



TPC Benchmark™ H
Full Disclosure Report
DELL PowerEdge 6950/AMD Opteron 8220SE DC - 2.8
GHz w/ 2M Cache
Using
Microsoft Windows Server 2003 Enterprise x64 Edition™
and SQL Server 2005 Enterprise x64 Edition™



Third Edition

Submitted for Review

May 17, 2006

Dell Inc. PowerEdge 6950 Server with Microsoft Windows Server 2003 Enterprise x64 Edition and SQL Server 2005 Enterprise x64 Edition

Third Printing May 2007

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Abstract

This report document the methodology and results of the TPC Benchmark H test conducted on a PowerEdge 6950 Server using Microsoft SQL Server 2005 Enterprise x64 Edition in conformance with the requirements of the TPC-H Benchmark Specification. The operating system used for the benchmark was Windows Server 2003 Enterprise x64 Edition. The application was written in C and compiled using the Visual Studio Professional Edition compiler.

Hardware	Software	Total System Cost
Dell PowerEdge 6950 with Quad AMD Opteron 8220SE DC - 2.8 GHz w/ 2M Cache Dell PowerVault MD1000 Storage Enclosures	Microsoft Windows Server 2003 Enterprise x64 Edition™ SQL Server 2005 Enterprise x64 Edition™	\$131,204

TPC-H Power@100GB	TPC-H Throughput@100GB	<u>QphH@100GB</u>	\$/QphH@100GB
21,949.9	13,446.1	17,179.7	\$7.64

The Transaction Processing Performance Council (TPC) developed the TPC-H Benchmark. The TPC was founded to define transactions processing benchmarks and to disseminate objective, verifiable performance data to the industry.

In order to verify compliance to the TPC-H benchmark specification, Lorna Livingtree, Performance Metrics, Inc., audited the benchmark configuration, environment and methodology used to produce and validate the test results, and the pricing model used to calculate the price/performance.



DELL
PowerEdge 6950
with SQL Server 2005
Enterprise x64 Edition™

TPC-H Revision 2.3.0
 Report Date: **Oct 23, 2006**
 Revision Date: **May 17, 2007**

Total System Cost
\$131,204 USD

TPC-H Composite Query per Hour
17,179.7 QphH@100GB

Price/Performance
\$7.64 USD/ QphH@100GB

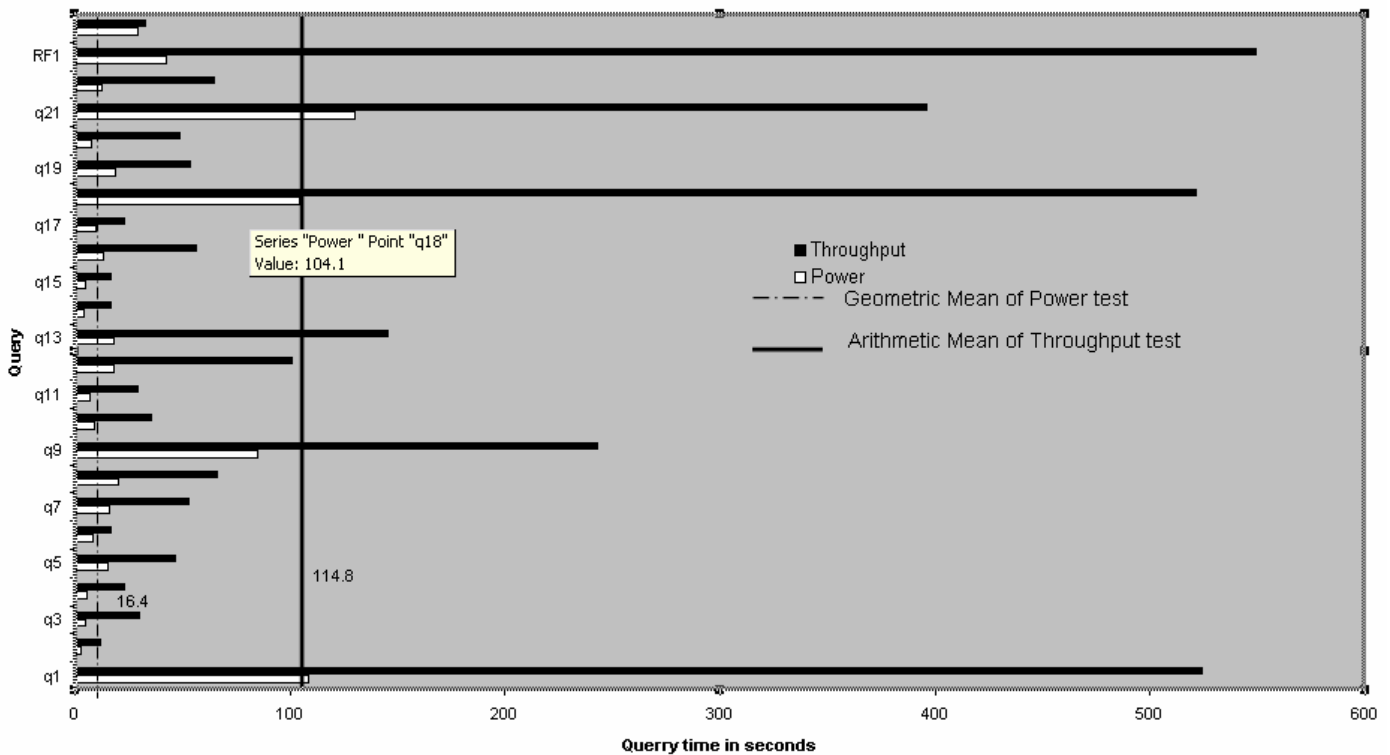
Database Size
100GB

Database Manager
 SQL Server 2005 Enterprise x64 Edition™

Operating System
 Microsoft Windows Server 2003 Enterprise x64 Edition™

Other Software
 Visual C++ Standard Edition
 Visual Basic 2003 .Net Professional

Availability Date
Dec 4, 2006



Database Load Time
 0:59:42

Total Disk/Database Size
 62.8

Load Includes Backup
 Y

RAID (Base tables only)
 N

RAID (Base tables and auxiliary data structures)
 N

RAID (Everything)
 N

System Configuration : 1 node
Processors (per node) : 4x AMD Opteron 8220SE DC - 2.8 GHz w/ 2M Cache
Memory: (per node) : 64GB RAM
Disk Drives: 180 – 36GB 15k SAS HDD, & 4 – 73GB 10k SAS HDD
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“Database Size includes only raw data (e.g., no temp, index, redundant storage space, etc.)”

Dell		PowerEdge PE6950			TPC-H REV 2.3 EXECUTIVE SUMMARY		
		Server			Report Date: 23-Oct-06		
					Revision Date: 17-May-07		
Description	Part Number	Third Party	Unit Price	Qty	Extended Price	3 yr. Maint. Price	
Server Hardware		Brand	Pricing				
PE6950, DUAL 8220SE, 2X1MB, 2.8GZ	222-5737		6,369.00	1	\$6,369.00	\$320.00	
& 2 Broadcom NICs							
QUAD OPTERON 8220SE PROCESSORS	311-6612		3,499.00	1	\$3,499.00		
64GB, 16X4GB, 2R, DDR2, 667	311-6601		19,988.00	1	\$19,988.00		
1.44MB, 3.5IN, USB, EXT FDD	341-2530		\$39.00	1	\$39.00		
24X CD-ROM, INTERNAL	313-2700		\$30.00	1	\$30.00		
PERC5/i, Integrated	341-3025		\$299.00	1	\$299.00		
PERC5/E SAS RAID, 2X4 EXTERNAL	341-3018		\$799.00	6	\$4,794.00		
73GB, 3GBPS, SAS, 3.5IN, 15K	341-3029		\$299.00	4	\$1,196.00		
E773s 17-inch Color CRT Monitor	320-5091		\$199.00	1	\$199.00		
					Subtotal	\$36,413.00	\$320.00
PowerVault Disk Subsystem							
PV MD1000, RACK, 3U, 15 BAY, LBZL	222-2299		2,680.00	12	\$32,160.00	\$19,776.00	
TWO ENCL MGT MODULES, SAS/SATA	420-5927		\$345.83	12	\$4,149.96		
36GB, 3GBPS, SAS, 3.5IN, 15K	341-2816		\$249.00	180	\$44,820.00		
RACK-111/24U/Dell	A0213544		\$479.95	1	\$479.95		
					Subtotal	\$81,609.91	\$19,776.00
Server Software							
SQL Server 2005 Enterprise x64 Edition **	810-04793	Microsoft	1	\$8,487.00	1	\$8,487.00	
SQL Server 2005 Client Licence **	359-01911	Microsoft	1	156	25	\$3,900.00	
Windows Server 2003 Enterprise x64 Server **	P72-00274	Microsoft	1	\$2,334.00	1	\$2,334.00	
Visual C++ Standard Edition **	254-00170	Microsoft	1	\$109.00	1	\$109.00	
Visual Basic 2003 .Net Professional	046-00856	Microsoft	1	\$109.00	1	\$109.00	
Professional Support (1 Incident)		Microsoft	1	\$245.00	1	\$245.00	
					Subtotal	\$14,939.00	\$245.00
All components from Dell are discounted 16% based on total dollar volume of this configuration.					Other Discounts (16%)	\$22,099.03	
					Total	\$110,863	\$20,341
Notes: * Maint. included in PowerVault MD1000 disk pod				Three-Year Cost of Ownership:		\$131,204	USD
** All Microsoft maintenance is covered by the maintenance costs of Microsoft SQL Server							
Pricing: NIO = These components are Not Immediately Orderable; 1 = Microsoft, all others are Dell				QphH@100G		17,179.7	
Pricing may be verified by calling 1-800-BUY-DELL and referencing quote # 364397064							
as a complex quote.							
Audited by Lorna Livingtree, Performance Metrics Inc.				\$ / QphH@100G:		\$7.64	USD
Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components. Individually negotiated discounts are not permitted. Special prices based on assumptions about past or future purchases are not permitted. All discounts reflect standard pricing policies for the listed components. For complete details, see the pricing sections of the TPC benchmark specifications. If you find that the stated prices are not available according to these items, please inform the TPC at pricing@tpc.org.							



