferInfo( hConsole, &csbi );
    dwConSize = csbi.dwSize.X * csbi.dwSize.Y;

    //fill the entire screen with blanks
    FillConsoleOutputCharacter( hConsole, (TCHAR) ' ', dwConSize,
coordScreen, &cCharsWritten );
    GetConsoleScreenBufferInfo( hConsole, &csbi );

    //now set the buffer's attributes accordingly

```

```

    FillConsoleOutputAttribute( hConsole, csbi.wAttributes,dwConSize,
    coordScreen, &cCharsWritten );

    //put the cursor at (0, 0)
    SetConsoleCursorPosition( hConsole, coordScreen );

    return;
}

/* FUNCTION: BOOL IsNumeric(char *ptr)
 *
 * PURPOSE:   This function determines if a string is numeric. It fails
if any characters other
 *           than numeric and null terminator are present.
 *
 * ARGUMENTS: char          *ptr   pointer to string to check.
 *
 * RETURNS:   BOOL   FALSE  if string is not all numeric
 *           TRUE   if string contains
only numeric characters i.e. '0' - '9'
 *
 * COMMENTS:  A comma is counted as a valid delimiter.
 *
 */

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

    while( *ptr && isdigit(*ptr) )
        ptr++;
    if ( !*ptr || *ptr == ',' )
        return TRUE;
    else
        return FALSE;
}

```


Appendix B - Database Design

Build Scripts

BACKUP.SQL

```
-- File:      BACKUP.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.00
--           Copyright Microsoft, 1996
-- 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 = 5

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

go
```

CREATEDB.SQL

```
-- File:      CREATEDB.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.00
--           Copyright Microsoft, 1996
-- Purpose:   Creates tpcc database and backup files
--           for 1530 warehouses.

use master
go

-- remove any existing database and backup files

exec sp_dbremove tpcc, dropdev
exec sp_dropdevice 'tpccback1', delfile
exec sp_dropdevice 'tpccback2', delfile
go

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

-- create main database files

create database tpcc on
    (name="MSSQL70_tpcc_root",filename="C:\MSSQL7\Data\tpcc_root.mdf",
size=10MB, FILEGROWTH=0)
log on
    (name="MSSQL70_tpcc_log",filename="L:",size=47500MB, FILEGROWTH=0)
```

```
-- create filegroups

alter database tpcc add filegroup MSSQL70_misc_fg
alter database tpcc add filegroup MSSQL70_cs_fg

-- add files to filegroups

alter database tpcc add file
    (name="MSSQL70_misc1",filename="M:",size=8800MB, FILEGROWTH=0),
    (name="MSSQL70_misc2",filename="N:",size=8800MB, FILEGROWTH=0),
    (name="MSSQL70_misc3",filename="O:",size=8800MB, FILEGROWTH=0),
    (name="MSSQL70_misc4",filename="P:",size=8800MB, FILEGROWTH=0),
    (name="MSSQL70_misc5",filename="Q:",size=8800MB, FILEGROWTH=0)
to filegroup MSSQL70_misc_fg

alter database tpcc add file
    (name="MSSQL70_cs1",filename="E:",size=18400MB, FILEGROWTH=0),
    (name="MSSQL70_cs2",filename="F:",size=18400MB, FILEGROWTH=0),
    (name="MSSQL70_cs3",filename="G:",size=18400MB, FILEGROWTH=0),
    (name="MSSQL70_cs4",filename="H:",size=18400MB, FILEGROWTH=0),
    (name="MSSQL70_cs5",filename="I:",size=18400MB, FILEGROWTH=0)
to filegroup MSSQL70_cs_fg

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

go

-- create backup devices

exec sp_addumpdevice 'disk','tpccback1','R:\tpccback1.dmp'
exec sp_addumpdevice 'disk','tpccback2','S:\tpccback2.dmp'

go
```

DBOPT1.SQL

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

use master
go

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

use tpcc
go

checkpoint
```

go

DBOPT2.SQL

```
-- File:      DBOPT2.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.01
--           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','AllowRowLocks',FALSE
go
sp_indexoption 'orders','AllowRowLocks',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-specified hierarchy'
```

```
Print '  Lockflag = 1 ==> Lock at Page-level then Table-level'
Print '  Lockflag = 2 ==> Lock at Row-level then Table-level'
Print '  Lockflag = 3 ==> Lock at Table-level'
Print ' '
```

```
select name,lockflags
from sysindexes
where object_id("warehouse")=id or
      object_id("district")=id or
      object_id("customer")=id or
      object_id("stock")=id or
      object_id("orders")=id or
      object_id("order_line")=id or
      object_id("history")=id or
      object_id("new_order")=id or
      object_id("item")=id
order by lockflags asc
go
```

```
sp_configure allow,0
go
```

```
reconfigure with override
go
```

```
exec sp_dboption tpcc, 'auto update statistics', FALSE
exec sp_dboption tpcc, 'auto create statistics', FALSE
go
```

```
exec sp_tableoption "district","pintable",true
exec sp_tableoption "warehouse","pintable",true
exec sp_tableoption "new_order","pintable",true
exec sp_tableoption "item","pintable",true
go
```

IDXCUSCL.SQL

```
-- File:      IDXCUSCL.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.00
--           Copyright Microsoft, 1996
-- Purpose:   Creates clustered index on customer table
```

```
use tpcc
go
```

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

```
if exists ( select name from sysindexes where name = 'customer_c1' )
          drop index customer.customer_c1
```

```
create unique clustered index customer_c1 on customer(c_w_id, c_d_id,
c_id)
          on MSSQL70_cs_fg
```

```
select @enddate = getdate()
select "End date: ", convert(varchar(30),@enddate,9)
```

```
select "Elapsed time (in seconds): ", datediff(second, @startdate,
@enddate)
```

```
go
```

IDXCUSNC.SQL

```
-- File:      IDXCUSNC.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.00
--           Copyright Microsoft, 1996
-- Purpose:   Creates non-clustered index on customer table
```

```
use tpcc
go
```

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

```
if exists ( select name from sysindexes where name = 'customer_nc1' )
    drop index customer.customer_nc1
```

```
create unique nonclustered index customer_nc1 on customer(c_w_id, c_d_id,
c_last, c_first, c_id)
on MSSQL70_cs_fg
```

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

```
go
```

IDXDISCL.SQL

```
-- File:      IDXDISCL.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.00
--           Copyright Microsoft, 1996
-- Purpose:   Creates clustered index on district table
```

```
use tpcc
go
```

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

```
if exists ( select name from sysindexes where name = 'district_c1' )
    drop index district.district_c1
```

```
create unique clustered index district_c1 on district(d_w_id, d_id)
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:      IDXODLCL.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.00
--           Copyright Microsoft, 1996
-- Purpose:   Creates clustered index on order_line table

```

```

use tpcc
go

```

```

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

```

```

if exists ( select name from sysindexes where name = 'order_line_c1' )
    drop index order_line.order_line_c1

```

```

create unique clustered index order_line_c1 on order_line(ol_w_id,
ol_d_id, ol_o_id, ol_number)
    on MSSQL70_misc_fg

```

```

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

```

```

go

```

IDXORDCL.SQL

```

-- File:      IDXORDCL.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.00
--           Copyright Microsoft, 1996
-- Purpose:   Creates clustered index on orders table

```

```

use tpcc
go

```

```

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

```

```

if exists ( select name from sysindexes where name = 'orders_c1' )
    drop index orders.orders_c1

```

```

create unique clustered index orders_c1 on orders(o_w_id, o_d_id, o_id)
    on MSSQL70_misc_fg

```

```

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

```

```

go

```

IDXORDNC.SQL

```

-- File:      IDXORDNC.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.00
--           Copyright Microsoft, 1996
-- Purpose:   Creates non-clustered index on orders table

```

```

use tpcc
go

```

```

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

```

```

if exists ( select name from sysindexes where name = 'orders_nc1' )
    drop index orders.orders_nc1

```

```

create unique nonclustered index orders_nc1 on orders(o_w_id, o_d_id,
o_c_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)
    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

```

RESTORE.SQL

```

-- File:      RESTORE.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.00
--           Copyright Microsoft, 1996
-- Purpose:   Loads database backup from backup files

declare @startdate datetime
declare @enddate datetime

```

```

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

restore database tpcc from tpccback1, tpccback2 with replace, stats = 5

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

go

```

TABLES.SQL

```

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

use tpcc
go

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

go
create table warehouse
(
    w_id                smallint,
    w_name              char(10),
    w_street_1          char(20),
    w_street_2          char(20),
    w_city              char(20),
    w_state             char(2),
    w_zip              char(9),
    w_tax              numeric(4,4),
    w_ytd              numeric(12,2)
) on MSSQL70_misc_fg
go

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

go
create table district
(
    d_id                tinyint,
    d_w_id             smallint,
    d_name              char(10),
    d_street_1          char(20),
    d_street_2          char(20),
    d_city              char(20),
    d_state             char(2),
    d_zip              char(9),
    d_tax              numeric(4,4),
    d_ytd              numeric(12,2),
    d_next_o_id        int
) on MSSQL70_misc_fg
go

if exists ( select name from sysobjects where name = 'customer' )

```

```

drop table customer
go
create table customer
(
    c_id                int,
    c_d_id              tinyint,
    c_w_id              smallint,
    c_first             char(16),
    c_middle            char(2),
    c_last              char(16),
    c_street_1          char(20),
    c_street_2          char(20),
    c_city              char(20),
    c_state             char(2),
    c_zip              char(9),
    c_phone             char(16),
    c_since             datetime,
    c_credit            char(2),
    c_credit_lim        numeric(12,2),
    c_discount          numeric(4,4),
    c_balance           numeric(12,2),
    c_ytd_payment       numeric(12,2),
    c_payment_cnt       smallint,
    c_delivery_cnt      smallint,
    c_data              char(500)
) on MSSQL70_cs_fg
go

if exists ( select name from sysobjects where name = 'history' )
drop table history
go
create table history
(
    h_c_id              int,
    h_c_d_id            tinyint,
    h_c_w_id            smallint,
    h_d_id              tinyint,
    h_w_id              smallint,
    h_date              datetime,
    h_amount            numeric(6,2),
    h_data              char(24)
) on MSSQL70_misc_fg
go

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

if exists ( select name from sysobjects where name = 'orders' )
drop table orders
go
create table orders
(
    o_id                int,

```

```

    o_d_id              tinyint,
    o_w_id              smallint,
    o_c_id             int,
    o_entry_d           datetime,
    o_carrier_id        tinyint,
    o_ol_cnt            tinyint,
    o_all_local         tinyint
) on MSSQL70_misc_fg
go

if exists ( select name from sysobjects where name = 'order_line' )
drop table order_line
go
create table order_line
(
    ol_o_id             int,
    ol_d_id             tinyint,
    ol_w_id             smallint,
    ol_number           tinyint,
    ol_i_id             int,
    ol_supply_w_id      smallint,
    ol_delivery_d        datetime,
    ol_quantity         smallint,
    ol_amount           numeric(6,2),
    ol_dist_info        char(24)
) on MSSQL70_misc_fg
go

if exists ( select name from sysobjects where name = 'item' )
drop table item
go
create table item
(
    i_id                int,
    i_im_id             int,
    i_name              char(24),
    i_price             numeric(5,2),
    i_data              char(50)
) on MSSQL70_misc_fg
go

if exists ( select name from sysobjects where name = 'stock' )
drop table stock
go
create table stock
(
    s_i_id             int,
    s_w_id             smallint,
    s_quantity          smallint,
    s_dist_01          char(24),
    s_dist_02          char(24),
    s_dist_03          char(24),
    s_dist_04          char(24),
    s_dist_05          char(24),
    s_dist_06          char(24),
    s_dist_07          char(24),
    s_dist_08          char(24),
    s_dist_09          char(24),
    s_dist_10          char(24),
    s_ytd              int,
    s_order_cnt         smallint,

```

```

        s_remote_cnt      smallint,
        s_data            char(50)
    ) on MSSQL70_cs_fg
go

```

VERIFYTPCCLOAD

```

use tpcc
print 'WAREHOUSE'
select rows from sysindexes where id=object_id("warehouse")
print 'DISTRICT = (10 * No of warehouses)'
select rows from sysindexes where id=object_id("district")
print 'ITEM = 100,000'
select rows from sysindexes where id=object_id("item")
print 'CUSTOMER = (30,000 * No of warehouses)'
select rows from sysindexes where id=object_id("customer")
print 'ORDERS = (30,000 * No of warehouses)'
select rows from sysindexes where id=object_id("orders")
print 'HISTORY = (30,000 * No of warehouses)'
select rows from sysindexes where id=object_id("history")
print 'STOCK = (100,000 * No of warehouses)'
select rows from sysindexes where id=object_id("stock")
print 'ORDER_LINE = (300,000 * No of warehouses + some change)'
select rows from sysindexes where id=object_id("order_line")
print 'NEW_ORDER = (9000 * No of warehouses)'
select rows from sysindexes where id=object_id("new_order")
print '*****Index Check*****'
use tpcc
go
sp_helpindex customer
go
sp_helpindex stock
go
sp_helpindex district
go
sp_helpindex item
go
sp_helpindex new_order
go
sp_helpindex orders
go
sp_helpindex order_line
go
sp_helpindex warehouse
go

```

Stored Procedures

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 uplock)
        where no_w_id = @w_id and
              no_d_id = @d_id
        order by no_o_id asc

        if (@@rowcount <> 0)
        begin

-- claim the order for this district

            delete new_order
            where no_w_id = @w_id and
                  no_d_id = @d_id and
                  no_o_id = @o_id

-- set carrier_id on this order (and get customer id)

            update orders
            set o_carrier_id = @o_carrier_id,
                @c_id = o_c_id
            where o_w_id = @w_id and
                  o_d_id = @d_id and

```

```

        o_id = @o_id
-- set date in all lineitems for this order (and sum amounts)
    update order_line
        set ol_delivery_d = getdate(),
            @total = @total + ol_amount
    where ol_w_id = @w_id and
        ol_d_id = @d_id and
            ol_o_id = @o_id
-- accumulate 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

```

NEWORD.SQL

```

-- File: NEWORD.SQL
-- Microsoft TPC-C Benchmark Kit Ver. 4.00
-- 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,
    @c_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 available 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_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
                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

```

ORDSTAT.SQL

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

```
use tpcc
go
```

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

```
create proc tpcc_orderstatus @w_id          smallint,
                             @d_id          int,
                             @c_id          tinyint,
                             @c_last       char(16) = ""
as
```

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

```
begin tran o
```

```
    if (@c_id = 0)
        begin
```

```
-- get customer id and info using last name
```

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

```
    set rowcount @cnt
```

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

```
    set rowcount 0
end
```

```
    else
        begin
```

```
-- get customer info if by id
```

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

```
        select @cnt = @@rowcount
```

```
    end
```

```
-- if no such customer
```

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

```
-- get order info
```

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

```
-- select order lines for the current order
```

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

```
custnotfound:
```

```
commit tran o
```

```
-- return data to client
```

```
select @c_id,
       @c_last,
       @c_first,
       @c_middle,
       @o_entry_d,
```

```

        @o_carrier_id,
        @c_balance,
        @o_id
go

                                PAYMENTS.SQL

-- File:      PAYMENT.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.00
--           Copyright Microsoft, 1996
-- Purpose:   Creates payment transaction stored procedure

use tpcc
go

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

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

""

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

```

```

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

select @screen_data = ""

begin tran p

-- get payment date

    select @datetime = getdate()

    if (@c_id = 0)
    begin

-- get customer id and info using last name

        select @cnt = count(*)
        from customer (repeatableread)
        where c_last = @c_last and
              c_w_id = @c_w_id and
              c_d_id = @c_d_id

        select @val = (@cnt + 1) / 2
        set rowcount @val

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

        set rowcount 0

    end

-- get customer info and update balances

    update customer set
        @c_balance      = c_balance = c_balance - @h_amount,
        c_payment_cnt   = c_payment_cnt + 1,
        c_ytd_payment   = c_ytd_payment + @h_amount,
        @c_first        = c_first,
        @c_middle       = c_middle,
        @c_last         = c_last,
        @c_street_1     = c_street_1,
        @c_street_2     = c_street_2,
        @c_city         = c_city,
        @c_state        = c_state,
        @c_zip          = c_zip,
        @c_phone        = c_phone,
        @c_credit       = c_credit,
        @c_credit_lim   = c_credit_lim,
        @c_discount     = c_discount,

```

```

        @c_since      = c_since,
        @data         = c_data,
        @c_id_local   = c_id
where c_id   = @c_id and
      c_w_id = @c_w_id and
      c_d_id = @c_d_id

-- if customer has bad credit get some more info

      if (@c_credit = "BC")
begin

--      compute new info

          select @c_data = convert(char(5),@c_id) +
                  convert(char(4),@c_d_id) +
                  convert(char(5),@c_w_id) +
                  convert(char(4),@d_id) +
                  convert(char(5),@w_id) +
                  convert(char(19),@h_amount) +
                  substring(@data, 1, 458)

--      update customer info

          update customer set
              c_data = @c_data
          where c_id   = @c_id and
              c_w_id = @c_w_id and
              c_d_id = @c_d_id

          select @screen_data = substring (@c_data,1,200)
        end

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

          update district
          set d_ytd      = d_ytd + @h_amount,
              @d_street_1 = d_street_1,
              @d_street_2 = d_street_2,
              @d_city     = d_city,
              @d_state    = d_state,
              @d_zip      = d_zip,
              @d_name     = d_name,
              @d_id_local = d_id
          where d_w_id = @w_id and
              d_id   = @d_id

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

          update warehouse
          set w_ytd      = w_ytd + @h_amount,
              @w_street_1 = w_street_1,
              @w_street_2 = w_street_2,
              @w_city     = w_city,
              @w_state    = w_state,
              @w_zip      = w_zip,
              @w_name     = w_name,
              @w_id_local = w_id
          where w_id = @w_id

--      create history record

```

```

insert into history values (@c_id_local,
                           @c_d_id,
                           @c_w_id,
                           @d_id_local,
                           @w_id_local,
                           @datetime,
                           @h_amount,
                           @w_name + "
" + @d_name)

commit tran p

-- return data to client

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

go

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,
                           @threshold     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 < @threshold

go

```

Loader Source

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     = DEFALDPACKSIZE;
    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) DEFFLDPACKSIZE);
    printf("-f Loader Results Output Filename
%s\n", LOADER_RES_FILE);
    printf("-s Starting Warehouse
%ld\n", (long) DEF_STARTING_WAREHOUSE);
    printf("-i Build Option (data = 0, data and index = 1)
%ld\n", (long) BUILD_INDEX);
    printf("-o Cluster Index Build Order (before = 1, after = 0)
%ld\n", (long) INDEX_ORDER);
    printf("-c Build Scaled Database (normal = 0, tiny = 1)
%ld\n", (long) SCALE_DOWN);
    printf("-d Index Script Path
%s\n", INDEX_SCRIPT_PATH);
}

```

```

        printf("-t Table to Load          all
tables \n");
        printf("    [item|warehouse|customer|orders]\n");
        printf("    Notes: \n");
        printf("    - the '-t' parameter may be included multiple times to
\n");
        printf("        specify multiple tables to be loaded \n");
        printf("    - 'item' loads ITEM table \n");
        printf("    - 'warehouse' loads WAREHOUSE, DISTRICT, and STOCK tables
\n");
        printf("    - 'customer' loads CUSTOMER and HISTORY tables \n");
        printf("    - 'orders' load NEW-ORDER, ORDERS, ORDER-LINE tables
\n");

        printf("\nNote:  Command line switches are case sensitive.\n");

        exit(0);
}

```

RANDOM.C

```

//      File:          RANDOM.C
//                          Microsoft TPC-C Kit Ver. 4.00
//                          Copyright Microsoft, 1996, 1997, 1998
//      Purpose:      Random number generation routines for database
loader

// Includes
#include "tpcc.h"
#include "math.h"

// Defines
#define A          16807
#define M          2147483647
#define Q          127773      /* M div A */
#define R          2836      /* M mod A */
#define Thread    __declspec(thread)

// Globals
long  Thread Seed = 0;      /* thread local seed */

/*****
*
*
* random -
*
*      Implements a GOOD pseudo random number generator.  This generator
*
*      will/should? run the complete period before repeating.
*
*
* Copied from:
*
*      Random Numbers Generators: Good Ones Are Hard to Find.
*
*/

```

```

*      Communications of the ACM - October 1988 Volume 31 Number 10
*
*
*
* Machine Dependencies:
*
*      long must be 2 ^ 31 - 1 or greater.
*
*
*
****/

/*****
* seed - load the Seed value used in irand and drand.  Should be used
before *
*      first call to irand or drand.
*
****/

void seed(long val)
{
#ifdef DEBUG
    printf("[%ld]DBG: Entering seed()...\n", (int) GetCurrentThreadId());
    printf("Old Seed %ld New Seed %ld\n",Seed, val);
#endif

    if ( val < 0 )
        val = abs(val);

    Seed = val;
}

/*****
*
*
* irand - returns a 32 bit integer pseudo random number with a period of
*
*      1 to 2 ^ 32 - 1.
*
*
* parameters:
*
*      none.
*
* returns:
*
*      32 bit integer - defined as long ( see above ).
*
*/

```



```

* side effects:
*
*      seed get recomputed.
*
*****
***/
long irand()
{
    register long    s;      /* copy of seed */
    register long    test;   /* test flag */
    register long    hi;     /* tmp value for speed */
    register long    lo;     /* tmp value for speed */

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

    s = Seed;
    hi = s / Q;
    lo = s % Q;

    test = A * lo - R * hi;
    if ( test > 0 )
        Seed = test;
    else
        Seed = test + M;

    return( Seed );
}

/*****
*
* drand - returns a double pseudo random number between 0.0 and 1.0.
*
*      See irand.
*****
***/
double drand()
{
#ifdef DEBUG
    printf("[%ld]DBG: Entering drand()...\n", (int) GetCurrentThreadId());
#endif

    return( (double)irand() / 2147483647.0);
}

//=====
// Function   : RandomNumber
//
// Description:
//=====
long RandomNumber(long lower, long upper)
{
    long rand_num;

```

```

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

    if ( upper == lower ) /* pgd 08-13-96 perf enhancement */
        return lower;

    upper++;

    if ( upper <= lower )
        rand_num = upper;
    else
        rand_num = lower + irand() % (upper - lower); /* pgd 08-13-
96 perf enhancement */

#ifdef DEBUG
    printf("[%ld]DBG: RandomNumber between %ld & %ld ==> %ld\n",
(int) GetCurrentThreadId(), lower, upper,
rand_num);
#endif

    return rand_num;
}

#if 0
//Original code pgd 08/13/96
long RandomNumber(long lower,
                  long upper)
{
    long rand_num;

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

    upper++;

    if ((upper <= lower))
        rand_num = upper;
    else
        rand_num = lower + irand() % ((upper > lower) ? upper -
lower : upper);

#ifdef DEBUG
    printf("[%ld]DBG: RandomNumber between %ld & %ld ==> %ld\n",
(int) GetCurrentThreadId(), lower, upper,
rand_num);
#endif

    return rand_num;
}

```

```

#endif

//=====
// Function : NURand
//
// Description:
//=====
long NURand(int iConst,
           long x,
           long y,
           long C)
{
    long rand_num;

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

    rand_num = (((RandomNumber(0,iConst) | RandomNumber(x,y)) + C) % (y-
x+1))+x;

#ifdef DEBUG
    printf("[%ld]DBG: NURand: num = %d\n", (int) GetCurrentThreadId(),
rand_num);
#endif

    return rand_num;
}

```

STRINGS.C

```

// File: STRINGS.C
// Microsoft TPC-C Kit Ver. 4.00
// Copyright Microsoft, 1996, 1997, 1998
// Purpose: Source file for database loader string functions

```

```

// Includes
#include "tpcc.h"
#include <string.h>
#include <ctype.h>

```

```

//=====
//
// Function name: MakeAddress
//=====

```

```

void MakeAddress(char *street_1,
                char *street_2,
                char *city,
                char *state,
                char *zip)
{
#ifdef DEBUG

```

```

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

    MakeAlphaString (10, 20, ADDRESS_LEN, street_1);
    MakeAlphaString (10, 20, ADDRESS_LEN, street_2);
    MakeAlphaString (10, 20, ADDRESS_LEN, city);
    MakeAlphaString ( 2,  2, STATE_LEN, state);
    MakeZipNumberString( 9,  9, ZIP_LEN, zip);

#ifdef DEBUG
    printf("[%ld]DBG: MakeAddress: street_1: %s, street_2: %s, city: %s,
state: %s, zip: %s\n",
           (int) GetCurrentThreadId(), street_1, street_2,
city, state, zip);
#endif

    return;
}

//=====
//
// Function name: LastName
//
//=====

void LastName(int num,
             char *name)
{
    static char *n[] =
    {
        "BAR" , "OUGHT", "ABLE" , "PRI" , "PRES",
        "ESE" , "ANTI" , "CALLY", "ATION", "EING"
    };

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

    if ((num >= 0) && (num < 1000))
    {
        strcpy(name, n[(num/100)%10]);
        strcat(name, n[(num/10)%10]);
        strcat(name, n[(num/1)%10]);

        if (strlen(name) < LAST_NAME_LEN)
        {
            PaddString(LAST_NAME_LEN, name);
        }
    }
    else
    {
        printf("\nError in LastName()... num <%ld> out of range
(0,999)\n", num);
        exit(-1);
    }
}

```

```

#ifdef DEBUG
    printf("[%ld]DBG: LastName: num = [%d] ==> [%d] [%d] [%d]\n",
           (int) GetCurrentThreadId(), num, num/100,
           (num/10)%10, num%10);
    printf("[%ld]DBG: LastName: String = %s\n", (int)
           GetCurrentThreadId(), name);
#endif

    return;
}

//=====
//
// Function name: MakeAlphaString
//
//=====
//philipdu 08/13/96 Changed MakeAlphaString to use A-Z, a-z, and 0-9 in
//accordance with spec see below:
//The spec says:
//4.3.2.2 The notation random a-string [x .. y]
//respectively, n-string [x .. y]) represents a string of random
alphanumeric
//respectively, numeric) characters of a random length of minimum x,
maximum y,
//and mean (y+x)/2. Alphanumerics are A..Z, a..z, and 0..9. The only
other
//requirement is that the character set used "must be able to represent a
minimum
//of 128 different characters". We are using 8-bit chars, so this is a
non issue.
//It is completely unreasonable to stuff non-printing chars into the text
fields.
//-CLevine 08/13/96

int MakeAlphaString( int x, int y, int z, char *str)
{
    int len;
    int i;
    static char chArray[] =
"0123456789ABCDEFGHIJKLMNPOQRSTUVWXYZabcdefghijklmnopqrstuvwxyz";
    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 percentage is valid
    if ((percent < 0) || (percent > 100))
    {
        printf("MakeOriginalAlphaString: Invalid percentage: %d\n",
percent);
        exit(-1);
    }

    // verify string is at least 8 chars in length
    if ((x + y) <= 8)
    {
        printf("MakeOriginalAlphaString: string length must be >=
8\n");
        exit(-1);
    }

    // Make Alpha String
    len = MakeAlphaString(x,y, z, str);

    val = RandomNumber(1,100);
    if (val <= percent)
    {
        start = RandomNumber(0, len - 8);
        strncpy(str + start, "ORIGINAL", 8);
    }

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

    return strlen(str);
}

//=====
//
// Function name: MakeNumberString

```

```

//
//=====
int MakeNumberString(int x, int y, int z, char *str)
{
    char tmp[16];

    //MakeNumberString is always called MakeZipNumberString(16, 16,
16, string)

    memset(str, '0', 16);
    itoa(RandomNumber(0, 99999999), tmp, 10);
    memcpy(str, tmp, strlen(tmp));

    itoa(RandomNumber(0, 99999999), tmp, 10);
    memcpy(str+8, tmp, strlen(tmp));

    str[16] = 0;

    return 16;
}

//=====
//
// Function name: MakeZipNumberString
//
//=====
int MakeZipNumberString(int x, int y, int z, char *str)
{
    char tmp[16];

    //MakeZipNumberString is always called MakeZipNumberString(9, 9,
9, string)

    strcpy(str, "000011111");

    itoa(RandomNumber(0, 9999), tmp, 10);
    memcpy(str, tmp, strlen(tmp));

    return 9;
}

//=====
//
// Function name: InitString
//
//=====
void InitString(char *str, int len)
{
#ifdef DEBUG
    printf("[%ld]DBG: Entering InitString()\n", (int)
GetCurrentThreadId());
#endif

    memset(str, ' ', len);
    str[len] = 0;
}

//=====

```

```

// Function name: InitAddress
//
// Description:
//
//=====
void InitAddress(char *street_1, char *street_2, char *city, char *state,
char *zip)
{
    memset(street_1, ' ', ADDRESS_LEN+1);
    memset(street_2, ' ', ADDRESS_LEN+1);
    memset(city, ' ', ADDRESS_LEN+1);

    street_1[ADDRESS_LEN+1] = 0;
    street_2[ADDRESS_LEN+1] = 0;
    city[ADDRESS_LEN+1] = 0;

    memset(state, ' ', STATE_LEN+1);
    state[STATE_LEN+1] = 0;

    memset(zip, ' ', ZIP_LEN+1);
    zip[ZIP_LEN+1] = 0;
}

//=====
//
// Function name: PaddString
//
//=====
void PaddString(int max, char *name)
{
    int len;

    len = strlen(name);
    if ( len < max )
        memset(name+len, ' ', max - len);
    name[max] = 0;

    return;
}

TIME.C

// File: TIME.C
// Microsoft TPC-C Kit Ver. 4.00
// Copyright Microsoft, 1996, 1997, 1998
// Purpose: Source file for time functions

// Includes
#include "tpcc.h"

// Globals
static long start_sec;

//=====
//

```

```

// Function name: TimeNow
//
//=====
long TimeNow()
{
    long        time_now;
    struct      _timeb el_time;

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

    _ftime(&el_time);

    time_now = ((el_time.time - start_sec) * 1000) + el_time.millitm;

    return time_now;
}

```

TPCC.H

```

//      File:          TPC.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;
} TPCCCLR_ARGS;

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

```

```

#define ADDRESS_LEN          20
#define STATE_LEN           2
#define ZIP_LEN             9
#define S_DIST_LEN         24
#define S_DATA_LEN         50
#define D_NAME_LEN         10
#define FIRST_NAME_LEN     16
#define MIDDLE_NAME_LEN    2
#define PHONE_LEN          16
#define CREDIT_LEN         2
#define C_DATA_LEN         500
#define H_DATA_LEN         24
#define DIST_INFO_LEN      24
#define MAX_OL_NEW_ORDER_ITEMS 15
#define MAX_OL_ORDER_STATUS_ITEMS 15
#define STATUS_LEN         25
#define OL_DIST_INFO_LEN   24
#define C_SINCE_LEN        23
#define H_DATE_LEN         23
#define OL_DELIVERY_D_LEN  23
#define O_ENTRY_D_LEN      23

// Functions in random.c
void seed();
long irand();
double drand();
void WUCreate();
short WURand();
long RandomNumber(long lower, long upper);

// Functions in getargs.c;
void GetArgsLoader();
void GetArgsLoaderUsage();

// Functions in time.c
long TimeNow();

// Functions in strings.c
void MakeAddress();
void LastName();
int MakeAlphaString();
int MakeOriginalAlphaString();
int MakeNumberString();
int MakeZipNumberString();
void InitString();
void InitAddress();
void PaddString();

// 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"

```

TPCCLDR.C

```

// Defines
#define MAXITEMS            100000
#define MAXITEMS_SCALE_DOWN 100
#define CUSTOMERS_PER_DISTRICT 3000
#define CUSTOMERS_SCALE_DOWN 30
#define DISTRICT_PER_WAREHOUSE 10
#define ORDERS_PER_DISTRICT 3000
#define ORDERS_SCALE_DOWN 30
#define MAX_CUSTOMER_THREADS 2
#define MAX_ORDER_THREADS 3
#define MAX_MAIN_THREADS 4

// Functions declarations
void HandleErrorDBC (SQLHDBC hdbc1);

long NURand();
void LoadItem();
void LoadWarehouse();

void Stock();
void District();

void LoadCustomer();
void CustomerBufInit();
void CustomerBufLoad();
void LoadCustomerTable();
void LoadHistoryTable();

void LoadOrders();
void OrdersBufInit();
void OrdersBufLoad();
void LoadOrdersTable();
void LoadNewOrderTable();
void LoadOrderLineTable();
void GetPermutation();
void CheckForCommit();
void OpenConnections();
void BuildIndex();
void FormatDate ();

// Shared memory structures
typedef struct
{
    long ol;
    long ol_i_id;
    short ol_supply_w_id;
    short ol_quantity;
    double ol_amount;
    char ol_dist_info[DIST_INFO_LEN+1];
    char ol_delivery_d[OL_DELIVERY_D_LEN+1];
} ORDER_LINE_STRUCT;

typedef struct
{
    long o_id;
    short o_d_id;
    short o_w_id;
    long o_c_id;

```

```

short      o_carrier_id;
short      o_ol_cnt;
short      o_all_local;
ORDER_LINE_STRUCT o_ol[15];
} ORDERS_STRUCT;

typedef struct
{
    long      c_id;
    short     c_d_id;
    short     c_w_id;
    char      c_first[FIRST_NAME_LEN+1];
    char      c_middle[MIDDLE_NAME_LEN+1];
    char      c_last[LAST_NAME_LEN+1];
    char      c_street_1[ADDRESS_LEN+1];
    char      c_street_2[ADDRESS_LEN+1];
    char      c_city[ADDRESS_LEN+1];
    char      c_state[STATE_LEN+1];
    char      c_zip[ZIP_LEN+1];
    char      c_phone[PHONE_LEN+1];
    char      c_credit[CREDIT_LEN+1];
    double    c_credit_lim;
    double    c_discount;
// fix to avoid ODBC float to numeric conversion problem.
// double    c_balance;
    char      c_balance[6];

    double    c_ytd_payment;
    short     c_payment_cnt;
    short     c_delivery_cnt;
    char      c_data[C_DATA_LEN+1];
    double    h_amount;
    char      h_data[H_DATA_LEN+1];
} CUSTOMER_STRUCT;

typedef struct
{
    char      c_last[LAST_NAME_LEN+1];
    char      c_first[FIRST_NAME_LEN+1];
    long      c_id;
} CUSTOMER_SORT_STRUCT;

typedef struct
{
    long      time_start;
} LOADER_TIME_STRUCT;

// Global variables
char      szLastError[300];

HENV      henv;

HDBC      i_hdbc1;           // for ITEM table
HDBC      w_hdbc1;           // for WAREHOUSE,
DISTRICT, STOCK
HDBC      c_hdbc1;           // for CUSTOMER
HDBC      c_hdbc2;           // for HISTORY
HDBC      o_hdbc1;           // for ORDERS

```

```

HDBC      o_hdbc2;           // for NEW-ORDER
HDBC      o_hdbc3;           // for ORDER-LINE

HSTMT     i_hstmt1;
HSTMT     w_hstmt1;
HSTMT     c_hstmt1, c_hstmt2;
HSTMT     o_hstmt1, o_hstmt2, o_hstmt3;

ORDERS_STRUCT orders_buf[ORDERS_PER_DISTRICT];
CUSTOMER_STRUCT customer_buf[CUSTOMERS_PER_DISTRICT];
long orders_rows_loaded;
long new_order_rows_loaded;
long order_line_rows_loaded;
long history_rows_loaded;
long customer_rows_loaded;
long stock_rows_loaded;
long district_rows_loaded;
long item_rows_loaded;
long warehouse_rows_loaded;
long main_time_start;
long main_time_end;
long max_items;
long customers_per_district;
long orders_per_district;
long first_new_order;
long last_new_order;

TPCCLDR_ARGS *aptr, args;

//=====
//
// Function name: main
//
//=====

int main(int argc, char **argv)
{
    DWORD      dwThreadID[MAX_MAIN_THREADS];
    HANDLE      hThread[MAX_MAIN_THREADS];
    FILE        *fLoader;
    char        buffer[255];
    int         i;

    for (i=0; i<MAX_MAIN_THREADS; i++)
        hThread[i] = NULL;

    printf("\n*****");
    printf("\n*                               *");
    printf("\n* Microsoft SQL Server         *");
    printf("\n* TPC-C BENCHMARK KIT: Database loader *");
    printf("\n* Version %s                      *",
TPCKIT_VER);
    printf("\n*                               *");
    printf("\n*****\n\n");
};

```

```

// process command line arguments
aptr = &args;
GetArgsLoader(argc, argv, aptr);

printf("Build interface is ODBC.\n");

if (aptr->build_index == 0)
    printf("Data load only - no index creation.\n");
else
    printf("Data load and index creation.\n");

if (aptr->index_order == 0)
    printf("Clustered indexes will be created after bulk
load.\n");
else
    printf("Clustered indexes will be created before bulk
load.\n");

// set database scale values
if (aptr->scale_down == 1)
{
    printf("*** Scaled Down Database ***\n");
    max_items = MAXITEMS_SCALE_DOWN;
    customers_per_district = CUSTOMERS_SCALE_DOWN;
    orders_per_district = ORDERS_SCALE_DOWN;
    first_new_order = 0;
    last_new_order = 30;
}
else
{
    max_items = MAXITEMS;
    customers_per_district = CUSTOMERS_PER_DISTRICT;
    orders_per_district = ORDERS_PER_DISTRICT;
    first_new_order = 2100;
    last_new_order = 3000;
}

// open connections to SQL Server
OpenConnections();

// open file for loader results
fLoader = fopen(aptr->loader_res_file, "w");

if (fLoader == NULL)
{
    printf("Error, loader result file open failed.");
    exit(-1);
}

// start loading data

sprintf(buffer, "TPC-C load started for %ld warehouses.\n", aptr-
>num_warehouses);

printf("%s", buffer);
fprintf(fLoader, "%s", buffer);

main_time_start = (TimeNow() / MILLI);

```

```

// start parallel load threads

if (aptr->tables_all || aptr->table_item)
{
    fprintf(fLoader, "\nStarting loader threads for: item\n");

    hThread[0] = CreateThread(NULL,
                                0,
(LPTHREAD_START_ROUTINE) LoadItem,
                                NULL,
                                0,
&dwThreadID[0]);

    if (hThread[0] == NULL)
    {
        printf("Error, failed in creating creating thread =
0.\n");
        exit(-1);
    }

    if (aptr->tables_all || aptr->table_warehouse)
    {
        fprintf(fLoader, "Starting loader threads for:
warehouse\n");

        hThread[1] = CreateThread(NULL,
                                0,
(LPTHREAD_START_ROUTINE) LoadWarehouse,
                                NULL,
                                0,
&dwThreadID[1]);

        if (hThread[1] == NULL)
        {
            printf("Error, failed in creating creating thread =
1.\n");
            exit(-1);
        }

        if (aptr->tables_all || aptr->table_customer)
        {
            fprintf(fLoader, "Starting loader threads for:
customer\n");

            hThread[2] = CreateThread(NULL,
                                0,
(LPTHREAD_START_ROUTINE) LoadCustomer,
                                NULL,
                                0,
&dwThreadID[2]);

            if (hThread[2] == NULL)

```



```

        {
            printf("Error, failed in creating creating main
thread = 2.\n");
            exit(-1);
        }
    }

    if (aptr->tables_all || aptr->table_orders)
    {
        fprintf(fLoader, "Starting loader threads for: orders\n");

        hThread[3] = CreateThread(NULL,
                                0,
(LPTHREAD_START_ROUTINE) LoadOrders,
                                NULL,
                                0,
&dwThreadID[3]);

        if (hThread[3] == NULL)
        {
            printf("Error, failed in creating creating main
thread = 3.\n");
            exit(-1);
        }

        // Wait for threads to finish...
        for (i=0; i<MAX_MAIN_THREADS; i++)
        {
            if (hThread[i] != NULL)
            {
                WaitForSingleObject( hThread[i], INFINITE );
                CloseHandle(hThread[i]);
                hThread[i] = NULL;
            }
        }

        main_time_end = (TimeNow() / MILLI);

        sprintf(buffer, "\nTPC-C load completed successfully in %ld
minutes.\n",
                (main_time_end - main_time_start)/60);

        printf("%s",buffer);
        fprintf(fLoader, "%s", buffer);

        fclose(fLoader);

        SQLFreeEnv(henv);

        exit(0);

        return 0;
    }

//=====
//
// Function name: LoadItem