DELL
PowerEdge 6950
w/ SQL Server 2005
Enterprise x64 Edition™

TPC-H Revision 2.3.0

Report Date: **Oct 23, 2006**

Revision Date: **May 17, 2007**

Numerical Quantities Summary

Measurement Results:

Database Scale Factor	100
Total Data Storage/Database Size	62.8
Start of Database Load	2006-10-14 10:53:03
End of Database Load	2006-10-14 11:52:45
Database Load Time	0:59:42
Query Streams for Throughput Test	5
TPC-H Power	21,949.9
TPC-H Throughput	13,446.1
TPC-H Composite Query-per-Hour Metric (QphH@100GB)	17,179.7
Total System Price Over 3 Years	\$131,204
TPC-H Price Performance Metric (\$/QphH@100GB)	\$7.64

Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 2,945.1 seconds

Duration of stream execution:

	Seed	Start Date/Time	End Date/Time	Duration
Stream00	1014115245	10/14/06 13:22:48	10/14/06 13:33:40	0:10:52
Stream01	1014115246	10/14/06 13:34:13	10/14/06 14:16:26	0:42:14
Stream02	1014115247	10/14/06 13:34:13	10/14/06 14:16:48	0:42:35
Stream03	1014115248	10/14/06 13:34:13	10/14/06 14:16:12	0:41:59
Stream04	1014115249	10/14/06 13:34:13	10/14/06 14:15:49	0:41:37
Stream05	1014115250	10/14/06 13:34:13	10/14/06 14:16:15	0:42:02
Refresh00		10/14/06 13:22:05	10/14/06 13:22:47	0:00:42
		10/14/06 13:33:41	10/14/06 13:34:10	0:00:29
Refresh01		10/14/06 13:34:12	10/14/06 14:18:02	0:43:49
Refresh02		10/14/06 14:18:05	10/14/06 14:19:17	0:01:11
Refresh03		10/14/06 14:19:21	10/14/06 14:20:34	0:01:13
Refresh04		10/14/06 14:20:40	10/14/06 14:21:55	0:01:15
Refresh05		10/14/06 14:22:02	10/14/06 14:23:18	0:01:16



Numerical Quantities Summary

Timing Intervals in Seconds:

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Stream00	108.4	2.8	5.1	5.9	15.6	8.2	16.0	20.2
Stream01	506.7	14.1	20.3	12.3	45.9	18.1	46.5	56.7
Stream02	544.7	9.8	47.4	17.9	38.6	17.1	58.5	45.3
Stream03	536.6	14.2	10.0	25.8	48.2	15.3	52.8	79.8
Stream04	487.0	9.3	18.7	22.2	43.0	15.9	64.6	94.1
Stream05	546.0	12.9	54.7	35.8	56.5	16.0	42.5	55.7
Min Qi	487.0	9.3	10.0	12.3	38.6	15.3	42.5	45.3
Max Qi	546.0	14.2	54.7	35.8	56.5	18.1	64.6	94.1
Avg Qi	524.2	12.1	30.2	22.8	46.4	16.5	53.0	66.3

Query	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Stream00	84.7	9.3	6.8	18.0	45.0	4.1	5.0	13.5
Stream01	243.4	33.9	30.7	148.7	146.6	17.4	16.9	62.0
Stream02	328.6	42.9	26.7	87.8	143.6	16.9	19.7	59.8
Stream03	203.6	29.6	32.8	84.0	156.6	15.2	17.3	58.7
Stream04	223.2	36.0	24.0	92.0	141.0	16.2	18.9	53.2
Stream05	215.3	36.5	32.9	91.5	139.1	16.8	21.6	48.5
Min Qi	203.6	29.6	24.0	84.0	139.1	15.2	16.9	48.5
Max Qi	328.6	42.9	32.9	148.7	156.6	17.4	21.6	62.0
Avg Qi	242.8	35.8	29.4	100.8	145.4	16.5	18.9	56.4

Query	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream00	9.9	104.1	18.7	7.9	130.3	12.8	42.4	29.4
Stream01	22.9	478.9	68.6	57.1	425.9	60.2	2594.4	31.3
Stream02	29.4	493.0	46.9	56.7	367.1	56.7	37.3	32.1
Stream03	24.9	628.0	50.8	35.9	326.1	73.1	37.7	32.1
Stream04	17.0	522.5	58.7	37.5	434.2	67.1	40.4	33.1
Stream05	21.8	485.0	43.6	56.7	425.3	67.4	36.8	36.1
Min Qi	17.0	478.9	43.6	35.9	326.1	56.7	36.8	31.3
Max Qi	29.4	628.0	68.6	57.1	434.2	73.1	2594.4	36.1
Avg Qi	23.2	521.5	53.7	48.8	395.7	64.9	549.3	32.9

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General Items

Test Sponsor

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

DELL is the sponsor of this TPC Benchmark™ H result.

Parameter Settings

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

- *Database Tuning Options*
- *Optimizer/Query execution options*
- *Query processing tool/language configuration parameters*
- *Recovery/commit options*
- *Consistency/locking options*
- *Operating system and configuration parameter*
- *Configuration parameters and options for any other software in the pricing structure*
- *Compiler optimization options*

Providing a full list of all parameters and options can satisfy this requirement, as long as all those that have been modified from their default values have been clearly identified and these parameters and options are only set once.

Comment 1: *In the event that some parameters and options are set multiple times, it must be easily discernible by an interested reader when the parameter or option was modified and what new value it received each time.*

Comment 2: *This requirement can be satisfied by providing a full list of all parameters and options, as long as all those that have been modified from their default values have been clearly identified and these parameters and options are only set once.*

Details of system and database configurations and parameters are provided in Appendix A.

Configuration Items

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 in 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.*

- *Type and the run-time execution location of software components (e.g., DBMS, query processing tools/languages, middle-ware components, software drivers, etc.).*

The System Under Test (SUT), DELL PowerEdge 6950 Server, depicted in the next diagram consists of:

- 4 - AMD Opteron 8220SE DC - 2.8 GHz w/ 2M Cache.
- 64GB RAM.
- 6 - DELL PERC 5/E RAID Controllers, each with 256MB RAM of cache.
- 12 - DELL PowerVault MD1000.
- 180 – 36GB, 3GBPS 15k SAS
- 4 – 73GB, 3GBPS 10k SAS.

Per *Clause 7.1.1*:

Specifically excluded from the priced system calculation are:

- *End-user communication devices and related cables, connectors, and concentrators;*
- *Equipment and tools used exclusively in the production of the full disclosure report;*
- *Equipment and tools used exclusively for the execution of the DBGEN or QGEN (see Clause 2.1.4 and Clause 4.2.1) programs.*

Measured and Priced Configuration

The measured and priced configurations are the same.

PE6950

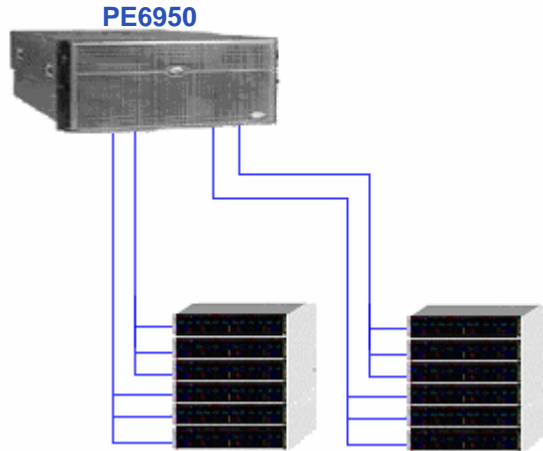
4xAMD Opteron 8220SE DC - 2.8
GHz w/ 2M Cache
64GB DDR2
6xPERC 5/E Controllers
4x73GB, 3GBPS, 10k SAS

DBMS

SQL Server 2005 Enterprise
x64 Edition

OS

Microsoft Windows Server
2003 Enterprise x64 Edition



Storage

12xMD1000
180x36GB, 15K, 3GBPS
SAS

12xMD1000

Measured Configuration

PE6950

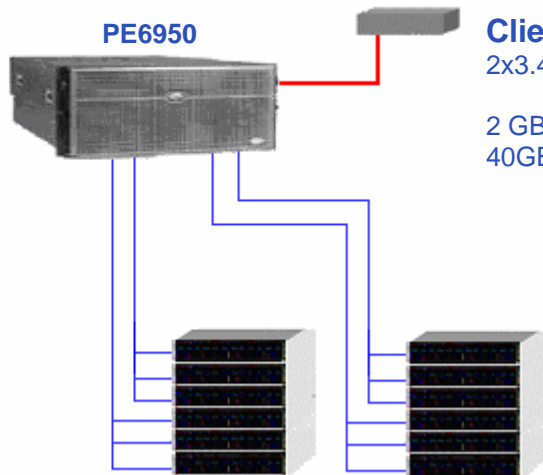
4xAMD Opteron 8220SE DC - 2.8
GHz w/ 2M Cache
64GB DDR2
6xPERC 5/E Controllers
4x73GB, 3GBPS, 10k SAS

DBMS

SQL Server 2005 Enterprise
x64 Edition

OS

Microsoft Windows Server
2003 Enterprise x64 Edition



Client: PE SC 1420

2x3.4GHz Xeon 1MB L2
cache
2 GB DDR
40GB Sata

Storage

12xMD1000
180x36GB, 15K, 3GBPS
SAS

12xMD1000

Clause 1: Logical Database Design

Table Definitions

Listings must be provided for all table definition statements and all other statements used to set up the test and qualification databases.