```

```

//
//=====
void LoadItem()
{
    long        i_id;
    long        i_im_id;
    char        i_name[I_NAME_LEN+1];
    double      i_price;
    char        i_data[I_DATA_LEN+1];
    char        name[20];
    long        time_start;
    RETCODE     rc;
    DBINT       rcint;
    char        bcpHint[128];

    // Seed with unique number
    seed(1);

    printf("Loading item table...\n");

    // if build index before load
    if ((aptr->build_index == 1) && (aptr->index_order == 1))
        BuildIndex("idxitmc1");

    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);
5); rc = bcp_bind(i_hdbc1, (BYTE *) i_data, 0, I_DATA_LEN, NULL, 0, 0,
    if (rc != SUCCEED)
        HandleErrorDBC(i_hdbc1);
    time_start = (TimeNow() / MILLI);
    item_rows_loaded = 0;
    for (i_id = 1; i_id <= max_items; i_id++)
    {
        i_im_id = RandomNumber(1L, 10000L);
        MakeAlphaString(14, 24, I_NAME_LEN, i_name);
        i_price = ((float) RandomNumber(100L, 10000L))/100.0;
        MakeOriginalAlphaString(26, 50, I_DATA_LEN, i_data, 10);
        rc = bcp_sendrow(i_hdbc1);
        if (rc != SUCCEED)
            HandleErrorDBC(i_hdbc1);
        item_rows_loaded++;
        CheckForCommit(i_hdbc1, i_hstmt1, item_rows_loaded, "item",
&time_start);
    }
    rcint = bcp_done(i_hdbc1);
    if (rcint < 0)
        HandleErrorDBC(i_hdbc1);
    printf("Finished loading item table.\n");
    SQLFreeStmt(i_hstmt1, SQL_DROP);
    SQLDisconnect(i_hdbc1);
    SQLFreeConnect(i_hdbc1);
    // if build index after load
    if ((aptr->build_index == 1) && (aptr->index_order == 0))
        BuildIndex("idxitmcl");
}

//=====
//
// Function   : LoadWarehouse
//
// Loads WAREHOUSE table and loads Stock and District as Warehouses are
// created
//
//=====

void LoadWarehouse()
{
    short    w_id;

```

```

char    w_name[W_NAME_LEN+1];
char    w_street_1[ADDRESS_LEN+1];
char    w_street_2[ADDRESS_LEN+1];
char    w_city[ADDRESS_LEN+1];
char    w_state[STATE_LEN+1];
char    w_zip[ZIP_LEN+1];
double  w_tax;
double  w_ytd;
char    name[20];
long    time_start;
RETCODE rc;
DBINT   rcint;
char    bcphint[128];

// Seed with unique number
seed(2);

printf("Loading warehouse table...\n");

// if build index before load...
if ((aptr->build_index == 1) && (aptr->index_order == 1))
    BuildIndex("idxwarcl");

InitString(w_name, W_NAME_LEN+1);
InitAddress(w_street_1, w_street_2, w_city, w_state, w_zip);

sprintf(name, "%s..%s", aptr->database, "warehouse");

rc = bcp_init(w_hdbc1, name, NULL, "logs\\whouse.err", DB_IN);
if (rc != SUCCEED)
    HandleErrorDBC(w_hdbc1);

if ((aptr->build_index == 1) && (aptr->index_order == 1))
{
    sprintf(bcphint, "tablock, order (w_id), ROWS_PER_BATCH =
%d", aptr->num_warehouses);
    rc = bcp_control(w_hdbc1, BCPHINTS, (void*) bcphint);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);
}

rc = bcp_bind(w_hdbc1, (BYTE *) &w_id, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT2, 1);
if (rc != SUCCEED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) w_name, 0, W_NAME_LEN, NULL, 0, 0,
2);
if (rc != SUCCEED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) w_street_1, 0, ADDRESS_LEN, NULL,
0, 0, 3);
if (rc != SUCCEED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) w_street_2, 0, ADDRESS_LEN, NULL,
0, 0, 4);
if (rc != SUCCEED)
    HandleErrorDBC(w_hdbc1);

```

```

rc = bcp_bind(w_hdbc1, (BYTE *) w_city, 0, ADDRESS_LEN, NULL, 0,
0, 5);
if (rc != SUCCEED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) w_state, 0, STATE_LEN, NULL, 0, 0,
6);
if (rc != SUCCEED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) w_zip, 0, ZIP_LEN, NULL, 0, 0, 7);
if (rc != SUCCEED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) &w_tax, 0, SQL_VARLEN_DATA, NULL,
0, SQLFLT8, 8);
if (rc != SUCCEED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) &w_ytd, 0, SQL_VARLEN_DATA, NULL,
0, SQLFLT8, 9);
if (rc != SUCCEED)
    HandleErrorDBC(w_hdbc1);

time_start = (TimeNow() / MILLI);

warehouse_rows_loaded = 0;

for (w_id = (short)aptr->starting_warehouse; w_id <= aptr-
>num_warehouses; w_id++)
{
    MakeAlphaString(6,10, W_NAME_LEN, w_name);

    MakeAddress(w_street_1, w_street_2, w_city, w_state,
w_zip);

    w_tax = ((float) RandomNumber(0L,2000L))/10000.00;

    w_ytd = 300000.00;

    rc = bcp_sendrow(w_hdbc1);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    warehouse_rows_loaded++;
    CheckForCommit(w_hdbc1, i_hstmt1, warehouse_rows_loaded,
"warehouse", &time_start);
}

rcint = bcp_done(w_hdbc1);
if (rcint < 0)
    HandleErrorDBC(w_hdbc1);

printf("Finished loading warehouse table.\n");

// if build index after load...
if ((aptr->build_index == 1) && (aptr->index_order == 0))
    BuildIndex("idxwarcl");

stock_rows_loaded = 0;

```

```

district_rows_loaded = 0;

District();
Stock();
}

//=====
//
// Function   : District
//
//=====

void District()
{
    short    d_id;
    short    d_w_id;
    char     d_name[D_NAME_LEN+1];
    char     d_street_1[ADDRESS_LEN+1];
    char     d_street_2[ADDRESS_LEN+1];
    char     d_city[ADDRESS_LEN+1];
    char     d_state[STATE_LEN+1];
    char     d_zip[ZIP_LEN+1];
    double   d_tax;
    double   d_ytd;
    char     name[20];
    long     d_next_o_id;
    long     time_start;
    int      w_id;
    RETCODE rc;
    DBINT    rcint;
    char     bcphint[128];

    // Seed with unique number
    seed(4);

    printf("Loading district table...\n");

    // build index before load
    if ((aptr->build_index == 1) && (aptr->index_order == 1))
        BuildIndex("idxdiscl");

    InitString(d_name, D_NAME_LEN+1);
    InitAddress(d_street_1, d_street_2, d_city, d_state, d_zip);
    sprintf(name, "%s..%s", aptr->database, "district");

    rc = bcp_init(w_hdbc1, name, NULL, "logs\\district.err", DB_IN);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    if ((aptr->build_index == 1) && (aptr->index_order == 1))
    {
        sprintf(bcphint, "tablock, order (d_w_id, d_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 10));
        rc = bcp_control(w_hdbc1, BCPHINTS, (void*) bcphint);
        if (rc != SUCCEED)
            HandleErrorDBC(w_hdbc1);
    }
}

```

```

    rc = bcp_bind(w_hdbc1, (BYTE *) &d_id, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT2, 1);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) &d_w_id, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT2, 2);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) d_name, 0, D_NAME_LEN, NULL, 0, 0,
3);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) d_street_1, 0, ADDRESS_LEN, NULL,
0, 0, 4);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) d_street_2, 0, ADDRESS_LEN, NULL,
0, 0, 5);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) d_city, 0, ADDRESS_LEN, NULL, 0,
0, 6);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) d_state, 0, STATE_LEN, NULL, 0, 0,
7);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) d_zip, 0, ZIP_LEN, NULL, 0, 0, 8);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) &d_tax, 0, SQL_VARLEN_DATA, NULL,
0, SQLFLT8, 9);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) &d_ytd, 0, SQL_VARLEN_DATA, NULL,
0, SQLFLT8, 10);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = bcp_bind(w_hdbc1, (BYTE *) &d_next_o_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT4, 11);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    d_ytd = 30000.0;

    d_next_o_id = orders_per_district+1;

    time_start = (TimeNow() / MILLI);

```

```

        for (w_id = aptr->starting_warehouse; w_id <= aptr-
>num_warehouses; w_id++)
        {
            d_w_id = w_id;

            for (d_id = 1; d_id <= DISTRICT_PER_WAREHOUSE; d_id++)
            {
                MakeAlphaString(6,10,D_NAME_LEN, d_name);
                MakeAddress(d_street_1, d_street_2, d_city,
d_state, d_zip);

                d_tax = ((float) RandomNumber(0L,2000L))/10000.00;

                rc = bcp_sendrow(w_hdbc1);
                if (rc != SUCCEED)
                    HandleErrorDBC(w_hdbc1);

                district_rows_loaded++;
                CheckForCommit(w_hdbc1, w_hstmt1,
district_rows_loaded, "district", &time_start);
            }
        }

        rcint = bcp_done(w_hdbc1);
        if (rcint < 0)
            HandleErrorDBC(w_hdbc1);

        printf("Finished loading district table.\n");

        // if build index after load...
        if ((aptr->build_index == 1) && (aptr->index_order == 0))
            BuildIndex("idxdiscl");

    return;
}

//=====
//
// Function   : Stock
//
//=====

void Stock()
{
    long      s_i_id;
    short     s_w_id;
    short     s_quantity;
    char      s_dist_01[S_DIST_LEN+1];
    char      s_dist_02[S_DIST_LEN+1];
    char      s_dist_03[S_DIST_LEN+1];
    char      s_dist_04[S_DIST_LEN+1];
    char      s_dist_05[S_DIST_LEN+1];
    char      s_dist_06[S_DIST_LEN+1];
    char      s_dist_07[S_DIST_LEN+1];
    char      s_dist_08[S_DIST_LEN+1];
    char      s_dist_09[S_DIST_LEN+1];
    char      s_dist_10[S_DIST_LEN+1];
    long      s_ytd;
    short     s_order_cnt;

```

```

short      s_remote_cnt;
char       s_data[S_DATA_LEN+1];
short      len;
char       name[20];
long       time_start;
RETCODE rc;
DBINT      rcint;
char       bcphint[128];

// Seed with unique number
seed(3);

// if build index before load...
if ((aptr->build_index == 1) && (aptr->index_order == 1))
    BuildIndex("idxstkcl");

sprintf(name, "%s..%s", aptr->database, "stock");

rc = bcp_init(w_hdbc1, name, NULL, "logs\\stock.err", DB_IN);
if (rc != SUCCEEDED)
    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 != SUCCEEDED)
        HandleErrorDBC(w_hdbc1);
}

rc = bcp_bind(w_hdbc1, (BYTE *) &s_i_id, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT4, 1);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) &s_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 2);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) &s_quantity, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 3);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_01, 0, S_DIST_LEN, NULL, 0,
0, 4);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_02, 0, S_DIST_LEN, NULL, 0,
0, 5);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_03, 0, S_DIST_LEN, NULL, 0,
0, 6);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

```

```

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_04, 0, S_DIST_LEN, NULL, 0,
0, 7);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_05, 0, S_DIST_LEN, NULL, 0,
0, 8);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_06, 0, S_DIST_LEN, NULL, 0,
0, 9);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_07, 0, S_DIST_LEN, NULL, 0,
0, 10);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_08, 0, S_DIST_LEN, NULL, 0,
0, 11);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_09, 0, S_DIST_LEN, NULL, 0,
0, 12);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_dist_10, 0, S_DIST_LEN, NULL, 0,
0, 13);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) &s_ytd, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT4, 14);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) &s_order_cnt, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 15);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) &s_remote_cnt, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 16);
if (rc != SUCCEEDED)
    HandleErrorDBC(w_hdbc1);

rc = bcp_bind(w_hdbc1, (BYTE *) s_data, 0, S_DATA_LEN, NULL, 0, 0,
17);
if (rc != SUCCEEDED)
    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];
    char                 rc_1;
    char                 recnum, MsgLen;
    // SQLCHAR           SqlState[6],
Msg[SQL_MAX_MESSAGE_LENGTH];
    // SQLINTEGER        NativeError;

    // Seed with unique number
    seed(5);

    printf("Loading customer and history tables...\n");

    // if build index before load..
    if ((aptr->build_index == 1) && (aptr->index_order == 1))
        BuildIndex("idxcuscl");

    // Initialize bulk copy
    sprintf(name, "%s..%s", aptr->database, "customer");

    rc = bcp_init(c_hdbc1, name, NULL, "logs\\customer.err", DB_IN);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    if ((aptr->build_index == 1) && (aptr->index_order == 1))
    {
        sprintf(bcphint, "tablock, order (c_w_id, c_d_id, c_id),
ROWS_PER_BATCH = %u", (aptr->num_warehouses * 30000));
        rc = bcp_control(c_hdbc1, BCPHINTS, (void*) bcphint);
        if (rc != SUCCEED)
            HandleErrorDBC(c_hdbc1);
    }

    sprintf(name, "%s..%s", aptr->database, "history");

    rc = bcp_init(c_hdbc2, name, NULL, "logs\\history.err", DB_IN);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc2);

    sprintf(bcphint, "tablock");
    rc = bcp_control(c_hdbc2, BCPHINTS, (void*) bcphint);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc2);

    customer_rows_loaded    = 0;
    history_rows_loaded     = 0;

    CustomerBufInit();

    customer_time_start.time_start = (TimeNow() / MILLI);
    history_time_start.time_start = (TimeNow() / MILLI);

    for (w_id = (short)aptr->starting_warehouse; w_id <= aptr-
>num_warehouses; w_id++)

```

```

{
    for (d_id = 1; d_id <= DISTRICT_PER_WAREHOUSE; d_id++)
    {
        CustomerBufLoad(d_id, w_id);

        // Start parallel loading threads here...

        // Start customer table thread

        printf("...Loading customer table for: d_id = %d,
w_id = %d\n", d_id, w_id);

        hThread[0] = CreateThread(NULL,
                                0,
(LPTHREAD_START_ROUTINE) LoadCustomerTable,
&customer_time_start,
                                0,
&dwThreadID[0]);

        if (hThread[0] == NULL)
        {
            printf("Error, failed in creating creating
thread = 0.\n");
            exit(-1);
        }

        // Start History table thread

        printf("...Loading history table for: d_id = %d,
w_id = %d\n", d_id, w_id);

        hThread[1] = CreateThread(NULL,
                                0,
(LPTHREAD_START_ROUTINE) LoadHistoryTable,
&history_time_start,
                                0,
&dwThreadID[1]);

        if (hThread[1] == NULL)
        {
            printf("Error, failed in creating creating
thread = 1.\n");
            exit(-1);
        }

        WaitForSingleObject( hThread[0], INFINITE );
        WaitForSingleObject( hThread[1], INFINITE );

        if (CloseHandle(hThread[0]) == FALSE)
        {
            printf("Error, failed in closing customer
thread handle with errno: %d\n", GetLastError());
        }
    }
}

```

```

        if (CloseHandle(hThread[1]) == FALSE)
        {
            printf("Error, failed in closing history
thread handle with errno: %d\n", GetLastError());
        }
    }

}

// flush the bulk connection
rcint = bcp_done(c_hdbc1);
if (rcint < 0)
    HandleErrorDBC(c_hdbc1);

rcint = bcp_done(c_hdbc2);
if (rcint < 0)
    HandleErrorDBC(c_hdbc2);

printf("Finished loading customer table.\n");

// if build index after load...
if ((aptr->build_index == 1) && (aptr->index_order == 0))
    BuildIndex("idxcuscl");

// build non-clustered index
if (aptr->build_index == 1)
    BuildIndex("idxcusnc");

// Output the NURAND used for the loader into C_FIRST for C_ID =
1,
// C_W_ID = 1, and C_D_ID = 1
sprintf(cmd, "isql -S%s -U%s -P%s -d%s -e -Q\"update customer set
c_first = 'C_LOAD = %d' where c_id = 1 and c_w_id = 1 and c_d_id = 1\" >
logs\\nurand_load.log",
        aptr->server,
        aptr->user,
        aptr->password,
        aptr->database,
        LOADER_NURAND_C);

system(cmd);

SQLFreeStmt(c_hstmt1, SQL_DROP);
SQLDisconnect(c_hdbc1);
SQLFreeConnect(c_hdbc1);

SQLFreeStmt(c_hstmt2, SQL_DROP);
SQLDisconnect(c_hdbc2);
SQLFreeConnect(c_hdbc2);

return;
}

//=====
//
// Function : CustomerBufInit

```

```

//
//=====
void CustomerBufInit()
{
    int    i;

    for (i=0;i<customers_per_district;i++)
    {
        customer_buf[i].c_id = 0;
        customer_buf[i].c_d_id = 0;
        customer_buf[i].c_w_id = 0;

        strcpy(customer_buf[i].c_first,"");
        strcpy(customer_buf[i].c_middle,"");
        strcpy(customer_buf[i].c_last,"");
        strcpy(customer_buf[i].c_street_1,"");
        strcpy(customer_buf[i].c_street_2,"");
        strcpy(customer_buf[i].c_city,"");
        strcpy(customer_buf[i].c_state,"");
        strcpy(customer_buf[i].c_zip,"");
        strcpy(customer_buf[i].c_phone,"");
        strcpy(customer_buf[i].c_credit,"");

        customer_buf[i].c_credit_lim = 0;
        customer_buf[i].c_discount = (float) 0;

        // fix to avoid ODBC float to numeric conversion problem.
        // customer_buf[i].c_balance = 0;
        strcpy(customer_buf[i].c_balance,"");

        customer_buf[i].c_ytd_payment = 0;
        customer_buf[i].c_payment_cnt = 0;
        customer_buf[i].c_delivery_cnt = 0;

        strcpy(customer_buf[i].c_data,"");

        customer_buf[i].h_amount = 0;

        strcpy(customer_buf[i].h_data,"");
    }
}

//=====
//
// Function    : CustomerBufLoad
//
// Fills shared buffer for HISTORY and CUSTOMER
//=====
void CustomerBufLoad(int d_id, int w_id)
{
    long                i;
    CUSTOMER_SORT_STRUCT  c[CUSTOMERS_PER_DISTRICT];

    for (i=0;i<customers_per_district;i++)

```

```

{
    if (i < 1000)
        LastName(i, c[i].c_last);
    else
        LastName(NURand(255,0,999,LOADER_NURAND_C),
c[i].c_last);

    MakeAlphaString(8,16,FIRST_NAME_LEN, c[i].c_first);

    c[i].c_id = i+1;
}

printf("...Loading customer buffer for: d_id = %d, w_id = %d\n",
        d_id, w_id);

for (i=0;i<customers_per_district;i++)
{
    customer_buf[i].c_d_id = d_id;
    customer_buf[i].c_w_id = w_id;
    customer_buf[i].h_amount = 10.0;

    customer_buf[i].c_ytd_payment = 10.0;

    customer_buf[i].c_payment_cnt = 1;
    customer_buf[i].c_delivery_cnt = 0;

    // Generate CUSTOMER and HISTORY data

    customer_buf[i].c_id = c[i].c_id;

    strcpy(customer_buf[i].c_first, c[i].c_first);
    strcpy(customer_buf[i].c_last, c[i].c_last);

    customer_buf[i].c_middle[0] = 'O';
    customer_buf[i].c_middle[1] = 'E';

    MakeAddress(customer_buf[i].c_street_1,
                customer_buf[i].c_street_2,
                customer_buf[i].c_city,
                customer_buf[i].c_state,
                customer_buf[i].c_zip);

    MakeNumberString(16, 16, PHONE_LEN,
customer_buf[i].c_phone);

    if (RandomNumber(1L, 100L) > 10)
        customer_buf[i].c_credit[0] = 'G';
    else
        customer_buf[i].c_credit[0] = 'B';
    customer_buf[i].c_credit[1] = 'C';

    customer_buf[i].c_credit_lim = 50000.0;
    customer_buf[i].c_discount = ((float) RandomNumber(0L,
5000L)) / 10000.0;

    // fix to avoid ODBC float to numeric conversion problem.

    // customer_buf[i].c_balance = -10.0;
    strcpy(customer_buf[i].c_balance,"-10.0");

```



```

        MakeAlphaString(500, 500, C_DATA_LEN,
customer_buf[i].c_data);

        // Generate HISTORY data
        MakeAlphaString(12, 24, H_DATA_LEN,
customer_buf[i].h_data);
    }
}

//=====
//
// Function   : LoadCustomerTable
//
//=====

void LoadCustomerTable(LOADER_TIME_STRUCT *customer_time_start)
{
    int         i;
    long        c_id;
    short       c_d_id;
    short       c_w_id;
    char        c_first[FIRST_NAME_LEN+1];
    char        c_middle[MIDDLE_NAME_LEN+1];
    char        c_last[LAST_NAME_LEN+1];
    char        c_street_1[ADDRESS_LEN+1];
    char        c_street_2[ADDRESS_LEN+1];
    char        c_city[ADDRESS_LEN+1];
    char        c_state[STATE_LEN+1];
    char        c_zip[ZIP_LEN+1];
    char        c_phone[PHONE_LEN+1];
    char        c_credit[CREDIT_LEN+1];
    double      c_credit_lim;
    double      c_discount;

    // fix to avoid ODBC float to numeric conversion problem.

    // double          c_balance;
    char              c_balance[6];

    double          c_ytd_payment;
    short           c_payment_cnt;
    short           c_delivery_cnt;
    char           c_data[C_DATA_LEN+1];
    char           c_since[C_SINCE_LEN+1];
    RETCODE        rc;

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 1);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 2);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT2, 3);
    if (rc != SUCCEED)

```

```

        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_first, 0, FIRST_NAME_LEN, NULL, 0,
0, 4);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_middle, 0, MIDDLE_NAME_LEN, NULL, 0,
0, 5);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_last, 0, LAST_NAME_LEN, NULL, 0, 0,
6);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_street_1, 0, ADDRESS_LEN, NULL, 0,
0, 7);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_street_2, 0, ADDRESS_LEN, NULL, 0, 0,
8);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_city, 0, ADDRESS_LEN, NULL, 0, 0,
9);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_state, 0, STATE_LEN, NULL, 0, 0,
10);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_zip, 0, ZIP_LEN, NULL, 0, 0, 11);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_phone, 0, PHONE_LEN, NULL, 0, 0,
12);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_since, 0, C_SINCE_LEN, NULL, 0,
SQLCHARACTER, 13);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_credit, 0, CREDIT_LEN, NULL, 0, 0,
14);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_credit_lim, 0, SQL_VARLEN_DATA,
NULL, 0, SQLFLT8, 15);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

```

```

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_discount, 0, SQL_VARLEN_DATA, NULL,
0, SQLFLT8, 16);
    if (rc != SUCCEEDED)
        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 != SUCCEEDED)
    //     HandleErrorDBC(c_hdbc1);
    rc = bcp_bind(c_hdbc1, (BYTE *) c_balance, 0, 5, NULL, 0,
SQLCHARACTER, 17);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_ytd_payment, 0, SQL_VARLEN_DATA,
NULL, 0, SQLFLT8, 18);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_payment_cnt, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 19);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) &c_delivery_cnt, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 20);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc1);

    rc = bcp_bind(c_hdbc1, (BYTE *) c_data, 0, 500, NULL, 0, 0, 21);
    if (rc != SUCCEEDED)
        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 != SUCCEEDED)
        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 != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 2);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 3);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 4);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &c_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 5);

```

```

    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &h_date, 0, H_DATE_LEN, NULL, 0,
SQLCHARACTER, 6);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) &h_amount, 0, SQL_VARLEN_DATA, NULL,
0, SQLFLT8, 7);
    if (rc != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = bcp_bind(c_hdbc2, (BYTE *) h_data, 0, H_DATA_LEN, NULL, 0, 0, 8);
    if (rc != SUCCEEDED)
        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 != SUCCEEDED)
            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("idxordc1");
    BuildIndex("idxnodc1");
    BuildIndex("idxodlc1");
}

// initialize bulk copy
sprintf(name, "%s..%s", aptr->database, "orders");

rc = bcp_init(o_hdbc1, name, NULL, "logs\\orders.err", DB_IN);
if (rc != SUCCEEDED)
    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 != SUCCEEDED)
        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 != SUCCEEDED)
    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 != SUCCEEDED)
        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 != SUCCEEDED)
    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 != SUCCEEDED)
        HandleErrorDBC(o_hdbc3);
}

orders_rows_loaded = 0;

```

```

new_order_rows_loaded = 0;
order_line_rows_loaded = 0;

OrdersBufInit();

orders_time_start.time_start = (TimeNow() / MILLI);
new_order_time_start.time_start = (TimeNow() / MILLI);
order_line_time_start.time_start = (TimeNow() / MILLI);

for (w_id = (short)aptr->starting_warehouse; w_id <= aptr-
>num_warehouses; w_id++)
{
    for (d_id = 1; d_id <= DISTRICT_PER_WAREHOUSE; d_id++)
    {
        OrdersBufLoad(d_id, w_id);

        // start parallel loading threads here...

        // start Orders table thread
        printf("...Loading Order Table for: d_id = %d, w_id
= %d\n", d_id, w_id);
        hThread[0] = CreateThread(NULL,
                                0,
(LPTHREAD_START_ROUTINE) LoadOrdersTable,
&orders_time_start,
                                0,
&dwThreadID[0]);

        if (hThread[0] == NULL)
        {
            printf("Error, failed in creating creating
thread = 0.\n");
            exit(-1);
        }

        // start NewOrder table thread
        printf("...Loading New-Order Table for: d_id = %d,
w_id = %d\n", d_id, w_id);
        hThread[1] = CreateThread(NULL,
                                0,
(LPTHREAD_START_ROUTINE) LoadNewOrderTable,
&new_order_time_start,
                                0,
&dwThreadID[1]);

        if (hThread[1] == NULL)
        {
            printf("Error, failed in creating creating
thread = 1.\n");
            exit(-1);
        }

        // start Order-Line table thread
        printf("...Loading Order-Line Table for: d_id = %d,
w_id = %d\n", d_id, w_id);
        hThread[2] = CreateThread(NULL,
                                0,
(LPTHREAD_START_ROUTINE) LoadOrderLineTable,
&order_line_time_start,
                                0,
&dwThreadID[2]);

        if (hThread[2] == NULL)
        {
            printf("Error, failed in creating creating
thread = 2.\n");
            exit(-1);
        }

        WaitForSingleObject( hThread[0], INFINITE );
        WaitForSingleObject( hThread[1], INFINITE );
        WaitForSingleObject( hThread[2], INFINITE );

        if (CloseHandle(hThread[0]) == FALSE)
        {
            printf("Error, failed in closing Orders
thread handle with errno: %d\n", GetLastError());
        }

        if (CloseHandle(hThread[1]) == FALSE)
        {
            printf("Error, failed in closing NewOrder
thread handle with errno: %d\n", GetLastError());
        }

        if (CloseHandle(hThread[2]) == FALSE)
        {
            printf("Error, failed in closing OrderLine
thread handle with errno: %d\n", GetLastError());
        }
    }

    printf("Finished loading orders.\n");

    return;
}

//=====
//
// Function   : OrdersBufInit
//
// Clears shared buffer for ORDERS, NEWORDER, and ORDERLINE

```

```

//
//=====
void OrdersBufInit()
{
    int    i;
    int    j;

    for (i=0;i<orders_per_district;i++)
    {
        orders_buf[i].o_id = 0;
        orders_buf[i].o_d_id = 0;
        orders_buf[i].o_w_id = 0;
        orders_buf[i].o_c_id = 0;
        orders_buf[i].o_carrier_id = 0;
        orders_buf[i].o_ol_cnt = 0;
        orders_buf[i].o_all_local = 0;

        for (j=0;j<=14;j++)
        {
            orders_buf[i].o_ol[j].ol = 0;
            orders_buf[i].o_ol[j].ol_i_id = 0;
            orders_buf[i].o_ol[j].ol_supply_w_id = 0;
            orders_buf[i].o_ol[j].ol_quantity = 0;
            orders_buf[i].o_ol[j].ol_amount = 0;
            strcpy(orders_buf[i].o_ol[j].ol_dist_info,"");
        }
    }
}

//=====
//
// Function   : OrdersBufLoad
//
// Fills shared buffer for ORDERS, NEWORDER, and ORDERLINE
//
//=====
void OrdersBufLoad(int d_id, int w_id)
{
    int    cust[ORDERS_PER_DIST+1];
    long   o_id;
    short  ol;

    printf("...Loading Order Buffer for: d_id = %d, w_id = %d\n",
           d_id, w_id);

    GetPermutation(cust, ORDERS_PER_DIST);

    for (o_id=0;o_id<orders_per_district;o_id++)
    {
        // Generate ORDER and NEW-ORDER data

        orders_buf[o_id].o_d_id = d_id;
        orders_buf[o_id].o_w_id = w_id;
        orders_buf[o_id].o_id = o_id+1;

```

```

        orders_buf[o_id].o_c_id = cust[o_id+1];
        orders_buf[o_id].o_ol_cnt = (short)RandomNumber(5L, 15L);

        if (o_id < first_new_order)
        {
            orders_buf[o_id].o_carrier_id =
(short)RandomNumber(1L, 10L);
            orders_buf[o_id].o_all_local = 1;
        }
        else
        {
            orders_buf[o_id].o_carrier_id = 0;
            orders_buf[o_id].o_all_local = 1;
        }

        for (ol=0; ol<orders_buf[o_id].o_ol_cnt; ol++)
        {
            orders_buf[o_id].o_ol[ol].ol = ol+1;
            orders_buf[o_id].o_ol[ol].ol_i_id =
RandomNumber(1L, max_items);
            orders_buf[o_id].o_ol[ol].ol_supply_w_id = w_id;
            orders_buf[o_id].o_ol[ol].ol_quantity = 5;
            MakeAlphaString(24, 24, OL_DIST_INFO_LEN,
&orders_buf[o_id].o_ol[ol].ol_dist_info);

            // Generate ORDER-LINE data
            if (o_id < first_new_order)
            {
                orders_buf[o_id].o_ol[ol].ol_amount = 0;
                // Added to insure ol_delivery_d set
                properly during load

                FormatDate(&orders_buf[o_id].o_ol[ol].ol_delivery_d);
            }
            else
            {
                orders_buf[o_id].o_ol[ol].ol_amount =
RandomNumber(1,999999)/100.0;
                // Added to insure ol_delivery_d set
                properly during load

                // odbc datetime format

                strcpy(orders_buf[o_id].o_ol[ol].ol_delivery_d,"1899-12-31
12:00:00.000");
            }
        }
    }
}

//=====
//
// Function   : LoadOrdersTable
//
//=====

```

```

void LoadOrdersTable(LOADER_TIME_STRUCT *orders_time_start)
{
    int            i;
    long          o_id;
    short         o_d_id;
    short         o_w_id;
    long          o_c_id;
    short         o_carrier_id;
    short         o_ol_cnt;
    short         o_all_local;
    char          o_entry_d[O_ENTRY_D_LEN+1];
    RETCODE       rc;
    DBINT         rcint;

    // bind ORDER data
    rc = bcp_bind(o_hdbc1, (BYTE *) &o_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 1);
    if (rc != SUCCEED)
        HandleErrorDBC(o_hdbc1);

    rc = bcp_bind(o_hdbc1, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 2);
    if (rc != SUCCEED)
        HandleErrorDBC(o_hdbc1);

    rc = bcp_bind(o_hdbc1, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 3);
    if (rc != SUCCEED)
        HandleErrorDBC(o_hdbc1);

    rc = bcp_bind(o_hdbc1, (BYTE *) &o_c_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 4);
    if (rc != SUCCEED)
        HandleErrorDBC(o_hdbc1);

    rc = bcp_bind(o_hdbc1, (BYTE *) &o_entry_d, 0, O_ENTRY_D_LEN,
NULL, 0, SQLCHARACTER, 5);
    if (rc != SUCCEED)
        HandleErrorDBC(o_hdbc1);

    rc = bcp_bind(o_hdbc1, (BYTE *) &o_carrier_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 6);
    if (rc != SUCCEED)
        HandleErrorDBC(o_hdbc1);

    rc = bcp_bind(o_hdbc1, (BYTE *) &o_ol_cnt, 0, SQL_VARLEN_DATA, NULL,
0, SQLINT2, 7);
    if (rc != SUCCEED)
        HandleErrorDBC(o_hdbc1);

    rc = bcp_bind(o_hdbc1, (BYTE *) &o_all_local, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 8);
    if (rc != SUCCEED)
        HandleErrorDBC(o_hdbc1);

    for (i = 0; i < orders_per_district; i++)
    {
        o_id          = orders_buf[i].o_id;
        o_d_id        = orders_buf[i].o_d_id;
        o_w_id        = orders_buf[i].o_w_id;
        o_c_id        = orders_buf[i].o_c_id;

```

```

        o_carrier_id = orders_buf[i].o_carrier_id;
        o_ol_cnt     = orders_buf[i].o_ol_cnt;
        o_all_local  = orders_buf[i].o_all_local;

        FormatDate(&o_entry_d);

        // send data to server
        rc = bcp_sendrow(o_hdbc1);
        if (rc != SUCCEED)
            HandleErrorDBC(o_hdbc1);

        orders_rows_loaded++;
        CheckForCommit(o_hdbc1, o_hstmt1, orders_rows_loaded,
"orders", &orders_time_start->time_start);
    }

    // rcint = bcp_batch(o_hdbc1);
    // if (rcint < 0)
    //     HandleErrorDBC(o_hdbc1);

    if ((o_w_id == aptr->num_warehouses) && (o_d_id == 10))
    {
        rcint = bcp_done(o_hdbc1);
        if (rcint < 0)
            HandleErrorDBC(o_hdbc1);

        SQLFreeStmt(o_hstmt1, SQL_DROP);
        SQLDisconnect(o_hdbc1);
        SQLFreeConnect(o_hdbc1);

        // if build index after load...
        if ((aptr->build_index == 1) && (aptr->index_order == 0))
            BuildIndex("idxordc1");

        // 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 != SUCCEEDED)
        HandleErrorDBC(o_hdbc2);

    rc = bcp_bind(o_hdbc2, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 2);
    if (rc != SUCCEEDED)
        HandleErrorDBC(o_hdbc2);

    rc = bcp_bind(o_hdbc2, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 3);
    if (rc != SUCCEEDED)
        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 != SUCCEEDED)
            HandleErrorDBC(o_hdbc2);

        new_order_rows_loaded++;
        CheckForCommit(o_hdbc2, o_hstmt2, new_order_rows_loaded,
"new_order", &new_order_time_start->time_start);
    }

    // rcint = bcp_batch(o_hdbc2);
    // if (rcint < 0)
    //     HandleErrorDBC(o_hdbc2);

    if ((o_w_id == aptr->num_warehouses) && (o_d_id == 10))
    {
        rcint = bcp_done(o_hdbc2);
        if (rcint < 0)
            HandleErrorDBC(o_hdbc2);

        SQLFreeStmt(o_hstmt2, SQL_DROP);
        SQLDisconnect(o_hdbc2);
        SQLFreeConnect(o_hdbc2);

        // if build index after load...
        if ((aptr->build_index == 1) && (aptr->index_order == 0))
            BuildIndex("idxnodcl");
    }
}

//=====
//
// Function   : LoadOrderLineTable
//
//=====

void LoadOrderLineTable(LOADER_TIME_STRUCT *order_line_time_start)
{
    int      i,j;
    long     o_id;

```

```

    short     o_d_id;
    short     o_w_id;
    long      ol;
    long      ol_i_id;
    short     ol_supply_w_id;
    short     ol_quantity;
    double    ol_amount;
    char      ol_dist_info[DIST_INFO_LEN+1];
    char      ol_delivery_d[OL_DELIVERY_D_LEN+1];
    RETCODE   rc;
    DBINT     rcint;

    // bind ORDER-LINE data
    rc = bcp_bind(o_hdbc3, (BYTE *) &o_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 1);
    if (rc != SUCCEEDED)
        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &o_d_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 2);
    if (rc != SUCCEEDED)
        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &o_w_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT2, 3);
    if (rc != SUCCEEDED)
        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 4);
    if (rc != SUCCEEDED)
        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_i_id, 0, SQL_VARLEN_DATA, NULL, 0,
SQLINT4, 5);
    if (rc != SUCCEEDED)
        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_supply_w_id, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 6);
    if (rc != SUCCEEDED)
        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_delivery_d, 0,
OL_DELIVERY_D_LEN, NULL, 0, SQLCHARACTER, 7);
    if (rc != SUCCEEDED)
        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_quantity, 0, SQL_VARLEN_DATA,
NULL, 0, SQLINT2, 8);
    if (rc != SUCCEEDED)
        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) &ol_amount, 0, SQL_VARLEN_DATA, NULL,
0, SQLFLT8, 9);
    if (rc != SUCCEEDED)
        HandleErrorDBC(o_hdbc3);

    rc = bcp_bind(o_hdbc3, (BYTE *) ol_dist_info, 0, DIST_INFO_LEN, NULL,
0, 0, 10);
    if (rc != SUCCEEDED)

```

```

        HandleErrorDBC(o_hdbc3);
    for (i = 0; i < orders_per_district; i++)
    {
        o_id    = orders_buf[i].o_id;
        o_d_id  = orders_buf[i].o_d_id;
        o_w_id  = orders_buf[i].o_w_id;

        for (j=0; j < orders_buf[i].o_ol_cnt; j++)
        {
            ol            = orders_buf[i].o_ol[j].ol;
            ol_i_id      = orders_buf[i].o_ol[j].ol_i_id;
            ol_supply_w_id =
orders_buf[i].o_ol[j].ol_supply_w_id;
            ol_quantity  = orders_buf[i].o_ol[j].ol_quantity;
            ol_amount    = orders_buf[i].o_ol[j].ol_amount;

            strcpy(ol_delivery_d,orders_buf[i].o_ol[j].ol_delivery_d);

            strcpy(ol_dist_info,orders_buf[i].o_ol[j].ol_dist_info);

            rc = bcp_sendrow(o_hdbc3);
            if (rc != SUCCEED)
                HandleErrorDBC(o_hdbc3);

            order_line_rows_loaded++;
            CheckForCommit(o_hdbc3, o_hstmt3,
order_line_rows_loaded, "order_line", &order_line_time_start->time_start);
        }

        // rcint = bcp_batch(o_hdbc3);
        // if (rcint < 0)
        //     HandleErrorDBC(o_hdbc3);

        if ((o_w_id == aptr->num_warehouses) && (o_d_id == 10))
        {
            rcint = bcp_done(o_hdbc3);
            if (rcint < 0)
                HandleErrorDBC(o_hdbc3);

            SQLFreeStmt(o_hstmt3, SQL_DROP);
            SQLDisconnect(o_hdbc3);
            SQLFreeConnect(o_hdbc3);

            // if build index after load...
            if ((aptr->build_index == 1) && (aptr->index_order == 0))
                BuildIndex("idxodlcl");
        }
    }

//=====
//
// Function  : GetPermutation
//

```

```

//=====
void GetPermutation(int perm[], int n)
{
    int i, r, t;

    for (i=1;i<=n;i++)
        perm[i] = i;

    for (i=1;i<=n;i++)
    {
        r = RandomNumber(i,n);
        t = perm[i];
        perm[i] = perm[r];
        perm[r] = t;
    }
}

//=====
//
// Function  : CheckForCommit
//
//=====
void CheckForCommit(HDBC hdbc,
                    HSTMT hstmt,
                    int rows_loaded,
                    char *table_name,
                    long *time_start)
{
    long        time_end, time_diff;
               // DBINT        rcint;

    if ( !(rows_loaded % aptr->batch) )
    {
        // rcint = bcp_batch(hdbc);
        // if (rcint < 0)
        //     HandleErrorDBC(hdbc);

        time_end = (TimeNow() / MILLI);
        time_diff = time_end - *time_start;

        printf("-> Loaded %ld rows into %s in %ld sec - Total = %d
(%0.2f rps)\n",
                    aptr->batch,
                    table_name,
                    time_diff,
                    rows_loaded,
                    (float) aptr->batch / (time_diff ? time_diff
: 1L));

        *time_start = time_end;
    }

    return;
}

```



```

//=====
//
// Function   : OpenConnections
//
//=====

void OpenConnections()
{
    RETCODE      rc;

    char          szDriverString[300];
    char          szDriverStringOut[1024];
    SQLSMALLINT   cbDriverStringOut;

    SQLAllocHandle(SQL_HANDLE_ENV, SQL_NULL_HANDLE, &henv );
    SQLSetEnvAttr(henv, SQL_ATTR_ODBC_VERSION, (void*)SQL_OV_ODBC3, 0
);

    SQLAllocHandle(SQL_HANDLE_DBC, henv , &i_hdbc1);
    SQLAllocHandle(SQL_HANDLE_DBC, henv , &w_hdbc1);
    SQLAllocHandle(SQL_HANDLE_DBC, henv , &c_hdbc1);
    SQLAllocHandle(SQL_HANDLE_DBC, henv , &c_hdbc2);
    SQLAllocHandle(SQL_HANDLE_DBC, henv , &o_hdbc1);
    SQLAllocHandle(SQL_HANDLE_DBC, henv , &o_hdbc2);
    SQLAllocHandle(SQL_HANDLE_DBC, henv , &o_hdbc3);

    SQLSetConnectAttr(i_hdbc1, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );
    SQLSetConnectAttr(w_hdbc1, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );
    SQLSetConnectAttr(c_hdbc1, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );
    SQLSetConnectAttr(c_hdbc2, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );
    SQLSetConnectAttr(o_hdbc1, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );
    SQLSetConnectAttr(o_hdbc2, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );
    SQLSetConnectAttr(o_hdbc3, SQL_COPT_SS_BCP, (void *)SQL_BCP_ON,
SQL_IS_INTEGER );

    // Open connections to SQL Server

    // Connection 1

    sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
            aptr->server,
            aptr->user,
            aptr->password,
            aptr->database );

    rc = SQLSetConnectOption (i_hdbc1, SQL_PACKET_SIZE, aptr-
>pack_size);
    if (rc != SUCCEED)
        HandleErrorDBC(i_hdbc1);
}

```

```

rc = SQLDriverConnect ( i_hdbc1,
                        NULL,
                        (SQLCHAR*)&szDriverString[0]
                        ,
                        SQL_NTS,
                        (SQLCHAR*)&szDriverStringOut[0] ,
                        sizeof(szDriverStringOut) ,
                        &cbDriverStringOut,
                        SQL_DRIVER_NOPROMPT );

    if (rc != SUCCEED)
        HandleErrorDBC(i_hdbc1);

    // Connection 2

    sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
            aptr->server,
            aptr->user,
            aptr->password,
            aptr->database );

    rc = SQLSetConnectOption (w_hdbc1, SQL_PACKET_SIZE, aptr-
>pack_size);
    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    rc = SQLDriverConnect ( w_hdbc1,
                        NULL,
                        (SQLCHAR*)&szDriverString[0] ,
                        SQL_NTS,
                        (SQLCHAR*)&szDriverStringOut[0] ,
                        sizeof(szDriverStringOut) ,
                        &cbDriverStringOut,
                        SQL_DRIVER_NOPROMPT
);

    if (rc != SUCCEED)
        HandleErrorDBC(w_hdbc1);

    // Connection 3

    sprintf( szDriverString , "DRIVER={SQL
Server};SERVER=%s;UID=%s;PWD=%s;DATABASE=%s" ,
            aptr->server,
            aptr->user,
            aptr->password,
            aptr->database );

    rc = SQLSetConnectOption (c_hdbc1, SQL_PACKET_SIZE, aptr-
>pack_size);
    if (rc != SUCCEED)
        HandleErrorDBC(c_hdbc1);

    rc = SQLDriverConnect ( c_hdbc1,
                        NULL,
                        (SQLCHAR*)&szDriverString[0] ,
                        SQL_NTS,

```

```

        (SQLCHAR*)&szDriverStringOut[0],
        sizeof(szDriverStringOut),
        &cbDriverStringOut,
        SQL_DRIVER_NOPROMPT
    );
    if (rc != SUCCEEDED)
        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 != SUCCEEDED)
        HandleErrorDBC(c_hdbc2);

    rc = SQLDriverConnect ( c_hdbc2,
                            NULL,
                            (SQLCHAR*)&szDriverString[0] ,
                            SQL_NTS,
                            (SQLCHAR*)&szDriverStringOut[0] ,
                            sizeof(szDriverStringOut),
                            &cbDriverStringOut,
                            SQL_DRIVER_NOPROMPT
    );
    if (rc != SUCCEEDED)
        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 != SUCCEEDED)
        HandleErrorDBC(o_hdbc1);

    rc = SQLDriverConnect ( o_hdbc1,
                            NULL,
                            (SQLCHAR*)&szDriverString[0] ,
                            SQL_NTS,
                            (SQLCHAR*)&szDriverStringOut[0] ,

```

```

        sizeof(szDriverStringOut),
        &cbDriverStringOut,
        SQL_DRIVER_NOPROMPT
    );
    if (rc != SUCCEEDED)
        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 != SUCCEEDED)
        HandleErrorDBC(o_hdbc2);

    rc = SQLDriverConnect ( o_hdbc2,
                            NULL,
                            (SQLCHAR*)&szDriverString[0] ,
                            SQL_NTS,
                            (SQLCHAR*)&szDriverStringOut[0] ,
                            sizeof(szDriverStringOut),
                            &cbDriverStringOut,
                            SQL_DRIVER_NOPROMPT
    );
    if (rc != SUCCEEDED)
        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 != SUCCEEDED)
        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;
}

```


Appendix C - Tunable Parameters

Microsoft SQL Server Startup Parameters

```
C:\MSSQL\BINN\SQLSERVR.EXE -c -x -t3502
```

Where:

- -c Start SQL Server independently of the Service Control Manager
- -x Disables the keeping of CPU time and cache hit ratio statistics
- -t3502 Writes a message to the SQL Server Errorlog showing the beginning and ending time of each checkpoint

SQL Server Stack Size

The default stack size for Microsoft SQL Server 7.0 was changed using the EDITBIN utility. The EDITBIN utility ships with Microsoft Visual C++ V4.0. The command used to change the stack size is:

```
editbin /S: 131072 sqlservr.exe
```

This command is fully documented as an article in the Microsoft Knowledge Base on the Microsoft Web Site at www.microsoft.com/support.

BOOT.INI

The /3gb switch was added to the boot.ini file to cause Windows NT Enterprise Edition to allow 3GB of user and 1GB of kernel virtual address space, rather than the usual 2GB of virtual address space for each.

Microsoft SQL Server Configuration Parameters

```
1> 2> 3> 4> 5> 6> 7> 8> 9> 10> 11>
-- File:      VERSION.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.00
--           Copyright Microsoft, 1996
-- Purpose:   Returns SQL Server version string
```

```
print " "
select convert(char(30), getdate(),9)
print " "
```

```
-----
Nov  2 1998  1:15:30:030PM
```

(1 row affected)

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

```
-----
-----
-----
-----
Microsoft SQL Server  7.00 - 7.00.549 (Intel X86)
Aug 18 1998 15:05:22
Cop
yright (c) 1988-1998 Microsoft Corporation
Enterprise Edition on Windo
ws NT 4.0 (Build 1381: Service Pack 4, RC 1.99)
```

(1 row affected)

```
1> 2>
1> 2> 3> 4> 5> 6> 7> 8> 9> 10>
-- File:      CONFIG.SQL
--           Microsoft TPC-C Benchmark Kit Ver. 4.00
--           Copyright Microsoft, 1996
-- Purpose:   Collects SQL Server configuration parameters
```

```
print " "
select convert(char(30), getdate(),9)
print " "
```

```
-----
Nov  2 1998  1:15:31:920PM
```

(1 row affected)

```
1> 2> 3> DBCC execution completed. If DBCC printed error messages, contact
your system administrator.
```

Configuration option changed. Run the RECONFIGURE statement to install.

```
sp_configure "show advanced",1
1> 2> reconfigure with override
1> 2> sp_configure
```

name	minimum	maximum	config_value	run_value

affinity mask				
0 2147483647		15		15
allow updates				
0 1		0		0
cost threshold for parallelism				
0 32767		5		5
cursor threshold				
-1 2147483647		-1		-1
default language				
0 9999		0		0
default sortorder id				
0 255		50		50
extended memory size (MB)				
0 2147483647		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 async IO				
1 255		255		255
max degree of parallelism				
0 32		1		1
max server memory (MB)				
4 2147483647 2147483647		2147483647		2147483647
max text repl size (B)				
0 2147483647		65536		65536
max worker threads				
10 1024		232		232
media retention				
0 365		0		0
min memory per query (KB)				
512 2147483647		512		512
min server memory (MB)				
0 2147483647		0		0
nested triggers				
0 1		0		0
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		30		30
remote proc trans				
0 1		0		0
remote query timeout (s)				
0 2147483647		0		0
resource timeout (s)				
5 2147483647		10		10
scan for startup procs				
0 1		0		0
set working set size				
0 1		0		0
show advanced options				
0 1		1		1
spin counter				
1 2147483647		10000		10000
time slice (ms)				
50 1000		100		100
Unicode comparison style				
0 2147483647		0		0
Unicode locale id				
0 2147483647		33280		33280
user connections				
0 32767		270		270
user options				
0 4095		0		0

1>

Internal RAID Configuration Parameters

```
*****
*           MYLEX Disk Array Controller - Configuration Utility
*
*           Version 4.76
*
*****

CONFIGURATION INFORMATION OF :
=====

3 Channel - 15 Target DAC1164P #1 Firmware version 5.06

PHYSICAL PACK INFORMATION :
=====

Number of Packs = 1
```

Pack 0 : [0:0] [1:0]

SYSTEM DRIVE INFORMATION :
=====

Number of System Drives = 1

Sys Drv #	Phy. Size	Raid Level	Eff. Size	Write Policy
0	104194 MB	1	52097 MB	Write Thru

 * MYLEX Disk Array Controller - Configuration Utility
 *
 * Version 4.76
 *

CONFIGURATION INFORMATION OF :
=====

3 Channel - 15 Target DAC1164P #2 Firmware version 5.06

PHYSICAL PACK INFORMATION :
=====

Number of Packs = 4

Pack 0	: [0:0]	[0:1]	[0:2]	[0:3]	[0:4]	[0:5]	[0:6]
Pack 1	: [0:8]	[0:9]	[0:10]	[0:11]	[0:12]	[0:13]	[0:14]
Pack 2	: [1:0]	[1:1]	[1:2]	[1:3]	[1:4]	[1:5]	[1:6]
Pack 3	: [1:8]	[1:9]	[1:10]	[1:11]	[1:12]	[1:13]	[1:14]

SYSTEM DRIVE INFORMATION :
=====

Number of System Drives = 1

Sys Drv #	Phy. Size	Raid Level	Eff. Size	Write Policy
0	243124 MB	0	243124 MB	Write Thru

 * MYLEX Disk Array Controller - Configuration Utility
 *
 * Version 4.76
 *

CONFIGURATION INFORMATION OF :
=====

3 Channel - 15 Target DAC1164P #3 Firmware version 5.06

PHYSICAL PACK INFORMATION :
=====

Number of Packs = 5

Pack 0	: [0:0]	[0:1]	[0:2]	[0:3]	[0:4]	[0:5]	[0:6]
Pack 1	: [0:8]	[0:9]	[0:10]	[0:11]	[0:12]	[0:13]	[0:14]
Pack 2	: [1:0]	[1:1]	[1:2]	[1:3]	[1:4]	[1:5]	[1:6]
Pack 3	: [1:8]	[1:9]	[1:10]	[1:11]	[1:12]	[1:13]	[1:14]
Pack 4	: [2:0]	[2:1]	[2:2]	[2:3]	[2:4]	[2:5]	[2:6]

SYSTEM DRIVE INFORMATION :
=====

Number of System Drives = 2

Sys Drv #	Phy. Size	Raid Level	Eff. Size	Write Policy
0	243124 MB	0	243124 MB	Write Thru
1	69464 MB	5	60781 MB	Write Back

 * MYLEX Disk Array Controller - Configuration Utility
 *
 * Version 4.76
 *

CONFIGURATION INFORMATION OF :
=====

3 Channel - 15 Target DAC1164P #4 Firmware version 5.06

PHYSICAL PACK INFORMATION :
=====

Number of Packs = 4

Pack 0	: [0:0]	[0:1]	[0:2]	[0:3]	[0:4]	[0:5]	[0:6]
Pack 1	: [0:8]	[0:9]	[0:10]	[0:11]	[0:12]	[0:13]	[0:14]
Pack 2	: [1:0]	[1:1]	[1:2]	[1:3]	[1:4]	[1:5]	[1:6]
Pack 3	: [1:8]	[1:9]	[1:10]	[1:11]	[1:12]	[1:13]	[1:14]

SYSTEM DRIVE INFORMATION :
=====

Number of System Drives = 1

Sys Drv #	Phy. Size	Raid Level	Eff. Size	Write Policy
0	243124 MB	0	243124 MB	Write Thru

```

*****
*           MYLEX Disk Array Controller - Configuration Utility
*
*           Version 4.76
*
*****

```

CONFIGURATION INFORMATION OF :
=====

3 Channel - 15 Target DAC1164P #5 Firmware version 5.06

PHYSICAL PACK INFORMATION :
=====

Number of Packs = 4

```

Pack 0 : [0:0] [0:1] [0:2] [0:3] [0:4] [0:5] [0:6]
Pack 1 : [0:8] [0:9] [0:10] [0:11] [0:12] [0:13] [0:14]
Pack 2 : [1:0] [1:1] [1:2] [1:3] [1:4] [1:5] [1:6]
Pack 3 : [1:8] [1:9] [1:10] [1:11] [1:12] [1:13] [1:14]

```

SYSTEM DRIVE INFORMATION :
=====

Number of System Drives = 1

Sys Drv #	Phy. Size	Raid Level	Eff. Size	Write Policy
0	243124 MB	0	243124 MB	Write Thru

```

*****
*           MYLEX Disk Array Controller - Configuration Utility
*
*           Version 4.76
*
*****

```

CONFIGURATION INFORMATION OF :
=====

3 Channel - 15 Target DAC1164P #6 Firmware version 5.06

PHYSICAL PACK INFORMATION :
=====

Number of Packs = 5

```

Pack 0 : [0:0] [0:1] [0:2] [0:3] [0:4] [0:5] [0:6]
Pack 1 : [0:8] [0:9] [0:10] [0:11] [0:12] [0:13] [0:14]
Pack 2 : [1:0] [1:1] [1:2] [1:3] [1:4] [1:5] [1:6]

```

```

Pack 3 : [1:8] [1:9] [1:10] [1:11] [1:12] [1:13] [1:14]
Pack 4 : [2:0] [2:1] [2:2] [2:3] [2:4] [2:5] [2:6] [2:8]

```

SYSTEM DRIVE INFORMATION :
=====

Number of System Drives = 2

Sys Drv #	Phy. Size	Raid Level	Eff. Size	Write Policy
0	243124 MB	0	243124 MB	Write Thru
1	69464 MB	5	60781 MB	Write Back

External RAID Configuration Parameters

```

*****
*           Unisys Ultra-Wide RAID Controller OSM1000-C32
*
*****

```

CPU type: 5x86-133 (WB)

Firmware version 1.31G
Bootcode version 1.12B

Total cache: 32 MB

```

- Cache      Write Back:      enabled
              optimization:  sequential (128K stripe size)

- Raid       Rebuild Priority: low
              Write Priority:  on Initialization:  disabled
                              on Rebuild:      disabled
                              on Normal:      disabled

```

Logical Volume Partition table

Volume ID1	Capacity	RAID 0	# drives:
52098 MB			6

Host LUN Assignment

SCSI Chl	LUN	LVIDx	PortIdx	Capacity
0	0	0	0	52098 MB

Physical Drives

Id	Slot	Chl	Id	Capacity	Status	XferRate	Vendor/Product
		Firmware					
00640ST19101W	0	8B04	0	8683 MB	online	41.7 MB	UNISYS
00640ST19101W	0	8B04	1	8683 MB	online	41.7 MB	UNISYS

00640ST19101W	0	2	8683 MB	online	41.7 MB	UNISYS
	8B04					
00640ST19101W	0	3	8683 MB	online	41.7 MB	UNISYS
	8B04					
00640ST19101W	0	4	8683 MB	online	41.7 MB	UNISYS
	8B04					
00640ST19101W	0	5	8683 MB	online	41.7 MB	UNISYS
	8B04					

Configuration of Log Drives

A single Mylex DAC1164P RAID controller was used in the SUT for the mirrored log drives. Half of the drives were in one disk cage connected to one channel of the controller and half were in a second disk cage connected to a second channel of the controller. The controller implemented the RAID 1 mirroring across the two channels. Write caching was disabled on both the controller and on all the physical drives themselves.

One OSM1000-100 SCSI-to-SCSI RAID controller was used in each of the two log disk cages. Each of these controllers implemented RAID 0 striping on the six 9GB drives that were in each disk cage, so that the Mylex controller in the SUT saw just two large 'disks'. Each of the IFT controllers had a 32MB cache. Configuration options were set for Write Back caching and Optimized for Sequential IO. The IFT controllers used an algorithm that ensured that cached write data was held for no more than a fraction of a minute before being written to the physical drives.

For the priced configuration, each of the disk cages contained two redundant power supplies. Only one was required to be functional to keep the ITF controller and disk drives operational. A UPS was priced to provide power to one power supply in each disk cage. The second power supply in each disk cage was connected to normal wall power. Thus neither interruption of power or failure of the UPS would affect the two log disk cages (or their IFT controllers and disks). Since the two disk cages were completely independent of each other, this configuration ensured that there was no single point of failure in writing to the log.

NT Server Configuration Information

Microsoft Diagnostics Report For \\AVALON4

OS Version Report

Microsoft (R) Windows NT (TM) Server
Version 4.0 (Build 1381: Service Pack 4, RC 1.99) x86 Multiprocessor Free
Registered Owner: SAM&M, Unisys Corporation
Product Number: 70234-810-6895975-67328

System Report

System: AT/AT COMPATIBLE
Hardware Abstraction Layer: MPS 1.4 - APIC platform
BIOS Date: 09/02/98
BIOS Version: SC450NX - PhoenixBIOS 4.0 Releas

Processor list:

0: x86 Family 6 Model 5 Stepping 2 GenuineIntel ~400 Mhz
1: x86 Family 6 Model 5 Stepping 2 GenuineIntel ~400 Mhz
2: x86 Family 6 Model 5 Stepping 2 GenuineIntel ~400 Mhz
3: x86 Family 6 Model 5 Stepping 2 GenuineIntel ~400 Mhz

Video Display Report

BIOS Date: 06/05/97
BIOS Version: CL-GD5480 PCI VGA BIOS Version 1.00

Adapter:

Setting: 1024 x 768 x 65536
75 Hz
Type: cirrus compatible display adapter
String: Cirrus Logic Compatible
Memory: 2 MB
Chip Type: Cirrus Logic 5446
DAC Type: Integrated RAMDAC

Driver:

Vendor: Microsoft Corporation
File(s): cirrus.sys, vga.dll, cirrus.dll, vga256.dll, vga64K.dll
Version: 4.00, 4.0.0

Drives Report

C:\ (Local - FAT) SYSTEM Total: 2,096,160KB, Free: 1,055,424KB
Serial Number: F035 - 8AA4
Bytes per cluster: 512
Sectors per cluster: 64
Filename length: 255
R:\ (Local - NTFS) BACK1 Total: 62,239,724KB, Free: 2,631,304KB
Serial Number: 8834 - 444B
Bytes per cluster: 512
Sectors per cluster: 8
Filename length: 255
S:\ (Local - NTFS) BACK2 Total: 62,239,724KB, Free: 2,567,704KB
Serial Number: 983F - 5BFB
Bytes per cluster: 512

Sectors per cluster: 8
 Filename length: 255
 Z:\ (Local - NTFS) testfiles Total: 2,345,488KB, Free: 896,996KB
 Serial Number: B0C5 - 33C8
 Bytes per cluster: 512
 Sectors per cluster: 8
 Filename length: 255

Memory Report

 Handles: 2,289
 Threads: 116
 Processes: 19

Physical Memory (K)
 Total: 3,865,000
 Available: 635,944
 File Cache: 12,496

Kernel Memory (K)
 Total: 14,332
 Paged: 8,944
 Nonpaged: 5,388

Commit Charge (K)
 Total: 3,086,236
 Limit: 3,987,108
 Peak: 3,098,900

Pagefile Space (K)
 Total: 273,408
 Total in use: 8,800
 Peak: 8,820

C:\pagefile.sys
 Total: 273,408
 Total in use: 8,800
 Peak: 8,820

Services Report

 Alerter Stopped (Manual)
 C:\WINNT\System32\services.exe
 Service Account Name: LocalSystem
 Error Severity: Normal
 Service Flags: Shared Process
 Service Dependencies:
 LanmanWorkstation
 Computer Browser Stopped (Manual)
 C:\WINNT\System32\services.exe
 Service Account Name: LocalSystem
 Error Severity: Normal
 Service Flags: Shared Process
 Service Dependencies:
 LanmanWorkstation
 LanmanServer
 LmHosts

ClipBook Server Stopped (Manual)
 C:\WINNT\system32\clipsrv.exe
 Service Account Name: LocalSystem
 Error Severity: Normal
 Service Flags: Own Process
 Service Dependencies:
 NetDDE
 PCI Hot Plug Service Stopped (Disabled)
 C:\WINNT\System32\cpqphps.exe
 Service Account Name: LocalSystem
 Error Severity: Normal
 Service Flags: Own Process
 DHCP Client (TDI) Stopped (Disabled)
 C:\WINNT\System32\services.exe
 Service Account Name: LocalSystem
 Error Severity: Normal
 Service Flags: Shared Process
 Service Dependencies:
 Tcpip
 Afd
 NetBT
 EventLog (Event log) Running (Automatic)
 C:\WINNT\system32\services.exe
 Service Account Name: LocalSystem
 Error Severity: Normal
 Service Flags: Shared Process
 Server Running (Automatic)
 C:\WINNT\System32\services.exe
 Service Account Name: LocalSystem
 Error Severity: Normal
 Service Flags: Shared Process
 Group Dependencies:
 TDI
 Workstation (NetworkProvider) Running (Automatic)
 C:\WINNT\System32\services.exe
 Service Account Name: LocalSystem
 Error Severity: Normal
 Service Flags: Shared Process
 Group Dependencies:
 TDI
 License Logging Service Stopped (Manual)
 C:\WINNT\System32\llssrv.exe
 Service Account Name: LocalSystem
 Error Severity: Normal
 Service Flags: Own Process
 TCP/IP NetBIOS Helper Stopped (Manual)
 C:\WINNT\System32\services.exe
 Service Account Name: LocalSystem
 Error Severity: Normal
 Service Flags: Shared Process
 Group Dependencies:
 NetworkProvider
 Messenger Stopped (Manual)
 C:\WINNT\System32\services.exe
 Service Account Name: LocalSystem
 Error Severity: Normal
 Service Flags: Shared Process
 Service Dependencies:
 LanmanWorkstation

NetBios					
MSDTC (MS Transactions)	Stopped	(Manual)	Remote Procedure Call (RPC) Locator	Stopped	(Manual)
C:\WINNT\System32\msdtc.exe			C:\WINNT\System32\LOCATOR.EXE		
Service Account Name: LocalSystem			Service Account Name: LocalSystem		
Error Severity: Normal			Error Severity: Normal		
Service Flags: Own Process			Service Flags: Own Process		
Service Dependencies:			Service Dependencies:		
RPCSS			LanmanWorkstation		
NTLMSSP			Rdr		
MSSQLServer	Stopped	(Manual)	Remote Procedure Call (RPC) Service	Running	(Automatic)
C:\MSSQL7\binn\sqlservr.exe			C:\WINNT\system32\RpcSs.exe		
Service Account Name: LocalSystem			Service Account Name: LocalSystem		
Error Severity: Normal			Error Severity: Normal		
Service Flags: Own Process			Service Flags: Own Process		
Network DDE (NetDDEGroup)	Stopped	(Manual)	Schedule	Stopped	(Manual)
C:\WINNT\system32\netdde.exe			C:\WINNT\System32\AtSvc.Exe		
Service Account Name: LocalSystem			Service Account Name: LocalSystem		
Error Severity: Normal			Error Severity: Normal		
Service Flags: Shared Process			Service Flags: Own Process		
Service Dependencies:			SNMP	Stopped	(Disabled)
NetDDEDSDM			C:\WINNT\System32\snmp.exe		
Network DDE DSDM	Stopped	(Manual)	Service Account Name: LocalSystem		
C:\WINNT\system32\netdde.exe			Error Severity: Normal		
Service Account Name: LocalSystem			Service Flags: Own Process		
Error Severity: Normal			Service Dependencies:		
Service Flags: Shared Process			Tcpip		
Service Dependencies:			EventLog		
NetLogon (RemoteValidation)	Stopped	(Manual)	SNMP Trap Service	Stopped	(Disabled)
C:\WINNT\System32\lsass.exe			C:\WINNT\System32\snmptrap.exe		
Service Account Name: LocalSystem			Service Account Name: LocalSystem		
Error Severity: Normal			Error Severity: Normal		
Service Flags: Shared Process			Service Flags: Own Process		
Service Dependencies:			Service Dependencies:		
LanmanWorkstation			Tcpip		
LmHosts			EventLog		
NT LM Security Support Provider	Running	(Manual)	Spooler (SpoolerGroup)	Stopped	(Manual)
C:\WINNT\System32\SERVICES.EXE			C:\WINNT\system32\spoolss.exe		
Service Account Name: LocalSystem			Service Account Name: LocalSystem		
Error Severity: Normal			Error Severity: Normal		
Service Flags: Shared Process			Service Flags: Own Process, Interactive		
Plug and Play (PlugPlay)	Running	(Automatic)	SQLServerAgent	Stopped	(Manual)
C:\WINNT\system32\services.exe			C:\MSSQL7\binn\sqlagent.exe		
Service Account Name: LocalSystem			Service Account Name: LocalSystem		
Error Severity: Normal			Error Severity: Normal		
Service Flags: Shared Process			Service Flags: Own Process		
Protected Storage	Running	(Automatic)	Service Dependencies:		
C:\WINNT\System32\pstores.exe			MSSQLServer		
Service Account Name: LocalSystem			Telephony Service	Stopped	(Manual)
Error Severity: Normal			C:\WINNT\system32\tapisrv.exe		
Service Flags: Own Process, Interactive			Service Account Name: LocalSystem		
Service Dependencies:			Error Severity: Normal		
RPCSS			Service Flags: Own Process		
Directory Replicator	Stopped	(Manual)	UPS	Stopped	(Manual)
C:\WINNT\System32\lmrepl.exe			C:\WINNT\System32\ups.exe		
Service Account Name: LocalSystem			Service Account Name: LocalSystem		
Error Severity: Normal			Error Severity: Normal		
Service Flags: Own Process			Service Flags: Own Process		
Service Dependencies:					
LanmanWorkstation					
LanmanServer					

Drivers Report

Abiosdsk (Primary disk)	Stopped	(Disabled)
Error Severity: Ignore		
Service Flags: Kernel Driver, Shared Process		
AFD Networking Support Environment (TDI)	Running	(Automatic)
C:\WINNT\System32\drivers\afd.sys		
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
Aha154x (SCSI miniport)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
Aha174x (SCSI miniport)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
aic78xx (SCSI miniport)	Stopped	(Boot)
C:\WINNT\System32\DRIVERS\aic78xx.sys		
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
Always (SCSI miniport)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
ami0nt (SCSI miniport)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
amsint (SCSI miniport)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
Arrow (SCSI miniport)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
atapi (SCSI miniport)	Stopped	(Boot)
C:\WINNT\System32\DRIVERS\atapi.sys		
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
Atdisk (Primary disk)	Stopped	(Disabled)
Error Severity: Ignore		
Service Flags: Kernel Driver, Shared Process		
ati (Video)	Stopped	(Disabled)
Error Severity: Ignore		
Service Flags: Kernel Driver, Shared Process		
Beep (Base)	Running	(System)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
BusLogic (SCSI miniport)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
Busmouse (Pointer Port)	Stopped	(Disabled)
Error Severity: Ignore		
Service Flags: Kernel Driver, Shared Process		
Cdaudio (Filter)	Stopped	(System)
Error Severity: Ignore		
Service Flags: Kernel Driver, Shared Process		
Cdfs (File system)	Running	(Disabled)
Error Severity: Normal		
Service Flags: File System Driver, Shared Process		
Group Dependencies:		
SCSI CDROM Class		
Cdrom (SCSI CDROM Class)	Running	(System)

Error Severity: Ignore		
Service Flags: Kernel Driver, Shared Process		
Group Dependencies:		
SCSI miniport		
Changer (Filter)	Stopped	(System)
Error Severity: Ignore		
Service Flags: Kernel Driver, Shared Process		
cirrus (Video)	Running	(System)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
Cpqarray (SCSI miniport)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
cpqfw2e (SCSI miniport)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
dac960nt (SCSI miniport)	Running	(Boot)
C:\WINNT\System32\drivers\dac960nt.sys		
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
dce376nt (SCSI miniport)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
Delldsa (SCSI miniport)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
Dell_DGX (Video)	Stopped	(Disabled)
Error Severity: Ignore		
Service Flags: Kernel Driver, Shared Process		
Disk (SCSI Class)	Running	(Boot)
Error Severity: Ignore		
Service Flags: Kernel Driver, Shared Process		
Group Dependencies:		
SCSI miniport		
Diskperf (Filter)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
DptScsi (SCSI miniport)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
dtc329x (SCSI miniport)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
Intel(R) PRO NDIS Driver (NDIS)	Running	(Automatic)
C:\WINNT\System32\drivers\E100BNT.SYS		
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
em (Base)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		
et4000 (Video)	Stopped	(Disabled)
Error Severity: Ignore		
Service Flags: Kernel Driver, Shared Process		
Fastfat (Boot file system)	Running	(Disabled)
Error Severity: Normal		
Service Flags: File System Driver, Shared Process		
Fd16_700 (SCSI miniport)	Stopped	(Disabled)
Error Severity: Normal		
Service Flags: Kernel Driver, Shared Process		

Fd7000ex (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Fd8xx (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

flashpnt (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Floppy (Primary disk) Running (System)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

Ftdisk (Filter) Stopped (Disabled)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

PCI Hot Plug Driver Stopped (Disabled)
 System32\DRIVERS\hotplug.sys
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

i8042 Keyboard and PS/2 Mouse Port Driver (Keyboard Port) Running (System)
 System32\DRIVERS\i8042prt.sys
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Inport (Pointer Port) Stopped (Disabled)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

Jazzg300 (Video) Stopped (Disabled)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

Jazzg364 (Video) Stopped (Disabled)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

Jzvx1484 (Video) Stopped (Disabled)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

Keyboard Class Driver (Keyboard Class) Running (System)
 System32\DRIVERS\kbdclass.sys
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

KSecDD (Base) Running (System)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

macdisk (Filter) Running (Boot)
 C:\WINNT\System32\drivers\macdisk.sys
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

megaraid (SCSI Miniport) Stopped (Boot)
 C:\WINNT\System32\drivers\megaraid.sys
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

mga (Video) Stopped (Disabled)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

mga_mil (Video) Stopped (Disabled)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

mitsumi (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal

Service Flags: Kernel Driver, Shared Process

mkecr5xx (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Modem (Extended base) Stopped (Manual)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

Mouse Class Driver (Pointer Class) Running (System)
 System32\DRIVERS\mouclass.sys
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

mraid (Primary disk) Stopped (Boot)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

mraid35x (Primary disk) Stopped (Disabled)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

Msfs (File system) Running (System)
 Error Severity: Normal
 Service Flags: File System Driver, Shared Process

Mup (Network) Running (Manual)
 C:\WINNT\System32\drivers\mup.sys
 Error Severity: Normal
 Service Flags: File System Driver, Shared Process

NetBEUI Protocol (PNP TDI) Running (Automatic)
 C:\WINNT\System32\drivers\nbf.sys
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Ncr53c9x (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

ncr77c22 (Video) Stopped (Disabled)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

Ncrc700 (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Ncrc710 (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Microsoft NDIS System Driver (NDIS) Running (System)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

NetBIOS Interface (NetBIOSGroup) Stopped (Manual)
 C:\WINNT\System32\drivers\netbios.sys
 Error Severity: Normal
 Service Flags: File System Driver, Shared Process

Group Dependencies:
 TDI

WINS Client (TCP/IP) (PNP TDI) Running (Automatic)
 C:\WINNT\System32\drivers\netbt.sys
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Service Dependencies:
 Tcpip

NetDetect Stopped (Manual)
 C:\WINNT\system32\drivers\netdect.sys
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Npfs (File system) Running (System)
 Error Severity: Normal
 Service Flags: File System Driver, Shared Process

Ntfs (File system) Running (Disabled)
 Error Severity: Normal
 Service Flags: File System Driver, Shared Process

Null (Base) Running (System)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Oliscsi (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Parallel (Extended base) Running (Automatic)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process
 Service Dependencies:
 Parport
 Group Dependencies:
 Parallel arbitrator

Parport (Parallel arbitrator) Running (Automatic)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

ParVdm (Extended base) Running (Automatic)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process
 Service Dependencies:
 Parport
 Group Dependencies:
 Parallel arbitrator

PCIDump (PCI Configuration) Stopped (System)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

Pcmcia (System Bus Extender) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

PnP ISA Enabler Driver (Base) Stopped (System)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

PortFltr (port) Stopped (Manual)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process
 Group Dependencies:
 SCSI miniport

psidisp (Video) Stopped (Disabled)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

Ql10wnt (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

qv (Video) Stopped (Disabled)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

Rdr (Network) Running (Manual)
 C:\WINNT\System32\drivers\rdr.sys
 Error Severity: Normal
 Service Flags: File System Driver, Shared Process

s3 (Video) Stopped (Disabled)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

Scsiprnt (Extended base) Stopped (Automatic)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process
 Group Dependencies:
 SCSI miniport

Scsiscan (SCSI Class) Running (System)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process
 Group Dependencies:
 SCSI miniport

Serial (Extended base) Running (Automatic)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

Sermouse (Pointer Port) Stopped (Disabled)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process

Sfloppy (Primary disk) Stopped (System)
 Error Severity: Ignore
 Service Flags: Kernel Driver, Shared Process
 Group Dependencies:
 SCSI miniport

Simbad (Filter) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

slcd32 (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Sparrow (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Spock (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Srv (Network) Running (Manual)
 C:\WINNT\System32\drivers\srv.sys
 Error Severity: Normal
 Service Flags: File System Driver, Shared Process

symc810 (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Symc8XX (SCSI Miniport) Running (Boot)
 C:\WINNT\System32\drivers\Symc8XX.sys
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Sym_hi (SCSI Miniport) Running (Boot)
 C:\WINNT\System32\drivers\Sym_hi.sys
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

Sysdrv (Extended Base) Running (Automatic)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

T128 (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

T13B (SCSI miniport) Stopped (Disabled)
 Error Severity: Normal
 Service Flags: Kernel Driver, Shared Process

TCP/IP Service (PNP TDI) Running (Automatic)
 C:\WINNT\System32\drivers\tcpip.sys

```

Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
tga (Video) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
tmv1 (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Ultra124 (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Ultra14f (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Ultra24f (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
update (Base) Stopped (System)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
v7vram (Video) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
VgaSave (Video Save) Stopped (System)
C:\WINNT\System32\drivers\vga.sys
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
VgaStart (Video Init) Stopped (System)
C:\WINNT\System32\drivers\vga.sys
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Wd33c93 (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
wd90c24a (Video) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
wdvga (Video) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
weitekp9 (Video) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Xga (Video) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process

```

```

MPS 1.4 - APIC platform 5 5 0x0000000f
MPS 1.4 - APIC platform 6 6 0x0000000f
MPS 1.4 - APIC platform 7 7 0x0000000f
MPS 1.4 - APIC platform 8 8 0x0000000f
MPS 1.4 - APIC platform 9 9 0x0000000f
MPS 1.4 - APIC platform 10 10 0x0000000f
MPS 1.4 - APIC platform 11 11 0x0000000f
MPS 1.4 - APIC platform 12 12 0x0000000f
MPS 1.4 - APIC platform 13 13 0x0000000f
MPS 1.4 - APIC platform 14 14 0x0000000f
MPS 1.4 - APIC platform 15 15 0x0000000f
MPS 1.4 - APIC platform 16 16 0x0000000f
MPS 1.4 - APIC platform 17 17 0x0000000f
MPS 1.4 - APIC platform 18 18 0x0000000f
MPS 1.4 - APIC platform 19 19 0x0000000f
MPS 1.4 - APIC platform 20 20 0x0000000f
MPS 1.4 - APIC platform 21 21 0x0000000f
MPS 1.4 - APIC platform 22 22 0x0000000f
MPS 1.4 - APIC platform 23 23 0x0000000f
MPS 1.4 - APIC platform 24 24 0x0000000f
MPS 1.4 - APIC platform 25 25 0x0000000f
MPS 1.4 - APIC platform 26 26 0x0000000f
MPS 1.4 - APIC platform 27 27 0x0000000f
MPS 1.4 - APIC platform 28 28 0x0000000f
MPS 1.4 - APIC platform 29 29 0x0000000f
MPS 1.4 - APIC platform 30 30 0x0000000f
MPS 1.4 - APIC platform 31 31 0x0000000f
MPS 1.4 - APIC platform 32 32 0x0000000f
MPS 1.4 - APIC platform 33 33 0x0000000f
MPS 1.4 - APIC platform 34 34 0x0000000f
MPS 1.4 - APIC platform 35 35 0x0000000f
MPS 1.4 - APIC platform 36 36 0x0000000f
MPS 1.4 - APIC platform 37 37 0x0000000f
MPS 1.4 - APIC platform 38 38 0x0000000f
MPS 1.4 - APIC platform 39 39 0x0000000f
MPS 1.4 - APIC platform 40 40 0x0000000f
MPS 1.4 - APIC platform 41 41 0x0000000f
MPS 1.4 - APIC platform 42 42 0x0000000f
MPS 1.4 - APIC platform 43 43 0x0000000f
MPS 1.4 - APIC platform 44 44 0x0000000f
MPS 1.4 - APIC platform 45 45 0x0000000f
MPS 1.4 - APIC platform 46 46 0x0000000f
MPS 1.4 - APIC platform 47 47 0x0000000f
MPS 1.4 - APIC platform 61 61 0x0000000f
MPS 1.4 - APIC platform 65 65 0x0000000f
MPS 1.4 - APIC platform 80 80 0x0000000f
MPS 1.4 - APIC platform 193 193 0x0000000f
MPS 1.4 - APIC platform 225 225 0x0000000f
MPS 1.4 - APIC platform 253 253 0x0000000f
MPS 1.4 - APIC platform 254 254 0x0000000f
MPS 1.4 - APIC platform 255 255 0x0000000f
i8042prt 1 1 0xffffffff
i8042prt 12 12 0xffffffff
Serial 4 4 0x00000000
Serial 3 3 0x00000000
E100B 24 24 0x6db6db6d
Floppy 6 6 0x00000000
dac960nt 32 32 0x00000000
dac960nt 32 32 0x00000000

```

IRQ and Port Report

```

-----
Devices          Vector Level Affinity
-----
MPS 1.4 - APIC platform 8      8 0x0000000f
MPS 1.4 - APIC platform 0      0 0x0000000f
MPS 1.4 - APIC platform 1      1 0x0000000f
MPS 1.4 - APIC platform 2      2 0x0000000f
MPS 1.4 - APIC platform 3      3 0x0000000f
MPS 1.4 - APIC platform 4      4 0x0000000f

```

```

dac960nt      32  32 0x00000000
dac960nt      32  32 0x00000000
dac960nt      32  32 0x00000000
dac960nt      32  32 0x00000000
Symc8XX       32  32 0x00000000
Sym_hi        12  12 0x00000000
Sym_hi        13  13 0x00000000

```

```

-----
Devices          Physical Address  Length
-----
MPS 1.4 - APIC platform 0x00000000 0x0000000010
MPS 1.4 - APIC platform 0x00000020 0x0000000002
MPS 1.4 - APIC platform 0x00000040 0x0000000004
MPS 1.4 - APIC platform 0x00000048 0x0000000004
MPS 1.4 - APIC platform 0x00000061 0x0000000001
MPS 1.4 - APIC platform 0x00000070 0x0000000002
MPS 1.4 - APIC platform 0x00000080 0x0000000010
MPS 1.4 - APIC platform 0x00000092 0x0000000001
MPS 1.4 - APIC platform 0x000000a0 0x0000000002
MPS 1.4 - APIC platform 0x000000c0 0x0000000010
MPS 1.4 - APIC platform 0x000000f0 0x0000000010
i8042prt      0x00000060 0x0000000001
i8042prt      0x00000064 0x0000000001
Parport       0x00000378 0x0000000003
Serial        0x000003f8 0x0000000007
Serial        0x000002f8 0x0000000007
Floppy        0x000003f0 0x0000000006
Floppy        0x000003f7 0x0000000001
dac960nt      0x00003000 0x0000000080
dac960nt      0x00004000 0x0000000080
dac960nt      0x00006000 0x0000000080
dac960nt      0x00007000 0x0000000080
dac960nt      0x00008000 0x0000000080
dac960nt      0x00009000 0x0000000080
Symc8XX       0x00002000 0x0000000100
Sym_hi        0x00005000 0x0000000100
Sym_hi        0x00005400 0x0000000100
cirrus        0x000003b0 0x000000000c
cirrus        0x000003c0 0x0000000020