Appendix B contains the scripts that create and analyze the tables and indexes for the TPC-H database.

Physical Organization of Database

The physical organization of tables and indices, within the test and qualification databases, must be disclosed. If the column ordering of any table is different from that specified in Clause 1.4, it must be noted.

No record clustering or index clustering was used for this benchmark. Column ordering was reordered in tables. Refer to the table create statements in Appendix B for further details.

Horizontal Partitioning

Horizontal partitioning of tables and rows in the test and qualification databases (see Clause 1.5.4) must be disclosed.

Horizontal partitioning was not used in this benchmark.

Replication

Any replication of physical objects must be disclosed and must conform to the requirements of Clause 1.5.6.

Replication was not used for this benchmark.

Clause 2: Queries and Update Functions

Query Language

The query language used to implement the queries must be identified.

SQL was the query language used to implement all queries.

Random Number Generation

The method of verification for the random number generation must be described unless the supplied DBGEN and QGEN were used.

Version 2.3.0 of DBGEN and version 2.3.0 of QGEN were used to generate the random numbers for this TPC-H benchmark.

Substitution Parameters Generation

The method used to generate values for substitution parameters must be disclosed. If QGEN is not used for this purpose, then the source code of any non-commercial tool used must be disclosed. If QGEN is used, the version number, release number, modification number and patch level of QGEN must be disclosed.

QGEN version 2.3.0 was used to generate the substitution parameters.

Query Text and Output Data from Database

The executable query text used for query validation must be disclosed along with the corresponding output data generated during the execution of the query text against the qualification database. If minor modifications (see Clause 2.2.3) have been applied to any functional query definitions or approved variants in order to obtain executable query text, these modifications must be disclosed and justified. The justification for a particular minor query modification can apply collectively to all queries for which it has been used. The output data for the power and throughput tests must be made available electronically upon request.

Appendix D contains the query text and query output. The minor query modifications used in this implementation include the following:

Query Substitution Parameters and Seeds Used

All the query substitution parameters used during the performance test must be disclosed in tabular format, along with the seeds used to generate these parameters.

Appendix E contains the seed and query substitution parameters.

Isolation Level

The isolation level used to run the queries must be disclosed. If the isolation level does not map closely to one of the isolation levels defined in Clause 3.4, additional descriptive detail must be provided.

The queries and transactions were run with isolation level 3 (repeatable read).

Refresh Function Source Code

The details of how the refresh functions were implemented must be disclosed (including source code of any non-commercial program used).

The source code for the refresh functions is included in Appendix F.

Clause 3: Database System Properties

Atomicity

The results of the ACID tests must be disclosed along with a description of how the ACID requirements were met. This includes disclosing the code written to implement the ACID Transaction and Query.

Atomicity of Completed Transaction

Perform the ACID Transaction for a randomly selected set of input data and verify that the appropriate rows have been changed in the ORDER, LINEITEM, and HISTORY tables.

1. The total prices from the ORDER table and the extended price from the LINEITEM table were retrieved for a randomly selected order key.
2. The ACID Transaction was performed using the order key from step 1.
3. The ACID Transaction was committed.
4. The total price from the ORDER table and the extended price from the LINEITEM table were retrieved for the same order key. It was verified that the appropriate rows had been changed.

Aborted Transaction

Perform the ACID transaction for a randomly selected set of input data, substituting a ROLLBACK of the transaction for the COMMIT of the transaction. Verify that the appropriate rows have not been changed in the ORDER, LINEITEM, and HISTORY tables.

1. The total price from the ORDER table and the extended price from the LINEITEM table were retrieved for a randomly selected order key.
2. The ACID Transaction was performed using the order key from step 1. The transaction was stopped prior to the commit.
3. The ACID Transaction was rolled back.
4. The total price from the ORDER table and the extended price from the LINEITEM table were retrieved for the same order key, and verified to not have changed.

Consistency

A consistent state for the TPC-H database is defined to exist when:

*$$O_TOTALPRICE = \text{SUM} (\text{trunc} (\text{trunc} (L_EXTENDEDPRICE * (1 - L_DISCOUNT), 2) * (1 + L_TAX), 2))$$
 for each ORDERS and LINEITEM defined by (O_ORDERKEY = L_ORDERKEY)*

Consistency Test

Verify that ORDER and LINEITEM tables are initially consistent, submit the prescribed number of ACID Transactions with randomly selected input parameters, and re-verify the consistency of the ORDER and LINEITEM tables.

1. The consistency of the ORDER and LINEITEM tables was verified based on a sample of O_ORDERKEYs.
2. 100 ACID transactions were submitted from each of 6 execution streams.
3. The consistency of the ORDER and LINEITEM tables was verified a second time with the same O_ORDERKEYs.

Isolation

Operations of concurrent transactions must yield results which are indistinguishable from the results which would be obtained by forcing each transaction to be serially executed to completion in some order.

Read-Write Conflict with Commit

Demonstrate isolation for the read-write conflict of a read-write transaction and a read-only transaction when the read-write transaction is committed.

1. An ACID transaction was started for a randomly selected O_KEY, L_KEY, and DELTA. The ACID transaction was suspended prior to commit.
2. An ACID query was started for the same O_KEY used in step 1. The ACID query completed and did not see the uncommitted changes made by the ACID transaction.
3. The ACID transaction was committed.

Read-Write Conflict with Rollback

Demonstrate isolation for the read-write conflict of a read-write transaction and a read-only transaction when the read-write transaction is rolled back.

1. An ACID transaction was started for a randomly selected O_KEY, L_KEY, and DELTA. The ACID transaction was suspended prior to rollback.
2. An ACID query was started for the same O_KEY used in step 1. The ACID query completed and did not see the uncommitted changes made by the ACID transaction.
3. The ACID transaction was rolled back.

Write-Write Conflict with Commit

Demonstrate isolation for the write-write conflict of two update transactions when the first transaction is committed.

1. An ACID transaction, T1, was started for a randomly selected O_KEY, L_KEY, and DELTA. The ACID transaction was suspended prior to commit.
2. A second ACID transaction, T2, was started using the same O_KEY and L_KEY and a different randomly selected DELTA.
3. T2 waited.
4. T1 was allowed to commit and then T2 completed.
5. It was verified that T2.L_EXTENDPRICE was calculated correctly.

Write-Write Conflict with Rollback

Demonstrate isolation for the write-write conflict of two update transactions when the first transaction is rolled back.

1. An ACID transaction, T1, was started for a randomly selected O_KEY, L_KEY, and DELTA. The ACID transaction was suspended prior to rollback.
2. A second ACID transaction, T2, was started using the same O_KEY and L_KEY and a different randomly selected DELTA.
3. T2 waited.
4. T1 was allowed to rollback and then T2 completed.
5. It was verified that T2.L_EXTENDPRICE was calculated correctly.

Concurrent Read and Write Transactions on Different Tables

Demonstrate the ability of read and write transactions affecting different database tables to make progress concurrently.

The following steps were performed:

1. An ACID Transaction T1 for a randomly selected O_KEY, L_KEY and DELTA. The ACID Transaction T1 was suspended prior to commit.
2. Another ACID Transaction T2 was started using random values for PS_PARTKEY and PS_SUPPKEY.
3. T2 completed.
4. T1 completed and the appropriate rows in the ORDER, LINEITEM and HISTORY tables were changed.

Update Transactions during Continuous Read-Only Query Stream

Demonstrate the continuous submission of arbitrary (read-only) queries against one or more tables of the database does not indefinitely delay update transactions affecting those tables from making progress.

The following steps were performed:

1. An ACID Transaction T1 was started, executing Q1 against the qualification database. The substitution parameter was chosen from the interval [0..2159] so that the query ran for a sufficient amount of time.
2. Before T1 completed, an ACID Transaction T2 was started using randomly selected values of O_KEY, L_KEY and DELTA.
3. T2 completed before T1 completed.
4. It was verified that the appropriate rows in the ORDER, LINEITEM and HISTORY tables were changed.

Durability

The tested system must guarantee durability: the ability to preserve the effects of committed transactions and insure database consistency after recovery from any one of the failures listed in Clause 3.5.2.

Failure of a Durable Medium

Guarantee the database and committed updates are preserved across a permanent irrecoverable failure of any single durable medium containing TPC-H database tables or recovery log tables.

The database logs were stored on a RAID-10.

The tables for the database were stored on RAID-0 stripes.

During the test, one disk from the DELL MD1000 enclosure containing re-do log files was removed. As all re-do log files resided on RAID 10 volumes, the test continued uninterrupted. Next, a data drive was removed and a checkpoint submitted. Errors followed and the test was halted. The transaction log was backup up and the system rebooted replacing the failed drive. The database was restored from data and log backups. Post scripts confirmed success.

System Crash

Guarantee the database and committed updates are preserved across an instantaneous interruption (system crash/system hang) in processing which requires the system to reboot to recover.

1. Six streams of ACID transactions were started.
2. While the streams of ACID transactions were running the system was powered off.
3. When power was restored the system rebooted and the database was restarted.
4. The database went through a recovery period.
5. The success file and the HISTORY table counts were compared, and they matched.

Memory Failure

Guarantee the database and committed updates are preserved across failure of all or part of memory (loss of contents).

The system crash test and the memory failure test were combined. See the previous section.

Appendix C contains source code for all transactions.

Clause 4: Scaling and Database Population

Initial Cardinality of Tables

The cardinality (e.g., the number of rows) of each table of the test database, as it existed at the completion of the database load (see clause 4.2.5) must be disclosed.

Initial number of rows

Table	Occurrences
Orders	150,000,000
Lineitem	600,037,902
Customer	15,000,000
Part	20,000,000
Supplier	1,000,000
Partsupp	80,000,000
Nation	25
Region	5

Distribution of Tables and Logs Across Media

The distribution of tables and logs across all media must be explicitly described.

The SQL Server Database was stored on a PowerVault storage system composed of the following:

- 6 x DELL PERC 5/E Disk Controllers
- 12 x PowerVault MD1000 Disk Enclosures
- 180 x 36GB, 3GBPS, 15k rpm, SAS disk drives
- 4 x 73GB, 3GBPS, 10k rpm, SAS disk drives

6 logical volumes were configured each spanning 30 physical drives across each SAS channel of the controller in a RAID0 formation. The server had 4 73GB SAS disks onboard for both the OS and database logs.

Each logical volume had 2 raw and 1 NTFS partitions except for volume2, which had 2 raw and 2 NTFS partitions. Each logical volume had 2 database filegroups on raw partitions and an NTFS partition for flat file and database backup storage. Volume1 had an additional NTFS partition for flat file storage.

A detailed description of distribution of database file groups and log can be found below.

Distribution of Storage

Windows 2003 Disk Administration			DELL PERC 5/E Configuration				
Disk 0 1001.24 GB			Controller # 0				
Partition			Slot# 1		Channels		
1	2	3	SAS ID	A	B		
F: Lineitem_fg RAW 63.5 GB	O: General_fg RAW 30.75 GB	C:\B\O backup NTFS 906.98 GB	0	A0-1	B0-1		
			1	A0-2	B0-2		
			2	A0-3	B0-3		
			3	A0-4	B0-4		
			4	A0-5	B0-5		
			5	A0-6	B0-6		
			6	A0-7	B0-7		
			8	A0-8	B0-8		
			9	A0-9	B0-9		
			10	A0-10	B0-10		
			11	A0-11	B0-11		
			12	A0-12	B0-12		
			13	A0-13	B0-13		
			14	A0-14	B0-14		
			15	A0-15	B0-15		

Windows 2003 Disk Administration			DELL PERC 5/E Configuration				
Disk 1 1001.24 GB			Controller # 0				
Partition			Slot# 1		Channels		
1	2	3	SAS ID	A	B		
G: Lineitem_fg RAW 63.5 GB	P: General_fg RAW 30.75 GB	C:\B\P backup NTFS 906.98 GB	0	A0-1	B0-1		
			1	A0-2	B0-2		
			2	A0-3	B0-3		
			3	A0-4	B0-4		
			4	A0-5	B0-5		
			5	A0-6	B0-6		
			6	A0-7	B0-7		
			8	A0-8	B0-8		
			9	A0-9	B0-9		
			10	A0-10	B0-10		
			11	A0-11	B0-11		
			12	A0-12	B0-12		
			13	A0-13	B0-13		
			14	A0-14	B0-14		
			15	A0-15	B0-15		

Windows 2003 Disk Administration				DELL PERC 5/E Configuration				
Disk 2 1001.24 GB				Controller # 0				
Partition				Slot# 1	Channels			
1	2	3		SAS ID	A	B		
H: Lineitem_fg RAW 63.5 GB	Q: General_fg RAW 30.75 GB	Y: RF_files NTFS 2 GB	C:\B\Q backup NTFS 904.98	0	A0-1	B0-1		
				1	A0-2	B0-2		
				2	A0-3	B0-3		
				3	A0-4	B0-4		
				4	A0-5	B0-5		
				5	A0-6	B0-6		
				6	A0-7	B0-7		
				8	A0-8	B0-8		
				9	A0-9	B0-9		
				10	A0-10	B0-10		
				11	A0-11	B0-11		
				12	A0-12	B0-12		
				13	A0-13	B0-13		
				14	A0-14	B0-14		
				15	A0-15	B0-15		

Windows 2003 Disk Administration				DELL PERC 5/E Configuration				
Disk 3 1001.24 GB				Controller # 1				
Partition				Slot# 2	Channels			
1	2	3		SAS ID	A	B		
I: Lineitem_fg RAW 63.5 GB	R: General_fg RAW 30.75 GB	C:\B\R backup NTFS 906.98 GB		0	A0-1	B0-1		
				1	A0-2	B0-2		
				2	A0-3	B0-3		
				3	A0-4	B0-4		
				4	A0-5	B0-5		
				5	A0-6	B0-6		
				6	A0-7	B0-7		
				8	A0-8	B0-8		
				9	A0-9	B0-9		
				10	A0-10	B0-10		
				11	A0-11	B0-11		
				12	A0-12	B0-12		
				13	A0-13	B0-13		
				14	A0-14	B0-14		
				15	A0-15	B0-15		

Windows 2003 Disk Administration			DELL PERC 5/E Configuration			
Disk 9 133.5 GB			Controller # Int			
Partition			Slot# Int	Channels		
1	2		SAS ID	A	B	
C: OS NTFS 40 GB	E: Log RAW 60 GB		0	A0-1		
			1	A0-2		
			2	A0-3		
			3	A0-4		
			4			
			5			
			6			
			8			
			9			
			10			
			11			
			12			
			13			
			14			
			15			

Windows 2003 Disk Administration			DELL PERC 5/E Configuration			
Disk 4 1001.24 GB			Controller # 1			
Partition			Slot# 2	Channels		
1	2	3	SAS ID	A	B	
J: Lineitem_fg RAW 63.5 GB	S: General_fg RAW 30.75 GB	C:\B\S backup NTFS 906.98 GB	0	A0-1	B0-1	
			1	A0-2	B0-2	
			2	A0-3	B0-3	
			3	A0-4	B0-4	
			4	A0-5	B0-5	
			5	A0-6	B0-6	
			6	A0-7	B0-7	
			8	A0-8	B0-8	
			9	A0-9	B0-9	
			10	A0-10	B0-10	
			11	A0-11	B0-11	
			12	A0-12	B0-12	
			13	A0-13	B0-13	
			14	A0-14	B0-14	
			15	A0-15	B0-15	

Windows 2003 Disk Administration			DELL PERC 5/E Configuration			
Disk 5 1001.24 GB			Controller # 1			
Partition			Slot# 2	Channels		
1	2	3	SAS ID	A	B	
K: Lineitem_fg RAW 63.5 GB	T: General_fg RAW 30.75 GB	C:\B\T backup NTFS 906.98 GB	0	A0-1	B0-1	
			1	A0-2	B0-2	
			2	A0-3	B0-3	
			3	A0-4	B0-4	
			4	A0-5	B0-5	
			5	A0-6	B0-6	
			6	A0-7	B0-7	
			8	A0-8	B0-8	
			9	A0-9	B0-9	
			10	A0-10	B0-10	
			11	A0-11	B0-11	
			12	A0-12	B0-12	
			13	A0-13	B0-13	
			14	A0-14	B0-14	
			15	A0-15	B0-15	

Windows 2003 Disk Administration			DELL PERC 5/E Configuration			
Disk 6 1001.24 GB			Controller # 2			
Partition			Slot# 3	Channels		
1	2	3	SAS ID	A	B	
L: Lineitem_fg RAW 63.5 GB	U: General_fg RAW 30.75 GB	C:\B\U backup NTFS 906.98 GB	0	A0-1	B0-1	
			1	A0-2	B0-2	
			2	A0-3	B0-3	
			3	A0-4	B0-4	
			4	A0-5	B0-5	
			5	A0-6	B0-6	
			6	A0-7	B0-7	
			8	A0-8	B0-8	
			9	A0-9	B0-9	
			10	A0-10	B0-10	
			11	A0-11	B0-11	
			12	A0-12	B0-12	
			13	A0-13	B0-13	
			14	A0-14	B0-14	
			15	A0-15	B0-15	

Partitioning and Replication

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

The database was not replicated.
Horizontal partitioning was not used in this benchmark.

RAID Implementations

Implementations may use some form of RAID to ensure high availability. If used for data, auxiliary storage (e.g. indexes) or temporary space, the level of RAID used must be disclosed for each device.

RAID 10 was used for logs and OS.

RAID 0 was used for all tables, indexes, temp files and flat files.

DBGEN Version and Modifications

The version number, release number, modification number, and patch level of DBGEN must be disclosed. Any modifications to the DBGEN (see Clause 4.2.1) source code...must be disclosed. In the event that a program other than DBGEN was used to populate the database, it must be disclosed in its entirety.

The supplied DBGEN Version 2.3.0 was used for database population. No modifications were made to DBGEN.

Database Load time

The database load time for the test database (see clause 4.3) must be disclosed.

Database load time was 1 hour 34 minutes 15 seconds.

Data Storage Ratio

The data storage ratio must be disclosed. It is computed by dividing the total data storage of the priced configuration (expressed in GB) by the size chosen for the test database as defined in 4.1.3.1. The ratio must be reported to the nearest 1/100, rounded up.