```

DMA and Memory Report

```

-----
Devices          Channel  Port
-----
Floppy           2      0

```

```

-----
Devices          Physical Address  Length
-----
MPS 1.4 - APIC platform 0xfec00000 0x00000400
MPS 1.4 - APIC platform 0xfee00000 0x00000400
E100B           0xed200000 0x0000001e
dac960nt        0xec210000 0x00000080
dac960nt        0xf0000000 0x02000000
dac960nt        0xec310000 0x00000080
dac960nt        0xf2000000 0x02000000
dac960nt        0xf4110000 0x00000080
dac960nt        0xf6000000 0x02000000

```

```

dac960nt      0xf4210000 0x00000080
dac960nt      0xf8000000 0x02000000
dac960nt      0xf4310000 0x00000080
dac960nt      0xfa000000 0x02000000
dac960nt      0xf4410000 0x00000080
dac960nt      0xfc000000 0x02000000
Symc8XX       0xec101000 0x00000100
Sym_hi        0xf4004000 0x00000400
Sym_hi        0xf4000000 0x00002000
Sym_hi        0xf4004400 0x00000400
Sym_hi        0xf4002000 0x00002000
cirrus        0x000a0000 0x00020000

```

Environment Report

System Environment Variables

```

ComSpec=C:\WINNT\system32\cmd.exe
HOME=C:/
NTRESKIT=Z:\NTRESKIT
NUMBER_OF_PROCESSORS=4
OS=Windows_NT
Os2LibPath=C:\WINNT\system32\os2\dll;

Path=C:\MKS\mksnt;C:\WINNT\system32;C:\WINNT;Z:\NTRESKIT;Z:\NTRESKIT\Perl;
z:\emon\bin;C:\MSSQL7\BINN
PROCESSOR_ARCHITECTURE=x86
PROCESSOR_IDENTIFIER=x86 Family 6 Model 5 Stepping 2, GenuineIntel
PROCESSOR_LEVEL=6
PROCESSOR_REVISION=0502
ROOTDIR=C:/MKS
SHELL=C:/MKS/mksnt/sh.exe
TMPDIR=C:/TMP
windir=C:\WINNT

```

Environment Variables for Current User

```

TEMP=C:\TEMP
TMP=C:\TEMP

```

Network Report

```

-----
Your Access Level: Admin & Local
Workgroup or Domain: WORKGROUP
Network Version: 4.0
LanRoot: WORKGROUP
Logged On Users: 1
Current User (1): Administrator
  Logon Domain: AVALON4
  Logon Server: AVALON4

Transport: NetBT_E100B2, 00-A0-C9-C5-45-C4, VC's: 0, Wan: Wan

```


Transport: Nbf_E100B2, 00-A0-C9-C5-45-C4, VC's: 0, Wan: Wan

Character Wait: 3,600
Collection Time: 250
Maximum Collection Count: 16
Keep Connection: 600
Maximum Commands: 5
Session Time Out: 45
Character Buffer Size: 512
Maximum Threads: 17
Lock Quota: 6,144
Lock Increment: 10
Maximum Locks: 500
Pipe Increment: 10
Maximum Pipes: 500
Cache Time Out: 40
Dormant File Limit: 45
Read Ahead Throughput: 4,294,967,295
Mailslot Buffers: 3
Server Announce Buffers: 20
Illegal Datagrams: 5
Datagram Reset Frequency: 60
Log Election Packets: False
Use Opportunistic Locking: True
Use Unlock Behind: True
Use Close Behind: True
Buffer Pipes: True
Use Lock, Read, Unlock: True
Use NT Caching: True
Use Raw Read: True
Use Raw Write: True
Use Write Raw Data: True
Use Encryption: True
Buffer Deny Write Files: True
Buffer Read Only Files: True
Force Core Creation: True
512 Byte Max Transfer: False
Bytes Received: 1,106
SMB's Received: 11
Paged Read Bytes Requested: 0
Non Paged Read Bytes Requested: 0
Cache Read Bytes Requested: 0
Network Read Bytes Requested: 0
Bytes Transmitted: 1,184
SMB's Transmitted: 11
Paged Read Bytes Requested: 0
Non Paged Read Bytes Requested: 0
Cache Read Bytes Requested: 0
Network Read Bytes Requested: 0
Initially Failed Operations: 0
Failed Completion Operations: 0
Read Operations: 0
Random Read Operations: 0
Read SMB's: 0
Large Read SMB's: 0
Small Read SMB's: 0
Write Operations: 0
Random Write Operations: 0
Write SMB's: 0

Large Write SMB's: 0
Small Write SMB's: 0
Raw Reads Denied: 0
Raw Writes Denied: 0
Network Errors: 0
Sessions: 2
Failed Sessions: 0
Reconnects: 0
Core Connects: 0
LM 2.0 Connects: 0
LM 2.x Connects: 0
Windows NT Connects: 1
Server Disconnects: 1
Hung Sessions: 0
Use Count: 3
Failed Use Count: 0
Current Commands: 0
Server File Opens: 6
Server Device Opens: 0
Server Jobs Queued: 0
Server Session Opens: 0
Server Sessions Timed Out: 0
Server Sessions Errored Out: 0
Server Password Errors: 0
Server Permission Errors: 0
Server System Errors: 0
Server Bytes Sent: 3,339
Server Bytes Received: 3,918
Server Average Response Time: 0
Server Request Buffers Needed: 0
Server Big Buffers Needed: 0

NT Server Registry Information

Software\Microsoft

Key Name: SOFTWARE\Microsoft\MMC
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 11:42 AM

Key Name: SOFTWARE\Microsoft\MMC\NodeTypes
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 11:42 AM

Key Name: SOFTWARE\Microsoft\MMC\Settings
Class Name: <NO CLASS>
Last Write Time: 9/4/98 - 8:39 AM
Value 0
Name: Help File Index
Type: REG_DWORD
Data: 0x2

Key Name: SOFTWARE\Microsoft\MMC\SnapIns

Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 11:42 AM
 Key Name: SOFTWARE\Microsoft\MMC\SnapIns\{00100100-1816-11d0-8EF5-00AA0062C58F}
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:13 PM
 Value 0
 Name: About
 Type: REG_SZ
 Data: {00100101-1816-11d0-8EF5-00AA0062C58F}
 Value 1
 Name: NameString
 Type: REG_SZ
 Data: Microsoft SQL Enterprise Manager
 Key Name: SOFTWARE\Microsoft\MMC\SnapIns\{00100100-1816-11d0-8EF5-00AA0062C58F}\About
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:13 PM
 Value 0
 Name: <NO NAME>
 Type: REG_SZ
 Data: {00100101-1816-11d0-8EF5-00AA0062C58F}
 Key Name: SOFTWARE\Microsoft\MMC\SnapIns\{00100100-1816-11d0-8EF5-00AA0062C58F}\NameString
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:13 PM
 Value 0
 Name: <NO NAME>
 Type: REG_SZ
 Data: Microsoft SQL Enterprise Manager
 Key Name: SOFTWARE\Microsoft\MMC\SnapIns\{00100100-1816-11d0-8EF5-00AA0062C58F}\NodeTypes
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:13 PM
 Key Name: SOFTWARE\Microsoft\MMC\SnapIns\{00100100-1816-11d0-8EF5-00AA0062C58F}\NodeTypes\{00100200-1816-11d0-8EF5-00AA0062C58F}
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:13 PM
 Key Name: SOFTWARE\Microsoft\MMC\SnapIns\{00100100-1816-11d0-8EF5-00AA0062C58F}\Standalone
 Class Name: <NO CLASS>

Last Write Time: 9/2/98 - 3:13 PM
 Key Name: SOFTWARE\Microsoft\MSDTC
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:13 PM
 Value 0
 Name: MaxLogSize
 Type: REG_DWORD
 Data: 0x200
 Key Name: SOFTWARE\Microsoft\MSDTC\Setup
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:13 PM
 Value 0
 Name: InstallCode
 Type: REG_DWORD
 Data: 0
 Value 1
 Name: InstallState
 Type: REG_DWORD
 Data: 0x1
 Value 2
 Name: MajorVersion
 Type: REG_DWORD
 Data: 0x20000
 Value 3
 Name: MinorVersion
 Type: REG_DWORD
 Data: 0x2f8
 Key Name: SOFTWARE\Microsoft\MSDTC\Setup\ExitStatus
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:13 PM
 Value 0
 Name: CompletionComment
 Type: REG_SZ
 Data: Source = DtcComplete, ExitType = Success, Successful
 1 Install
 Value 1
 Name: ErrorCode
 Type: REG_DWORD
 Data: 0
 Value 2
 Name: ExitCode
 Type: REG_DWORD
 Data: 0
 Value 3
 Name: Source

Type: REG_DWORD
Data: 0x1

Key Name: SOFTWARE\Microsoft\MSSQLServer
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 1:00 PM

Key Name: SOFTWARE\Microsoft\MSSQLServer\Client
Class Name: <NO CLASS>
Last Write Time: 9/2/98 - 3:13 PM

Key Name: SOFTWARE\Microsoft\MSSQLServer\Client\ConnectTo
Class Name: <NO CLASS>
Last Write Time: 9/2/98 - 3:57 PM
Value 0
Name: DSQUERY
Type: REG_SZ
Data: DBMSSOEN

Key Name: SOFTWARE\Microsoft\MSSQLServer\Client\DB-Lib
Class Name: <NO CLASS>
Last Write Time: 9/21/98 - 3:37 PM
Value 0
Name: AutoAnsiToOem
Type: REG_SZ
Data: on

Key Name: SOFTWARE\Microsoft\MSSQLServer\Client\TDS
Class Name: <NO CLASS>
Last Write Time: 9/4/98 - 4:50 PM
Value 0
Name: <NO NAME>
Type: REG_SZ
Data: 7.0

Value 1
Name: .
Type: REG_SZ
Data: 7.0

Value 2
Name: Avalon4
Type: REG_SZ
Data: 7.0

Key Name: SOFTWARE\Microsoft\MSSQLServer\ClientSetup
Class Name: <NO CLASS>
Last Write Time: 9/2/98 - 3:16 PM
Value 0
Name: SQLPath
Type: REG_SZ
Data: C:\MSSQL7

Key Name: SOFTWARE\Microsoft\MSSQLServer\MSSQLServer
Class Name: <NO CLASS>
Last Write Time: 9/2/98 - 3:16 PM
Value 0
Name: AuditLevel
Type: REG_DWORD
Data: 0

Value 1
Name: BackupDirectory
Type: REG_SZ
Data: C:\MSSQL7\BACKUP

Value 2
Name: DefaultCompStyle
Type: REG_SZ
Data: 0

Value 3
Name: DefaultDomain
Type: REG_SZ
Data: AVALON4

Value 4
Name: DefaultLocaleID
Type: REG_SZ
Data: 8200

Value 5
Name: DefaultLogin
Type: REG_SZ
Data: guest

Value 6
Name: DefaultSortID
Type: REG_SZ
Data: 50

Value 7
Name: ListenOn
Type: REG_MULTI_SZ
Data: SSNMPN70, \\.\pipe\sql\query
SSMSSO70,1433

Value 8
Name: LoginMode
Type: REG_DWORD
Data: 0

Value 9
Name: Map#
Type: REG_SZ
Data: -

Value 10
Name: Map\$
Type: REG_SZ
Data:

```

Value 11
  Name:      Map_
  Type:      REG_SZ
  Data:      \

Value 12
  Name:      ResourceMgrID
  Type:      REG_SZ
  Data:      {4002167A-42B2-11D2-B9ED-00A0C9C545C4}

Value 13
  Name:      RWSListenAddress
  Type:      REG_SZ
  Data:

Value 14
  Name:      SetHostName
  Type:      REG_DWORD
  Data:      0

Value 15
  Name:      Tapeloadwaittime
  Type:      REG_DWORD
  Data:      0xffffffff

Key Name:
SOFTWARE\Microsoft\MSSQLServer\MSSQLServer\CurrentV
  Class Name: <NO CLASS>
  Last Write Time: 9/2/98 - 3:13 PM
  Value 0
    Name:      checksum
    Type:      REG_BINARY
    Data:      00000000 36 35 32 32 63 31 35 63 - 32 37 64 65 64 62 32 38
6522c15c
27dedb28
00000010 61 61 30 33 34 34 64 64 - 31 31 36 38 65 32 66 38
aa0344dd
1168e2f8
00000020 35 31 39 35 62 34 30 62 - 65 39 34 31 62 31 32 35
5195b40b
e941b125
00000030 62 37 66 32 64 36 39 36 - 36 36 34 62 64 63 63 32
b7f2d696
664bdcc2
00000040 31 31 30 62 36 36 65 30 - 34 31 38 61 31 63 33 39
110b66e0
418a1c39
00000050 38 30 65 33 61 34 66 63 - 63 36 65 34 38 64 38 38
80e3a4fc
c6e48d88
00000060 37 32 35 32 32 66 31 38 - 63 63 31 34 34 35 38 61
72522f18
cc14458a
00000070 62 31 65 34 37 36 39 63 - 36 66 33 32 66 65 32 38
b1e4769c

```

```

6f32fe28
00000080 31 64 65 36 00 1de6.

Value 1
  Name:      CurrentVersion
  Type:      REG_SZ
  Data:      7.00.549

Value 2
  Name:      RegisteredOwner
  Type:      REG_SZ
  Data:      SAM&M

Value 3
  Name:      SerialNumber
  Type:      REG_DWORD
  Data:      0x81530040

Key Name:
SOFTWARE\Microsoft\MSSQLServer\MSSQLServer\Paramete
  Class Name: <NO CLASS>
  Last Write Time: 9/2/98 - 3:13 PM
  Value 0
    Name:      SQLArg0
    Type:      REG_SZ
    Data:      -dC:\MSSQL7\data\master.mdf

Value 1
  Name:      SQLArg1
  Type:      REG_SZ
  Data:      -eC:\MSSQL7\log\ERRORLOG

Value 2
  Name:      SQLArg2
  Type:      REG_SZ
  Data:      -lC:\MSSQL7\data\mastlog.ldf

Key Name:
SOFTWARE\Microsoft\MSSQLServer\MSSQLServer\RPCNetLi
  Class Name: <NO CLASS>
  Last Write Time: 9/2/98 - 3:13 PM
  Value 0
    Name:      Security
    Type:      REG_SZ
    Data:

Key Name:      SOFTWARE\Microsoft\MSSQLServer\Providers
  Class Name: <NO CLASS>
  Last Write Time: 9/2/98 - 3:16 PM
  Value 0
    Name:      AllowInProcess
    Type:      REG_DWORD
    Data:      0x1

```

Key Name:
SOFTWARE\Microsoft\MSSQLServer\Providers\ADSDSOObj
ct
Class Name: <NO CLASS>
Last Write Time: 9/2/98 - 3:16 PM
Value 0
Name: AllowInProcess
Type: REG_DWORD
Data: 0x1

Key Name:
SOFTWARE\Microsoft\MSSQLServer\Providers\DTSPackage
DSO
Class Name: <NO CLASS>
Last Write Time: 9/2/98 - 3:16 PM
Value 0
Name: AllowInProcess
Type: REG_DWORD
Data: 0x1

Key Name:
SOFTWARE\Microsoft\MSSQLServer\Providers\Microsoft.
Jet.OLEDB.4.0
Class Name: <NO CLASS>
Last Write Time: 9/2/98 - 3:16 PM
Value 0
Name: AllowInProcess
Type: REG_DWORD
Data: 0x1

Key Name: SOFTWARE\Microsoft\MSSQLServer\Providers\MSDAORA
Class Name: <NO CLASS>
Last Write Time: 9/2/98 - 3:16 PM
Value 0
Name: AllowInProcess
Type: REG_DWORD
Data: 0x1

Key Name: SOFTWARE\Microsoft\MSSQLServer\Providers\MSDASQL
Class Name: <NO CLASS>
Last Write Time: 9/2/98 - 3:16 PM
Value 0
Name: AllowInProcess
Type: REG_DWORD
Data: 0x1

Key Name: SOFTWARE\Microsoft\MSSQLServer\Providers\MSIDX
S
Class Name: <NO CLASS>
Last Write Time: 9/2/98 - 3:16 PM
Value 0
Name: AllowInProcess
Type: REG_DWORD
Data: 0x1

Key Name:
SOFTWARE\Microsoft\MSSQLServer\Providers\MSQLImpPro
v
Class Name: <NO CLASS>
Last Write Time: 9/2/98 - 3:16 PM
Value 0
Name: AllowInProcess
Type: REG_DWORD
Data: 0x1

Key Name:
SOFTWARE\Microsoft\MSSQLServer\Providers\MSSEARCHSQ
L
Class Name: <NO CLASS>
Last Write Time: 9/2/98 - 3:16 PM
Value 0
Name: AllowInProcess
Type: REG_DWORD
Data: 0x1

Key Name:
SOFTWARE\Microsoft\MSSQLServer\Providers\SQLOLEDB
Class Name: <NO CLASS>
Last Write Time: 9/2/98 - 3:16 PM
Value 0
Name: AllowInProcess
Type: REG_DWORD
Data: 0x1

Key Name: SOFTWARE\Microsoft\MSSQLServer\Replication
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 1:00 PM

Key Name:
SOFTWARE\Microsoft\MSSQLServer\Replication\MergeRep
licationProvider
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 1:00 PM

Key Name:
SOFTWARE\Microsoft\MSSQLServer\Replication\MergeRep
licationProvider\7.0
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 1:00 PM

Key Name:
SOFTWARE\Microsoft\MSSQLServer\Replication\MergeRep
licationProvider\7.0\MsJet
Class Name: <NO CLASS>
Last Write Time: 9/2/98 - 3:20 PM
Value 0
Name: <NO NAME>
Type: REG_SZ
Data: {f159cf30-0db4-11d1-b272-00aa00b8de95}

Key Name: SOFTWARE\Microsoft\MSSQLServer\Setup
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:13 PM
 Value 0
 Name: SourcePath
 Type: REG_SZ
 Data: Z:\Sql70549.03p\x86\Data
 Value 1
 Name: SQLDataRoot
 Type: REG_SZ
 Data: C:\MSSQL7
 Value 2
 Name: SQLPath
 Type: REG_SZ
 Data: C:\MSSQL7
 Manager
 Key Name: SOFTWARE\Microsoft\MSSQLServer\SQL Service
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:16 PM
 Value 0
 Name: Action Verify
 Type: REG_DWORD
 Data: 0
 Value 1
 Name: DefaultSvc
 Type: REG_SZ
 Data: MSSQLServer
 Value 2
 Name: Remote
 Type: REG_DWORD
 Data: 0x1
 Value 3
 Name: Services
 Type: REG_MULTI_SZ
 Data: MSSQLServer
 SQLServerAgent
 MSDTC
 Key Name: SOFTWARE\Microsoft\MSSQLServer\SQLEW
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:16 PM
 Key Name: SOFTWARE\Microsoft\MSSQLServer\SQLEW\Replication
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:16 PM
 Value 0
 Name: PerfmonFile
 Type: REG_SZ

Data: C:\MSSQL7\BINN\REPLMON.PMC
 Key Name: SOFTWARE\Microsoft\MSSQLServer\SQLEW\Wizards
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:16 PM
 Value 0
 Name: Web Assistant
 Type: REG_SZ
 Data: C:\MSSQL7\BINN\semwebwz.DLL^WebWizardEntry
 Key Name: SOFTWARE\Microsoft\MSSQLServer\SQLServerAgent
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:16 PM
 Value 0
 Name: DownloadedMaxRows
 Type: REG_DWORD
 Data: 0x64
 Value 1
 Name: ErrorLogFile
 Type: REG_SZ
 Data: C:\MSSQL7\LOG\SQLAGENT.OUT
 Value 2
 Name: ErrorLoggingLevel
 Type: REG_DWORD
 Data: 0x3
 Value 3
 Name: JobHistoryMaxRows
 Type: REG_DWORD
 Data: 0x3e8
 Value 4
 Name: JobHistoryMaxRowsPerJob
 Type: REG_DWORD
 Data: 0x64
 Value 5
 Name: MailAutoStart
 Type: REG_DWORD
 Data: 0x1
 Value 6
 Name: MSXServerName
 Type: REG_SZ
 Data:
 Value 7
 Name: NonAlertableErrors
 Type: REG_SZ
 Data: 1204,4002
 Value 8
 Name: RestartSQLServer
 Type: REG_DWORD
 Data: 0x1

Value 9
 Name: ServerHost
 Type: REG_SZ
 Data:

Value 10
 Name: WorkingDirectory
 Type: REG_SZ
 Data: C:\MSSQL7\JOBS

Key Name:
 SOFTWARE\Microsoft\MSSQLServer\SQLServerAgent\Subsy
 stems
 Class Name: <NO CLASS>
 Last Write Time: 9/2/98 - 3:16 PM
 Value 0
 Name: ActiveScripting
 Type: REG_SZ
 Data:
 C:\MSSQL7\BINN\SQLATXSS.DLL,NULL,ActiveScriptStart,
 ActiveScriptEvent,ActiveScriptStop,10

Value 1
 Name: CmdExec
 Type: REG_SZ
 Data:
 C:\MSSQL7\BINN\SQLCMDSS.DLL,NULL,CmdExecStart,CmdEv
 ent,CmdExecStop,10

Value 2
 Name: Distribution
 Type: REG_SZ
 Data:
 C:\MSSQL7\BINN\SQLREPSS.DLL,C:\MSSQL7\BINN\DISTRIB.
 EXE,ReplStart,ReplEvent,ReplStop,100

Value 3
 Name: LogReader
 Type: REG_SZ
 Data:
 C:\MSSQL7\BINN\SQLREPSS.DLL,C:\MSSQL7\BINN\LOGREAD.
 EXE,ReplStart,ReplEvent,ReplStop,25

Value 4
 Name: Merge
 Type: REG_SZ
 Data:
 C:\MSSQL7\BINN\SQLREPSS.DLL,C:\MSSQL7\BINN\REPLMERG
 .EXE,ReplStart,ReplEvent,ReplStop,100

Value 5
 Name: Snapshot
 Type: REG_SZ
 Data:
 C:\MSSQL7\BINN\SQLREPSS.DLL,C:\MSSQL7\BINN\SNAPSHOT
 .EXE,ReplStart,ReplEvent,ReplStop,100

Software\Intel\E100B

Key Name: SOFTWARE\Intel\E100B
 Class Name: GenericClass
 Last Write Time: 6/10/98 - 4:01 AM

Key Name: SOFTWARE\Intel\E100B\CurrentVersion
 Class Name: GenericClass
 Last Write Time: 6/10/98 - 4:01 AM
 Value 0
 Name: Description
 Type: REG_SZ
 Data: Intel EtherExpress PRO Adapter Driver

Value 1
 Name: InstallDate
 Type: REG_DWORD
 Data: 0x357ec9fd

Value 2
 Name: MajorVersion
 Type: REG_DWORD
 Data: 0x3

Value 3
 Name: MinorVersion
 Type: REG_DWORD
 Data: 0

Value 4
 Name: RefCount
 Type: REG_DWORD
 Data: 0x1

Value 5
 Name: ServiceName
 Type: REG_SZ
 Data: E100B

Value 6
 Name: SoftwareType
 Type: REG_SZ
 Data: driver

Value 7
 Name: Title
 Type: REG_SZ
 Data: Intel EtherExpress PRO Adapter

Key Name: SOFTWARE\Intel\E100B\CurrentVersion\NetRules
 Class Name: GenericClass
 Last Write Time: 6/10/98 - 4:01 AM
 Value 0
 Name: bindable
 Type: REG_MULTI_SZ
 Data: E100BDriver E100BAdapter non exclusive 100

Value 1
 Name: bindform
 Type: REG_SZ
 Data: "E100BSys" yes no container

Value 2
 Name: class
 Type: REG_MULTI_SZ
 Data: E100BDriver basic

Value 3
 Name: InfName
 Type: REG_SZ
 Data: oemnad7.inf

Value 4
 Name: InfOption
 Type: REG_SZ
 Data: E100BEXP

Value 5
 Name: type
 Type: REG_SZ
 Data: E100BSys ndisDriver E100BDriver

Value 6
 Name: use
 Type: REG_SZ
 Data: driver

Services/dac960nt

Key Name: SYSTEM\CurrentControlSet\Services\dac960nt
 Class Name: <NO CLASS>
 Last Write Time: 6/17/98 - 6:48 PM

Value 0
 Name: ErrorControl
 Type: REG_DWORD
 Data: 0x1

Value 1
 Name: Group
 Type: REG_SZ
 Data: SCSI miniport

Value 2
 Name: ImagePath
 Type: REG_EXPAND_SZ
 Data: System32\drivers\dac960nt.sys

Value 3
 Name: PlugPlayServiceType
 Type: REG_DWORD
 Data: 0x1

Value 4
 Name: RequestedSystemResources
 Type: REG_RESOURCE_REQUIREMENTS_LIST
 Data:

Interface Type: Internal
 Bus Number: 0
 Slot Number: 0
 List 0
 Descriptor 0
 Resource: Interrupt
 Option: 0x00000000
 Disposition: Shared
 Type: Level Sensitive
 Minimum Vector: 0x20
 Maximum Vector: 0x20

Descriptor 1
 Resource: Memory
 Option: 0x00000001
 Disposition: Device Exclusive
 Type: Write Only
 Length: 0x2000
 Alignment: 0x2000
 Minimum Address: 0xfe606000
 Maximum Address: 0xfe607fff

Descriptor 2
 Resource: Memory
 Option: 0x00000009
 Disposition: Device Exclusive
 Type: Write Only
 Length: 0x2000
 Alignment: 0x2000
 Minimum Address: 0xfe606000
 Maximum Address: 0xfe607fff

Value 5
 Name: Start
 Type: REG_DWORD
 Data: 0

Value 6
 Name: Tag
 Type: REG_DWORD
 Data: 0x63

Value 7
 Name: Type
 Type: REG_DWORD
 Data: 0x1

Key Name: SYSTEM\CurrentControlSet\Services\dac960nt\Enum
 Class Name: <NO CLASS>
 Last Write Time: 6/17/98 - 6:46 PM
 Value 0

Name: 0
 Type: REG_SZ
 Data: Root\SCSIADAPTER\OEM1.INF&DAC960NT

Value 1
 Name: Count
 Type: REG_DWORD
 Data: 0x1

Value 2
 Name: NextInstance
 Type: REG_DWORD
 Data: 0x1

Services/Disk

Key Name: SYSTEM\CurrentControlSet\Services\Disk
 Class Name: <NO CLASS>
 Last Write Time: 10/10/96 - 1:09 AM

Value 0
 Name: DependOnGroup
 Type: REG_MULTI_SZ
 Data: SCSI miniport

Value 1
 Name: ErrorControl
 Type: REG_DWORD
 Data: 0

Value 2
 Name: Group
 Type: REG_SZ
 Data: SCSI Class

Value 3
 Name: Start
 Type: REG_DWORD
 Data: 0

Value 4
 Name: Tag
 Type: REG_DWORD
 Data: 0x2

Value 5
 Name: Type
 Type: REG_DWORD
 Data: 0x1

Key Name: SYSTEM\CurrentControlSet\Services\Disk\Enum
 Class Name: <NO CLASS>
 Last Write Time: 6/17/98 - 6:46 PM

Value 0
 Name: 0
 Type: REG_SZ
 Data: 0

Data: Root\LEGACY_DISK\0000

Value 1
 Name: Count
 Type: REG_DWORD
 Data: 0x1

Value 2
 Name: NextInstance
 Type: REG_DWORD
 Data: 0x1

Services/Diskperf

Key Name: SYSTEM\CurrentControlSet\Services\Diskperf
 Class Name: <NO CLASS>
 Last Write Time: 6/17/98 - 1:34 PM

Value 0
 Name: ErrorControl
 Type: REG_DWORD
 Data: 0x1

Value 1
 Name: Group
 Type: REG_SZ
 Data: Filter

Value 2
 Name: Start
 Type: REG_DWORD
 Data: 0x4

Value 3
 Name: Tag
 Type: REG_DWORD
 Data: 0x4

Value 4
 Name: Type
 Type: REG_DWORD
 Data: 0x1

Key Name: SYSTEM\CurrentControlSet\Services\Diskperf\Enum
 Class Name: <NO CLASS>
 Last Write Time: 6/17/98 - 6:46 PM

Value 0
 Name: 0
 Type: REG_SZ
 Data: Root\LEGACY_DISKPERF\0000

Value 1
 Name: Count
 Type: REG_DWORD
 Data: 0x1

Value 2
Name: NextInstance
Type: REG_DWORD
Data: 0x1

Services\E100B

Key Name: SYSTEM\CurrentControlSet\Services\E100B
Class Name: <NO CLASS>
Last Write Time: 6/17/98 - 6:48 PM

Value 0
Name: DisplayName
Type: REG_SZ
Data: Intel EtherExpress PRO Adapter

Value 1
Name: ErrorControl
Type: REG_DWORD
Data: 0x1

Value 2
Name: Group
Type: REG_SZ
Data: NDIS

Value 3
Name: ImagePath
Type: REG_EXPAND_SZ
Data: \SystemRoot\System32\drivers\e100bnt.sys

Value 4
Name: RequestedSystemResources
Type: REG_RESOURCE_REQUIREMENTS_LIST
Data:

Interface Type: Internal
Bus Number: 0
Slot Number: 0
List 0
Descriptor 0
Resource: Interrupt
Option: 0x00000000
Disposition: Shared
Type: Level Sensitive
Minimum Vector: 0x1c
Maximum Vector: 0x1c
Descriptor 1
Resource: Memory
Option: 0x00000001
Disposition: Device Exclusive
Type: Write Only
Length: 0x1000
Alignment: 0x1000
Minimum Address: 0xfe306000
Maximum Address: 0xfe306fff

Descriptor 2
Resource: Memory
Option: 0x00000009
Disposition: Device Exclusive
Type: Write Only
Length: 0x1000
Alignment: 0x1000
Minimum Address: 0xfe306000
Maximum Address: 0xfe306fff

Descriptor 3
Resource: Memory
Option: 0x00000008
Disposition: Device Exclusive
Type: Write Only
Length: 0x1000
Alignment: 0x1000
Minimum Address: 0xfe000000
Maximum Address: 0xfe0fffff

Descriptor 4
Resource: Port
Option: 0x00000001
Disposition: Device Exclusive
Type: Port
Length: 0x20
Alignment: 0x20
Minimum Address: 0x00003000
Maximum Address: 0x0000301f

Descriptor 5
Resource: Port
Option: 0x00000008
Disposition: Device Exclusive
Type: Port
Length: 0x20
Alignment: 0x20
Minimum Address: 0x00003000
Maximum Address: 0x0000301f

Descriptor 6
Resource: Memory
Option: 0x00000001
Disposition: Device Exclusive
Type: Read / Write
Length: 0x100000
Alignment: 0x100000
Minimum Address: 0xfe000000
Maximum Address: 0xfe0fffff

Descriptor 7
Resource: Memory
Option: 0x00000008
Disposition: Device Exclusive
Type: Read / Write
Length: 0x100000
Alignment: 0x100000
Minimum Address: 0xfe000000
Maximum Address: 0xfe0fffff

```

Value 5
  Name: Start
  Type: REG_DWORD
  Data: 0x2

Value 6
  Name: Type
  Type: REG_DWORD
  Data: 0x1

Key Name: SYSTEM\CurrentControlSet\Services\E100B\Enum
Class Name: <NO CLASS>
Last Write Time: 6/17/98 - 6:46 PM
Value 0
  Name: 0
  Type: REG_SZ
  Data: Root\LEGACY_E100B\0000

Value 1
  Name: Count
  Type: REG_DWORD
  Data: 0x1

Value 2
  Name: NextInstance
  Type: REG_DWORD
  Data: 0x1

Key Name: SYSTEM\CurrentControlSet\Services\E100B\Linkage
Class Name: GenericClass
Last Write Time: 6/10/98 - 4:07 AM
Value 0
  Name: Bind
  Type: REG_MULTI_SZ
  Data: \Device\E100B1

Value 1
  Name: Export
  Type: REG_MULTI_SZ
  Data: \Device\E100B1

Value 2
  Name: Route
  Type: REG_MULTI_SZ
  Data: "E100B1"

Key Name:
SYSTEM\CurrentControlSet\Services\E100B\Linkage\Dis
abled
Class Name: GenericClass

```

```

Last Write Time: 6/10/98 - 4:07 AM
Value 0
  Name: Bind
  Type: REG_MULTI_SZ
  Data:

Value 1
  Name: Export
  Type: REG_MULTI_SZ
  Data:

Value 2
  Name: Route
  Type: REG_MULTI_SZ
  Data:

Key Name:
SYSTEM\CurrentControlSet\Services\E100B\Parameters
Class Name: GenericClass
Last Write Time: 6/10/98 - 4:01 AM

Key Name: SYSTEM\CurrentControlSet\Services\E100B\Security
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 4:01 AM
Value 0
  Name: Security
  Type: REG_BINARY
  Data:
00000000 01 00 14 80 c0 00 00 00 - cc 00 00 00 14 00 00 00
.....
00000010 34 00 00 00 02 00 20 00 - 01 00 00 00 02 80 18 00
4.....
00000020 ff 01 0f 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
00000030 20 02 00 00 02 00 8c 00 - 05 00 00 00 00 00 18 00
.....
00000040 8d 01 02 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
00000050 73 00 00 00 00 00 1c 00 - fd 01 02 00 01 02 00 00
s.....
00000060 00 00 00 05 20 00 00 00 - 23 02 00 00 00 00 b6 80 ....
...
#.....
00000070 00 00 1c 00 ff 01 0f 00 - 01 02 00 00 00 00 05
.....
00000080 20 00 00 00 20 02 00 00 - 00 00 b6 80 00 00 1c 00 ...
...
00000090 ff 01 0f 00 01 02 00 00 - 00 00 00 05 20 00 00 00
.....
.....

```

```

000000a0 25 02 00 00 00 00 b6 80 - 00 00 18 00 fd 01 02 00
%.....
.....
000000b0 01 01 00 00 00 00 00 05 - 12 00 00 00 25 02 00 00
.....
....%...
000000c0 01 01 00 00 00 00 00 05 - 12 00 00 00 01 01 00 00
.....
.....
000000d0 00 00 00 05 12 00 00 00 -
.....

```

Services\E100B1

```

Key Name:      SYSTEM\CurrentControlSet\Services\E100B1
Class Name:    GenericClass
Last Write Time: 6/10/98 - 4:01 AM
Value 0
  Name:        ErrorControl
  Type:        REG_DWORD
  Data:        0x1

```

```

Value 1
  Name:        Start
  Type:        REG_DWORD
  Data:        0x3

```

```

Value 2
  Name:        Type
  Type:        REG_DWORD
  Data:        0x4

```

```

Key Name:      SYSTEM\CurrentControlSet\Services\E100B1\Linkage
Class Name:    GenericClass
Last Write Time: 6/17/98 - 6:48 PM
Value 0
  Name:        Bind
  Type:        REG_MULTI_SZ
  Data:        \Device\E100B1

```

```

Value 1
  Name:        Export
  Type:        REG_MULTI_SZ
  Data:        \Device\E100B1

```

```

Value 2
  Name:        Route
  Type:        REG_MULTI_SZ
  Data:        "E100B1"

```

```

Key Name:      SYSTEM\CurrentControlSet\Services\E100B1\Linkage\Di
sabled

```

```

Class Name:      GenericClass
Last Write Time: 6/10/98 - 4:01 AM

Key Name:
SYSTEM\CurrentControlSet\Services\E100B1\Parameters
Class Name:      GenericClass
Last Write Time: 6/12/98 - 11:46 AM
Value 0
  Name:          Adaptive_IFS
  Type:          REG_DWORD
  Data:          0x1

Value 1
  Name:          BusNumber
  Type:          REG_DWORD
  Data:          0x3

Value 2
  Name:          BusType
  Type:          REG_DWORD
  Data:          0x5

Value 3
  Name:          BusTypeLocal
  Type:          REG_DWORD
  Data:          0x5

Value 4
  Name:          Eid
  Type:          REG_DWORD
  Data:          0xc9c545c4

Value 5
  Name:          ForceDpx
  Type:          REG_DWORD
  Data:          0x1

Value 6
  Name:          MapRegisters
  Type:          REG_DWORD
  Data:          0x40

Value 7
  Name:          MediaType
  Type:          REG_DWORD
  Data:          0x1

Value 8
  Name:          MsPciScan
  Type:          REG_DWORD
  Data:          0x1

Value 9
  Name:          NetworkAddress
  Type:          REG_SZ
  Data:          0

Value 10
  Name:          NumCoalesce

```

Type: REG_DWORD
Data: 0x10

Value 11
Name: NumRfd
Type: REG_DWORD
Data: 0x40

Value 12
Name: NumTbdPerTcb
Type: REG_DWORD
Data: 0xc

Value 13
Name: NumTcb
Type: REG_DWORD
Data: 0x20

Value 14
Name: PerfOptims
Type: REG_DWORD
Data: 0x2

Value 15
Name: ProposeIAFTAddress
Type: REG_SZ
Data: 00A0C9C545C4

Value 16
Name: RxDmaCount
Type: REG_DWORD
Data: 0

Value 17
Name: RxFifo
Type: REG_DWORD
Data: 0x8

Value 18
Name: SlotNumber
Type: REG_DWORD
Data: 0x7

Value 19
Name: Speed
Type: REG_DWORD
Data: 0x64

Value 20
Name: Threshold
Type: REG_DWORD
Data: 0x10

Value 21
Name: TxDmaCount
Type: REG_DWORD
Data: 0

Value 22

Name: TxFifo
Type: REG_DWORD
Data: 0x8

Value 23
Name: Txmitwait
Type: REG_DWORD
Data: 0x1

Value 24
Name: UcodeSW
Type: REG_DWORD
Data: 0x1

Value 25
Name: UnderrunRetry
Type: REG_DWORD
Data: 0x1

Key Name:
SYSTEM\CurrentControlSet\Services\E100B1\Parameters

Class Name: \Tcpip
Last Write Time: 6/17/98 - 6:48 PM

Value 0
Name: DefaultGateway
Type: REG_MULTI_SZ
Data:

Value 1
Name: EnableDHCP
Type: REG_DWORD
Data: 0

Value 2
Name: IPAddress
Type: REG_MULTI_SZ
Data: 192.168.91.214

Value 3
Name: IPInterfaceContext
Type: REG_DWORD
Data: 0x1

Value 4
Name: IPInterfaceContextMax
Type: REG_DWORD
Data: 0x1

Value 5
Name: LLInterface
Type: REG_SZ
Data:

Value 6
Name: PPTPFiltering

```

Type:      REG_DWORD
Data:      0

Value 7
Name:      RawIPAllowedProtocols
Type:      REG_MULTI_SZ
Data:      0

Value 8
Name:      SubnetMask
Type:      REG_MULTI_SZ
Data:      255.255.255.0

Value 9
Name:      TCPAllowedPorts
Type:      REG_MULTI_SZ
Data:      0

Value 10
Name:      UDPAllowedPorts
Type:      REG_MULTI_SZ
Data:      0

Value 11
Name:      UseZeroBroadcast
Type:      REG_DWORD
Data:      0

```

Services\macdisk

```

Key Name:  SYSTEM\CurrentControlSet\Services\macdisk
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 11:57 AM
Value 0
Name:      ErrorControl
Type:      REG_DWORD
Data:      0x1

Value 1
Name:      Group
Type:      REG_SZ
Data:      Filter

Value 2
Name:      ImagePath
Type:      REG_EXPAND_SZ
Data:      System32\drivers\macdisk.sys

Value 3
Name:      PlugPlayServiceType
Type:      REG_DWORD
Data:      0x1

```

```

Value 4
Name:      Start
Type:      REG_DWORD
Data:      0

Value 5
Name:      Tag
Type:      REG_DWORD
Data:      0x1

Value 6
Name:      Type
Type:      REG_DWORD
Data:      0x1

```

```

Key Name:  SYSTEM\CurrentControlSet\Services\macdisk\Enum
Class Name: <NO CLASS>
Last Write Time: 6/17/98 - 6:46 PM

```

```

Value 0
Name:      0
Type:      REG_SZ
Data:      Root\SCSIADAPTER\OEM2.INF&MACDISK

Value 1
Name:      Count
Type:      REG_DWORD
Data:      0x1

Value 2
Name:      NextInstance
Type:      REG_DWORD
Data:      0x1

```

```

Key Name:  SYSTEM\CurrentControlSet\Services\macdisk\Security
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 11:57 AM
Value 0
Name:      Security
Type:      REG_BINARY
Data:
00000000  01 00 14 80 c0 00 00 00 - cc 00 00 00 14 00 00 00
.....
00000010  34 00 00 00 02 00 20 00 - 01 00 00 00 02 80 18 00
4.....
00000020  ff 01 0f 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
00000030  20 02 00 00 02 00 8c 00 - 05 00 00 00 00 00 18 00
.....
00000040  8d 01 02 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
.....

```

```

00000050 46 00 69 00 00 00 1c 00 - fd 01 02 00 01 02 00 00
F.i.....
.....
00000060 00 00 00 05 20 00 00 00 - 23 02 00 00 6c 00 74 00 ....
...
#...l.t.
00000070 00 00 1c 00 ff 01 0f 00 - 01 02 00 00 00 00 00 05
.....
.....
00000080 20 00 00 00 20 02 00 00 - 6c 00 74 00 00 00 1c 00 ...
...
l.t.....
00000090 ff 01 0f 00 01 02 00 00 - 00 00 00 05 20 00 00 00
.....
.....
000000a0 25 02 00 00 6c 00 74 00 - 00 00 18 00 fd 01 02 00
%...l.t.
.....
000000b0 01 01 00 00 00 00 00 05 - 12 00 00 00 25 02 00 00
.....
.....%...
000000c0 01 01 00 00 00 00 00 05 - 12 00 00 00 01 01 00 00
.....
.....
000000d0 00 00 00 05 12 00 00 00 -
.....

```

Services\MSDTC

```

Key Name:          SYSTEM\CurrentControlSet\Services\MSDTC\Security
Class Name:        <NO CLASS>
Last Write Time:   6/10/98 - 1:00 PM
Value 0
  Name:            Security
  Type:            REG_BINARY
  Data:
00000000 01 00 14 80 c0 00 00 00 - cc 00 00 00 14 00 00 00
.....
.....
00000010 34 00 00 00 02 00 20 00 - 01 00 00 00 02 80 18 00
4.....
.....
00000020 ff 01 0f 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
.....
00000030 20 02 00 00 02 00 8c 00 - 05 00 00 00 00 00 18 00
.....
.....
00000040 8d 01 02 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
.....
00000050 00 00 00 00 00 00 1c 00 - fd 01 02 00 01 02 00 00
.....
.....
00000060 00 00 00 05 20 00 00 00 - 23 02 00 00 00 00 00 00 ....
...
#.....

```

```

00000070 00 00 1c 00 ff 01 0f 00 - 01 02 00 00 00 00 00 05
.....
.....
00000080 20 00 00 00 20 02 00 00 - 00 00 00 00 00 00 1c 00 ...
...
.....
00000090 ff 01 0f 00 01 02 00 00 - 00 00 00 05 20 00 00 00
.....
.....
000000a0 25 02 00 00 00 00 00 00 - 00 00 18 00 fd 01 02 00
%.....
.....
000000b0 01 01 00 00 00 00 00 05 - 12 00 00 00 25 02 00 00
.....
.....%...
000000c0 01 01 00 00 00 00 00 05 - 12 00 00 00 01 01 00 00
.....
.....
000000d0 00 00 00 05 12 00 00 00 -
.....

```

Services\MSSQLServer

```

Key Name:          SYSTEM\CurrentControlSet\Services\MSSQLServer
Class Name:        <NO CLASS>
Last Write Time:   6/10/98 - 1:01 PM
Value 0
  Name:            DisplayName
  Type:            REG_SZ
  Data:            MSSQLServer

Value 1
  Name:            ErrorControl
  Type:            REG_DWORD
  Data:            0x1

Value 2
  Name:            ImagePath
  Type:            REG_EXPAND_SZ
  Data:            C:\MSSQL7\bin\sqlservr.exe

Value 3
  Name:            ObjectName
  Type:            REG_SZ
  Data:            LocalSystem

Value 4
  Name:            Start
  Type:            REG_DWORD
  Data:            0x3

Value 5
  Name:            Type
  Type:            REG_DWORD
  Data:            0x10

```

```

Key Name:
SYSTEM\CurrentControlSet\Services\MSSQLServer\Enum
Class Name: <NO CLASS>
Last Write Time: 6/17/98 - 6:46 PM
Value 0
  Name: 0
  Type: REG_SZ
  Data: Root\LEGACY_MSSQLSERVER\0000

Value 1
  Name: Count
  Type: REG_DWORD
  Data: 0x1

Value 2
  Name: NextInstance
  Type: REG_DWORD
  Data: 0x1

```

```

Key Name:
SYSTEM\CurrentControlSet\Services\MSSQLServer\Perfo
rmance
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 1:01 PM
Value 0
  Name: Close
  Type: REG_SZ
  Data: CloseSQLPerformanceData

Value 1
  Name: Collect
  Type: REG_SZ
  Data: CollectSQLPerformanceData

Value 2
  Name: First Counter
  Type: REG_DWORD
  Data: 0x738

Value 3
  Name: First Help
  Type: REG_DWORD
  Data: 0x739

Value 4
  Name: Last Counter
  Type: REG_DWORD
  Data: 0x80a

Value 5
  Name: Last Help
  Type: REG_DWORD
  Data: 0x80b

Value 6
  Name: Library
  Type: REG_SZ
  Data: SQLCTR70.DLL

```

```

Value 7
  Name: Open
  Type: REG_SZ
  Data: OpenSQLPerformanceData

Key Name:
SYSTEM\CurrentControlSet\Services\MSSQLServer\Secur
ity
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 1:00 PM
Value
  Name: Security
  Type: REG_BINARY
  Data:
00000000 01 00 14 80 c0 00 00 00 - cc 00 00 00 14 00 00 00
.....
00000010 34 00 00 00 02 00 20 00 - 01 00 00 00 02 80 18 00
4.....
00000020 ff 01 0f 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
00000030 20 02 00 00 02 00 8c 00 - 05 00 00 00 00 00 18 00
.....
00000040 8d 01 02 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
00000050 4e 00 54 00 00 00 1c 00 - fd 01 02 00 01 02 00 00
N.T....
00000060 00 00 00 05 20 00 00 00 - 23 02 00 00 5c 00 73 00 ....
...
#...\s.
00000070 00 00 1c 00 ff 01 0f 00 - 01 02 00 00 00 00 00 05
.....
00000080 20 00 00 00 20 02 00 00 - 5c 00 73 00 00 00 1c 00 ...
...
\s.....
00000090 ff 01 0f 00 01 02 00 00 - 00 00 00 05 20 00 00 00
.....
000000a0 25 02 00 00 5c 00 73 00 - 00 00 18 00 fd 01 02 00
%...\s.
000000b0 01 01 00 00 00 00 00 05 - 12 00 00 00 25 02 00 00
.....
....%...
000000c0 01 01 00 00 00 00 00 05 - 12 00 00 00 01 01 00 00
.....
000000d0 00 00 00 05 12 00 00 00 -
.....

```


Services\NDIS

Key Name: SYSTEM\CurrentControlSet\Services\NDIS
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: DisplayName
Type: REG_SZ
Data: Microsoft NDIS System Driver

Value 1
Name: ErrorControl
Type: REG_DWORD
Data: 0x1

Value 2
Name: Group
Type: REG_SZ
Data: NDIS

Value 3
Name: Start
Type: REG_DWORD
Data: 0x1

Value 4
Name: Type
Type: REG_DWORD
Data: 0x1

Key Name: SYSTEM\CurrentControlSet\Services\NDIS\Enum
Class Name: <NO CLASS>
Last Write Time: 6/17/98 - 6:46 PM
Value 0
Name: 0
Type: REG_SZ
Data: Root\LEGACY_NDIS\0000

Value 1
Name: Count
Type: REG_DWORD
Data: 0x1

Value 2
Name: NextInstance
Type: REG_DWORD
Data: 0x1

Key Name: SYSTEM\CurrentControlSet\Services\NDIS\MediaTypes
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM

Key Name: SYSTEM\CurrentControlSet\Services\NDIS\NetDetect
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM

Key Name: SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
SA
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM

Key Name: SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
SA\3C592
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x20596d50

Value 1
Name: Mask
Type: REG_DWORD
Data: 0xf0ffffff

Value 2
Name: token
Type: REG_SZ
Data: 3C592

Key Name: SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
SA\3C597
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x70596d50

Value 1
Name: Mask
Type: REG_DWORD
Data: 0xf0ffffff

Value 2
Name: token
Type: REG_SZ
Data: 3C597

Key Name: SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
SA\BONSAI
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x62110e

```

Value 1
  Name:      Mask
  Type:      REG_DWORD
  Data:      0xffffffff

Value 2
  Name:      token
  Type:      REG_SZ
  Data:      BONSAI

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
  Class Name: <NO CLASS>
  Last Write Time: 6/10/98 - 3:56 AM
Value 0
  Name:      Id
  Type:      REG_DWORD
  Data:      0x32530e

Value 1
  Name:      Mask
  Type:      REG_DWORD
  Data:      0xffffffff

Value 2
  Name:      token
  Type:      REG_SZ
  Data:      C320TNT

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
  Class Name: <NO CLASS>
  Last Write Time: 10/10/96 - 1:09 AM
Value 0
  Name:      Id
  Type:      REG_DWORD
  Data:      0x5042a310

Value 1
  Name:      Mask
  Type:      REG_DWORD
  Data:      0xf0ffffff

Value 2
  Name:      token
  Type:      REG_SZ
  Data:      DE425

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
  Class Name: <NO CLASS>
  Last Write Time: 10/10/96 - 1:09 AM
Value 0

```

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  Name:      Id
  Type:      REG_DWORD
  Data:      0x230a310

Value 1
  Name:      Mask
  Type:      REG_DWORD
  Data:      0xffffffff

Value 2
  Name:      token
  Type:      REG_SZ
  Data:      DEC300

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
  Class Name: <NO CLASS>
  Last Write Time: 10/10/96 - 1:09 AM
Value 0
  Name:      Id
  Type:      REG_DWORD
  Data:      0x2042a310

Value 1
  Name:      Mask
  Type:      REG_DWORD
  Data:      0xf0ffffff

Value 2
  Name:      token
  Type:      REG_SZ
  Data:      DEC422

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
  Class Name: <NO CLASS>
  Last Write Time: 10/10/96 - 1:09 AM
Value 0
  Name:      Id
  Type:      REG_DWORD
  Data:      0x260110e

Value 1
  Name:      Mask
  Type:      REG_DWORD
  Data:      0xffffffff

Value 2
  Name:      token
  Type:      REG_SZ
  Data:      DURANGO

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI

```

SA\ELNK3EISA
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x90506d50
Value 1
Name: Mask
Type: REG_DWORD
Data: 0xf0ffffff
Value 2
Name: token
Type: REG_SZ
Data: ELNK3EISA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
SA\ES3210
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x12949
Value 1
Name: Mask
Type: REG_DWORD
Data: 0xffffffff
Value 2
Name: token
Type: REG_SZ
Data: ES3210

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
SA\F70XX
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x6690e
Value 1
Name: Mask
Type: REG_DWORD
Data: 0xffffffff
Value 2
Name: token
Type: REG_SZ
Data: F70XX

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
SA\FL32
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x1010d425
Value 1
Name: Mask
Type: REG_DWORD
Data: 0xffffffff
Value 2
Name: token
Type: REG_SZ
Data: FL32

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
SA\FLNK
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x776d50
Value 1
Name: Mask
Type: REG_DWORD
Data: 0xffffffff
Value 2
Name: token
Type: REG_SZ
Data: FLNK

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
SA\J2577A
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x4019f022
Value 1
Name: Mask
Type: REG_DWORD
Data: 0xf0ffffff

Value 2
Name: token
Type: REG_SZ
Data: J2577A

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI

Class Name: SA\MAPLE
<NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0

Name: Id
Type: REG_DWORD
Data: 0x160110e

Value 1
Name: Mask
Type: REG_DWORD
Data: 0xffffffff

Value 2
Name: token
Type: REG_SZ
Data: MAPLE

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI

Class Name: SA\NE3200
<NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0

Name: Id
Type: REG_DWORD
Data: 0x7cc3a

Value 1
Name: Mask
Type: REG_DWORD
Data: 0xffffffff

Value 2
Name: token
Type: REG_SZ
Data: NE3200

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI

Class Name: SA\NETFLEX3
<NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0

Name: Id
Type: REG_DWORD
Data: 0x20f1110e

Value 1

Name: Mask
Type: REG_DWORD
Data: 0xf0ffffff

Value 2
Name: token
Type: REG_SZ
Data: NETFLEX3

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI

Class Name: SA\NETFLEX3.1
<NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0

Name: Id
Type: REG_DWORD
Data: 0x40f1110e

Value 1
Name: Mask
Type: REG_DWORD
Data: 0xf0ffffff

Value 2
Name: token
Type: REG_SZ
Data: NETFLEX3

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI

Class Name: SA\NETFLX
<NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0

Name: Id
Type: REG_DWORD
Data: 0x61110e

Value 1
Name: Mask
Type: REG_DWORD
Data: 0xffffffff

Value 2
Name: token
Type: REG_SZ
Data: NETFLX

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI

Class Name: SA\NF3500
<NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0

Name: Id

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Type:          REG_DWORD
Data:          0x84633a

Value 1
Name:          Mask
Type:          REG_DWORD
Data:          0xffffffff

Value 2
Name:          token
Type:          REG_SZ
Data:          NF3500

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
SA\NPEISA.1
Class Name:    <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name:          id
Type:          REG_DWORD
Data:          0x2093a

Value 1
Name:          Mask
Type:          REG_DWORD
Data:          0xffffffff

Value 2
Name:          token
Type:          REG_SZ
Data:          NPEISA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
SA\NPEISA.2
Class Name:    <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name:          id
Type:          REG_DWORD
Data:          0x3093a

Value 1
Name:          Mask
Type:          REG_DWORD
Data:          0xffffffff

Value 2
Name:          token
Type:          REG_SZ
Data:          NPEISA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
SA\P1990

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Class Name:    <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name:          Id
Type:          REG_DWORD
Data:          0x604f42

Value 1
Name:          Mask
Type:          REG_DWORD
Data:          0xffffffff

Value 2
Name:          token
Type:          REG_SZ
Data:          P1990

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
SA\RODAN
Class Name:    <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name:          Id
Type:          REG_DWORD
Data:          0x63110e

Value 1
Name:          Mask
Type:          REG_DWORD
Data:          0xffffffff

Value 2
Name:          token
Type:          REG_SZ
Data:          RODAN

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
SA\SKETHNT
Class Name:    <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name:          Id
Type:          REG_DWORD
Data:          0x2644d

Value 1
Name:          Mask
Type:          REG_DWORD
Data:          0xfffff

Value 2
Name:          token
Type:          REG_SZ
Data:          SKETHNT

```

Key Name:
 SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
 SA\SKFENT
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 3:56 AM
 Value 0
 Name: Id
 Type: REG_DWORD
 Data: 0x1644d
 Value 1
 Name: Mask
 Type: REG_DWORD
 Data: 0xfffff
 Value 2
 Name: token
 Type: REG_SZ
 Data: SKFENT

Key Name:
 SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
 SA\SMC8232
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 3:56 AM
 Value 0
 Name: Id
 Type: REG_DWORD
 Data: 0x80a34d
 Value 1
 Name: Mask
 Type: REG_DWORD
 Data: 0xfffff
 Value 2
 Name: token
 Type: REG_SZ
 Data: SMC8232

Key Name:
 SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
 SA\TLNK3E
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 3:56 AM
 Value 0
 Name: Id
 Type: REG_DWORD
 Data: 0x9c616d50
 Value 1
 Name: Mask
 Type: REG_DWORD
 Data: 0xf0fffff
 Value 2

Name: token
 Type: REG_SZ
 Data: TLNK3E

Key Name:
 SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\EI
 SA\TLNK3EISA
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 3:56 AM
 Value 0
 Name: Id
 Type: REG_DWORD
 Data: 0x90616d50
 Value 1
 Name: Mask
 Type: REG_DWORD
 Data: 0xf0fffff
 Value 2
 Name: token
 Type: REG_SZ
 Data: TLNK3EISA

Key Name:
 SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
 A
 Class Name: <NO CLASS>
 Last Write Time: 10/10/96 - 1:09 AM

Key Name:
 SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
 A\AT1700
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 3:56 AM
 Value 0
 Name: Id
 Type: REG_DWORD
 Data: 0x6413
 Value 1
 Name: token
 Type: REG_SZ
 Data: AT1700

Key Name:
 SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
 A\EE16MC
 Class Name: <NO CLASS>
 Last Write Time: 10/10/96 - 1:09 AM
 Value 0
 Name: Id
 Type: REG_DWORD
 Data: 0x628b
 Value 1

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Name: token
Type: REG_SZ
Data: EE16MC

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\ELINK527
Last Write Time: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x41

Value 1
Name: token
Type: REG_SZ
Data: ELINK527

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\ELNK3MCA.1
Last Write Time: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x627c

Value 1
Name: token
Type: REG_SZ
Data: ELNK3MCA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\ELNK3MCA.2
Last Write Time: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x627d

Value 1
Name: token
Type: REG_SZ
Data: ELNK3MCA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\ELNK3MCA.3
Last Write Time: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0

```

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Name: Id
Type: REG_DWORD
Data: 0x61db

Value 1
Name: token
Type: REG_SZ
Data: ELNK3MCA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\ELNK3MCA.4
Last Write Time: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x62f6

Value 1
Name: token
Type: REG_SZ
Data: ELNK3MCA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\ELNK3MCA.5
Last Write Time: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x62f7

Value 1
Name: token
Type: REG_SZ
Data: ELNK3MCA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\ELNKMC
Last Write Time: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x6042

Value 1
Name: token
Type: REG_SZ
Data: ELNKMC

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Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
A\F30XX
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x70
Value 1
Name: token
Type: REG_SZ
Data: F30XX

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
A\HPMCA
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x63ca
Value 1
Name: token
Type: REG_SZ
Data: HPMCA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
A\IBMENIIN
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0xffe0
Value 1
Name: token
Type: REG_SZ
Data: IBMENIIN

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
A\IBMTOKA
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0xe000
Value 1

Name: token
Type: REG_SZ
Data: IBMTOKA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
A\IBMTOKMC
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0xe001
Value 1
Name: token
Type: REG_SZ
Data: IBMTOKMC

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
A\IRMAtrac.1
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x5c1c
Value 1
Name: token
Type: REG_SZ
Data: IRMAtrac

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
A\IRMAtrac.2
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x5c1d
Value 1
Name: token
Type: REG_SZ
Data: IRMAtrac

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
A\NCRTOK
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0


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Name: Id
Type: REG_DWORD
Data: 0x100

Value 1
Name: token
Type: REG_SZ
Data: NCR TOK

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x69

Value 1
Name: token
Type: REG_SZ
Data: NPMCA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\OCTK16.1
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0xa84

Value 1
Name: token
Type: REG_SZ
Data: OCTK16

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\OCTK16.2
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0xa85

Value 1
Name: token
Type: REG_SZ
Data: OCTK16

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Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\OCTK16.3
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0xa86

Value 1
Name: token
Type: REG_SZ
Data: OCTK16

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\QUADENET.1
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x8f6d

Value 1
Name: token
Type: REG_SZ
Data: QUADENET

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\QUADENET.2
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x8f6a

Value 1
Name: token
Type: REG_SZ
Data: QUADENET

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\SKFMNT.1
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x83

Value 1

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```

Name: token
Type: REG_SZ
Data: SKFMNT

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\SKFMNT.2
Last Write Time: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0xab

Value 1
Name: token
Type: REG_SZ
Data: SKFMNT

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\STREAMER.1
Last Write Time: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x8fa0

Value 1
Name: token
Type: REG_SZ
Data: STREAMER

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\STREAMER.2
Last Write Time: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x8fa2

Value 1
Name: token
Type: REG_SZ
Data: STREAMER

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\STREAMER.3
Last Write Time: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0

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Name: Id
Type: REG_DWORD
Data: 0x8fa8

Value 1
Name: token
Type: REG_SZ
Data: STREAMER

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\STREAMER.4
Last Write Time: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x8faa

Value 1
Name: token
Type: REG_SZ
Data: STREAMER

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\TC$4046E
Last Write Time: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x51

Value 1
Name: token
Type: REG_SZ
Data: TC$4046E

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
Class Name: A\UBPS
Last Write Time: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x7012

Value 1
Name: token
Type: REG_SZ
Data: UBPS

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Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
A\WAVELAN_MCA
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x6a14
Value 1
Name: token
Type: REG_SZ
Data: WAVELAN_MCA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
A\WD8003EA
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x67c0
Value 1
Name: token
Type: REG_SZ
Data: WD8003EA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
A\WD8003WA
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x67c2
Value 1
Name: token
Type: REG_SZ
Data: WD8003WA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
A\WD8013EPA
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x61c8
Value 1

Name: token
Type: REG_SZ
Data: WD8013EPA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\MC
A\WD8013WPA
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x61c9
Value 1
Name: token
Type: REG_SZ
Data: WD8013WPA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\3C590
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x590010b7
Value 1
Name: token
Type: REG_SZ
Data: 3C590

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\3C595
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x595010b7
Value 1
Name: token
Type: REG_SZ
Data: 3C595

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\3C905
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x905010b7
Value 1
Name: token
Type: REG_SZ
Data: 3C905

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\ALANE0
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x59009004
Value 1
Name: token
Type: REG_SZ
Data: ALANE0

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\AMDPCI
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x20001022
Value 1
Name: token
Type: REG_SZ
Data: AMDPCI

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\DC21040
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x21011
Value 1

Name: token
Type: REG_SZ
Data: DC21040

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\DC21041
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x141011
Value 1
Name: token
Type: REG_SZ
Data: DC21041

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\DC21140
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x91011
Value 1
Name: token
Type: REG_SZ
Data: DC21140

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\DC21142
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x191011
Value 1
Name: token
Type: REG_SZ
Data: DC21142

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\DEFPA
Class Name: <NO CLASS>
Last Write Time: 10/10/96 - 1:09 AM
Value 0

Name: Id
Type: REG_DWORD
Data: 0xf1011

Value 1
Name: token
Type: REG_SZ
Data: DEFPA

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC

Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM

Value 0
Name: Id
Type: REG_DWORD
Data: 0x12298086

Value 1
Name: token
Type: REG_SZ
Data: E100BPCI

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC

Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM

Value 0
Name: Id
Type: REG_DWORD
Data: 0x12268086

Value 1
Name: token
Type: REG_SZ
Data: E10PCI

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC

Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM

Value 0
Name: Id
Type: REG_DWORD
Data: 0x100110b6

Value 1
Name: token
Type: REG_SZ
Data: LEC

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC

Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM

Value 0
Name: Id
Type: REG_DWORD
Data: 0x111bc

Value 1
Name: token
Type: REG_SZ
Data: NCPF

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC

Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM

Value 0
Name: Id
Type: REG_DWORD
Data: 0xf1300e11

Value 1
Name: token
Type: REG_SZ
Data: NETFLEX3

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC

Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM

Value 0
Name: Id
Type: REG_DWORD
Data: 0xae320e11

Value 1
Name: token
Type: REG_SZ
Data: NETFLEX3

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC

Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM

Value 0
Name: Id
Type: REG_DWORD
Data: 0xae340e11

Value 1

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Name: token
Type: REG_SZ
Data: NETFLEX3

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\NETFLEX3.4
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0xae350e11

Value 1
Name: token
Type: REG_SZ
Data: NETFLEX3

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\NETFLEX3.5
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0xae430e11

Value 1
Name: token
Type: REG_SZ
Data: NETFLEX3

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\NETFLEX3.6
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0xae400e11

Value 1
Name: token
Type: REG_SZ
Data: NETFLEX3

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\NETFLEX3.7
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0

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Name: Id
Type: REG_DWORD
Data: 0xf1500e11

Value 1
Name: token
Type: REG_SZ
Data: NETFLEX3

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\O100PCI
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x11108d

Value 1
Name: token
Type: REG_SZ
Data: O100PCI

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\OCE4XMP
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x13108d

Value 1
Name: token
Type: REG_SZ
Data: OCE4XMP

Key Name:
SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
I\OCTK16
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 3:56 AM
Value 0
Name: Id
Type: REG_DWORD
Data: 0x1108d

Value 1
Name: token
Type: REG_SZ
Data: OCTK16

```

Key Name:
 SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
 I\RNSFDDI
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 3:56 AM
 Value 0
 Name: Id
 Type: REG_DWORD
 Data: 0x22001112
 Value 1
 Name: token
 Type: REG_SZ
 Data: RNSFDDI

Key Name:
 SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
 I\RTL8029
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 3:56 AM
 Value 0
 Name: Id
 Type: REG_DWORD
 Data: 0x802910ec
 Value 1
 Name: token
 Type: REG_SZ
 Data: RTL8029

Key Name:
 SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
 I\SKFPNT
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 3:56 AM
 Value 0
 Name: Id
 Type: REG_DWORD
 Data: 0x40001148
 Value 1
 Name: token
 Type: REG_SZ
 Data: SKFPNT

Key Name:
 SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
 I\SKTOKNT_PCI
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 3:56 AM
 Value 0
 Name: Id
 Type: REG_DWORD
 Data: 0x42001148
 Value 1

Name: token
 Type: REG_SZ
 Data: SKTOKNT_PCI

Key Name:
 SYSTEM\CurrentControlSet\Services\NDIS\NetDetect\PC
 I\STREAMER
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 3:56 AM
 Value 0
 Name: Id
 Type: REG_DWORD
 Data: 0x181014
 Value 1
 Name: token
 Type: REG_SZ
 Data: STREAMER

Key Name:
 SYSTEM\CurrentControlSet\Services\NDIS\Parameters
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 2:17 PM
 Value 0
 Name: ProcessorAffinityMask
 Type: REG_DWORD
 Data: 0

Services\NetBIOS

Key Name: SYSTEM\CurrentControlSet\Services\NetBIOS
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 4:07 AM
 Value 0
 Name: DependOnGroup
 Type: REG_MULTI_SZ
 Data: TDI

Value 1
 Name: DependOnService
 Type: REG_MULTI_SZ
 Data:

Value 2
 Name: DisplayName
 Type: REG_SZ
 Data: NetBIOS Interface

Value 3
 Name: ErrorControl
 Type: REG_DWORD
 Data: 0x1

Value 4

```

Name: Group
Type: REG_SZ
Data: NetBIOSGroup

Value 5
Name: ImagePath
Type: REG_EXPAND_SZ
Data: \SystemRoot\System32\drivers\netbios.sys

Value 6
Name: Start
Type: REG_DWORD
Data: 0x3

Value 7
Name: Type
Type: REG_DWORD
Data: 0x2

Key Name: SYSTEM\CurrentControlSet\Services\NetBIOS\Enum
Class Name: <NO CLASS>
Last Write Time: 6/17/98 - 6:46 PM
Value 0
Name: 0
Type: REG_SZ
Data: Root\LEGACY_NETBIOS\0000

Value 1
Name: Count
Type: REG_DWORD
Data: 0x1

Value 2
Name: NextInstance
Type: REG_DWORD
Data: 0x1

Key Name: SYSTEM\CurrentControlSet\Services\NetBIOS\Linkage
Class Name: GenericClass
Last Write Time: 6/10/98 - 4:07 AM
Value 0
Name: Bind
Type: REG_MULTI_SZ
Data: \Device\Nbf_E100B1

Value 1
Name: Export
Type: REG_MULTI_SZ
Data: \Device\Netbios\Nbf_E100B1

Value 2
Name: LanaMap
Type: REG_BINARY
Data:

```

```

00000000 01 01
Value 3
Name: Route
Type: REG_MULTI_SZ
Data: "Nbf" "E100B" "E100B1"

Key Name: SYSTEM\CurrentControlSet\Services\NetBIOS\Linkage\D
Class Name: isabled
GenericClass
Last Write Time: 6/10/98 - 4:07 AM
Value 0
Name: Bind
Type: REG_MULTI_SZ
Data: \Device\NetBT_E100B1

Value 1
Name: Export
Type: REG_MULTI_SZ
Data: \Device\Netbios\NetBT_E100B1

Value 2
Name: Route
Type: REG_MULTI_SZ
Data: "NetBT" "E100B" "E100B1"

Key Name: SYSTEM\CurrentControlSet\Services\NetBIOS\Parameters
Class Name: GenericClass
Last Write Time: 6/10/98 - 4:05 AM

Key Name: SYSTEM\CurrentControlSet\Services\NetBIOS\Parameters\Winsock
Class Name: GenericClass
Last Write Time: 6/10/98 - 4:05 AM
Value 0
Name: HelperDllName
Type: REG_EXPAND_SZ
Data: %SystemRoot%\system32\wshnetbs.dll

Value 1
Name: Mapping
Type: REG_BINARY
Data:
00000000 02 00 00 00 03 00 00 00 - 11 00 00 00 05 00 00 00
.....
00000010 00 00 00 00 11 00 00 00 - 02 00 00 00 00 00 00 00
.....

```



```

Value 2
  Name:      MaxSockAddrLength
  Type:     REG_DWORD
  Data:     0x14

Value 3
  Name:      MinSockAddrLength
  Type:     REG_DWORD
  Data:     0x14

Key Name:
SYSTEM\CurrentControlSet\Services\NetBIOS\Security
  Class Name: <NO CLASS>
  Last Write Time: 6/10/98 - 4:05 AM
  Value 0
    Name:      Security
    Type:     REG_BINARY
    Data:
00000000 01 00 14 80 cc 00 00 00 - d8 00 00 00 14 00 00 00
.....
00000010 34 00 00 00 02 00 20 00 - 01 00 00 00 02 80 18 00
4.....
00000020 ff 01 0f 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
00000030 20 02 00 00 02 00 98 00 - 06 00 00 00 00 03 18 00
.....
00000040 00 00 02 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
00000050 00 00 00 00 00 03 18 00 - ff 01 0f 00 01 02 00 00
.....
00000060 00 00 00 05 20 00 00 00 - 20 02 00 00 00 03 18 00 ....
...
00000070 ff 01 0f 00 01 01 00 00 - 00 00 00 05 12 00 00 00
.....
00000080 20 02 00 00 00 03 18 00 - 00 00 02 00 01 02 00 00
.....
00000090 00 00 00 05 20 00 00 00 - 23 02 00 00 00 03 18 00 ....
...
#.....
000000a0 9d 00 00 00 01 01 00 00 - 00 00 00 05 04 00 00 00
.....
000000b0 23 02 00 00 00 03 18 00 - 9d 00 00 00 01 02 00 00
#.....
000000c0 00 00 00 05 20 00 00 00 - 21 02 00 00 01 01 00 00 ....
...
!.....

```

```

000000d0 00 00 00 05 12 00 00 00 - 01 01 00 00 00 00 00 05
.....
000000e0 12 00 00 00
.....

Key Name:
SYSTEM\CurrentControlSet\Services\NetBIOS\Information
  Class Name:      GenericClass
  Last Write Time: 6/10/98 - 4:05 AM
  Value 0
    Name:      ErrorControl
    Type:     REG_DWORD
    Data:     0x1

Value 1
  Name:      Start
  Type:     REG_DWORD
  Data:     0x3

Value 2
  Name:      Type
  Type:     REG_DWORD
  Data:     0x4

Key Name:
SYSTEM\CurrentControlSet\Services\NetBIOS\Information\Linkage
  Class Name:      GenericClass
  Last Write Time: 6/10/98 - 4:05 AM

Key Name:
SYSTEM\CurrentControlSet\Services\NetBIOS\Information\Linkage\Disabled
  Class Name:      GenericClass
  Last Write Time: 6/10/98 - 4:05 AM

Key Name:
SYSTEM\CurrentControlSet\Services\NetBIOS\Information\Parameters
  Class Name:      GenericClass
  Last Write Time: 6/10/98 - 4:07 AM
  Value 0
    Name:      EnumExport1
    Type:     REG_DWORD
    Data:     0x1

Value 1
  Name:      EnumExport2
  Type:     REG_DWORD
  Data:     0x1

Value 2
  Name:      LanaNum1
  Type:     REG_DWORD
  Data:     0

```

Value 3
 Name: LanaNum2
 Type: REG_DWORD
 Data: 0x1

Value 4
 Name: MaxLana
 Type: REG_DWORD
 Data: 0x1

Value 5
 Name: Route
 Type: REG_MULTI_SZ
 Data: "NetBT" "E100B" "E100B1"
 "Nbf" "E100B" "E100B1"

Services\NetBT

Key Name: SYSTEM\CurrentControlSet\Services\NetBT
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 4:07 AM

Value 0
 Name: DependOnGroup
 Type: REG_MULTI_SZ
 Data:

Value 1
 Name: DependOnService
 Type: REG_MULTI_SZ
 Data: Tcpip

Value 2
 Name: DisplayName
 Type: REG_SZ
 Data: WINS Client (TCP/IP)

Value 3
 Name: ErrorControl
 Type: REG_DWORD
 Data: 0x1

Value 4
 Name: Group
 Type: REG_SZ
 Data: PNP_TDI

Value 5
 Name: ImagePath
 Type: REG_EXPAND_SZ
 Data: \SystemRoot\System32\drivers\netbt.sys

Value 6
 Name: Start
 Type: REG_DWORD
 Data: 0x2

Value 7
 Name: Type
 Type: REG_DWORD
 Data: 0x1

Key Name: SYSTEM\CurrentControlSet\Services\NetBT\Adapters
 Class Name: GenericClass
 Last Write Time: 6/10/98 - 4:05 AM

Key Name: SYSTEM\CurrentControlSet\Services\NetBT\Adapters\E100B1
 Class Name: GenericClass
 Last Write Time: 6/10/98 - 4:07 AM

Value 0
 Name: NameServer
 Type: REG_SZ
 Data:

Value 1
 Name: NameServerBackup
 Type: REG_SZ
 Data:

Key Name: SYSTEM\CurrentControlSet\Services\NetBT\Enum
 Class Name: <NO CLASS>
 Last Write Time: 6/17/98 - 6:48 PM

Value 0
 Name: Count
 Type: REG_DWORD
 Data: 0

Value 1
 Name: NextInstance
 Type: REG_DWORD
 Data: 0

Key Name: SYSTEM\CurrentControlSet\Services\NetBT\Linkage
 Class Name: GenericClass
 Last Write Time: 6/10/98 - 4:07 AM

Value 0
 Name: Bind
 Type: REG_MULTI_SZ
 Data:

Value 1
 Name: Export
 Type: REG_MULTI_SZ
 Data:

Value 2
 Name: OtherDependencies
 Type: REG_MULTI_SZ
 Data: Tcpip

```

Value 3
  Name:      Route
  Type:      REG_MULTI_SZ
  Data:

Key Name:
SYSTEM\CurrentControlSet\Services\NetBT\Linkage\Dis
abled
Class Name:  GenericClass
Last Write Time: 6/10/98 - 4:07 AM
Value 0
  Name:      Bind
  Type:      REG_MULTI_SZ
  Data:      \Device\E100B1

Value 1
  Name:      Export
  Type:      REG_MULTI_SZ
  Data:      \Device\NetBT_E100B1

Value 2
  Name:      Route
  Type:      REG_MULTI_SZ
  Data:      "E100B" "E100B1"

Key Name:
SYSTEM\CurrentControlSet\Services\NetBT\Parameters
Class Name:  GenericClass
Last Write Time: 6/10/98 - 4:07 AM
Value 0
  Name:      BcastNameQueryCount
  Type:      REG_DWORD
  Data:      0x3

Value 1
  Name:      BcastQueryTimeout
  Type:      REG_DWORD
  Data:      0x2ee

Value 2
  Name:      CacheTimeout
  Type:      REG_DWORD
  Data:      0x927c0

Value 3
  Name:      EnabledDNS
  Type:      REG_DWORD
  Data:      0

Value 4
  Name:      EnableLMHOSTS
  Type:      REG_DWORD
  Data:      0x1

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Value 5
  Name:      EnableProxy
  Type:      REG_DWORD
  Data:      0

Value 6
  Name:      NameServerPort
  Type:      REG_DWORD
  Data:      0x89

Value 7
  Name:      NameSrvQueryCount
  Type:      REG_DWORD
  Data:      0x3

Value 8
  Name:      NameSrvQueryTimeout
  Type:      REG_DWORD
  Data:      0x5dc

Value 9
  Name:      NbProvider
  Type:      REG_SZ
  Data:      _tcp

Value 10
  Name:      ScopeID
  Type:      REG_SZ
  Data:

Value 11
  Name:      SessionKeepAlive
  Type:      REG_DWORD
  Data:      0x36ee80

Value 12
  Name:      Size/Small/Medium/Large
  Type:      REG_DWORD
  Data:      0x1

Value 13
  Name:      TransportBindName
  Type:      REG_SZ
  Data:      \Device\

Key Name:
SYSTEM\CurrentControlSet\Services\NetBT\Security
Class Name:  <NO CLASS>
Last Write Time: 6/10/98 - 4:05 AM
Value 0
  Name:      Security
  Type:      REG_BINARY
  Data:
00000000 01 00 14 80 c0 00 00 00 - cc 00 00 00 14 00 00 00
.....
00000010 34 00 00 00 02 00 20 00 - 01 00 00 00 02 80 18 00
4.....

```

```

.....
00000020 ff 01 0f 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
00000030 20 02 00 00 02 00 8c 00 - 05 00 00 00 00 00 18 00
.....
00000040 8d 01 02 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
00000050 01 01 00 00 00 00 1c 00 - fd 01 02 00 01 02 00 00
.....
00000060 00 00 00 05 20 00 00 00 - 23 02 00 00 00 00 00 05 ....
...
#.....
00000070 00 00 1c 00 ff 01 0f 00 - 01 02 00 00 00 00 00 05
.....
00000080 20 00 00 00 20 02 00 00 - 00 00 00 05 00 00 1c 00 ...
...
00000090 ff 01 0f 00 01 02 00 00 - 00 00 00 05 20 00 00 00
.....
000000a0 25 02 00 00 00 00 00 05 - 00 00 18 00 fd 01 02 00
%.....
000000b0 01 01 00 00 00 00 00 05 - 12 00 00 00 25 02 00 00
.....
...%...
000000c0 01 01 00 00 00 00 00 05 - 12 00 00 00 01 01 00 00
.....
000000d0 00 00 00 05 12 00 00 00 -
.....