Data Storage Ratio

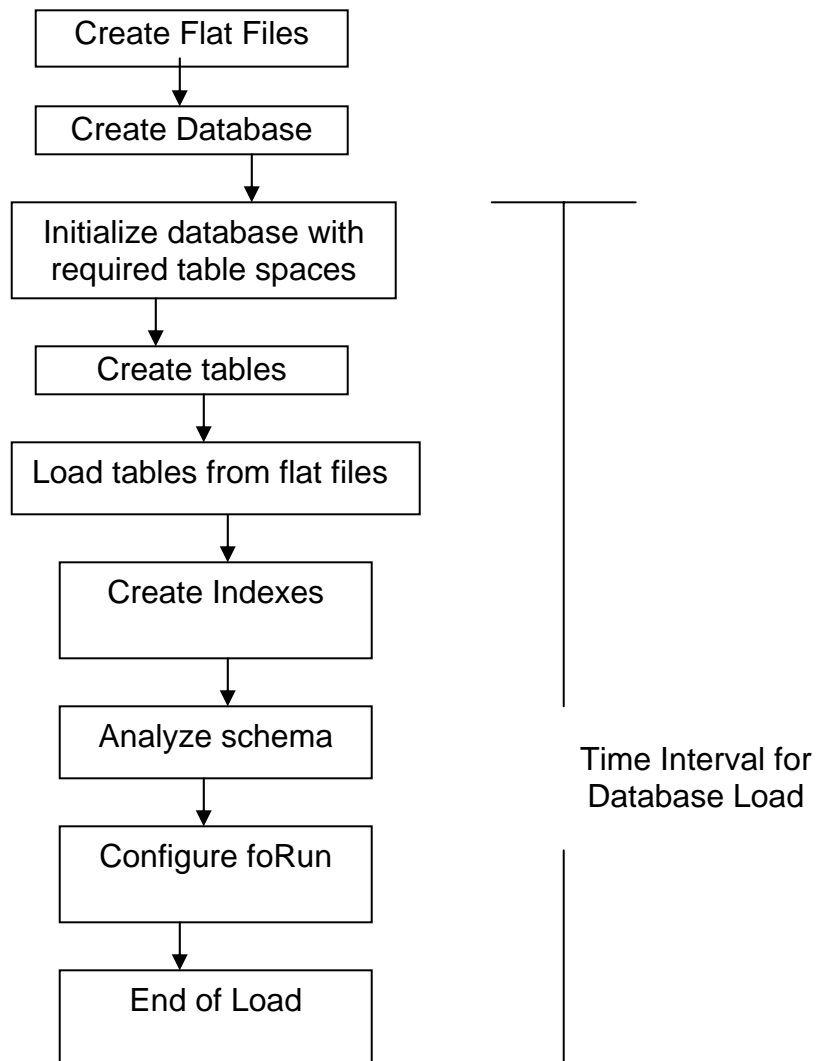
Disk Type	Number of Disks	Space per Disk	Subtotal Disk Space	Total Disk Storage	Data Storage Ratio
36GB 15k	180	33.37GB	6006.6GB		
73GB 10k	4	68.24GB	272.96GB		
				6279.56GB	62.8

Database Load Mechanism Details and Illustration

The details of the database load must be disclosed, including a block diagram illustrating the overall process. Disclosure of the load procedure includes all steps, scripts, input and configuration files required to completely reproduce the test and qualification databases.

DBGEN was used to create the flat files. The figure below describes the load procedure.

Database Load Process



Clause 5: Performance Metrics and Execution Rules

Steps in the Power Test

The details of the steps followed to implement the power test (e.g., system boot, database restart, etc.) must be disclosed.

The following steps were used to implement the power test:

1. Database restart.
2. RF1 update transaction.
3. Stream 00 execution.
4. RF2 update transaction.

Timing Intervals

The timing intervals (see Clause 5.3.6) for each query of the measured set and for both update functions must be reported for the power test.

The power test timing intervals are disclosed in the Numerical Quantities Summary at the beginning of this document.

Number of Streams for the Throughput Test

The number of execution streams used for the throughput test must be disclosed.

Five streams were used for the throughput test.

Start/Finish Time of Each Query Stream

The start time and finish time for each query execution stream must be reported for the throughput test.

The throughput test start time and finish time for each stream are disclosed in the Numerical Quantities Summary at the beginning of this document.

Total Elapsed Time

The total elapsed time of the measurement interval must be reported for the throughput test.

The total elapsed time of the throughput test was 2,945.1 seconds.

Start/Finish Time for Refresh Functions

Start and finish time for each refresh function in the update stream must be reported for the throughput test.

The start and finish time for each refresh function in the update stream are disclosed in the Numerical Quantities Summary at the beginning of this document.

Timing Intervals for Each Query and Each Update

The timing intervals (see Clause 5.3.6) for each query of each stream and for each update function must be reported for the throughput test.

The timing intervals for each query and each update function are contained in the Numerical Quantities Summary disclosed earlier in this document.

Performance Metrics

The computed performance metrics, related numerical quantities and the price performance metric must be reported.

The performance metrics, and the numbers, on which they are based, are contained in the Numerical Quantities section of the Executive Summary.

Reproducibility Method

A description of the method used to determine the reproducibility of the measurement results must be reported. This must include the performance metrics (QppH and QthH) from the reproducibility runs.

Performance results from the first two executions of the TPC-H benchmark indicated the following percent differences for the metrics:

Percentage Differences in Benchmark Executions

Run	QppH@100GB	QthH@100GB	QphH@100GB
1	22232.8	13462.1	17300.3
2	21,949.9	13,446.1	17,179.7
Percent Difference	0.99%	1.00%	0.99%

System Activity Between Run1 and Run2

Any activity on the SUT that takes place between the conclusion of Run1 and the beginning of Run2 must be disclosed.

The server was rebooted and the database was re-started between Run1 and Run2.

Clause 6: SUT and Driver Implementation

Driver

A detailed description of how the driver performs its functions must be supplied, including any related source code or scripts. This description should allow an independent reconstruction of the driver.

A single script performs all stream executions. QGEN is used to produce query text.

For each power-test run:

- RF1 refresh updates are submitted to the database
- QGEN-generated queries are submitted in the order defined by Clause 5.3.5.4
- RF2 refresh updates are submitted to the database

Implementation Specific Layer (ISL)

If an implementation-specific layer is used, then a detailed description of how it performs its functions must be supplied, including any related source code or scripts. This description should allow an independent reconstruction of the implementation-specific layer.

A command script was used to control and track the execution of queries. The scripts are contained in Appendix F. Qgen was used to generate the query streams, along with the appropriate substitution values.

Profile-Directed Optimization

If profile-directed optimization as described in Clause 5.2.9 is used, such use must be disclosed. In particular, the procedure and any scripts used to perform the optimization must be disclosed.

Profile-directed optimization was not used.

Clause 7: Pricing

Hardware and Software Used in the Priced System

A detailed list of hardware and software used in the priced system must be reported. Each 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, contents of the package must be disclosed. Pricing source(s) and effective date(s) of price(s) must also be reported.

A detailed list of the hardware and software used in the priced system is included in the Executive Summary at the beginning of this document. The price quotes are located in Appendix G.

Total Three Year Price

The total 3-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.

A detailed price sheet of all the hardware and software used in this configuration, including the 3-year maintenance cost, and total price, is included in the executive summary at the beginning of this document. This purchase qualifies for a 16% discount from Dell Inc. The price quotes are located in Appendix G.

Availability Date

The committed delivery date for general availability of products used in the price calculations must be reported. When the priced system includes products with different availability dates, the availability date reported on the executive summary must be the date by which all components are committed to being available. The full disclosure report must report availability dates individually for at least each of the categories for which a pricing subtotal must be provided.

All Dell components are available at the time of the Availability Date.

Orderability Date

For each of the components that are not orderable on the report date of the FDR, the following information must be included in the FDR:

- *Name and part number of the item that is not orderable*
- *The date when the component can be ordered (on or before the Availability Date)*
- *The method to be used to order the component (at or below the quoted price) when the date arrives*
- *The method for verifying the price*

Some components used in this benchmark are not orderable at the time of this publication. These items will be orderable on or before the stated Availability Date in this submission. For specific information regarding the orderable dates and prices of these items, please refer to the table below:

Orderable Information

Description	Part #	Order Date	Order Method	Price Verification
			1-800-BUY-DELL	
			1-800-BUY-DELL	

Note 1: All parts are currently orderable.

Clause 8: Auditor-Related Items

Auditor's Report

The auditor's agency name, address, phone number, and Attestation letter with a brief audit summary report indicating compliance must be included in the full disclosure report. A statement should be included specifying who to contact in order to obtain further information regarding the audit process.

Lorna Livingtree of Performance Metrics audited this implementation of the TPC Benchmark H. Information regarding the audit process may be obtained from:

Performance Metrics, Inc.
P.O Box 984
Klamath, CA 95548
(Phone) (707) 482-0523
(Fax) (707) 482-0115
E-mail: LornaL@perfmetrics.com

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

Transaction Processing Performance Council
Presidio of San Francisco
Building 572B (surface)
P.O Box 29920 (Mail)
San Francisco, CA 94129-0920 USA
Telephone: (415) 561-6272
Fax: (415) 561-6120
Info@tpc.org



October 19, 2006

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

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

Platform: PowerEdge 6950
Database Manager: Microsoft SQL Server 2005 Enterprise x64 Edition
Operating System: Windows Server 2003 Enterprise x64 Edition

CPU's	Memory	Total Disks	Qpph@ 100GB	QthH@100GB	QphH@100GB
4 AMD @ 2.8 Ghz	64 GB	180 @ 36 GB 4 @ 73 GB	21,949.9	13,446.1	17,179.7

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 database tables were defined with the proper columns, layout and sizes.
- The tested database was correctly scaled and populated for 100GB using DBGEN. The version of DBGEN was 2.3.0.
- The qualification database layout was identical to the tested database except for the number and size of the files and nodes.
- The query text was verified to use only compliant variants and minor modifications.
- The executable query text was generated by QGEN and submitted through a standard interactive interface. The version of QGEN was 2.3.0.
- The validation of the query text against the qualification database produced compliant results.
- The refresh functions were properly implemented and executed the correct number of inserts and deletes.
- The load timing was properly measured and reported.
- The execution times were correctly measured and reported.
- The performance metrics were correctly computed and reported.
- The repeatability of the measurement was verified.