```

Services\PROSet

```

Key Name: SYSTEM\CurrentControlSet\Services\PROSet
Class Name: GenericClass
Last Write Time: 6/10/98 - 4:01 AM

```

```

Key Name: SYSTEM\CurrentControlSet\Services\PROSet\Adapters
Class Name: GenericClass
Last Write Time: 6/10/98 - 4:01 AM

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```

Value 0
Name: EPRO100
Type: REG_SZ
Data: Intel EtherExpress PRO Adapter

```

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Key Name: SYSTEM\CurrentControlSet\Services\PROSet\EPRO100
Class Name: GenericClass
Last Write Time: 6/10/98 - 4:01 AM
Value 0

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Name: AdapterDescription
Type: REG_SZ
Data: EPRO100_GetAdapterDescription

Value 1
Name: Configure
Type: REG_SZ
Data: EPRO100_Configure

Value 2
Name: Detect
Type: REG_SZ
Data: EPRO100_Detect

Value 3
Name: DeviceExist
Type: REG_SZ
Data: EPRO100_DeviceExist

Value 4
Name: Diagnose
Type: REG_SZ
Data: EPRO100_Diagnose

Value 5
Name: DLL
Type: REG_SZ
Data: EPRO100.DLL

Value 6
Name: GetExtendedFeatures
Type: REG_SZ
Data: EPRO100_GetExtendedFeatures

Value 7
Name: Help
Type: REG_SZ
Data: E100SET.HLP

Value 8
Name: InstallAnyway
Type: REG_SZ
Data: EPRO100_InstallAnyway

Value 9
Name: RegistryKey
Type: REG_SZ
Data: EPRO100_GetRegistryKey

Value 10
Name: Summary
Type: REG_SZ
Data: EPRO100_Resource_Summary

```

```

Key Name: SYSTEM\CurrentControlSet\Services\PROSet\EPRO100\Parameters
Class Name: GenericClass

```

Last Write Time: 6/10/98 - 4:01 AM

Value 0
 Name: Adaptive_IFS
 Type: REG_SZ
 Data: 1,7,Adaptive Inter-Frame Spacing,0,2,1,0,255,1

Value 1
 Name: BusNumber
 Type: REG_SZ
 Data: 0,7,BusNumber,0,2,0,0,16,1

Value 2
 Name: BusType
 Type: REG_SZ
 Data: 0,7,BusType,0,2,5,2,5,1

Value 3
 Name: BusTypeLocal
 Type: REG_SZ
 Data: 0,7,BusTypeLocal,0,2,5,2,5,1

Value 4
 Name: Eid
 Type: REG_SZ
 Data: 0,7,Eid,0,2,0,0,4294967295,1

Value 5
 Name: Fifo
 Type: REG_SZ
 Data: 0,3,Fifo Depth,0,2,12,0,15,1

Value 6
 Name: ForcedPpx
 Type: REG_SZ
 Data: 1,4,Duplex Mode,0,1,Auto,Auto,Half,Full

Value 7
 Name: MapRegisters
 Type: REG_SZ
 Data:

Value 8
 Name: MediaType
 Type: REG_SZ
 Data: 0,7,MediaType,0,2,1,1,1,1

Value 9
 Name: MsPciScan
 Type: REG_SZ
 Data: 0,4,MsPciScan,0,2,1,0,1,1

Value 10
 Name: NetworkAddress
 Type: REG_SZ
 Data: 1,7,Locally Administered Address,0,5,0,0,1,1

Value 11
 Name: NumCoalesce
 Type: REG_SZ

Data: 1,7,Coalesce Buffers,0,2,8,1,32,1

Value 12
 Name: NumRfd
 Type: REG_SZ
 Data: 1,7,Receive Buffers,0,2,32,1,1024,1

Value 13
 Name: NumTbd
 Type: REG_SZ
 Data: 0,3,Transmit Buffer Descriptors,0,2,64,1,65535,1

Value 14
 Name: NumTbdPerTcb
 Type: REG_SZ
 Data: 0,4,Transmit Buffers per Frame,0,2,12,1,16,1

Value 15
 Name: NumTcb
 Type: REG_SZ
 Data: 1,7,Transmit Control Blocks,0,2,16,1,80,1

Value 16
 Name: Off
 Type: REG_SZ
 Data: 1,3,Off Timer,0,2,2,1,65535,1

Value 17
 Name: On
 Type: REG_SZ
 Data: 1,3,On Timer,0,2,32768,1,65535,1

Value 18
 Name: PerfOptims
 Type: REG_SZ
 Data: 0,4,PerfOptims,0,2,0,0,65535,1

Value 19
 Name: RxDmaCount
 Type: REG_SZ
 Data: 0,4,RxDmaCount,0,2,0,0,63,1

Value 20
 Name: RxFifo
 Type: REG_SZ
 Data: 0,4,Receive Fifo Depth,0,2,8,0,15,1

Value 21
 Name: Slot
 Type: REG_SZ
 Data:

Value 22
 Name: Speed
 Type: REG_SZ
 Data: 1,7,Network Speed,0,4,Auto,Auto,0,10Mbps,10,100Mbps,100

Value 23
 Name: Threshold
 Type: REG_SZ
 Data: 0,7,Transmit Threshold,0,2,16,0,200,1

Value 24
 Name: TxDmaCount
 Type: REG_SZ
 Data: 0,4,TxDmaCount,0,2,0,0,63,1

Value 25
 Name: TxFifo
 Type: REG_SZ
 Data: 0,4,Transmit Fifo Depth,0,2,8,0,15,1

Value 26
 Name: Txmitwait
 Type: REG_SZ
 Data: 0,7,Txmitwait,0,2,1,0,255,1

Value 27
 Name: UcodeSW
 Type: REG_SZ
 Data: 0,7,UcodeSW,0,2,1,0,1,1

Value 28
 Name: UnderrunRetry
 Type: REG_SZ
 Data: 0,4,UnderrunRetry,0,2,1,0,3,1

Services\SNMP

Key Name: SYSTEM\CurrentControlSet\Services\SNMP
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 4:05 AM

Value 0
 Name: DependOnGroup
 Type: REG_MULTI_SZ
 Data:

Value 1
 Name: DependOnService
 Type: REG_MULTI_SZ
 Data: Tcpip
 EventLog

Value 2
 Name: DisplayName
 Type: REG_SZ
 Data: SNMP

Value 3
 Name: ErrorControl
 Type: REG_DWORD
 Data: 0x1

Value 4
 Name: ImagePath
 Type: REG_EXPAND_SZ
 Data: %SystemRoot%\System32\snmp.exe

Value 5
 Name: ObjectName
 Type: REG_SZ
 Data: LocalSystem

Value 6
 Name: Start
 Type: REG_DWORD
 Data: 0x2

Value 7
 Name: Type
 Type: REG_DWORD
 Data: 0x10

Key Name: SYSTEM\CurrentControlSet\Services\SNMP\Enum
 Class Name: <NO CLASS>
 Last Write Time: 6/17/98 - 6:46 PM

Value 0
 Name: 0
 Type: REG_SZ
 Data: Root\LEGACY_SNMP\0000

Value 1
 Name: Count
 Type: REG_DWORD
 Data: 0x1

Value 2
 Name: NextInstance
 Type: REG_DWORD
 Data: 0x1

Key Name: SYSTEM\CurrentControlSet\Services\SNMP\Linkage
 Class Name: GenericClass
 Last Write Time: 6/10/98 - 4:05 AM

Key Name: SYSTEM\CurrentControlSet\Services\SNMP\Linkage\Disabled
 Class Name: GenericClass
 Last Write Time: 6/10/98 - 4:05 AM

Key Name: SYSTEM\CurrentControlSet\Services\SNMP\Parameters
 Class Name: GenericClass
 Last Write Time: 6/10/98 - 4:05 AM

Key Name: SYSTEM\CurrentControlSet\Services\SNMP\Parameters\EnableAuthenticationTraps
 Class Name: GenericClass

Last Write Time: 6/10/98 - 4:05 AM
 Value 0
 Name: switch
 Type: REG_DWORD
 Data: 0x1

Key Name:
 SYSTEM\CurrentControlSet\Services\SNMP\Parameters\ExtensionAgents
 Class Name: GenericClass
 Last Write Time: 6/10/98 - 4:05 AM
 Value 0
 Name: 1
 Type: REG_SZ
 Data:

SYSTEM\CurrentControlSet\Services\SNMP\Parameters\PermittedManagers
 Class Name: GenericClass
 Last Write Time: 6/10/98 - 4:05 AM

Key Name:
 SYSTEM\CurrentControlSet\Services\SNMP\Parameters\RFC1156Agent
 Class Name: GenericClass
 Last Write Time: 6/10/98 - 4:06 AM
 Value 0
 Name: sysContact
 Type: REG_SZ
 Data: SAM&M

Value 1
 Name: sysLocation
 Type: REG_SZ
 Data: MV Performance Lab

Value 2
 Name: sysServices
 Type: REG_DWORD
 Data: 0x4c

Key Name:
 SYSTEM\CurrentControlSet\Services\SNMP\Parameters\TrapConfiguration
 Class Name: GenericClass
 Last Write Time: 6/10/98 - 4:05 AM

Key Name:
 SYSTEM\CurrentControlSet\Services\SNMP\Parameters\ValidCommunities
 Class Name: GenericClass
 Last Write Time: 6/10/98 - 4:05 AM
 Value 0
 Name: 1
 Type: REG_SZ
 Data: public

Key Name: SYSTEM\CurrentControlSet\Services\SNMP\Security
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 4:05 AM

Value 0
 Name: Security
 Type: REG_BINARY
 Data:
 00000000 01 00 14 80 c0 00 00 00 - cc 00 00 00 14 00 00 00

 00000010 34 00 00 00 02 00 20 00 - 01 00 00 00 02 80 18 00
 4.....
 00000020 ff 01 0f 00 01 01 00 00 - 00 00 00 01 00 00 00 00

 00000030 20 02 00 00 02 00 8c 00 - 05 00 00 00 00 00 18 00

 00000040 8d 01 02 00 01 01 00 00 - 00 00 00 01 00 00 00 00

 00000050 12 00 00 00 00 00 1c 00 - fd 01 02 00 01 02 00 00

 00000060 00 00 00 05 20 00 00 00 - 23 02 00 00 01 01 00 00
 ...
 #.....
 00000070 00 00 1c 00 ff 01 0f 00 - 01 02 00 00 00 00 00 05

 00000080 20 00 00 00 20 02 00 00 - 01 01 00 00 00 00 1c 00 ...
 ...
 00000090 ff 01 0f 00 01 02 00 00 - 00 00 00 05 20 00 00 00

 000000a0 25 02 00 00 01 01 00 00 - 00 00 18 00 fd 01 02 00
 %.....
 000000b0 01 01 00 00 00 00 00 05 - 12 00 00 00 25 02 00 00

%...
 000000c0 01 01 00 00 00 00 00 05 - 12 00 00 00 01 01 00 00

 000000d0 00 00 00 05 12 00 00 00 -

Services\SQLServerAgent

Key Name: SYSTEM\CurrentControlSet\Services\SQLServerAgent
 Class Name: <NO CLASS>
 Last Write Time: 6/10/98 - 1:01 PM

```

Value 0
Name: DependOnGroup
Type: REG_MULTI_SZ
Data:

Value 1
Name: DependOnService
Type: REG_MULTI_SZ
Data: MSSQLServer

Value 2
Name: DisplayName
Type: REG_SZ
Data: SQLServerAgent

Value 3
Name: ErrorControl
Type: REG_DWORD
Data: 0x1

Value 4
Name: ImagePath
Type: REG_EXPAND_SZ
Data: C:\MSSQL7\bin\sqlagent.exe

Value 5
Name: ObjectName
Type: REG_SZ
Data: LocalSystem

Value 6
Name: Start
Type: REG_DWORD
Data: 0x3

Value 7
Name: Type
Type: REG_DWORD
Data: 0x10

Key Name:
SYSTEM\CurrentControlSet\Services\SQLServerAgent\Se
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 1:01 PM
Value 0
Name: Security
Type: REG_BINARY
Data:
00000000 01 00 14 80 c0 00 00 00 - cc 00 00 00 14 00 00 00
.....
00000010 34 00 00 00 02 00 20 00 - 01 00 00 00 02 80 18 00
4.....
00000020 ff 01 0f 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....

```

```

.....
00000030 20 02 00 00 02 00 8c 00 - 05 00 00 00 00 00 18 00
.....
00000040 8d 01 02 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
00000050 00 00 00 00 00 00 1c 00 - fd 01 02 00 01 02 00 00
.....
00000060 00 00 00 05 20 00 00 00 - 23 02 00 00 00 89 ba fd ....
...
#.....
00000070 00 00 1c 00 ff 01 0f 00 - 01 02 00 00 00 00 05
.....
00000080 20 00 00 00 20 02 00 00 - 00 89 ba fd 00 00 1c 00 ...
...
00000090 ff 01 0f 00 01 02 00 00 - 00 00 00 05 20 00 00 00
.....
000000a0 25 02 00 00 00 89 ba fd - 00 00 18 00 fd 01 02 00
%.....
000000b0 01 01 00 00 00 00 00 05 - 12 00 00 00 25 02 00 00
.....
....%...
000000c0 01 01 00 00 00 00 00 05 - 12 00 00 00 01 01 00 00
.....
.....
000000d0 00 00 00 05 12 00 00 00 -
.....

```

Services\Tcpip

```

Key Name: SYSTEM\CurrentControlSet\Services\Tcpip
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 4:06 AM
Value 0
Name: DisplayName
Type: REG_SZ
Data: TCP/IP Service

Value 1
Name: ErrorControl
Type: REG_DWORD
Data: 0x1

Value 2
Name: Group
Type: REG_SZ
Data: PNP_TDI

Value 3
Name: ImagePath

```



```

Type: REG_EXPAND_SZ
Data: \SystemRoot\System32\drivers\tcpip.sys

Value 4
Name: Start
Type: REG_DWORD
Data: 0x2

Value 5
Name: Type
Type: REG_DWORD
Data: 0x1

Key Name: SYSTEM\CurrentControlSet\Services\Tcpip\Enum
Class Name: <NO CLASS>
Last Write Time: 6/17/98 - 6:46 PM
Value 0
Name: 0
Type: REG_SZ
Data: Root\LEGACY_TCPIP\0000

Value 1
Name: Count
Type: REG_DWORD
Data: 0x1

Value 2
Name: NextInstance
Type: REG_DWORD
Data: 0x1

Key Name: SYSTEM\CurrentControlSet\Services\Tcpip\Linkage
Class Name: GenericClass
Last Write Time: 6/10/98 - 4:07 AM
Value 0
Name: Bind
Type: REG_MULTI_SZ
Data: \Device\E100B1

Value 1
Name: Export
Type: REG_MULTI_SZ
Data: \Device\Tcpip\E100B1

Value 2
Name: Route
Type: REG_MULTI_SZ
Data: "E100B" "E100B1"

Key Name:
SYSTEM\CurrentControlSet\Services\Tcpip\Linkage\Dis
abled
Class Name: GenericClass
Last Write Time: 6/10/98 - 4:07 AM

```

```

Value 0
Name: Bind
Type: REG_MULTI_SZ
Data:

Value 1
Name: Export
Type: REG_MULTI_SZ
Data:

Value 2
Name: Route
Type: REG_MULTI_SZ
Data:

Key Name:
SYSTEM\CurrentControlSet\Services\Tcpip\Parameters
Class Name: GenericClass
Last Write Time: 6/10/98 - 11:28 AM
Value 0
Name: DataBasePath
Type: REG_EXPAND_SZ
Data: %SystemRoot%\System32\drivers\etc

Value 1
Name: Domain
Type: REG_SZ
Data: mv.unisys.com

Value 2
Name: EnableSecurityFilters
Type: REG_DWORD
Data: 0

Value 3
Name: ForwardBroadcasts
Type: REG_DWORD
Data: 0

Value 4
Name: Hostname
Type: REG_SZ
Data: avalon4

Value 5
Name: IPEnableRouter
Type: REG_DWORD
Data: 0

Value 6
Name: KeepAliveInterval
Type: REG_DWORD
Data: 0x2710

Value 7
Name: NameServer
Type: REG_SZ
Data:

```

```

Value 8
  Name:      SearchList
  Type:      REG_SZ
  Data:

Value 9
  Name:      TcpAverageRTT
  Type:      REG_DWORD
  Data:      0x3e8

Key Name:
SYSTEM\CurrentControlSet\Services\Tcpip\Parameters\
  PersistentRoutes
Class Name:      GenericClass
Last Write Time: 6/10/98 - 4:05 AM

Key Name:
SYSTEM\CurrentControlSet\Services\Tcpip\Parameters\
  Winsock
Class Name:      GenericClass
Last Write Time: 6/10/98 - 4:05 AM
Value 0
  Name:      HelperDllName
  Type:      REG_EXPAND_SZ
  Data:      %SystemRoot%\System32\wshtcpip.dll

Value 1
  Name:      Mapping
  Type:      REG_BINARY
  Data:
00000000 0b 00 00 00 03 00 00 00 - 02 00 00 00 01 00 00 00
.....
00000010 06 00 00 00 02 00 00 00 - 01 00 00 00 00 00 00 00
.....
00000020 02 00 00 00 00 00 00 00 - 06 00 00 00 00 00 00 00
.....
00000030 00 00 00 00 06 00 00 00 - 00 00 00 00 01 00 00 00
.....
00000040 06 00 00 00 02 00 00 00 - 02 00 00 00 11 00 00 00
.....
00000050 02 00 00 00 02 00 00 00 - 00 00 00 00 02 00 00 00
.....
00000060 00 00 00 00 11 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000070 11 00 00 00 00 00 00 00 - 02 00 00 00 11 00 00 00
.....
00000080 02 00 00 00 03 00 00 00 - 00 00 00 00
.....

```

```

Value 2
  Name:      MaxSockAddrLength
  Type:      REG_DWORD
  Data:      0x10

Value 3
  Name:      MinSockAddrLength
  Type:      REG_DWORD
  Data:      0x10

Key Name:
SYSTEM\CurrentControlSet\Services\Tcpip\Performance
Class Name:      GenericClass
Last Write Time: 6/10/98 - 4:05 AM
Value 0
  Name:      Close
  Type:      REG_SZ
  Data:      CloseTcpIpPerformanceData

Value 1
  Name:      Collect
  Type:      REG_SZ
  Data:      CollectTcpIpPerformanceData

Value 2
  Name:      Library
  Type:      REG_SZ
  Data:      Perfctrs.dll

Value 3
  Name:      Open
  Type:      REG_SZ
  Data:      OpenTcpIpPerformanceData

Key Name:      SYSTEM\CurrentControlSet\Services\Tcpip\Security
Class Name:    <NO CLASS>
Last Write Time: 6/10/98 - 4:05 AM
Value 0
  Name:      Security
  Type:      REG_BINARY
  Data:
00000000 01 00 14 80 c0 00 00 00 - cc 00 00 00 14 00 00 00
.....
00000010 34 00 00 00 02 00 20 00 - 01 00 00 00 02 80 18 00
4.....
00000020 ff 01 0f 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
00000030 20 02 00 00 02 00 8c 00 - 05 00 00 00 00 00 18 00
.....
00000040 8d 01 02 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....

```

```

00000050 6d 00 00 00 00 00 1c 00 - fd 01 02 00 01 02 00 00
m.....
.....
00000060 00 00 00 05 20 00 00 00 - 23 02 00 00 43 00 48 00 ....
...
#...C.H.
00000070 00 00 1c 00 ff 01 0f 00 - 01 02 00 00 00 00 00 05
.....
.....
00000080 20 00 00 00 20 02 00 00 - 43 00 48 00 00 00 1c 00 ...
...
C.H.....
00000090 ff 01 0f 00 01 02 00 00 - 00 00 00 05 20 00 00 00
.....
.....
000000a0 25 02 00 00 43 00 48 00 - 00 00 18 00 fd 01 02 00
%...C.H.
.....
000000b0 01 01 00 00 00 00 00 05 - 12 00 00 00 25 02 00 00
.....
....%...
000000c0 01 01 00 00 00 00 00 05 - 12 00 00 00 01 01 00 00
.....
.....
000000d0 00 00 00 05 12 00 00 00 -
.....

```

```

Key Name:
SYSTEM\CurrentControlSet\Services\Tcpip\ServiceProv
            ider
Class Name: GenericClass
Last Write Time: 6/10/98 - 4:05 AM
Value 0
Name: Class
Type: REG_DWORD
Data: 0x8

Value 1
Name: DnsPriority
Type: REG_DWORD
Data: 0x7d0

Value 2
Name: HostsPriority
Type: REG_DWORD
Data: 0x1f4

Value 3
Name: LocalPriority
Type: REG_DWORD
Data: 0x1f3

Value 4
Name: Name
Type: REG_SZ
Data: TCP/IP

Value 5

```

```

Name: NetbtPriority
Type: REG_DWORD
Data: 0x7d1

```

```

Value 6
Name: ProviderPath
Type: REG_EXPAND_SZ
Data: %SystemRoot%\System32\wsock32.dll

```

Services\WinSock

```

Key Name: SYSTEM\CurrentControlSet\Services\WinSock
Class Name: GenericClass
Last Write Time: 6/10/98 - 4:05 AM

```

```

Value 0
Name: ErrorControl
Type: REG_DWORD
Data: 0x1

```

```

Value 1
Name: Start
Type: REG_DWORD
Data: 0x3

```

```

Value 2
Name: Type
Type: REG_DWORD
Data: 0x4

```

```

Key Name:
SYSTEM\CurrentControlSet\Services\WinSock\Autodial
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 11:59 AM
Value 0
Name: AutodialDllName32
Type: REG_SZ
Data: wininet.dll

```

```

Value 1
Name: AutodialFcnName32
Type: REG_SZ
Data: InternetAutodialCallback

```

```

Key Name:
SYSTEM\CurrentControlSet\Services\WinSock\Linkage
Class Name: GenericClass
Last Write Time: 6/10/98 - 4:05 AM

```

```

Key Name:
SYSTEM\CurrentControlSet\Services\WinSock\Linkage\D
            isabled
Class Name: GenericClass
Last Write Time: 6/10/98 - 4:05 AM

```

```

Key Name:
SYSTEM\CurrentControlSet\Services\WinSock\Parameter
      s
Class Name:      GenericClass
Last Write Time: 6/10/98 - 4:05 AM
Value 0
  Name:      Transports
  Type:      REG_MULTI_SZ
  Data:      Tcpip
              NetBIOS

Mig Key Name:      SYSTEM\CurrentControlSet\Services\WinSock\Setup
      ration
Class Name:      <NO CLASS>
Last Write Time: 6/10/98 - 4:07 AM
Value 0
  Name:      Known Static Providers
  Type:      REG_MULTI_SZ
  Data:      Tcpip
              NwlnkIpx
              NwlnkSpx
              AppleTalk
              IsoTp

Value 1
  Name:      Provider List
  Type:      REG_MULTI_SZ
  Data:      Tcpip
              NetBIOS

Value 2
  Name:      Setup Version
  Type:      REG_DWORD
  Data:      0x1009

Mig Key Name:      SYSTEM\CurrentControlSet\Services\WinSock\Setup
      ration\Providers
Class Name:      <NO CLASS>
Last Write Time: 6/10/98 - 4:06 AM

Mig Key Name:      SYSTEM\CurrentControlSet\Services\WinSock\Setup
      ration\Providers\NetBIOS
Class Name:      <NO CLASS>
Last Write Time: 6/10/98 - 4:07 AM
Value 0
  Name:      WinSock 1.1 Provider Data
  Type:      REG_BINARY
  Data:      00000000 0e 10 00 00 11 00 00 00 - 14 00 00 00 14 00 00 00
  .....
```

```

00000010 05 00 00 00 ff ff ff ff - 00 fa 00 00 66 00 00 00
.....
....f...
00000020 09 12 00 00 11 00 00 00 - 14 00 00 00 14 00 00 00
.....
.....
00000030 02 00 00 00 ff ff ff ff - 00 fa 00 00 40 00 00 00
.....
....@...
00000040 5c 00 44 00 65 00 76 00 - 69 00 63 00 65 00 5c 00
\D.e.v.
i.c.e.\.
00000050 4e 00 62 00 66 00 5f 00 - 45 00 31 00 30 00 30 00
N.b.f._.
E.1.0.0.
00000060 42 00 31 00 00 00 5c 00 - 44 00 65 00 76 00 69 00
B.1...\.
D.e.v.i.
00000070 63 00 65 00 5c 00 4e 00 - 62 00 66 00 5f 00 45 00
c.e.\.N.
b.f._.E.
00000080 31 00 30 00 30 00 42 00 - 31 00 00 00
1.0.0.B.
1...

Value 1
  Name:      WinSock 2.0 Provider ID
  Type:      REG_BINARY
  Data:      00000000 30 18 5f 8d 73 c2 cf 11 - 95 c8 00 80 5f 48 a1 92
0._.s...
....H..

Mig Key Name:      SYSTEM\CurrentControlSet\Services\WinSock\Setup
      ration\Providers\Tcpip
Class Name:      <NO CLASS>
Last Write Time: 6/10/98 - 4:06 AM
Value 0
  Name:      WinSock 2.0 Provider ID
  Type:      REG_BINARY
  Data:      00000000 a0 1a 0f e7 8b ab cf 11 - 8c a3 00 80 5f 48 a1 92
.....
....H..

Mig Key Name:      SYSTEM\CurrentControlSet\Services\WinSock\Setup
      ration\Well Known Guides
Class Name:      <NO CLASS>
Last Write Time: 6/10/98 - 4:06 AM
Value 0
  Name:      AppleTalk
  Type:      REG_BINARY
  Data:      00000000 a0 17 3b 2c df c6 cf 11 - 95 c8 00 80 5f 48 a1 92
..i,.....
```

```

...._H..
Value 1
  Name:      IsoTp
  Type:      REG_BINARY
  Data:
00000000  b0 cb e4 89 c1 b9 cf 11 - 95 c8 00 80 5f 48 a1 92
.....
...._H..
Value 2
  Name:      McsXns
  Type:      REG_BINARY
  Data:
00000000  b1 cb e4 89 c1 b9 cf 11 - 95 c8 00 80 5f 48 a1 92
.....
...._H..

```

Services\WinSock2

```

Key Name:      SYSTEM\CurrentControlSet\Services\WinSock2
Class Name:    <NO CLASS>
Last Write Time: 6/10/98 - 4:01 AM

Key Name:
SYSTEM\CurrentControlSet\Services\WinSock2\Paramete
  Name:      rs
Class Name:  <NO CLASS>
Last Write Time: 6/10/98 - 4:06 AM
Value 0
  Name:      Current_NameSpace_Catalog
  Type:      REG_SZ
  Data:      NameSpace_Catalog5

Value 1
  Name:      Current_Protocol_Catalog
  Type:      REG_SZ
  Data:      Protocol_Catalog9

Value 2
  Name:      WinSock_Registry_Version
  Type:      REG_SZ
  Data:      2.0

Key Name:
SYSTEM\CurrentControlSet\Services\WinSock2\Paramete
  Name:      rs\NameSpace_Catalog5
Class Name:  <NO CLASS>
Last Write Time: 6/10/98 - 4:05 AM
Value 0
  Name:      Next_Provider_ID
  Type:      REG_DWORD
  Data:      0x7d0

Value 1
  Name:      Num_Catalog_Entries

```

```

Type:      REG_DWORD
Data:      0x1

Key Name:
SYSTEM\CurrentControlSet\Services\WinSock2\Paramete
  Name:      rs\NameSpace_Catalog5\Catalog_Entries
Class Name:  <NO CLASS>
Last Write Time: 6/10/98 - 4:05 AM

Key Name:
SYSTEM\CurrentControlSet\Services\WinSock2\Paramete
  Name:      rs\NameSpace_Catalog5\Catalog_Entries\000000000001
Class Name:  <NO CLASS>
Last Write Time: 6/10/98 - 4:05 AM
Value 0
  Name:      DisplayString
  Type:      REG_SZ
  Data:      TCP/IP

Value 1
  Name:      Enabled
  Type:      REG_DWORD
  Data:      0x1

Value 2
  Name:      LibraryPath
  Type:      REG_SZ
  Data:      %SystemRoot%\System32\rnr20.dll

Value 3
  Name:      ProviderId
  Type:      REG_BINARY
  Data:
00000000  40 9d 05 22 9e 7e cf 11 - ae 5a 00 aa 00 a7 11 2b
@..".~..
.Z.....+

Value 4
  Name:      StoresServiceClassInfo
  Type:      REG_DWORD
  Data:      0x5e7

Value 5
  Name:      SupportedNameSpace
  Type:      REG_DWORD
  Data:      0xc

Value 6
  Name:      Version
  Type:      REG_DWORD
  Data:      0

Key Name:
SYSTEM\CurrentControlSet\Services\WinSock2\Paramete
  Name:      rs\Protocol_Catalog9
Class Name:  <NO CLASS>

```

```

Last Write Time: 6/10/98 - 4:07 AM
Value 0
  Name: Next_Catalog_Entry_ID
  Type: REG_DWORD
  Data: 0x3f2

Value 1
  Name: Next_Provider_ID
  Type: REG_DWORD
  Data: 0x1

Value 2
  Name: Num_Catalog_Entries
  Type: REG_DWORD
  Data: 0x5

Key Name:
SYSTEM\CurrentControlSet\Services\WinSock2\Paramete
rs\Protocol_Catalog9\Catalog_Entries
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 4:07 AM

Key Name:
SYSTEM\CurrentControlSet\Services\WinSock2\Paramete
rs\Protocol_Catalog9\Catalog_Entries\000000000001
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 4:07 AM
Value 0
  Name: PackedCatalogItem
  Type: REG_BINARY
  Data:
00000000 25 53 79 73 74 65 6d 52 - 6f 6f 74 25 5c 73 79 73
%SystemR
oot%\sys
00000010 74 65 6d 33 32 5c 6d 73 - 61 66 64 2e 64 6c 6c 00
tem32\ms
afd.dll.
00000020 61 66 64 2e 64 6c 6c 00 - 76 00 65 00 72 00 20 00
afd.dll.
v.e.r. .
00000030 6e 00 6f 00 64 00 65 00 - 73 00 2c 00 20 00 66 00
n.o.d.e.
s.,. .f.
00000040 6f 00 72 00 20 00 77 00 - 68 00 69 00 63 00 68 00 o.r.
.w.
h.i.c.h.
00000050 20 00 74 00 68 00 65 00 - 72 00 65 00 20 00 61 00
.t.h.e.
r.e. .a.
00000060 72 00 65 00 20 00 73 00 - 65 00 70 00 61 00 72 00 r.e.
.s.
e.p.a.r.
00000070 61 00 74 00 65 00 20 00 - 69 00 74 00 65 00 6d 00
a.t.e. .
i.t.e.m.
00000080 73 00 20 00 74 00 6f 00 - 20 00 62 00 65 00 0d 00 s.
.t.o.

```

```

.b.e...
00000090 0a 00 3b 00 20 00 70 00 - 72 00 65 00 73 00 65 00 ...;
.p.
r.e.s.e.
000000a0 6e 00 74 00 65 00 64 00 - 20 00 74 00 6f 00 20 00
n.t.e.d.
.t.o. .
000000b0 74 00 68 00 65 00 20 00 - 75 00 73 00 65 00 72 00
t.h.e. .
u.s.e.r.
000000c0 2e 00 20 00 20 00 54 00 - 68 00 65 00 73 00 65 00 ..
.T.
h.e.s.e.
000000d0 20 00 63 00 6f 00 6d 00 - 62 00 69 00 6e 00 61 00
.c.o.m.
b.i.n.a.
000000e0 74 00 69 00 6f 00 6e 00 - 20 00 6e 00 6f 00 64 00
t.i.o.n.
.n.o.d.
000000f0 65 00 73 00 20 00 61 00 - 72 00 65 00 20 00 6f 00 e.s.
.a.
r.e. .o.
00000100 6e 00 6c 00 66 00 02 00 - 00 00 00 00 00 00 00 00
n.l.f...
.....
00000110 00 00 00 00 08 00 00 00 - a0 1a 0f e7 8b ab cf 11
.....
.....
00000120 8c a3 00 80 5f 48 a1 92 - e9 03 00 00 01 00 00 00
...._H..
.....
00000130 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
.....
00000140 00 00 00 00 00 00 00 00 - 00 00 00 00 02 00 00 00
.....
.....
00000150 02 00 00 00 10 00 00 00 - 10 00 00 00 01 00 00 00
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00000160 06 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
.....
00000170 00 00 00 00 00 00 00 00 - 4d 00 53 00 41 00 46 00
.....
.....
M.S.A.F.
00000180 44 00 20 00 54 00 63 00 - 70 00 69 00 70 00 20 00 D.
.T.c.
p.i.p. .
00000190 5b 00 54 00 43 00 50 00 - 2f 00 49 00 50 00 5d 00
[.T.C.P.
/.I.P.].
000001a0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
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000001b0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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000001c0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000001d0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000001e0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000001f0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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00000200 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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00000210 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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00000220 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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00000230 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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00000240 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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00000250 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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00000260 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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00000270 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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00000280 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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00000290 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000002a0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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000002b0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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000002c0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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000002d0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000002e0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000002f0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....

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.....
00000300 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000310 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000320 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000330 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000340 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000350 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000360 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000370 00 00 00 00 00 00 00 00 -
.....

Key Name:
SYSTEM\CurrentControlSet\Services\WinSock2\Paramete
rs\Protocol_Catalog9\Catalog_Entries\000000000002
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 4:07 AM
Value 0
Name: PackedCatalogItem
Type: REG_BINARY
Data:
00000000 25 53 79 73 74 65 6d 52 - 6f 6f 74 25 5c 73 79 73
%SystemR
oot%\sys
00000010 74 65 6d 33 32 5c 6d 73 - 61 66 64 2e 64 6c 6c 00
tem32\ms
afd.dll.
00000020 61 66 64 2e 64 6c 6c 00 - 76 00 65 00 72 00 20 00
afd.dll.
v.e.r. .
00000030 6e 00 6f 00 64 00 65 00 - 73 00 2c 00 20 00 66 00
n.o.d.e.
s,. .f.
00000040 6f 00 72 00 20 00 77 00 - 68 00 69 00 63 00 68 00 o.r.
.w.
h.i.c.h.
00000050 20 00 74 00 68 00 65 00 - 72 00 65 00 20 00 61 00
.t.h.e.
r.e. .a.
00000060 72 00 65 00 20 00 73 00 - 65 00 70 00 61 00 72 00 r.e.
.s.
e.p.a.r.
00000070 61 00 74 00 65 00 20 00 - 69 00 74 00 65 00 6d 00
a.t.e. .

```

i.t.e.m. 00000080	73 00 20 00 74 00 6f 00 - 20 00 62 00 65 00 0d 00	s.	000001b0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.t.o. .b.e... 00000090	0a 00 3b 00 20 00 70 00 - 72 00 65 00 73 00 65 00	..;	000001c0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.p. r.e.s.e. 000000a0	6e 00 74 00 65 00 64 00 - 20 00 74 00 6f 00 20 00		000001d0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
n.t.e.d. .t.o. . 000000b0	74 00 68 00 65 00 20 00 - 75 00 73 00 65 00 72 00		000001e0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
t.h.e. . u.s.e.r. 000000c0	2e 00 20 00 20 00 54 00 - 68 00 65 00 73 00 65 00	.. .	000001f0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.T. h.e.s.e. 000000d0	20 00 63 00 6f 00 6d 00 - 62 00 69 00 6e 00 61 00		00000200	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.c.o.m. b.i.n.a. 000000e0	74 00 69 00 6f 00 6e 00 - 20 00 6e 00 6f 00 64 00		00000210	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
t.i.o.n. .n.o.d. 000000f0	65 00 73 00 20 00 61 00 - 72 00 65 00 20 00 6f 00	e.s.	00000220	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.a. r.e. .o. 00000100	6e 00 6c 00 09 06 02 00 - 00 00 00 00 00 00 00 00		00000230	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
n.l..... 00000110	00 00 00 00 08 00 00 00 - a0 1a 0f e7 8b ab cf 11		00000240	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
..... 00000120	8c a3 00 80 5f 48 a1 92 - ea 03 00 00 01 00 00 00		00000250	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
...._H.. 00000130	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00		00000260	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
..... 00000140	00 00 00 00 00 00 00 00 - 00 00 00 00 02 00 00 00		00000270	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
..... 00000150	02 00 00 00 10 00 00 00 - 10 00 00 00 02 00 00 00		00000280	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
..... 00000160	11 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00		00000290	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
..... 00000170	bb ff 00 00 00 00 00 00 - 4d 00 53 00 41 00 46 00		000002a0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
..... M.S.A.F. 00000180	44 00 20 00 54 00 63 00 - 70 00 69 00 70 00 20 00	D.	000002b0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.T.c. p.i.p. . 00000190	5b 00 55 00 44 00 50 00 - 2f 00 49 00 50 00 5d 00		000002c0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
[.U.D.P. /.I.P.]. 000001a0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00		000002d0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....			000002e0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00


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.....
000002f0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000300 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000310 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000320 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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00000330 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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00000340 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000350 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000360 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000370 00 00 00 00 00 00 00 00 -
.....

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Key Name:
SYSTEM\CurrentControlSet\Services\WinSock2\Paramete
rs\Protocol_Catalog9\Catalog_Entries\000000000003
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 4:07 AM
Value 0
Name: PackedCatalogItem
Type: REG_BINARY
Data:
00000000 25 53 79 73 74 65 6d 52 - 6f 6f 74 25 5c 73 79 73
%SystemR
oot%\sys
00000010 74 65 6d 33 32 5c 6d 73 - 61 66 64 2e 64 6c 6c 00
tem32\ms
afd.dll.
00000020 61 66 64 2e 64 6c 6c 00 - 76 00 65 00 72 00 20 00
afd.dll.
v.e.r. .
00000030 6e 00 6f 00 64 00 65 00 - 73 00 2c 00 20 00 66 00
n.o.d.e.
s.,. .f.
00000040 6f 00 72 00 20 00 77 00 - 68 00 69 00 63 00 68 00 o.r.
.w.
h.i.c.h.
00000050 20 00 74 00 68 00 65 00 - 72 00 65 00 20 00 61 00
.t.h.e.
r.e. .a.
00000060 72 00 65 00 20 00 73 00 - 65 00 70 00 61 00 72 00 r.e.
.s.

```

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e.p.a.r.
00000070 61 00 74 00 65 00 20 00 - 69 00 74 00 65 00 6d 00
a.t.e. .
i.t.e.m.
00000080 73 00 20 00 74 00 6f 00 - 20 00 62 00 65 00 0d 00 s.
.t.o.
.b.e...
00000090 0a 00 3b 00 20 00 70 00 - 72 00 65 00 73 00 65 00 .;.
.p.
r.e.s.e.
000000a0 6e 00 74 00 65 00 64 00 - 20 00 74 00 6f 00 20 00
n.t.e.d.
.t.o. .
000000b0 74 00 68 00 65 00 20 00 - 75 00 73 00 65 00 72 00
t.h.e. .
u.s.e.r.
000000c0 2e 00 20 00 20 00 54 00 - 68 00 65 00 73 00 65 00 . . .
.T.
h.e.s.e.
000000d0 20 00 63 00 6f 00 6d 00 - 62 00 69 00 6e 00 61 00
.c.o.m.
b.i.n.a.
000000e0 74 00 69 00 6f 00 6e 00 - 20 00 6e 00 6f 00 64 00
t.i.o.n.
.n.o.d.
000000f0 65 00 73 00 20 00 61 00 - 72 00 65 00 20 00 6f 00 e.s.
.a.
r.e. .o.
00000100 6e 00 6c 00 09 06 02 00 - 00 00 00 00 00 00 00 00
n.l.....
.....
00000110 00 00 00 00 0c 00 00 00 - a0 1a 0f e7 8b ab cf 11
.....
.....
00000120 8c a3 00 80 5f 48 a1 92 - eb 03 00 00 01 00 00 00
...._H..
.....
00000130 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000140 00 00 00 00 00 00 00 00 - 00 00 00 00 02 00 00 00
.....
00000150 02 00 00 00 10 00 00 00 - 10 00 00 00 03 00 00 00
.....
00000160 00 00 00 00 ff 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000170 bb ff 00 00 00 00 00 00 - 4d 00 53 00 41 00 46 00
.....
M.S.A.F.
00000180 44 00 20 00 54 00 63 00 - 70 00 69 00 70 00 20 00 D.
.T.c.
p.i.p. .
00000190 5b 00 52 00 41 00 57 00 - 2f 00 49 00 50 00 5d 00
[.R.A.W.
/.I.P.].

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000001a0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000001b0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000001c0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000001d0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000001e0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000001f0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000200 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000210 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000220 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000230 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000240 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000250 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000260 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000270 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000280 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000290 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000002a0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000002b0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000002c0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000002d0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....

```

```

.....
000002e0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000002f0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000300 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000310 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000320 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000330 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000340 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000350 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000360 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000370 00 00 00 00 00 00 00 00 -
.....