- The ACID properties were successfully demonstrated and verified.
- The system pricing was checked for major components and maintenance.
- The executive summary pages of the FDR were verified for accuracy.

Auditor's Notes: None.

Sincerely,

A handwritten signature in cursive script that reads "Lorna Livingtree".

Lorna Livingtree
Auditor

Appendix A: Tunable Parameters

Server Configuration Parameters

Microsoft Windows 2003 Server Parameters

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

Microsoft SQL Server 2005 Startup Parameters

Microsoft SQL Server was started with the following command line options

```
sqlservr -c -x -E -T697
```

Microsoft SQL Server 2005 Configuration Parameters

name	minimum	maximum			
config_value	run_value				
-----	-----				
Ad Hoc Distributed Queries		0	1	0	0
0					
affinity I/O mask	-2147483648	2147483647			
0	0				
affinity mask	-2147483648	2147483647			
255	255				
affinity64 I/O mask	-2147483648	2147483647			
0	0				
affinity64 mask	-2147483648	2147483647			
0	0				
Agent XPs	0	1	0	0	
allow updates	0	1	1	1	
awe enabled	0	1	1	1	
blocked process threshold	0	86400	0	0	
0					
c2 audit mode	0	1	0	0	
clr enabled	0	1	0	0	
cost threshold for parallelism	0	32767	0	0	
0					
cross db ownership chaining	0	1	0	0	
0					
cursor threshold	-1	2147483647	-1		
-1					
Database Mail XPs	0	1	0	0	
0					

default full-text language	0	2147483647			
1033	1033				
default language	0	9999	0	0	
0					
default trace enabled	0	1	1		
1					
disallow results from triggers	0	1	0		
0					
fill factor (%)	0	100	0	0	
ft crawl bandwidth (max)	0	32767	100		
100					
ft crawl bandwidth (min)	0	32767	0		
0					
ft notify bandwidth (max)	0	32767	100		
100					
ft notify bandwidth (min)	0	32767	0		
0					
in-doubt xact resolution	0	2	0		
0					
index create memory (KB)	704	2147483647			
0	0				
lightweight pooling	0	1	1		
1					
locks	5000	2147483647	0		
0					
max degree of parallelism	0	64	0		
0					
max full-text crawl range	0	256	4		
4					
max server memory (MB)	16	2147483647			
63488	63488				
max text repl size (B)	0	2147483647			
65536	65536				
max worker threads	128	32767	1024		
1024					
media retention	0	365	0		
0					
min memory per query (KB)	512	2147483647			
512	512				
min server memory (MB)	0	2147483647			
61440	61440				
nested triggers	0	1	1	1	
network packet size (B)	512	32767			
32767	32767				
Ole Automation Procedures	0	1	0		
0					
open objects	0	2147483647	0		
0					
PH timeout (s)	1	3600	60		
60					
precompute rank	0	1	0		
0					
priority boost	0	1	1	1	
query governor cost limit	0	2147483647			
0	0				
query wait (s)	-1	2147483647			
2147483647	2147483647				
recovery interval (min)	0	32767	32767		
32767					

```

remote access                0      1      1      1
remote admin connections     0      0      1      0
0
remote login timeout (s)    0 2147483647
20      20
remote proc trans           0      1      0
0
remote query timeout (s)    0 2147483647
600     600
Replication XPs             0      1      0
0
scan for startup procs      0      1      0
0
server trigger recursion    0      1      1
1
set working set size        0      1      0
0
show advanced options       0      1      1
1
SMO and DMO XPs             0      1      1
1
SQL Mail XPs                0      1      0
0
transform noise words        0      1      0
0
two digit year cutoff       1753   9999   2049
2049
user connections            0 32767   0
0
user options                0 32767   0
0
Web Assistant Procedures    0      1      0
0
xp_cmdshell                 0      1      0      0

```

```

Processor AMD64 Family 15 Model 65 Stepping 2 AuthenticAMD ~2800
Mhz
Processor AMD64 Family 15 Model 65 Stepping 2 AuthenticAMD ~2800
Mhz
Processor AMD64 Family 15 Model 65 Stepping 2 AuthenticAMD ~2800
Mhz
BIOS Version/Date Dell Inc. 0.2.6, 8/9/2006
SMBIOS Version 2.4
Windows Directory C:\WINDOWS
System Directory C:\WINDOWS\system32
Boot Device \Device\HarddiskVolume5
Locale United States
Hardware Abstraction Layer Version = "5.2.3790.1830
(srv03_sp1_rtm.050324-1447)"
User Name Not Available
Time Zone Central Daylight Time
Total Physical Memory 65,534.27 MB
Available Physical Memory 604.24 MB
Total Virtual Memory 66.95 GB
Available Virtual Memory 5.03 GB
Page File Space 4.51 GB
Page File C:\pagefile.sys

```

[Hardware Resources]

[Conflicts/Sharing]

```

Resource Device
IRQ 41 PCI standard PCI-to-PCI bridge
IRQ 41 DELL PERC 5/E Adapter RAID Controller

Memory Address 0xF0000000-0xF1FFFFFFPCI bus
Memory Address 0xF0000000-0xF1FFFFFFMotherboard resources

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

IRQ 43 PCI standard PCI-to-PCI bridge
IRQ 43 DELL PERC 5/E Adapter RAID Controller

IRQ 32 PCI standard PCI-to-PCI bridge
IRQ 32 DELL PERC 5/E Adapter RAID Controller

IRQ 5 Standard OpenHCD USB Host Controller
IRQ 5 Standard OpenHCD USB Host Controller
IRQ 5 Standard Enhanced PCI to USB Host Controller

```

```

Memory Address 0xDF400000-0xDF7FFFFF PCI bus
Memory Address 0xDF400000-0xDF7FFFFF PCI standard PCI-to-
PCI bridge
Memory Address 0xDF400000-0xDF7FFFFF PCI standard PCI-to-
PCI bridge

IRQ 33 PCI standard PCI-to-PCI bridge
IRQ 33 Broadcom BCM5708C NetXtreme II GigE

Memory Address 0xE8000000-0xE80FFFFF PCI standard PCI-to-
PCI bridge
Memory Address 0xE8000000-0xE80FFFFF PCI standard PCI-to-
PCI bridge

Memory Address 0xDF700000-0xDF7FFFFF PCI standard PCI-to-
PCI bridge
Memory Address 0xDF700000-0xDF7FFFFF PCI standard PCI-to-
PCI bridge

Memory Address 0xDF600000-0xDF6FFFFF PCI standard PCI-to-
PCI bridge
Memory Address 0xDF600000-0xDF6FFFFF PCI standard PCI-to-
PCI bridge

```

System Information

System Information report written at: 10/18/06 01:36:40
System Name: PE6950
[System Summary]

```

Item Value
OS Name Microsoft(R) Windows(R) Server 2003 Enterprise x64 Edition
Version 5.2.3790 Service Pack 1 Build 3790
Other OS Description Not Available
OS Manufacturer Microsoft Corporation
System Name PE6950
System Manufacturer Dell Inc.
System Model PowerEdge 6950
System Type x64-based PC
Processor AMD64 Family 15 Model 65 Stepping 2 AuthenticAMD ~2800
Mhz
Processor AMD64 Family 15 Model 65 Stepping 2 AuthenticAMD ~2800
Mhz
Processor AMD64 Family 15 Model 65 Stepping 2 AuthenticAMD ~2800
Mhz
Processor AMD64 Family 15 Model 65 Stepping 2 AuthenticAMD ~2800
Mhz
Processor AMD64 Family 15 Model 65 Stepping 2 AuthenticAMD ~2800
Mhz

```

Memory Address 0xF2000000-0xF3FFFFFF PCI bus
Memory Address 0xF2000000-0xF3FFFFFF Motherboard resources

Memory Address 0xEE500000-0xEE6FFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xEE500000-0xEE6FFFFFF PCI standard PCI-to-PCI bridge

IRQ 35 PCI standard PCI-to-PCI bridge
IRQ 35 DELL PERC 5/I Adapter RAID Controller

Memory Address 0xEC000000-0xEDFFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xEC000000-0xEDFFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xEC000000-0xEDFFFFFF Broadcom
BCM5708C NetXtreme II GigE

IRQ 36 PCI standard PCI-to-PCI bridge
IRQ 36 DELL PERC 5/E Adapter RAID Controller

I/O Port 0x0000E000-0x0000EFFF PCI bus
I/O Port 0x0000E000-0x0000EFFF Standard OpenHCD USB Host Controller

IRQ 37 PCI standard PCI-to-PCI bridge
IRQ 37 Broadcom BCM5708C NetXtreme II GigE

IRQ 38 PCI standard PCI-to-PCI bridge
IRQ 38 DELL PERC 5/E Adapter RAID Controller

IRQ 39 PCI standard PCI-to-PCI bridge
IRQ 39 DELL PERC 5/E Adapter RAID Controller

Memory Address 0xE0000000-0xE82FFFFFF PCI bus
Memory Address 0xE0000000-0xE82FFFFFF Standard VGA
Graphics Adapter

Memory Address 0xDF800000-0xDFFFFFFF PCI bus
Memory Address 0xDF800000-0xDFFFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xDF800000-0xDFFFFFFF PCI standard PCI-to-PCI bridge

Memory Address 0xEE300000-0xEE4FFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xEE300000-0xEE4FFFFFF PCI standard PCI-to-PCI bridge

Memory Address 0xA0000-0xBFFFF PCI bus
Memory Address 0xA0000-0xBFFFF Standard VGA Graphics Adapter

Memory Address 0xDFC00000-0xDFDFFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xDFC00000-0xDFDFFFFFF PCI standard PCI-to-PCI bridge

Memory Address 0xDFA00000-0xDFBFFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xDFA00000-0xDFBFFFFFF PCI standard PCI-to-PCI bridge

Memory Address 0xDFE00000-0xDFFFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xDFE00000-0xDFFFFFFF PCI standard PCI-to-PCI bridge

Memory Address 0xDF500000-0xDF5FFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xDF500000-0xDF5FFFFFF PCI standard PCI-to-PCI bridge

Memory Address 0xE8200000-0xE82FFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xE8200000-0xE82FFFFFF PCI standard PCI-to-PCI bridge

Memory Address 0xE8100000-0xE81FFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xE8100000-0xE81FFFFFF PCI standard PCI-to-PCI bridge

Memory Address 0xEE100000-0xEE2FFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xEE100000-0xEE2FFFFFF PCI standard PCI-to-PCI bridge

Memory Address 0xEA000000-0xEE6FFFFFF PCI bus
Memory Address 0xEA000000-0xEE6FFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xEA000000-0xEE6FFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xEA000000-0xEE6FFFFFF Broadcom
BCM5708C NetXtreme II GigE

[DMA]

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

[Forced Hardware]

Device	PNP Device ID
--------	---------------

[I/O]

Resource	Device	Status
0x00000000-0x00000CF7	PCI bus	OK
0x00000000-0x00000CF7	Direct memory access controller	OK
0x00000D00-0x00003FFF	PCI bus	OK
0x0000E000-0x0000EFFF	PCI bus	OK
0x0000E000-0x0000EFFF	Standard OpenHCD USB Host Controller	OK
0x00000080-0x0000009F	Direct memory access controller	OK
0x000000C0-0x000000DF	Direct memory access controller	OK
0x000000F0-0x000000FF	Numeric data processor	OK
0x00000020-0x0000003F	Programmable interrupt controller	OK
0x000000A0-0x000000BF	Programmable interrupt controller	OK
0x000004D0-0x000004D1	Programmable interrupt controller	OK
0x00000061-0x00000061	System speaker	OK
0x00000040-0x0000005F	System timer	OK
0x00000070-0x0000007F	System CMOS/real time clock	OK
0x000003F0-0x000003F5	Standard floppy disk controller	OK
0x000003F7-0x000003F7	Standard floppy disk controller	OK
0x000003F8-0x000003FF	Communications Port (COM1)	OK
0x000002F8-0x000002FF	Communications Port (COM2)	OK
0x00000800-0x0000087F	System board	OK
0x00000880-0x0000089F	System board	OK
0x00000CD6-0x00000CD7	System board	OK
0x000000E0-0x000000E3	System board	OK
0x000000E4-0x000000E7	System board	OK
0x0000040B-0x0000040B	System board	OK
0x000004D6-0x000004D6	System board	OK
0x000008A0-0x000008BF	System board	OK
0x000008C0-0x000008CF	System board	OK
0x000008D0-0x000008DF	System board	OK
0x000008E0-0x000008E3	System board	OK
0x000008E4-0x000008E7	System board	OK
0x00000C00-0x00000CA7	System board	OK
0x00000CA0-0x00000CA7	System board	OK

0x0000CA9-0x0000CAB	System board	OK	0xE80F0000-0xE80FFFFF	DELL PERC 5/E Adapter RAID Controller
0x0000CAD-0x0000CAF	System board	OK	OK	
0x0000F50-0x0000F58	System board	OK	0xEE2E0000-0xEE2FFFFF	DELL PERC 5/E Adapter RAID Controller
0x0000060-0x0000060	System board	OK	OK	
0x0000064-0x0000064	System board	OK	0xEC000000-0xEDFFFFFF	PCI standard PCI-to-PCI bridge OK
0x0000CA8-0x0000CA8	System board	OK	0xEC000000-0xEDFFFFFF	PCI standard PCI-to-PCI bridge OK
0x0000CAC-0x0000CAC	System board	OK	0xEC000000-0xEDFFFFFF	Broadcom BCM5708C NetXtreme II GigE
0x0000E400-0x0000E4FF	Standard OpenHCD USB Host Controller	OK	OK	
0x0000E800-0x0000E8FF	Standard Enhanced PCI to USB Host Controller	OK	0xEE300000-0xEE4FFFFF	PCI standard PCI-to-PCI bridge OK
0x0000EC00-0x0000ECFF	Standard VGA Graphics Adapter	OK	0xEE300000-0xEE4FFFFF	PCI standard PCI-to-PCI bridge OK
0x000003B0-0x000003BB	Standard VGA Graphics Adapter	OK	0xE8100000-0xE81FFFFF	PCI standard PCI-to-PCI bridge OK
0x000003C0-0x000003DF	Standard VGA Graphics Adapter	OK	0xE8100000-0xE81FFFFF	PCI standard PCI-to-PCI bridge OK
			0xE81F0000-0xE81FFFFF	DELL PERC 5/I Adapter RAID Controller
			OK	
			0xEE4E0000-0xEE4FFFFF	DELL PERC 5/I Adapter RAID Controller
			OK	
			0xEE500000-0xEE6FFFFF	PCI standard PCI-to-PCI bridge OK
			0xEE500000-0xEE6FFFFF	PCI standard PCI-to-PCI bridge OK
			0xE8200000-0xE82FFFFF	PCI standard PCI-to-PCI bridge OK
			0xE8200000-0xE82FFFFF	PCI standard PCI-to-PCI bridge OK
			0xE82F0000-0xE82FFFFF	DELL PERC 5/E Adapter RAID Controller
			OK	
			0xEE6E0000-0xEE6FFFFF	DELL PERC 5/E Adapter RAID Controller
			OK	
			0xDF400000-0xDF7FFFFF	PCI bus OK
			0xDF400000-0xDF7FFFFF	PCI standard PCI-to-PCI bridge OK
			0xDF400000-0xDF7FFFFF	PCI standard PCI-to-PCI bridge OK
			0xDF800000-0xDFFFFFFF	PCI bus OK
			0xDF800000-0xDFFFFFFF	PCI standard PCI-to-PCI bridge OK
			0xDF800000-0xDFFFFFFF	PCI standard PCI-to-PCI bridge OK
			0xF2000000-0xF3FFFFFF	PCI bus OK
			0xF2000000-0xF3FFFFFF	Motherboard resources OK
			0xDF4F0000-0xDF4FFFFF	DELL PERC 5/E Adapter RAID Controller
			OK	
			0xDF9E0000-0xDF9FFFFF	DELL PERC 5/E Adapter RAID Controller
			OK	
			0xDFA00000-0xDFBFFFFFF	PCI standard PCI-to-PCI bridge OK
			0xDFA00000-0xDFBFFFFFF	PCI standard PCI-to-PCI bridge OK
			0xDF500000-0xDF5FFFFF	PCI standard PCI-to-PCI bridge OK
			0xDF500000-0xDF5FFFFF	PCI standard PCI-to-PCI bridge OK
			0xDF500000-0xDF5FFFFF	PCI standard PCI-to-PCI bridge OK
			0xDF5F0000-0xDF5FFFFF	DELL PERC 5/E Adapter RAID Controller
			OK	
			0xDFBE0000-0xDFBFFFFFF	DELL PERC 5/E Adapter RAID Controller
			OK	
			0xDFC00000-0xDFDFFFFFF	PCI standard PCI-to-PCI bridge OK
			0xDFC00000-0xDFDFFFFFF	PCI standard PCI-to-PCI bridge OK
			0xDF600000-0xDF6FFFFF	PCI standard PCI-to-PCI bridge OK
			0xDF600000-0xDF6FFFFF	PCI standard PCI-to-PCI bridge OK
			0xDF6F0000-0xDF6FFFFF	DELL PERC 5/E Adapter RAID Controller
			OK	
			0xDFDE0000-0xDFDFFFFFF	DELL PERC 5/E Adapter RAID Controller
			OK	
			0xDFE00000-0xDFFFFFFF	PCI standard PCI-to-PCI bridge OK
			0xDFE00000-0xDFFFFFFF	PCI standard PCI-to-PCI bridge OK
			0xDF700000-0xDF7FFFFF	PCI standard PCI-to-PCI bridge OK
			0xDF700000-0xDF7FFFFF	PCI standard PCI-to-PCI bridge OK
			0xDF7F0000-0xDF7FFFFF	DELL PERC 5/E Adapter RAID Controller
			OK	
			0xDFFE0000-0xDFFFFFFF	DELL PERC 5/E Adapter RAID Controller
			OK	
			0xFED00000-0xFED003FF	High precision event timer OK

[IRQs]

Resource	Device	Status
IRQ 9	Microsoft ACPI-Compliant System	OK
IRQ 13	Numeric data processor	OK
IRQ 0	System timer	OK
IRQ 8	System CMOS/real time clock	OK
IRQ 6	Standard floppy disk controller	OK
IRQ 4	Communications Port (COM1)	OK
IRQ 3	Communications Port (COM2)	OK
IRQ 5	Standard OpenHCD USB Host Controller	OK
IRQ 5	Standard OpenHCD USB Host Controller	OK
IRQ 5	Standard Enhanced PCI to USB Host Controller	OK
IRQ 32	PCI standard PCI-to-PCI bridge	OK
IRQ 32	DELL PERC 5/E Adapter RAID Controller	OK
IRQ 33	PCI standard PCI-to-PCI bridge	OK
IRQ 33	Broadcom BCM5708C NetXtreme II GigE	OK
IRQ 37	PCI standard PCI-to-PCI bridge	OK
IRQ 37	Broadcom BCM5708C NetXtreme II GigE	OK
IRQ 35	PCI standard PCI-to-PCI bridge	OK
IRQ 35	DELL PERC 5/I Adapter RAID Controller	OK
IRQ 36	PCI standard PCI-to-PCI bridge	OK
IRQ 36	DELL PERC 5/E Adapter RAID Controller	OK
IRQ 38	PCI standard PCI-to-PCI bridge	OK
IRQ 38	DELL PERC 5/E Adapter RAID Controller	OK
IRQ 39	PCI standard PCI-to-PCI bridge	OK
IRQ 39	DELL PERC 5/E Adapter RAID Controller	OK
IRQ 43	PCI standard PCI-to-PCI bridge	OK
IRQ 43	DELL PERC 5/E Adapter RAID Controller	OK
IRQ 41	PCI standard PCI-to-PCI bridge	OK
IRQ 41	DELL PERC 5/E Adapter RAID Controller	OK
IRQ 42	PCI standard PCI-to-PCI bridge	OK