Key Name:
SYSTEM\CurrentControlSet\Services\WinSock2\Paramete
rs\Protocol_Catalog9\Catalog_Entries\00000000000004
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 4:07 AM
Value 0
Name: PackedCatalogItem
Type: REG_BINARY
Data:
00000000 25 53 79 73 74 65 6d 52 - 6f 6f 74 25 5c 73 79 73
%SystemR
oot%\sys
00000010 74 65 6d 33 32 5c 6d 73 - 61 66 64 2e 64 6c 6c 00
tem32\ms
afd.dll.
00000020 61 66 64 2e 64 6c 6c 00 - 76 00 65 00 72 00 20 00
afd.dll.
v.e.r. .
00000030 6e 00 6f 00 64 00 65 00 - 73 00 2c 00 20 00 66 00
n.o.d.e.
s.,. .f.
00000040 6f 00 72 00 20 00 77 00 - 68 00 69 00 63 00 68 00 o.r.
.w.
h.i.c.h.
00000050 20 00 74 00 68 00 65 00 - 72 00 65 00 20 00 61 00
.t.h.e.

```

r.e. .a. 00000060	72 00 65 00 20 00 73 00 - 65 00 70 00 61 00 72 00	r.e.	.[\.\ D.e.v.i. 000001a0	53 00 20 00 5b 00 5c 00 - 44 00 65 00 76 00 69 00	S.
.s. e.p.a.r. 00000070	61 00 74 00 65 00 20 00 - 69 00 74 00 65 00 6d 00		c.e.\.N. b.f._.E. 000001b0	63 00 65 00 5c 00 4e 00 - 62 00 66 00 5f 00 45 00	
a.t.e. .i.t.e.m. 00000080	73 00 20 00 74 00 6f 00 - 20 00 62 00 65 00 0d 00	s.	1.0.0.B. 1.] .S. 000001c0	31 00 30 00 30 00 42 00 - 31 00 5d 00 20 00 53 00	
.t.o. .b.e... 00000090	0a 00 3b 00 20 00 70 00 - 72 00 65 00 73 00 65 00	..;	E.Q.P.A. C.K.E.T. 000001d0	45 00 51 00 50 00 41 00 - 43 00 4b 00 45 00 54 00	
.p. r.e.s.e. 000000a0	6e 00 74 00 65 00 64 00 - 20 00 74 00 6f 00 20 00		.l..... 000001e0	20 00 31 00 00 00 00 00 - 00 00 00 00 00 00 00	
n.t.e.d. .t.o. . 000000b0	74 00 68 00 65 00 20 00 - 75 00 73 00 65 00 72 00		..... ..... 000001f0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00	
t.h.e. .u.s.e.r. 000000c0	2e 00 20 00 20 00 54 00 - 68 00 65 00 73 00 65 00	.. .	..... ..... 00000200	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00	
.T. h.e.s.e. 000000d0	20 00 63 00 6f 00 6d 00 - 62 00 69 00 6e 00 61 00		..... ..... 00000210	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00	
.c.o.m. b.i.n.a. 000000e0	74 00 69 00 6f 00 6e 00 - 20 00 6e 00 6f 00 64 00		..... ..... 00000220	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00	
t.i.o.n. .n.o.d. 000000f0	65 00 73 00 20 00 61 00 - 72 00 65 00 20 00 6f 00	e.s.	..... ..... 00000230	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00	
.a. r.e. .o. 00000100	6e 00 6c 00 0e 00 02 00 - 00 00 00 00 00 00 00		..... ..... 00000240	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00	
n.l..... 00000110	00 00 00 00 00 00 00 00 - 30 18 5f 8d 73 c2 cf 11		..... ..... 00000250	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00	
..... 0._.s... 00000120	95 c8 00 80 5f 48 a1 92 - f0 03 00 00 01 00 00 00		..... ..... 00000260	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00	
...._H.. 00000130	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00		..... ..... 00000270	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00	
..... 00000140	00 00 00 00 00 00 00 00 - 00 00 00 00 02 00 00 00		..... ..... 00000280	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00	
..... 00000150	11 00 00 00 14 00 00 00 - 14 00 00 00 05 00 00 00		..... ..... 00000290	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00	
..... 00000160	ff ff ff ff 00 00 00 00 - 00 00 00 00 00 00 00 00		..... ..... 000002a0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00	
..... 00000170	00 fa 00 00 00 00 00 00 - 4d 00 53 00 41 00 46 00		..... ..... 000002b0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00	
..... M.S.A.F. 00000180	44 00 20 00 4e 00 65 00 - 74 00 42 00 49 00 4f 00	D.	..... ..... 000002c0	00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00	
.N.e. t.B.I.O.			.....	

```

.....
000002d0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000002e0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
000002f0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000300 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000310 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000320 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000330 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000340 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000350 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000360 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000370 00 00 00 00 00 00 00 00 -
.....

```

Key Name:
SYSTEM\CurrentControlSet\Services\WinSock2\Paramete

```

rs\Protocol_Catalog9\Catalog_Entries\000000000005
Class Name: <NO CLASS>
Last Write Time: 6/10/98 - 4:07 AM
Value 0
Name: PackedCatalogItem
Type: REG_BINARY
Data:
00000000 25 53 79 73 74 65 6d 52 - 6f 6f 74 25 5c 73 79 73
%SystemR
oot%\sys
00000010 74 65 6d 33 32 5c 6d 73 - 61 66 64 2e 64 6c 6c 00
tem32\ms
afd.dll.
00000020 61 66 64 2e 64 6c 6c 00 - 76 00 65 00 72 00 20 00
afd.dll.
v.e.r. .
00000030 6e 00 6f 00 64 00 65 00 - 73 00 2c 00 20 00 66 00
n.o.d.e.
s,. .f.
00000040 6f 00 72 00 20 00 77 00 - 68 00 69 00 63 00 68 00 o.r.
.w.

```

```

h.i.c.h.
00000050 20 00 74 00 68 00 65 00 - 72 00 65 00 20 00 61 00
.t.h.e.
r.e. .a.
00000060 72 00 65 00 20 00 73 00 - 65 00 70 00 61 00 72 00 r.e.
.s.
e.p.a.r.
00000070 61 00 74 00 65 00 20 00 - 69 00 74 00 65 00 6d 00
a.t.e. .
i.t.e.m.
00000080 73 00 20 00 74 00 6f 00 - 20 00 62 00 65 00 0d 00 s.
.t.o.
.b.e...
00000090 0a 00 3b 00 20 00 70 00 - 72 00 65 00 73 00 65 00 .;.
.p.
r.e.s.e.
000000a0 6e 00 74 00 65 00 64 00 - 20 00 74 00 6f 00 20 00
n.t.e.d.
.t.o. .
000000b0 74 00 68 00 65 00 20 00 - 75 00 73 00 65 00 72 00
t.h.e. .
u.s.e.r.
000000c0 2e 00 20 00 20 00 54 00 - 68 00 65 00 73 00 65 00 . . .
.T.
h.e.s.e.
000000d0 20 00 63 00 6f 00 6d 00 - 62 00 69 00 6e 00 61 00
.c.o.m.
b.i.n.a.
000000e0 74 00 69 00 6f 00 6e 00 - 20 00 6e 00 6f 00 64 00
t.i.o.n.
.n.o.d.
000000f0 65 00 73 00 20 00 61 00 - 72 00 65 00 20 00 6f 00 e.s.
.a.
r.e. .o.
00000100 6e 00 6c 00 09 02 02 00 - 00 00 00 00 00 00 00 00
n.l.....
.....
00000110 00 00 00 00 00 00 00 00 - 30 18 5f 8d 73 c2 cf 11
.....
0. .s...
00000120 95 c8 00 80 5f 48 a1 92 - f1 03 00 00 01 00 00 00
...._H..
.....
00000130 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000140 00 00 00 00 00 00 00 00 - 00 00 00 00 02 00 00 00
.....
00000150 11 00 00 00 14 00 00 00 - 14 00 00 00 02 00 00 00
.....
00000160 ff ff ff ff 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
00000170 00 fa 00 00 00 00 00 00 - 4d 00 53 00 41 00 46 00
.....
M.S.A.F.

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.N.e. 00000180 44 00 20 00 4e 00 65 00 - 74 00 42 00 49 00 4f 00 D.
      t.B.I.O.
      00000190 53 00 20 00 5b 00 5c 00 - 44 00 65 00 76 00 69 00 S.
.[.\.
      D.e.v.i.
      000001a0 63 00 65 00 5c 00 4e 00 - 62 00 66 00 5f 00 45 00
c.e.\.N.
      b.f._.E.
      000001b0 31 00 30 00 30 00 42 00 - 31 00 5d 00 20 00 44 00
1.0.0.B.
      1.]. .D.
      000001c0 41 00 54 00 41 00 47 00 - 52 00 41 00 4d 00 20 00
A.T.A.G.
      R.A.M. .
      000001d0 31 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
1.....
      000001e0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
      000001f0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
      00000200 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
      00000210 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
      00000220 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
      00000230 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
      00000240 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
      00000250 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
      00000260 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
      00000270 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
      00000280 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
      00000290 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
      000002a0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
      000002b0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....

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.....
000002c0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
.....
000002d0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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.....
000002e0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
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000002f0 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
.....
00000300 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
.....
00000310 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
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00000320 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
.....
00000330 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
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00000340 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
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00000350 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
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00000360 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00
.....
.....
00000370 00 00 00 00 00 00 00 00 -
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NT Client Configuration Information

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Microsoft Diagnostics Report For \\CLIENT1
-----

OS Version Report
-----
Microsoft (R) Windows NT (TM) Server
Version 4.0 (Build 1381: Service Pack 3) x86 Multiprocessor Free
Registered Owner: Unisys, Unisys
Product Number: 31797-OEM-0026695-85788
-----

System Report
-----
System: AT/AT COMPATIBLE
Hardware Abstraction Layer: MPS 1.4 - APIC platform

```

BIOS Date: 10/13/97
BIOS Version: PhoenixBIOS 4.0 Release 5.10.7

Processor list:

0: x86 Family 6 Model 3 Stepping 4 GenuineIntel ~299 Mhz
1: x86 Family 6 Model 3 Stepping 4 GenuineIntel ~299 Mhz

Video Display Report

BIOS Date: 11/16/95
BIOS Version: CL-GD5440 VGA BIOS Version 1.06

Adapter:

Setting: 800 x 600 x 256
60 Hz

Type: cirrus compatible display adapter
String: Cirrus Logic Compatible

Memory: 2 MB
Chip Type: CL 5430
DAC Type: Integrated RAMDAC

Driver:

Vendor: Microsoft Corporation
File(s): cirrus.sys, vga.dll, cirrus.dll, vga256.dll, vga64K.dll
Version: 4.00, 4.0.0

Drives Report

C:\ (Local - NTFS) Total: 0KB, Free: 0KB
Serial Number: E80B - 4E03
Bytes per cluster: 512
Sectors per cluster: 1
Filename length: 255

Memory Report

Handles: 1,120
Threads: 109
Processes: 16

Physical Memory (K)
Total: 261,552
Available: 224,332
File Cache: 10,064

Kernel Memory (K)
Total: 18,668
Paged: 7,508
Nonpaged: 11,160

Commit Charge (K)
Total: 27,768
Limit: 505,824
Peak: 310,732

Pagefile Space (K)
Total: 262,144
Total in use: 5,300

Peak: 106,656

C:\pagefile.sys
Total: 262,144
Total in use: 5,300
Peak: 106,656

Services Report

Alerter	Stopped	(Manual)
C:\WINNT\System32\services.exe		
Service Account Name: LocalSystem		
Error Severity: Normal		
Service Flags: Shared Process		
Service Dependencies:		
LanmanWorkstation		
Computer Browser	Running	(Automatic)
C:\WINNT\System32\services.exe		
Service Account Name: LocalSystem		
Error Severity: Normal		
Service Flags: Shared Process		
Service Dependencies:		
LanmanWorkstation		
LanmanServer		
LmHosts		
ClipBook Server	Stopped	(Manual)
C:\WINNT\system32\clipsrv.exe		
Service Account Name: LocalSystem		
Error Severity: Normal		
Service Flags: Own Process		
Service Dependencies:		
NetDDE		
DHCP Client (TDI)	Stopped	(Disabled)
C:\WINNT\System32\services.exe		
Service Account Name: LocalSystem		
Error Severity: Normal		
Service Flags: Shared Process		
Service Dependencies:		
Tcpip		
Afd		
NetBT		
3Com dRMON SmartAgent PC Software	Stopped	(Manual)
C:\WINNT\System32\drmon\smartagt\smartagt.exe		
Service Account Name: LocalSystem		
Error Severity: Normal		
Service Flags: Own Process		
Service Dependencies:		
DTA		
EventLog (Event log)	Running	(Automatic)
C:\WINNT\system32\services.exe		
Service Account Name: LocalSystem		
Error Severity: Normal		
Service Flags: Shared Process		
Adaptec Failover Backup Monitor	Stopped	(Manual)
C:\WINNT\System32\forbmon.exe		
Service Account Name: LocalSystem		
Error Severity: Normal		

Service Flags: Own Process			Service Flags: Shared Process		
Server	Running	(Automatic)	OracleClientCache80	Stopped	(Manual)
C:\WINNT\System32\services.exe			C:\ORANT\BIN\ONRSD80.EXE		
Service Account Name: LocalSystem			Service Account Name: LocalSystem		
Error Severity: Normal			Error Severity: Normal		
Service Flags: Shared Process			Service Flags: Own Process		
Group Dependencies:			Plug and Play (PlugPlay)	Running	(Automatic)
TDI			C:\WINNT\system32\services.exe		
Workstation (NetworkProvider)	Running	(Automatic)	Service Account Name: LocalSystem		
C:\WINNT\System32\services.exe			Error Severity: Normal		
Service Account Name: LocalSystem			Service Flags: Shared Process		
Error Severity: Normal			Protected Storage	Running	(Automatic)
Service Flags: Shared Process			C:\WINNT\System32\pstores.exe		
Group Dependencies:			Service Account Name: LocalSystem		
TDI			Error Severity: Normal		
License Logging Service	Stopped	(Manual)	Service Flags: Own Process, Interactive		
C:\WINNT\System32\llssrv.exe			Service Dependencies:		
Service Account Name: LocalSystem			RpcSs		
Error Severity: Normal			Remote Command Server	Running	(Automatic)
Service Flags: Own Process			C:\WINNT\System32\rcmdsvc.exe		
TCP/IP NetBIOS Helper	Running	(Automatic)	Service Account Name: LocalSystem		
C:\WINNT\System32\services.exe			Error Severity: Normal		
Service Account Name: LocalSystem			Service Flags: Own Process		
Error Severity: Normal			Service Dependencies:		
Service Flags: Shared Process			LanmanServer		
Group Dependencies:			Directory Replicator	Stopped	(Manual)
NetworkProvider			C:\WINNT\System32\lmrepl.exe		
Messenger	Stopped	(Manual)	Service Account Name: LocalSystem		
C:\WINNT\System32\services.exe			Error Severity: Normal		
Service Account Name: LocalSystem			Service Flags: Own Process		
Error Severity: Normal			Service Dependencies:		
Service Flags: Shared Process			LanmanWorkstation		
Service Dependencies:			LanmanServer		
LanmanWorkstation			Remote Procedure Call (RPC) Locator	Stopped	(Manual)
NetBios			C:\WINNT\System32\LOCATOR.EXE		
Network DDE (NetDDEGroup)	Stopped	(Manual)	Service Account Name: LocalSystem		
C:\WINNT\system32\netdde.exe			Error Severity: Normal		
Service Account Name: LocalSystem			Service Flags: Own Process		
Error Severity: Normal			Service Dependencies:		
Service Flags: Shared Process			LanmanWorkstation		
Service Dependencies:			Rdr		
NetDDEDSDM			Remote Procedure Call (RPC) Service	Running	(Automatic)
Network DDE DSMD	Stopped	(Manual)	C:\WINNT\system32\RpcSs.exe		
C:\WINNT\system32\netdde.exe			Service Account Name: LocalSystem		
Service Account Name: LocalSystem			Error Severity: Normal		
Error Severity: Normal			Service Flags: Own Process		
Service Flags: Shared Process			Schedule	Stopped	(Manual)
Service Dependencies:			C:\WINNT\System32\AtSvc.Exe		
NetDDEDSMD			Service Account Name: LocalSystem		
Network DDE DSMD	Stopped	(Manual)	Error Severity: Normal		
C:\WINNT\system32\netdde.exe			Service Flags: Own Process		
Service Account Name: LocalSystem			Spooler (SpoolerGroup)	Stopped	(Manual)
Error Severity: Normal			C:\WINNT\system32\spoolss.exe		
Service Flags: Shared Process			Service Account Name: LocalSystem		
Service Dependencies:			Error Severity: Normal		
LanmanWorkstation			Service Flags: Own Process, Interactive		
LmHosts			Telephony Service	Stopped	(Manual)
NT LM Security Support Provider	Running	(Manual)	C:\WINNT\system32\tapisrv.exe		
C:\WINNT\System32\SERVICES.EXE			Service Account Name: LocalSystem		
Service Account Name: LocalSystem					
Error Severity: Normal					

```

Error Severity: Normal
Service Flags: Own Process
TUXEDO IPC Helper          Stopped (Automatic)
  C:\TUXEDO\bin\tuxipc.exe
  Service Account Name: LocalSystem
Error Severity: Normal
Service Flags: Own Process
TListen (Port: 3050)      Stopped (Manual)
  C:\TUXEDO\bin\slisten.exe
  Service Account Name: LocalSystem
Error Severity: Normal
Service Flags: Own Process
UPS                        Stopped (Manual)
  C:\WINNT\System32\ups.exe
  Service Account Name: LocalSystem
Error Severity: Normal
Service Flags: Own Process
World Wide Web Publishing Service Stopped (Manual)
  C:\WINNT\System32\inetsrv\inetinfo.exe
  Service Account Name: LocalSystem
Error Severity: Ignore
Service Flags: Shared Process
Service Dependencies:
  RPCSS
  NTLMSPP

```

Drivers Report

```

-----
Abiosdsk (Primary disk)   Stopped (Disabled)
  Error Severity: Ignore
  Service Flags: Kernel Driver, Shared Process
AFD Networking Support Environment (TDI) Running (Automatic)
  C:\WINNT\System32\drivers\afd.sys
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
Aha154x (SCSI miniport)  Stopped (Disabled)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
Aha174x (SCSI miniport)  Stopped (Disabled)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
aic78xx (SCSI miniport)  Running (Boot)
  C:\WINNT\System32\DRIVERS\aic78xx.sys
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
Always (SCSI miniport)   Stopped (Disabled)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
ami0nt (SCSI miniport)   Stopped (Disabled)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
amsint (SCSI miniport)   Stopped (Disabled)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
Arrow (SCSI miniport)     Stopped (Disabled)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process

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```

atapi (SCSI miniport)    Stopped (Disabled)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
Atdisk (Primary disk)    Stopped (Disabled)
  Error Severity: Ignore
  Service Flags: Kernel Driver, Shared Process
ati (Video)              Stopped (Disabled)
  Error Severity: Ignore
  Service Flags: Kernel Driver, Shared Process
Beep (Base)              Running (System)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
BusLogic (SCSI miniport) Stopped (Disabled)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
Busmouse (Pointer Port)  Stopped (Disabled)
  Error Severity: Ignore
  Service Flags: Kernel Driver, Shared Process
Cdaudio (Filter)         Stopped (System)
  Error Severity: Ignore
  Service Flags: Kernel Driver, Shared Process
Cdfs (File system)       Running (Disabled)
  Error Severity: Normal
  Service Flags: File System Driver, Shared Process
  Group Dependencies:
    SCSI CDROM Class
Cdrom (SCSI CDROM Class) Running (System)
  Error Severity: Ignore
  Service Flags: Kernel Driver, Shared Process
  Group Dependencies:
    SCSI miniport
Changer (Filter)         Stopped (System)
  Error Severity: Ignore
  Service Flags: Kernel Driver, Shared Process
cirrus (Video)           Running (System)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
Cpqarray (SCSI miniport) Stopped (Disabled)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
cpqfw2e (SCSI miniport)  Stopped (Disabled)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
dac960nt (SCSI miniport) Stopped (Disabled)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
dce376nt (SCSI miniport) Stopped (Disabled)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
Delldsa (SCSI miniport)  Stopped (Disabled)
  Error Severity: Normal
  Service Flags: Kernel Driver, Shared Process
Dell_DGX (Video)         Stopped (Disabled)
  Error Severity: Ignore
  Service Flags: Kernel Driver, Shared Process
Disk (SCSI Class)        Running (Boot)
  Error Severity: Ignore
  Service Flags: Kernel Driver, Shared Process
  Group Dependencies:

```


SCSI miniport
Diskperf (Filter) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
DptScsi (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
DTA (TDI) Stopped (Manual)
C:\WINNT\System32\drivers\dtadrv.sys
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
dte329x (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
3Com 3C90x Adapter Driver (NDIS) Running (Automatic)
C:\WINNT\System32\drivers\el90x.sys
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Adaptec EMPCI Adapter Driver (NDIS) Running (Automatic)
C:\WINNT\System32\drivers\EMPCI.sys
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
et4000 (Video) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Fastfat (Boot file system) Stopped (Disabled)
Error Severity: Normal
Service Flags: File System Driver, Shared Process
Fd16_700 (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Fd7000ex (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Fd8xx (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
flashpnt (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Floppy (Primary disk) Running (System)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Ftdisk (Filter) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
i8042 Keyboard and PS/2 Mouse Port Driver (Keyboard Port) Running (System)
System32\DRIVERS\i8042prt.sys
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Inport (Pointer Port) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Jazzg300 (Video) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Jazzg364 (Video) Stopped (Disabled)
Error Severity: Ignore

Service Flags: Kernel Driver, Shared Process
Jzvx1484 (Video) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Keyboard Class Driver (Keyboard Class) Running (System)
System32\DRIVERS\kbdclass.sys
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
KSecDD (Base) Running (System)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
mga (Video) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
mga_mil (Video) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
mitsumi (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
mkecr5xx (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Modem (Extended base) Stopped (Manual)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Mouse Class Driver (Pointer Class) Running (System)
System32\DRIVERS\mouclass.sys
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Msfs (File system) Running (System)
Error Severity: Normal
Service Flags: File System Driver, Shared Process
Mup (Network) Running (Manual)
C:\WINNT\System32\drivers\mup.sys
Error Severity: Normal
Service Flags: File System Driver, Shared Process
NetBEUI Protocol (PNP_TDI) Running (Automatic)
C:\WINNT\System32\drivers\nbf.sys
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Ncr53c9x (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
ncr77c22 (Video) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Ncrc700 (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Ncrc710 (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Microsoft NDIS System Driver (NDIS) Running (System)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
NetBIOS Interface (NetBIOSGroup) Stopped (Manual)
C:\WINNT\System32\drivers\netbios.sys
Error Severity: Normal

Service Flags: File System Driver, Shared Process
Group Dependencies:
TDI
WINS Client (TCP/IP) (PNP_TDI) Stopped (Automatic)
C:\WINNT\System32\drivers\netbt.sys
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Service Dependencies:
Tcpiip
NetDetect Stopped (Manual)
C:\WINNT\system32\drivers\netdect.sys
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Npfs (File system) Running (System)
Error Severity: Normal
Service Flags: File System Driver, Shared Process
Ntfs (File system) Running (Disabled)
Error Severity: Normal
Service Flags: File System Driver, Shared Process
Null (Base) Running (System)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Oliscsi (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Parallel (Extended base) Running (Automatic)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Service Dependencies:
Parport
Group Dependencies:
Parallel arbitrator
Parport (Parallel arbitrator) Running (Automatic)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
ParVdm (Extended base) Running (Automatic)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Service Dependencies:
Parport
Group Dependencies:
Parallel arbitrator
PCIDump (PCI Configuration) Stopped (System)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Pcmcia (System Bus Extender) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
PnP ISA Enabler Driver (Base) Stopped (System)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
psidisp (Video) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Ql10wmt (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
qv (Video) Stopped (Disabled)
Error Severity: Ignore

Service Flags: Kernel Driver, Shared Process
Rdr (Network) Running (Manual)
C:\WINNT\System32\drivers\rdr.sys
Error Severity: Normal
Service Flags: File System Driver, Shared Process
s3 (Video) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Scsiprnt (Extended base) Stopped (Automatic)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Group Dependencies:
SCSI miniport
Scsiscan (SCSI Class) Stopped (System)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Group Dependencies:
SCSI miniport
Serial (Extended base) Running (Automatic)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Sermouse (Pointer Port) Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Sfloppy (Primary disk) Stopped (System)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Group Dependencies:
SCSI miniport
Simbad (Filter) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
slcd32 (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Sparrow (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Spock (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Srv (Network) Running (Manual)
C:\WINNT\System32\drivers\srv.sys
Error Severity: Normal
Service Flags: File System Driver, Shared Process
symc810 (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
T128 (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
T13B (SCSI miniport) Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
TCP/IP Service (PNP TDI) Running (Automatic)
C:\WINNT\System32\drivers\tcpip.sys
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
tga (Video) Stopped (Disabled)

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Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
tmv1 (SCSI miniport)          Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Ultra124 (SCSI miniport)     Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Ultra14f (SCSI miniport)     Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
Ultra24f (SCSI miniport)     Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
v7vram (Video)               Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
VgaSave (Video Save)         Stopped (System)
C:\WINNT\System32\drivers\vga.sys
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
VgaStart (Video Init)        Stopped (System)
C:\WINNT\System32\drivers\vga.sys
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Wd33c93 (SCSI miniport)      Stopped (Disabled)
Error Severity: Normal
Service Flags: Kernel Driver, Shared Process
wd90c24a (Video)             Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
wdvga (Video)                Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
weitekp9 (Video)             Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process
Xga (Video)                  Stopped (Disabled)
Error Severity: Ignore
Service Flags: Kernel Driver, Shared Process

```

IRQ and Port Report

```

-----
Devices          Vector Level Affinity
-----
MPS 1.4 - APIC platform      8      8 0x00000003
MPS 1.4 - APIC platform      0      0 0x00000003
MPS 1.4 - APIC platform      1      1 0x00000003
MPS 1.4 - APIC platform      2      2 0x00000003
MPS 1.4 - APIC platform      3      3 0x00000003
MPS 1.4 - APIC platform      4      4 0x00000003
MPS 1.4 - APIC platform      5      5 0x00000003
MPS 1.4 - APIC platform      6      6 0x00000003
MPS 1.4 - APIC platform      7      7 0x00000003
MPS 1.4 - APIC platform      8      8 0x00000003
MPS 1.4 - APIC platform      9      9 0x00000003
MPS 1.4 - APIC platform     10     10 0x00000003

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MPS 1.4 - APIC platform      11     11 0x00000003
MPS 1.4 - APIC platform      12     12 0x00000003
MPS 1.4 - APIC platform      13     13 0x00000003
MPS 1.4 - APIC platform      14     14 0x00000003
MPS 1.4 - APIC platform      15     15 0x00000003
MPS 1.4 - APIC platform      16     16 0x00000003
MPS 1.4 - APIC platform      17     17 0x00000003
MPS 1.4 - APIC platform      18     18 0x00000003
MPS 1.4 - APIC platform      19     19 0x00000003
MPS 1.4 - APIC platform      20     20 0x00000003
MPS 1.4 - APIC platform      21     21 0x00000003
MPS 1.4 - APIC platform      22     22 0x00000003
MPS 1.4 - APIC platform      23     23 0x00000003
MPS 1.4 - APIC platform      24     24 0x00000003
MPS 1.4 - APIC platform      25     25 0x00000003
MPS 1.4 - APIC platform      26     26 0x00000003
MPS 1.4 - APIC platform      27     27 0x00000003
MPS 1.4 - APIC platform      28     28 0x00000003
MPS 1.4 - APIC platform      29     29 0x00000003
MPS 1.4 - APIC platform      30     30 0x00000003
MPS 1.4 - APIC platform      31     31 0x00000003
MPS 1.4 - APIC platform      32     32 0x00000003
MPS 1.4 - APIC platform      33     33 0x00000003
MPS 1.4 - APIC platform      34     34 0x00000003
MPS 1.4 - APIC platform      35     35 0x00000003
MPS 1.4 - APIC platform      36     36 0x00000003
MPS 1.4 - APIC platform      37     37 0x00000003
MPS 1.4 - APIC platform      38     38 0x00000003
MPS 1.4 - APIC platform      39     39 0x00000003
MPS 1.4 - APIC platform      40     40 0x00000003
MPS 1.4 - APIC platform      41     41 0x00000003
MPS 1.4 - APIC platform      42     42 0x00000003
MPS 1.4 - APIC platform      43     43 0x00000003
MPS 1.4 - APIC platform      44     44 0x00000003
MPS 1.4 - APIC platform      45     45 0x00000003
MPS 1.4 - APIC platform      46     46 0x00000003
MPS 1.4 - APIC platform      47     47 0x00000003
MPS 1.4 - APIC platform      61     61 0x00000003
MPS 1.4 - APIC platform      65     65 0x00000003
MPS 1.4 - APIC platform      80     80 0x00000003
MPS 1.4 - APIC platform     193    193 0x00000003
MPS 1.4 - APIC platform     225    225 0x00000003
MPS 1.4 - APIC platform     253    253 0x00000003
MPS 1.4 - APIC platform     254    254 0x00000003
MPS 1.4 - APIC platform     255    255 0x00000003
i8042prt              1      1 0xffffffff
i8042prt              12     12 0xffffffff
Serial                 4      4 0x00000000
Serial                 3      3 0x00000000
El90x                  10     10 0x00000000
El90x                  11     11 0x00000000
EMPCI                   5      5 0x00000000
EMPCI                   5      5 0x00000000
EMPCI                   5      5 0x00000201
EMPCI                   5      5 0x00000000
Floppy                  6      6 0x00000000
aic78xx                 9      9 0x00000000

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Devices          Physical Address Length

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```

-----
MPS 1.4 - APIC platform 0x00000000 0x0000000010
MPS 1.4 - APIC platform 0x00000020 0x0000000002
MPS 1.4 - APIC platform 0x00000040 0x0000000004
MPS 1.4 - APIC platform 0x00000048 0x0000000004
MPS 1.4 - APIC platform 0x00000061 0x0000000001
MPS 1.4 - APIC platform 0x00000070 0x0000000002
MPS 1.4 - APIC platform 0x00000080 0x0000000010
MPS 1.4 - APIC platform 0x00000092 0x0000000001
MPS 1.4 - APIC platform 0x000000a0 0x0000000002
MPS 1.4 - APIC platform 0x000000c0 0x0000000010
MPS 1.4 - APIC platform 0x000000d0 0x0000000010
MPS 1.4 - APIC platform 0x000000f0 0x0000000010
MPS 1.4 - APIC platform 0x00000400 0x0000000010
MPS 1.4 - APIC platform 0x00000461 0x0000000002
MPS 1.4 - APIC platform 0x00000464 0x0000000002
MPS 1.4 - APIC platform 0x00000480 0x0000000010
MPS 1.4 - APIC platform 0x000004c2 0x000000000e
MPS 1.4 - APIC platform 0x000004d0 0x0000000002
MPS 1.4 - APIC platform 0x000004d4 0x000000002c
MPS 1.4 - APIC platform 0x00000c84 0x0000000001
i8042prt 0x00000060 0x0000000001
i8042prt 0x00000064 0x0000000001
Parport 0x00000378 0x0000000003
Serial 0x000003f8 0x0000000007
Serial 0x000002f8 0x0000000007
El90x 0x0000fc40 0x0000000040
El90x 0x0000fcc0 0x0000000040
EMPCI 0x0000ec00 0x0000000080
EMPCI 0x0000e880 0x0000000080
EMPCI 0x0000e800 0x0000000080
EMPCI 0x0000e480 0x0000000080
Floppy 0x000003f0 0x0000000006
Floppy 0x000003f7 0x0000000001
aic78xx 0x0000f800 0x0000000100
cirrus 0x000003b0 0x000000000c
cirrus 0x000003c0 0x0000000020

```

DMA and Memory Report

```

-----
Devices Channel Port
-----
Floppy 2 0
-----
Devices Physical Address Length
-----
MPS 1.4 - APIC platform 0xfec00000 0x00000400
MPS 1.4 - APIC platform 0xfef00000 0x00000400
aic78xx 0xfedff000 0x00001000
cirrus 0x000a0000 0x00020000
cirrus 0xfd000000 0x01000000

```

Environment Report

```

-----

```

System Environment Variables

```

APPDIR=c:\tuxedo\runtime
ComSpec=C:\WINNT\system32\cmd.exe
LIBPATH=c:\tuxedo\lib
NUMBER_OF_PROCESSORS=2
OS=Windows_NT
Os2LibPath=C:\WINNT\system32\os2\dll;

```

```

Path=C:\WINNT\system32;C:\WINNT;C:\MSSQL7\BINN;C:\TUXEDO\bin;C:\ORANT\BIN

```

```

PROCESSOR_ARCHITECTURE=x86
PROCESSOR_IDENTIFIER=x86 Family 6 Model 3 Stepping 4, GenuineIntel
PROCESSOR_LEVEL=6
PROCESSOR_REVISION=0304
TMCONTEXTS=1
TUXCONFIG=c:\tuxedo\runtime\tuxconfig
TUXDIR=c:\tuxedo
windir=C:\WINNT

```

Environment Variables for Current User

```

TEMP=C:\TEMP
TMP=C:\TEMP

```

Network Report

```

-----
Your Access Level: Admin & Local
Workgroup or Domain: WORKGROUP
Network Version: 4.0
LanRoot: WORKGROUP
Logged On Users: 1
Current User (1): Administrator
Logon Domain: CLIENT1
Logon Server: CLIENT1

Transport: Nbf_El90x1, 00-10-4B-9D-F5-A7, VC's: 1, Wan: Wan
Transport: Nbf_El90x2, 00-10-4B-9D-F5-B5, VC's: 0, Wan: Wan
Transport: Nbf_EMPCI3, 00-00-92-A7-76-CC, VC's: 1, Wan: Wan
Transport: Nbf_EMPCI4, 00-00-92-A7-76-CD, VC's: 1, Wan: Wan
Transport: Nbf_EMPCI5, 00-00-92-A7-76-CE, VC's: 1, Wan: Wan
Transport: Nbf_EMPCI6, 00-00-92-A7-76-CF, VC's: 0, Wan: Wan

```

```

Character Wait: 3,600
Collection Time: 250
Maximum Collection Count: 16
Keep Connection: 600
Maximum Commands: 5
Session Time Out: 45
Character Buffer Size: 512
Maximum Threads: 17
Lock Quota: 6,144
Lock Increment: 10
Maximum Locks: 500
Pipe Increment: 10
Maximum Pipes: 500

```

Cache Time Out: 40
 Dormant File Limit: 45
 Read Ahead Throughput: 4,294,967,295
 Mailslot Buffers: 3
 Server Announce Buffers: 20
 Illegal Datagrams: 5
 Datagram Reset Frequency: 60
 Log Election Packets: False
 Use Opportunistic Locking: True
 Use Unlock Behind: True
 Use Close Behind: True
 Buffer Pipes: True
 Use Lock, Read, Unlock: True
 Use NT Caching: True
 Use Raw Read: True
 Use Raw Write: True
 Use Write Raw Data: True
 Use Encryption: True
 Buffer Deny Write Files: True
 Buffer Read Only Files: True
 Force Core Creation: True
 512 Byte Max Transfer: False
 Bytes Received: 767,196
 SMB's Received: 8,247
 Paged Read Bytes Requested: 0
 Non Paged Read Bytes Requested: 0
 Cache Read Bytes Requested: 0
 Network Read Bytes Requested: 0
 Bytes Transmitted: 899,039
 SMB's Transmitted: 8,247
 Paged Read Bytes Requested: 0
 Non Paged Read Bytes Requested: 0
 Cache Read Bytes Requested: 0
 Network Read Bytes Requested: 0
 Initially Failed Operations: 0
 Failed Completion Operations: 0
 Read Operations: 0
 Random Read Operations: 0
 Read SMB's: 0
 Large Read SMB's: 0
 Small Read SMB's: 0
 Write Operations: 0
 Random Write Operations: 0
 Write SMB's: 0
 Large Write SMB's: 0
 Small Write SMB's: 0
 Raw Reads Denied: 0
 Raw Writes Denied: 0
 Network Errors: 0
 Sessions: 1,372
 Failed Sessions: 0
 Reconnects: 0
 Core Connects: 0
 LM 2.0 Connects: 0
 LM 2.x Connects: 0
 Windows NT Connects: 1,372
 Server Disconnects: 0
 Hung Sessions: 0
 Use Count: 2,744

Failed Use Count: 0
 Current Commands: 0
 Server File Opens: 89
 Server Device Opens: 0
 Server Jobs Queued: 0
 Server Session Opens: 1
 Server Sessions Timed Out: 2
 Server Sessions Errored Out: 2
 Server Password Errors: 0
 Server Permission Errors: 0
 Server System Errors: 0
 Server Bytes Sent: 29,275,959
 Server Bytes Received: 3,378,946
 Server Average Response Time: 0
 Server Request Buffers Needed: 0
 Server Big Buffers Needed: 0

Internet Information Server Registry Parameters

Key Name: SYSTEM\CurrentControlSet\Services\InetInfo
 Class Name: <NO CLASS>
 Last Write Time: 5/29/98 - 1:57 AM

Key Name: SYSTEM\CurrentControlSet\Services\InetInfo\Parameters
 Class Name: <NO CLASS>
 Last Write Time: 9/16/98 - 9:35 AM

Value 0
 Name: BandwidthLevel
 Type: REG_DWORD
 Data: 0xffffffff

Value 1
 Name: DisableMemoryCache
 Type: REG_DWORD
 Data: 0x1

Value 2
 Name: ListenBackLog
 Type: REG_DWORD
 Data: 0x19

Value 3
 Name: MemoryCacheSize
 Type: REG_DWORD
 Data: 0

Value 4
 Name: ObjectCacheTTL
 Type: REG_DWORD
 Data: 0xffffffff

Value 5
 Name: PoolThreadLimit
 Type: REG_DWORD
 Data: 0xaa

Key Name:
SYSTEM\CurrentControlSet\Services\InetInfo\Parameters\Filter
Class Name: <NO CLASS>
Last Write Time: 5/29/98 - 1:57 AM

Value 0
Name: FilterType
Type: REG_DWORD
Data: 0

Value 1
Name: NumDenySites
Type: REG_DWORD
Data: 0

Value 2
Name: NumGrantSites
Type: REG_DWORD
Data: 0

Key Name:
SYSTEM\CurrentControlSet\Services\InetInfo\Parameters\MimeMap
Class Name: <NO CLASS>
Last Write Time: 5/29/98 - 1:57 AM

Value 0
Name: application/envoy, evy, , 5
Type: REG_SZ
Data:

Value 1
Name: application/mac-binhex40, hqx, , 4
Type: REG_SZ
Data:

Value 2
Name: application/msword, doc, , 5
Type: REG_SZ
Data:

Value 3
Name: application/msword, dot, , 5
Type: REG_SZ
Data:

Value 4
Name: application/octet-stream, *, , 5
Type: REG_SZ
Data:

Value 5
Name: application/octet-stream, bin, , 5
Type: REG_SZ
Data:

Value 6
Name: application/octet-stream, exe, , 5
Type: REG_SZ
Data:

Value 7
Name: application/oda, oda, , 5
Type: REG_SZ
Data:

Value 8
Name: application/pdf, pdf, , 5
Type: REG_SZ
Data:

Value 9
Name: application/postscript, ai, , 5
Type: REG_SZ
Data:

Value 10
Name: application/postscript, eps, , 5
Type: REG_SZ
Data:

Value 11
Name: application/postscript, ps, , 5
Type: REG_SZ
Data:

Value 12
Name: application/rtf, rtf, , 5
Type: REG_SZ
Data:

Value 13
Name: application/winhelp, hlp, , 5
Type: REG_SZ
Data:

Value 14
Name: application/x-bcpio, bcpio, , 5
Type: REG_SZ
Data:

Value 15
Name: application/x-cpio, cpio, , 5
Type: REG_SZ
Data:

Value 16
Name: application/x-csh, csh, , 5
Type: REG_SZ
Data:

Value 17
Name: application/x-director, dcr, , 5
Type: REG_SZ
Data:

Value 18
Name: application/x-director, dir, , 5
Type: REG_SZ
Data:

Value 19
 Name: application/x-director,dxr,,5
 Type: REG_SZ
 Data:

Value 20
 Name: application/x-dvi,dvi,,5
 Type: REG_SZ
 Data:

Value 21
 Name: application/x-gtar,gtar,,9
 Type: REG_SZ
 Data:

Value 22
 Name: application/x-hdf,hdf,,5
 Type: REG_SZ
 Data:

Value 23
 Name: application/x-latex,latex,,5
 Type: REG_SZ
 Data:

Value 24
 Name: application/x-msaccess,mdb,,5
 Type: REG_SZ
 Data:

Value 25
 Name: application/x-mscardfile,crd,,5
 Type: REG_SZ
 Data:

Value 26
 Name: application/x-msclip,clip,,5
 Type: REG_SZ
 Data:

Value 27
 Name: application/x-msexcel,xla,,5
 Type: REG_SZ
 Data:

Value 28
 Name: application/x-msexcel,xlc,,5
 Type: REG_SZ
 Data:

Value 29
 Name: application/x-msexcel,xlm,,5
 Type: REG_SZ
 Data:

Value 30
 Name: application/x-msexcel,xls,,5
 Type: REG_SZ
 Data:

Data:

Value 31
 Name: application/x-msexcel,xlt,,5
 Type: REG_SZ
 Data:

Value 32
 Name: application/x-msexcel,xlw,,5
 Type: REG_SZ
 Data:

Value 33
 Name: application/x-msmediaview,m13,,5
 Type: REG_SZ
 Data:

Value 34
 Name: application/x-msmediaview,m14,,5
 Type: REG_SZ
 Data:

Value 35
 Name: application/x-mmetafile,wmf,,5
 Type: REG_SZ
 Data:

Value 36
 Name: application/x-msmoney,mny,,5
 Type: REG_SZ
 Data:

Value 37
 Name: application/x-mspowerpoint,ppt,,5
 Type: REG_SZ
 Data:

Value 38
 Name: application/x-msproject,mpp,,5
 Type: REG_SZ
 Data:

Value 39
 Name: application/x-mspublisher,pub,,5
 Type: REG_SZ
 Data:

Value 40
 Name: application/x-msterminal,trm,,5
 Type: REG_SZ
 Data:

Value 41
 Name: application/x-msworks,wks,,5
 Type: REG_SZ
 Data:

Value 42
 Name: application/x-mswrite,wri,,5
 Data:

Type: REG_SZ
Data:

Value 43
Name: application/x-netcdf,cdf,,5
Type: REG_SZ
Data:

Value 44
Name: application/x-netcdf,nc,,5
Type: REG_SZ
Data:

Value 45
Name: application/x-perfmon,pma,,5
Type: REG_SZ
Data:

Value 46
Name: application/x-perfmon,pmc,,5
Type: REG_SZ
Data:

Value 47
Name: application/x-perfmon,pml,,5
Type: REG_SZ
Data:

Value 48
Name: application/x-perfmon,pmr,,5
Type: REG_SZ
Data:

Value 49
Name: application/x-perfmon,pmw,,5
Type: REG_SZ
Data:

Value 50
Name: application/x-sh,sh,,5
Type: REG_SZ
Data:

Value 51
Name: application/x-shar,shar,,5
Type: REG_SZ
Data:

Value 52
Name: application/x-sv4cpio,sv4cpio,,5
Type: REG_SZ
Data:

Value 53
Name: application/x-sv4crc,sv4crc,,5
Type: REG_SZ
Data:

Value 54

Name: application/x-tar,tar,,5
Type: REG_SZ
Data:

Value 55
Name: application/x-tcl,tcl,,5
Type: REG_SZ
Data:

Value 56
Name: application/x-tex,tex,,5
Type: REG_SZ
Data:

Value 57
Name: application/x-texinfo,texi,,5
Type: REG_SZ
Data:

Value 58
Name: application/x-texinfo,texinfo,,5
Type: REG_SZ
Data:

Value 59
Name: application/x-troff,roff,,5
Type: REG_SZ
Data:

Value 60
Name: application/x-troff,t,,5
Type: REG_SZ
Data:

Value 61
Name: application/x-troff,tr,,5
Type: REG_SZ
Data:

Value 62
Name: application/x-troff-man,man,,5
Type: REG_SZ
Data:

Value 63
Name: application/x-troff-me,me,,5
Type: REG_SZ
Data:

Value 64
Name: application/x-troff-ms,ms,,5
Type: REG_SZ
Data:

Value 65
Name: application/x-ustar,ustar,,5
Type: REG_SZ
Data:

Value 66
 Name: application/x-wais-source,src,,7
 Type: REG_SZ
 Data:

Value 67
 Name: application/zip,zip,,9
 Type: REG_SZ
 Data:

Value 68
 Name: audio/basic,au,,<
 Type: REG_SZ
 Data:

Value 69
 Name: audio/basic,snd,,<
 Type: REG_SZ
 Data:

Value 70
 Name: audio/x-aiff,aif,,<
 Type: REG_SZ
 Data:

Value 71
 Name: audio/x-aiff,aifc,,<
 Type: REG_SZ
 Data:

Value 72
 Name: audio/x-aiff,aiff,,<
 Type: REG_SZ
 Data:

Value 73
 Name: audio/x-pn-realaudio,ram,,<
 Type: REG_SZ
 Data:

Value 74
 Name: audio/x-wav,wav,,<
 Type: REG_SZ
 Data:

Value 75
 Name: image/bmp,bmp,,:
 Type: REG_SZ
 Data:

Value 76
 Name: image/cis-cod,cod,,5
 Type: REG_SZ
 Data:

Value 77
 Name: image/gif,gif,,g
 Type: REG_SZ
 Data:

Value 78
 Name: image/ief,ief,,:
 Type: REG_SZ
 Data:

Value 79
 Name: image/jpeg,jpe,,:
 Type: REG_SZ
 Data:

Value 80
 Name: image/jpeg,jpeg,,:
 Type: REG_SZ
 Data:

Value 81
 Name: image/jpeg,jpg,,:
 Type: REG_SZ
 Data:

Value 82
 Name: image/tiff,tif,,:
 Type: REG_SZ
 Data:

Value 83
 Name: image/tiff,tiff,,:
 Type: REG_SZ
 Data:

Value 84
 Name: image/x-cmu-raster,ras,,:
 Type: REG_SZ
 Data:

Value 85
 Name: image/x-cmx,cmx,,5
 Type: REG_SZ
 Data:

Value 86
 Name: image/x-portable-anymap,pnm,,:
 Type: REG_SZ
 Data:

Value 87
 Name: image/x-portable-bitmap,pbm,,:
 Type: REG_SZ
 Data:

Value 88
 Name: image/x-portable-graymap,pgm,,:
 Type: REG_SZ
 Data:

Value 89
 Name: image/x-portable-pixmap,ppm,,:
 Type: REG_SZ
 Data:

Data:		Type:	REG_SZ
Value 90		Data:	
Name:	image/x-rgb,rgb,,:	Value 102	
Type:	REG_SZ	Name:	text/tab-separated-values,tsv,,0
Data:		Type:	REG_SZ
		Data:	
Value 91		Value 103	
Name:	image/x-xbitmap,xbm,,:	Name:	text/x-setext,etx,,0
Type:	REG_SZ	Type:	REG_SZ
Data:		Data:	
Value 92		Value 104	
Name:	image/x-xpixmap,xpm,,:	Name:	video/mpeg,mpe,,;
Type:	REG_SZ	Type:	REG_SZ
Data:		Data:	
Value 93		Value 105	
Name:	image/x-xwindowdump,xwd,,:	Name:	video/mpeg,mpeg,,;
Type:	REG_SZ	Type:	REG_SZ
Data:		Data:	
Value 94		Value 106	
Name:	text/html,htm,,h	Name:	video/mpeg,mpg,,;
Type:	REG_SZ	Type:	REG_SZ
Data:		Data:	
Value 95		Value 107	
Name:	text/html,html,,h	Name:	video/quicktime,mov,,;
Type:	REG_SZ	Type:	REG_SZ
Data:		Data:	
Value 96		Value 108	
Name:	text/html,stm,,h	Name:	video/quicktime,qt,,;
Type:	REG_SZ	Type:	REG_SZ
Data:		Data:	
Value 97		Value 109	
Name:	text/plain,bas,,0	Name:	video/x-msvideo,avi,,<
Type:	REG_SZ	Type:	REG_SZ
Data:		Data:	
Value 98		Value 110	
Name:	text/plain,c,,0	Name:	video/x-sgi-movie,movie,,<
Type:	REG_SZ	Type:	REG_SZ
Data:		Data:	
Value 99		Value 111	
Name:	text/plain,h,,0	Name:	x-world/x-vrml,flr,,5
Type:	REG_SZ	Type:	REG_SZ
Data:		Data:	
Value 100		Value 112	
Name:	text/plain,txt,,0	Name:	x-world/x-vrml,wrl,,5
Type:	REG_SZ	Type:	REG_SZ
Data:		Data:	
Value 101		Value 113	
Name:	text/richtext,rtx,,0		

Name: x-world/x-vrml,wrz,,5
 Type: REG_SZ
 Data:

Value 114
 Name: x-world/x-vrml,xaf,,5
 Type: REG_SZ
 Data:

Value 115
 Name: x-world/x-vrml,xof,,5
 Type: REG_SZ
 Data:

Key Name: SYSTEM\CurrentControlSet\Services\InetInfo\Performance
 Class Name: <NO CLASS>
 Last Write Time: 5/29/98 - 1:57 AM

Value 0
 Name: Close
 Type: REG_SZ
 Data: CloseINFOPerformanceData

Value 1
 Name: Collect
 Type: REG_SZ
 Data: CollectINFOPerformanceData

Value 2
 Name: First Counter
 Type: REG_DWORD
 Data: 0x738

Value 3
 Name: First Help
 Type: REG_DWORD
 Data: 0x739

Value 4
 Name: Last Counter
 Type: REG_DWORD
 Data: 0x756

Value 5
 Name: Last Help
 Type: REG_DWORD
 Data: 0x757

Value 6
 Name: Library
 Type: REG_SZ
 Data: infoctrs.DLL

Value 7
 Name: Open
 Type: REG_SZ
 Data: OpenINFOPerformanceData

World Wide Web Server Registry Parameters

Key Name: SYSTEM\CurrentControlSet\Services\W3SVC
 Class Name: <NO CLASS>
 Last Write Time: 5/29/98 - 12:18 PM

Value 0
 Name: DependOnGroup
 Type: REG_MULTI_SZ
 Data:

Value 1
 Name: DependOnService
 Type: REG_MULTI_SZ
 Data: RPCSS
 NTLMSSP

Value 2
 Name: DisplayName
 Type: REG_SZ
 Data: World Wide Web Publishing Service

Value 3
 Name: ErrorControl
 Type: REG_DWORD
 Data: 0

Value 4
 Name: ImagePath
 Type: REG_EXPAND_SZ
 Data: C:\WINNT\System32\inet_srv\inetinfo.exe

Value 5
 Name: ObjectName
 Type: REG_SZ
 Data: LocalSystem

Value 6
 Name: Start
 Type: REG_DWORD
 Data: 0x3

Value 7
 Name: Type
 Type: REG_DWORD
 Data: 0x20

Key Name: SYSTEM\CurrentControlSet\Services\W3SVC\Enum
 Class Name: <NO CLASS>
 Last Write Time: 11/6/98 - 3:04 PM

Value 0
 Name: 0
 Type: REG_SZ
 Data: Root\LEGACY_W3SVC\0000

Value 1
 Name: Count

Type: REG_DWORD
Data: 0x1

Value 2
Name: NextInstance
Type: REG_DWORD
Data: 0x1

Key Name: SYSTEM\CurrentControlSet\Services\W3SVC\Parameters
Class Name: <NO CLASS>
Last Write Time: 5/29/98 - 12:38 PM

Value 0
Name: AccessDeniedMessage
Type: REG_SZ
Data: Error: Access is Denied.

Value 1
Name: AdminEmail
Type: REG_SZ
Data: Admin@corp.com

Value 2
Name: AdminName
Type: REG_SZ
Data: Administrator

Value 3
Name: AnonymousUserName
Type: REG_SZ
Data: IUSR_CLIENT4

Value 4
Name: Authorization
Type: REG_DWORD
Data: 0x5

Value 5
Name: CacheExtensions
Type: REG_DWORD
Data: 0x1

Value 6
Name: CheckForWAISDB
Type: REG_DWORD
Data: 0

Value 7
Name: ConnectionTimeout
Type: REG_DWORD
Data: 0x1C20

Value 8
Name: DebugFlags
Type: REG_DWORD
Data: 0x8

Value 9
Name: Default Load File

Type: REG_SZ
Data: Default.htm

Value 10
Name: Dir Browse Control
Type: REG_DWORD
Data: 0x4000001e

Value 11
Name: Filter DLLs
Type: REG_SZ
Data: C:\WINNT\System32\inet_srv\sspifilt.dll

Value 12
Name: GlobalExpire
Type: REG_DWORD
Data: 0xffffffff

Value 13
Name: InstallPath
Type: REG_SZ
Data: C:\WINNT\System32\inet_srv

Value 14
Name: LogFileDirectory
Type: REG_EXPAND_SZ
Data: %SystemRoot%\System32\LogFiles

Value 15
Name: LogFileFormat
Type: REG_DWORD
Data: 0

Value 16
Name: LogFilePeriod
Type: REG_DWORD
Data: 0x1

Value 17
Name: LogFileTruncateSize
Type: REG_DWORD
Data: 0x1388000

Value 18
Name: LogSqlDataSource
Type: REG_SZ
Data: HTTPLOG

Value 19
Name: LogSqlPassword
Type: REG_SZ
Data: sqllog

Value 20
Name: LogSqlTableName
Type: REG_SZ
Data: Internetlog

Value 21

Name: LogSqlUserName
 Type: REG_SZ
 Data: InternetAdmin

Value 22
 Name: LogType
 Type: REG_DWORD
 Data: 0

Value 23
 Name: MajorVersion
 Type: REG_DWORD
 Data: 0x2

Value 24
 Name: MaxConnections
 Type: REG_DWORD
 Data: 0x2710

Value 25
 Name: MinorVersion
 Type: REG_DWORD
 Data: 0

Value 26
 Name: NTAAuthenticationProviders
 Type: REG_SZ
 Data: NTLM

Value 27
 Name: ScriptTimeout
 Type: REG_DWORD
 Data: 0x384

Value 28
 Name: SecurePort
 Type: REG_DWORD
 Data: 0x1bb

Value 29
 Name: ServerComment
 Type: REG_SZ
 Data:

Value 30
 Name: ServerSideIncludesEnabled
 Type: REG_DWORD
 Data: 0x1

Value 31
 Name: ServerSideIncludesExtension
 Type: REG_SZ
 Data: .stm

Key Name:
 SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\Script Map
 Class Name: <NO CLASS>
 Last Write Time: 5/29/98 - 1:57 AM

Value 0
 Name: .idc
 Type: REG_SZ
 Data: C:\WINNT\System32\inetsrv\httpodbc.dll

Key Name:
 SYSTEM\CurrentControlSet\Services\W3SVC\Parameters\Virtual Roots
 Class Name: <NO CLASS>
 Last Write Time: 5/29/98 - 12:38 PM

Value 0
 Name: /,
 Type: REG_SZ
 Data: C:\InetPub\wwwroot,,5

Value 1
 Name: /iisadmin,
 Type: REG_SZ
 Data: C:\WINNT\System32\inetsrv\iisadmin,,1

Value 2
 Name: /Scripts,
 Type: REG_SZ
 Data: C:\InetPub\scripts,,4

Key Name:
 SYSTEM\CurrentControlSet\Services\W3SVC\Performance
 Class Name: <NO CLASS>
 Last Write Time: 5/29/98 - 1:57 AM

Value 0
 Name: Close
 Type: REG_SZ
 Data: CloseW3PerformanceData

Value 1
 Name: Collect
 Type: REG_SZ
 Data: CollectW3PerformanceData

Value 2
 Name: First Counter
 Type: REG_DWORD
 Data: 0x758

Value 3
 Name: First Help
 Type: REG_DWORD
 Data: 0x759

Value 4
 Name: Last Counter
 Type: REG_DWORD
 Data: 0x790

Value 5
 Name: Last Help
 Type: REG_DWORD
 Data: 0x791

Value 6
Name: Library
Type: REG_SZ
Data: w3ctrs.DLL

Value 7
Name: Open
Type: REG_SZ
Data: OpenW3PerformanceData

Key Name: SYSTEM\CurrentControlSet\Services\W3SVC\Security
Class Name: <NO CLASS>
Last Write Time: 5/29/98 - 1:57 AM

Value 0
Name: Security
Type: REG_BINARY
Data:
00000000 01 00 14 80 c0 00 00 00 - cc 00 00 00 14 00 00 00
.....
00000010 34 00 00 00 02 00 20 00 - 01 00 00 00 02 80 18 00 4.....
.....
00000020 ff 01 0f 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
00000030 20 02 00 00 02 00 8c 00 - 05 00 00 00 00 00 18 00
.....
00000040 8d 01 02 00 01 01 00 00 - 00 00 00 01 00 00 00 00
.....
00000050 00 00 73 00 00 00 1c 00 - fd 01 02 00 01 02 00 00
..s.....
00000060 00 00 00 05 20 00 00 00 - 23 02 00 00 c8 00 14 00
..#.....
00000070 00 00 1c 00 ff 01 0f 00 - 01 02 00 00 00 00 00 05
.....
00000080 20 00 00 00 20 02 00 00 - c8 00 14 00 00 00 1c 00 ...
.....
00000090 ff 01 0f 00 01 02 00 00 - 00 00 00 05 20 00 00 00
...
000000a0 25 02 00 00 c8 00 14 00 - 00 00 18 00 fd 01 02 00
%.....
000000b0 01 01 00 00 00 00 00 05 - 12 00 00 00 25 02 00 00
.....%
000000c0 01 01 00 00 00 00 00 05 - 12 00 00 00 01 01 00 00
.....
000000d0 00 00 00 05 12 00 00 00 -

Key Name: SOFTWARE\Unisys
Class Name: <NO CLASS>
Last Write Time: 5/29/98 - 12:34 PM

Key Name: SOFTWARE\Unisys\TPCC
Class Name: <NO CLASS>
Last Write Time: 6/1/98 - 3:18 PM

Value 0
Name: MAXTERMS
Type: REG_SZ
Data: 6000

Tuxedo Configuration

Note: this configuration file is repeated on each of the other 2 clients with the exception of the Hostname, "CLIENT1", which is replaced by "CLIENT2" thru "CLIENT3" .

```
*RESOURCES
IPCKEY          133133

MAXACCESSERS   400
MAXSERVERS     210
MAXSERVICES    1100
MODEL          SHM
MASTER        tpcctm
LDBAL         N
SCANUNIT      60
BLOCKTIME     60
BELQUERY      60

*MACHINES
DEFAULT:

CLIENT1        LMID=tpcctm
                TUXDIR="c:\tuxedo"
                APPDIR="c:\tuxedo\runtime"
                TUXCONFIG="c:\tuxedo\runtime\tuxconfig"
                ULOGPFX="c:\tuxedo\runtime\ulog\ULOG"
                TYPE="WinNT"
                UID=0
                GID=0

*GROUPS
GRALL          LMID=tpcctm      GRPNO=1      OPENINFO=NONE

GRDEL         LMID=tpcctm      GRPNO=3      OPENINFO=NONE

*SERVERS
DEFAULT:

                CLOPT="-A -- -sAVALON4 -dtpcc"

tpccsvr       SRVGRP=GRALL
                SRVID=100
                MIN=75 MAX=200
                RQADDR=allq REPLYQ=Y

tpccdelv      SRVGRP=GRDEL
                SRVID=300
                MIN=8 MAX=10
                CLOPT="-A -- -sAVALON4 -dtpcc"
                RQADDR=delq REPLYQ=Y

*SERVICES
```

Appendix D - RTE Code

Admin Environment

```
if '%1'==' ' goto usage
if '%2'==' ' goto usage
if '%3'==' ' goto usage

:paramok

net time \\%1 /SET /Y

if %ERRORLEVEL% NEQ 0 pause

set WEBADMINCFG=web%2.cfg
set WEBMAXDRIVERS=%3
set WEBDIAGLEVEL=4
set WEBEVENTLOG=0
set WEBEVENTHOST=
set WEBCHECKLEVEL=2

webadmin.exe

goto end

:usage
@ECHO You must supply the following parameters:
@ECHO "webnnn.cmd <clock sync host name> <cfg file suffix> <driver count>"
pause

:end
```

Profiles used for Performance Run

Web1530.cfg

```
//
// Common Driver Configuration
//
INITBASEPORT 4300
INITSYNCMAX 4
INITPAUSE 1
INITRSCALE 400
INITTSCALE 100
INITRWID 1, 1530
INITFIXEDWID 1
INITCCLAST 208
INITCCID 208
INITCITEMID 208
//
// Configuration Driver 1
```

```
//
1 INITIPADDR 192.168.90.31
1 INITIISADDR 192.168.13.1
1 INITIISPORT 80
1 INITBROWSERS 1020
1 INITMYWID 1,102
//
// Configuration Driver 2
//
2 INITIPADDR 192.168.90.32
2 INITIISADDR 192.168.23.2
2 INITIISPORT 80
2 INITBROWSERS 1020
2 INITMYWID 103,204
//
// Configuration Driver 3
//
3 INITIPADDR 192.168.90.33
3 INITIISADDR 192.168.33.3
3 INITIISPORT 80
3 INITBROWSERS 1020
3 INITMYWID 205,306
//
// Configuration Driver 4
//
4 INITIPADDR 192.168.90.33
4 INITIISADDR 192.168.34.3
4 INITIISPORT 80
4 INITBROWSERS 1020
4 INITMYWID 307,408
//
// Configuration Driver 5
//
5 INITIPADDR 192.168.90.32
5 INITIISADDR 192.168.24.2
5 INITIISPORT 80
5 INITBROWSERS 1020
5 INITMYWID 409,510
//
// Configuration Driver 6
//
6 INITIPADDR 192.168.90.31
6 INITIISADDR 192.168.14.1
6 INITIISPORT 80
6 INITBROWSERS 1020
6 INITMYWID 511,612
//
// Configuration Driver 7
//
7 INITIPADDR 192.168.90.31
7 INITIISADDR 192.168.15.1
7 INITIISPORT 80
7 INITBROWSERS 1020
7 INITMYWID 613,714
```

```

//
// Configuration Driver 8
//
8 INITIPADDR 192.168.90.32
8 INITIISADDR 192.168.25.2
8 INITIISPORT 80
8 INITBROWSERS 1020
8 INITMYWID 715,816
//
// Configuration Driver 9
//
9 INITIPADDR 192.168.90.33
9 INITIISADDR 192.168.35.3
9 INITIISPORT 80
9 INITBROWSERS 1020
9 INITMYWID 817,918
//
// Configuration Driver 10
//
10 INITIPADDR 192.168.90.34
10 INITIISADDR 192.168.32.3
10 INITIISPORT 80
10 INITBROWSERS 1020
10 INITMYWID 919,1020
//
// Configuration Driver 11
//
11 INITIPADDR 192.168.90.34
11 INITIISADDR 192.168.22.2
11 INITIISPORT 80
11 INITBROWSERS 1020
11 INITMYWID 1021,1122
//
// Configuration Driver 12
//
12 INITIPADDR 192.168.90.34
12 INITIISADDR 192.168.12.1
12 INITIISPORT 80
12 INITBROWSERS 1020
12 INITMYWID 1123,1224
//
// Configuration Driver 13
//
13 INITIPADDR 192.168.90.35
13 INITIISADDR 192.168.16.1
13 INITIISPORT 80
13 INITBROWSERS 1020
13 INITMYWID 1225,1326
//
// Configuration Driver 14
//
14 INITIPADDR 192.168.90.35
14 INITIISADDR 192.168.26.2
14 INITIISPORT 80
14 INITBROWSERS 1020
14 INITMYWID 1327,1428
//
// Configuration Driver 15
//

```

```

15 INITIPADDR 192.168.90.35
15 INITIISADDR 192.168.36.3
15 INITIISPORT 80
15 INITBROWSERS 1020
15 INITMYWID 1429,1530
//

```

Driver Environment

```
if '%1'==' ' goto usage
```

```
:paramok
```

```

set WEBDRIVERNO=%1
set WEBADMBASEPORT=4300
set WEBDIAGLEVEL=2
set WEBEVENTLOG=1
set WEBEVENTHOST=
set WEBLOGLEVEL=1
set WEBSINGLETRAN=0
set WEBTPCCAUDIT=0
set WEBRTFUDGETM=110
set WEBNEWORDERPROB=4484
set WEBPAYMENTPROB=4307
set WEBORDERSTATUSPROB=403
set WEBDELIVERYPROB=403
set WEBSTOCKLEVELPROB=403
set WEBTTNEWORDER=12030
set WEBTTPAYMENT=12030
set WEBTTDELIVERY=5060
set WEBTTORDERSTATUS=10070
set WEBTTSTOCKLEVEL=5060

```

```
webdriver.exe > webdriver%1.log
```

```
goto end
```

```
:usage
```

```
@ECHO You must supply the following parameters:
```

```
@ECHO "webdriver.cmd <driver number>"
```

```
pause
```

```
:end
```

```
exit
```


Appendix E - Disk Storage

TPC-C 180-Day Disk Space Requirements

Warehouses	1530	tpmC	19,118.37	12.50	
Table	Initial Rows	Data KB	Index KB	Extra 5% KB	Total With 5% KB
Warehouse	1,530	168	32	10	210
District	15,300	1,704	48	88	1,840
Customer	45,900,000	33,381,824	2,143,768	1,776,280	37,301,872
History (D)	45,900,000	2,550,048	0		2,550,048
Order (D)	45,900,000	1,406,904	777,088		2,183,992
New-Order	13,770,000	217,712	608	10,916	229,236
Order-Line (D)	459,001,971	28,687,624	71,464		28,759,088
Item	100,000	9,528	72	480	10,080
Stock	15,300,000	48,960,000	109,744	2,453,487	51,523,231
Totals KB		115,215,512	3,102,824	4,241,260	122,559,596
Db/Filegroup	Count	Size MB	MB Allocated	MB Loaded +5%	MB for 8 Hours
master, model & msdb	22	22	22	22	22
tempdb	210	210	210	210	210
msssql70_tpc_c_root	1	10	10	10	10
msssql70_cs_fg	5	18,400	92,000	86,743	86,743
msssql70_misc_fg	5	8,800	44,000	32,944	40,925
Total Allocated MB		136,242	119,929	119,929	127,911
Dynamic Space MB		MB			
Static Space	31,879	Sum of data for orders, order_line & history			
Free Space	87,808	Sum of data+index+5% - Dynamic Space			
	16,555	Total allocated space - (Dynamic & Static Spaces)			
Daily Growth	6,374	(Dynamic Space / (W * 62.5)) * tpmC			
Daily Spread	6,994	Free space - 1.5 * Daily growth (zero if negative)			
	0	SQL Server can be configured to eliminate Daily Spread			
180 Day Space MB	1,235,071	Static Space + 180 * (Daily Growth + Daily Spread)			
180 Day Space GB	1,206.12				
8 hr log GB	46.91	(need double for mirroring)			
Disk Capacity MB	4339	4,2373 GB	Capacity of 4GB disks		
	8683	8,4795 GB	Capacity of 9GB disks		
Space Usage	GB Needed	Disks Priced	GB Priced		
180-day space DB	1206.12 GB	0	0.00 GB	4GB drives	
		141	1195.61 GB	9GB drives	
Total DB		141	1195.61 GB		
8-hr log+mirror	93.83 GB	12	101.75 GB	9GB drives	
OS, SQL Server	1.09 GB	1	4.24 GB	4GB drives	
Total space	1301.04 GB	154	1301.60 GB		

TPC-C 180-Day Dynamic Table Growth Rates						19,118.37	tpmC
Tables	Initial (KB)	Final (KB)	Change(KB)	Unused (KB)	KB / New-Order	8-Hr MB	
History	2,550,048	3,138,048	588,000	96,056	0.0731	3,145.59	
Orders	2,183,992	3,446,256	1,262,264	10,520	0.1570	3,539.56	
Order_line	28,759,088	34,070,608	5,311,520	8,680	0.6605	34,004.58	
Dynamic	33,493,128	40,654,912	7,161,784	115,256	0.8906	40,689.73	
New_order	218,320	369,928	151,608	11,312	0.0189	382.17	
Static							
Log	371,392	43,152,347	42,780,955		5.3202	48,040.78	46,915
SUM(d_next_o_id)	45,915,300	53,956,554	8,041,254				

Appendix F - Third-Party Price Quotations

NOV 23 1998 17:41 FR MICROSOFT RECP #1 425 936 7329 TO 919493805539 P.02/03
One Microsoft Way Fax 425 936 7329
Redmond, WA 98052-8399 <http://www.microsoft.com/>

Microsoft

November 23, 1998

Mr. Jerrold Buggert
Director, Systems Analysis, Modeling, Measurement
Unisys Corporation
25725 Jeronimo Road
Mission Viejo, CA 92691

via FAX # 949-380-5539

Dear Jerry,

Microsoft has received your request for permission to disclose the results of TPC-C benchmark tests conducted by Unisys with Microsoft SQL Server 7.0, Enterprise Edition on the following system:

Unisys Aquanta QS/2V Server, 4-processors, Pentium II Xeon, 400 MHz, 1MB L2 cache
Test Results: 19100 tpnC @ \$22/tpnC approximately

Microsoft hereby grants Unisys permission to disclose these results to third parties and acknowledges that Unisys has formally requested permission to do so in accordance with the license agreement for Microsoft SQL Server 7.0 software.

Best regards,



Sid Arora
Product Manager, Microsoft SQL Server
Applications Marketing

Microsoft Corporation is an equal opportunity employer.

NOV 23 1998 17:41 FR MICROSOFT RECP #1 425 936 7329 TO 919493805539

P.03/03

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

1st 425 936 7329
FAX 425 936 7329
<http://www.microsoft.com/>



November 23, 1998

Mr. Jerrold Buggert
Director, Systems Analysis, Modeling, Measurement
Unisys Corporation
25725 Jeronimo Road
Mission Viejo, CA 92691
via FAX # 949-380-5539

Dear Jerry,

Here is the information you requested regarding pricing of certain Microsoft products:

Microsoft SQL Server 7.0, Enterprise Edition, unlimited user licence	\$28999
Microsoft Windows NT Server, Enterprise Edition 4.0, incl 25 CALs	\$3999
Windows NT Server 4.0 software, incl 5 CALs	\$809
Visual C++ Professional 5.0	\$499
5-yr maintenance for above software @ \$2095/yr	\$10475

This quote is valid for the next 60 days. Please let me know if I can be of any further assistance.

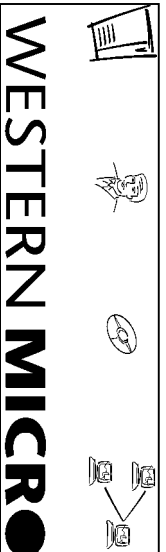
Best regards,



Sid Arora
Product Manager, Microsoft SQL Server
Applications Marketing

Microsoft Corporation is an equal opportunity employer.

** TOTAL PAGE.03 **



Western Micro Technology
(800)937-8446

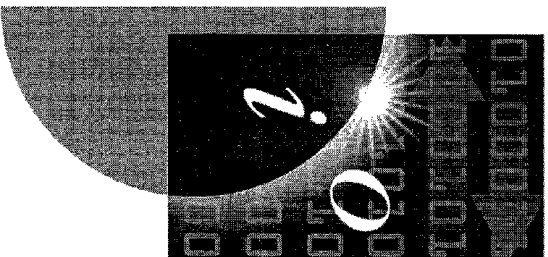
1/21/98

Quoted to: Jerry Bugger/Unisys for TPC.org
Prepared by: Tony Jacobs

Qty.	Description	Style	Price	Extended Price
1	SYS: Aquanta QR/2V, w/ CDRom, 0 Proc, 0MB Mem	QVR200071-BCS	\$5,327	\$5,327
4	PROC: 1x400MHz Pentium II 1/1MB Cache	XEV2400-1MB	\$3,627	\$14,508
6	ACC: Voltage Regulator Module, Processor	XEO24001-VRM	\$46	\$276
16	MEM: 256 MB Memory Upgrade	DIM5072-256	\$963	\$15,408
1	DISK: 4GB Drive, Ultra SCSI SCA	HDS417-CX1	\$746	\$746
1	ETHERNET: 100Mbit/sec, PCI 32-bit	ETH10100051-PCI	\$117	\$117
1	CDROM: 14-32x Speed, SCSI	CDR1432-SI	\$161	\$161
1	MONITOR:15-inch Color	EVG2100-P	\$320	\$320
1	KEYBD: 104 Key Spacesaver	PCK104-SKB	\$31	\$31
1	MOUSE: 2 Button PS2	PWM1-PS2	\$23	\$23
1	CAB: Rack Cabinet, w/ fill pnls, 19U	CAB191-SXR	\$1,165	\$1,165
1	CAB: Bezel kit 19U	BEZ1911-CAB	\$165	\$165
1	PNL: L&R side panels 19U	PAN1921-SXR	\$162	\$162
	Server Total			\$38,409
12	CBL: SCSI 68-pin HD Conn.	CBL2210-OSM	\$90	\$1,080
169	DISK: 9GB Drive, 10K, SCA + 10% spares	OSD9203-W45	\$930	\$157,170
10	CAB: 7 SCA Disk Cage w/ 050 I/F & Cat Cbl, 3U	OSM310050-U05	\$1,345	\$13,450
10	CAB: 7 SCA Disk Cage w/ 057 I/F, 3U	OSM310057-U05	\$1,350	\$13,500
2	CAB: 7 SCA Disk Cage w/ 100 I/F, 0MB, 3U	OSM310100-U05	\$2,727	\$5,454
2	MEM: 32MB OSM Cache	OSM1000-C32	\$150	\$300
22	CAB: Rackmount Kit for Disk Cages	OSM3000-RMK	\$84	\$1,848
2	PWR: OSM 2nd Power Supply	OSM3000-APM	\$261	\$522
1	PWR: 3000 VA UPS, 3U	UPD30001-SXR	\$2,239	\$2,239
2	CAB: Rack Cabinet, w/ fill pnls, 36U	CAB361-SXR	\$1,384	\$2,768
2	CAB: Bezel kit 36U	BEZ3611-CAB	\$206	\$412
2	CAB: Stabilizer kit 0U	WGT39581-SXR	\$110	\$220
2	PNL: L&R side panels 36U	PAN3621-SXR	\$192	\$384
	Storage Total			\$199,347
3	SYS: Aquanta GPS, 0 Proc, 0MB Mem	GPS60071-BAS	\$945	\$2,835
6	PROC:1x300MHz Pentium II/512KB Cache	GPS2300-512	\$863	\$5,178
3	UPGRD: GPS P-II 2nd CPU Supt.	GPS600071-P2U	\$32	\$96
6	MEM: 128 MB Memory Upgrade	DIM672-128	\$741	\$4,446
3	DISK: 2GB Ultra SCSI 3.5 Internal	HDS2000-SW7	\$573	\$1,719
3	CDROM: 14-32x Speed, SCSI	CDR1432-SI	\$161	\$483
6	ETHERNET: 100Mbit/sec, PCI 32-bit	ETH1010007-PCI	\$101	\$606
3	ETHERNET: 100Mbit/sec, PCI 32-bit, Quad	SF1001-ET4	\$1,212	\$3,636
3	MONITOR:15-inch Color	EVG2100-P	\$320	\$960
3	KEYBD: 104 Key Spacesaver	PCK104-SKB	\$93	\$279
3	MOUSE: 2 Button PS2	PWM1-PS2	\$23	\$69
	Client Total			\$20,121
	Server, Storage and Client Total			\$257,877
	Discount based on total dollar volume			(\$25,788)
	Quote Total			\$232,089

Quote valid for 75 days.

Disks come with return to factory, 5 year warranty, 7 day replenishment



Quotation

To: Glenn Weeks	From: Michael Alam
Company: Unisys Corporation - Orange County Operations 25725 Jeronimo Rd Mission Viejo, CA 92531	Date: October 28, 1998
RE: Mylex ExtremeRAID DAC1164P	Total Pages: 1

Dear Mr. Weeks,

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

Part # / Description	MSRP
DAC1164P-3E-32-MY	\$2838 ea
<hr/>	
<i>PCI RAID Ultra 2 (LVD) DAC1164P 3E/2I CH 32MB w/Battery Back Up</i>	
<hr/>	

Notes:

Above prices are based on FOB, ex-factory, Fremont, California and firm for 90 days.

Lead time: 30 days ARO.

Product is covered by a 3 year warranty, and maintenance cost for additional 2 years is \$50.

Failed product will be repaired or replaced within 7 days.

Best regards,

Michael Alam, Regional Sales Manager

34551 Ardenwood Blvd,
Fremont, CA 94555-3807
Tel: 510.796-6100
Sales Fax: 510.745-8016
www.mylex.com



ENTERPRISE MIDDLEWARE SOLUTIONS

October 6, 1998

Mr. Jerrold Buggert
Director, Systems Analysis, Modeling, Measurement
Unisys Corporation
25725 Jeronimo Road
Mission Viejo, CA 92691
Fax (714) 380-5468

Dear Mr. Buggert:

Per your request I am enclosing the pricing information regarding TUXEDO 6.x that you requested. This pricing applies to Tuxedo 6.1, 6.2, 6.3 and 6.4. Please note that Tuxedo 6.4 is our most recent version of Tuxedo but that all 6.x releases are generally available. Core functionality services pricing is appropriate for your activities. As per the table below, server systems are classified in one of 5 tiers based on CPU type and capacity. The Acquanta GPS systems with 2 CPU capacity are classified as tier 1 systems, those with 4 CPU capacity are tier 2.

Tuxedo Core Functionality Services (CFS) Program Product Pricing and Description

TUX-CFS provides a basic level of middleware support for distributed computing, and is best used by organizations with substantial resources and knowledge for advanced distributed computing implementations.

TUX-CFS prices are server only and are based on the overall performance characteristics of the server and uses the same five tier computer classification as TUXEDO 6.x. Prices range from \$3,000 for Tier 1 to \$250,000 for Tier 5. Under this pricing option EVERY system running TUX-CFS at the user site must have a TUXEDO license installed and pay the appropriate per server license fees.

BEA Tux/CFS Unlimited User License Fees Per Server

Unlimited User License fees per server	Number of Users	Dollar Amount	Maintenance (5 x 8) per year	Maintenance (7 x 24) per year
Tier 1 -- PC Servers with 1 or 2 CPUs, entry level RISC Uni-processor workstations and servers (Class 1and Class 2)	Unlimited	\$3,000.00	\$450.00	\$660.00
Tier 2 -- PC Servers with 3 or 4 CPUs, Midrange RISC Uni-processor servers and workstations (class 3)	Unlimited	\$12,000.00	\$1,800.00	\$2,640.00
Tier 3 -- Midrange Multiprocessors, up to 8 CPUs per system capacity (Class 4 and 5)	Unlimited	\$30,000.00	\$4,500.00	\$6,600.00

10/06/98

BEA SYSTEMS, INC.

Tier 4 -- Large (more than 8, less than 32 CPUs) and Mainframe Systems (Class 6)	Unlimited	\$100,000.00	\$15,000.00	\$22,000.00
Tier 5 -- Massively Parallel Systems, > 32 processors	Unlimited	\$250,000.00	\$37,500.00	\$55,000.00

Intel based server tier classifications:

Platform	Operating System	Tier 1	Tier 1	Tier 2	Tier 3	Tier 3
Intel Pentium/ Pentium Pro PCs	Interactive R3.2 ESIX SVR 4.0 SCO UNIX 3.2.2 and 3.2.4 SCO ODT 2.x,3.x Solaris x86 2.X UnixWare, Windows NT 3.5/4.0	All 386/486 PCs are Class 1	ALL Pentium and Pentium Pro PCs with 1 or 2 CPUs capacity are Tier 1	ALL Pentium and Pentium Pro PCs with 3 or 4 CPUs capacity are Tier 2		ALL Pentium and Pentium Pro PCs with 5,6,7, or 8 CPUs are Tier 3

Very Truly Yours,



Lewis D. Brentano,
Director, Market Planning

NOVEMBER 18th, 1998

RICK FREEMAN
 UNISYS CORPORATION
 25725 JERONIMO ROAD
 MISSION VIEJO, CALIFORNIA, 92691
 FAX: 949-380-5539

RICK
 HERE IS THE MODIFIED QUOTE AS REQUESTED BY GLEN WEEKS.

ITEM	QTY.	DESCRIPTION	UNIT	EXTENDED
DEH2924	2000+	COMPEX TP1008C 8 PORT 10BASE-T HUB WITH BNC UPLINK. LIFETIME WARRANTY.	\$ 33.00	\$ 66,000.00
DEH2648	2000+	LANTECH LTC WORKGROUP 8 PORT 10BASE-T HUB WITH SWITCH SELECTABLE 8 th PORT AS UPLINK OR DEDICATED 8 th PORT. 5 YEAR WARRANTY.	\$ 34.50	\$ 69,000.00
DEH4009	2000+	MACSENSE 8 PORT 10BASE-T HUB WITH BNC & RJ45 UPLINK PORTS. LIFETIME WARRANTY	\$ 33.95	\$ 67,900.00

THIS QUOTE IS VALID FOR 90 DAYS.
 THANK YOU FOR YOUR CONSIDERATION

BOB CHENEY
 ACCOUNT MANAGER
 DATACOMM WAREHOUSE
 800-328-2261 EXT: 22878
 732-942-2513 OR 732-905-5731 FAX
 CHENEYR@MMWHSE.COM



NETLUX

14180 Live Oak Ave., Unit E
Baldwin Park, Ca. 91760

1-800-789-1780
Phone#626-851-9737
Fax #626-851-9837

December 2, 1998

Rick Freeman
Unisys Corporation
25725 Jeronimo Road
Mission Viejo, CA 92691
Fax: (949) 380-5539
cc: (949) 380-5344

Quotation

Quantity	Part No.	Description	Unit Price	Total
3	NX-H8TXD	8-port 100Mbps FAST Ethernet Hub	\$205.00	\$ 615.00

Terms and Conditions:
FOB Origin
Quote Valid for 90 days
5 Year Warranty

Sincerely,
Martin Parry
NETLUX