[Memory]

Resource	Device	Status
0xA0000-0xBFFFF	PCI bus	OK
0xA0000-0xBFFFF	Standard VGA Graphics Adapter	OK
0xE0000000-0xE82FFFFF	PCI bus	OK
0xE0000000-0xE82FFFFF	Standard VGA Graphics Adapter	OK
0xEA000000-0xEE6FFFFF	PCI bus	OK
0xEA000000-0xEE6FFFFF	PCI standard PCI-to-PCI bridge	OK
0xEA000000-0xEE6FFFFF	PCI standard PCI-to-PCI bridge	OK
0xEA000000-0xEE6FFFFF	Broadcom BCM5708C NetXtreme II GigE	OK
0xF0000000-0xF1FFFFFF	PCI bus	OK
0xF0000000-0xF1FFFFFF	Motherboard resources	OK
0xEE0ED000-0xEE0EDFFF	Standard OpenHCD USB Host Controller	OK
0xEE0EE000-0xEE0EEFFF	Standard OpenHCD USB Host Controller	OK
0xEE0EF000-0xEE0EFFF	Standard Enhanced PCI to USB Host Controller	OK
0xEE0F0000-0xEE0FFFFF	Standard VGA Graphics Adapter	OK
0xEE100000-0xEE2FFFFF	PCI standard PCI-to-PCI bridge	OK
0xEE100000-0xEE2FFFFF	PCI standard PCI-to-PCI bridge	OK
0xE8000000-0xE80FFFFF	PCI standard PCI-to-PCI bridge	OK
0xE8000000-0xE80FFFFF	PCI standard PCI-to-PCI bridge	OK

0xEE500000-0xEE6FFFFF	PCI standard PCI-to-PCI bridge OK
0xEE500000-0xEE6FFFFF	PCI standard PCI-to-PCI bridge OK
0xE8200000-0xE82FFFFF	PCI standard PCI-to-PCI bridge OK
0xE8200000-0xE82FFFFF	PCI standard PCI-to-PCI bridge OK
0xE82F0000-0xE82FFFFF	DELL PERC 5/E Adapter RAID Controller
OK	
0xEE6E0000-0xEE6FFFFF	DELL PERC 5/E Adapter RAID Controller
OK	
0xDF400000-0xDF7FFFFF	PCI bus OK
0xDF400000-0xDF7FFFFF	PCI standard PCI-to-PCI bridge OK
0xDF400000-0xDF7FFFFF	PCI standard PCI-to-PCI bridge OK
0xDF800000-0xDFFFFFFF	PCI bus OK
0xDF800000-0xDFFFFFFF	PCI standard PCI-to-PCI bridge OK
0xDF800000-0xDFFFFFFF	PCI standard PCI-to-PCI bridge OK
0xF2000000-0xF3FFFFFF	PCI bus OK
0xF2000000-0xF3FFFFFF	Motherboard resources OK
0xDF4F0000-0xDF4FFFFF	DELL PERC 5/E Adapter RAID Controller
OK	
0xDF9E0000-0xDF9FFFFF	DELL PERC 5/E Adapter RAID Controller
OK	
0xDFA00000-0xDFBFFFFFF	PCI standard PCI-to-PCI bridge OK
0xDFA00000-0xDFBFFFFFF	PCI standard PCI-to-PCI bridge OK
0xDF500000-0xDF5FFFFF	PCI standard PCI-to-PCI bridge OK
0xDF500000-0xDF5FFFFF	PCI standard PCI-to-PCI bridge OK
0xDF500000-0xDF5FFFFF	PCI standard PCI-to-PCI bridge OK
0xDF5F0000-0xDF5FFFFF	DELL PERC 5/E Adapter RAID Controller
OK	
0xDFBE0000-0xDFBFFFFFF	DELL PERC 5/E Adapter RAID Controller
OK	
0xDFC00000-0xDFDFFFFFF	PCI standard PCI-to-PCI bridge OK
0xDFC00000-0xDFDFFFFFF	PCI standard PCI-to-PCI bridge OK
0xDF600000-0xDF6FFFFF	PCI standard PCI-to-PCI bridge OK
0xDF600000-0xDF6FFFFF	PCI standard PCI-to-PCI bridge OK
0xDF6F0000-0xDF6FFFFF	DELL PERC 5/E Adapter RAID Controller
OK	
0xDFDE0000-0xDFDFFFFFF	DELL PERC 5/E Adapter RAID Controller
OK	
0xDFE00000-0xDFFFFFFF	PCI standard PCI-to-PCI bridge OK
0xDFE00000-0xDFFFFFFF	PCI standard PCI-to-PCI bridge OK
0xDF700000-0xDF7FFFFF	PCI standard PCI-to-PCI bridge OK
0xDF700000-0xDF7FFFFF	PCI standard PCI-to-PCI bridge OK
0xDF7F0000-0xDF7FFFFF	DELL PERC 5/E Adapter RAID Controller
OK	
0xDFFE0000-0xDFFFFFFF	DELL PERC 5/E Adapter RAID Controller
OK	
0xFED00000-0xFED003FF	High precision event timer OK

[Components]

[Multimedia]

[Audio Codecs]

CODEC	Manufacturer	Description	Status	File
Version	Size	Creation Date		
c:\windows\system32\msadp32.acm	Microsoft Corporation			
OK	C:\WINDOWS\system32\MSADP32.ACM			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	23.50 KB			
(24,064 bytes)	3/25/2005 6:00 AM			
c:\windows\system32\tsoft32.acm	DSP GROUP, INC.			
OK	C:\WINDOWS\system32\TSSOFT32.ACM	1.01		
13.50 KB (13,824 bytes)	3/25/2005 6:00 AM			
c:\windows\system32\msgsm32.acm	Microsoft Corporation			
OK	C:\WINDOWS\system32\MSGSM32.ACM			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	34.50 KB			
(35,328 bytes)	3/25/2005 6:00 AM			
c:\windows\system32\imaadp32.acm	Microsoft Corporation			
OK	C:\WINDOWS\system32\IMAADP32.ACM			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB			
(24,576 bytes)	3/25/2005 6:00 AM			
c:\windows\system32\msg711.acm	Microsoft Corporation			
OK	C:\WINDOWS\system32\MSG711.ACM			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	13.50 KB			
(13,824 bytes)	3/25/2005 6:00 AM			

[Video Codecs]

CODEC	Manufacturer	Description	Status	File
Version	Size	Creation Date		
c:\windows\system32\msvidc32.dll	Microsoft Corporation			
OK	C:\WINDOWS\system32\MSVIDC32.DLL			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	43.00 KB			
(44,032 bytes)	3/25/2005 6:00 AM			
c:\windows\system32\msrle32.dll	Microsoft Corporation			
OK	C:\WINDOWS\system32\MSRLE32.DLL			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	15.50 KB			
(15,872 bytes)	3/25/2005 6:00 AM			
c:\windows\system32\iyuv_32.dll	Microsoft Corporation			
OK	C:\WINDOWS\system32\IYUV_32.DLL			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	52.50 KB			
(53,760 bytes)	3/24/2005 11:19 AM			
c:\windows\system32\tsbyuv.dll	Microsoft Corporation			
OK	C:\WINDOWS\system32\TSBYUV.DLL			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	12.50 KB			
(12,800 bytes)	3/24/2005 11:34 AM			
c:\windows\system32\msyuv.dll	Microsoft Corporation			
OK	C:\WINDOWS\system32\MSYUV.DLL			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	21.00 KB			
(21,504 bytes)	3/24/2005 11:21 AM			

[CD-ROM]

Item	Value
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[Sound Device]

Item	Value
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[Display]

Item	Value
Name	Standard VGA Graphics Adapter
PNP Device ID	PCI\VEN_1002&DEV_515E&SUBSYS_01EA1028&REV_02\3&13C0B0C5&0&20
Adapter Type	ATI ES1000, (Standard display types) compatible
Adapter Description	Standard VGA Graphics Adapter
Adapter RAM	16.00 MB (16,777,216 bytes)
Installed Drivers	vga.dll,framebuf.dll,vga256,vga64k
Driver Version	5.2.3790.1830
INF File	display.inf (vga section)
Color Planes	1
Color Table Entries	4294967296
Resolution	1024 x 768 x 1 hertz
Bits/Pixel	32
Memory Address	0xE0000000-0xE82FFFFF

I/O Port	0x0000EC00-0x0000ECFF
Memory Address	0xEE0F0000-0xEE0FFFFF
I/O Port	0x000003B0-0x000003BB
I/O Port	0x000003C0-0x000003DF
Memory Address	0xA0000-0xBFFFF
Driver	c:\windows\system32\drivers\vgapnp.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 33.00 KB (33,792 bytes), 9/29/2006 8:23 AM)

[Infrared]

Item	Value
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[Input]

[Keyboard]

Item	Value
Description	USB Human Interface Device
Name	Enhanced (101- or 102-key)
Layout	00000409
PNP Device ID	USB\VID_0518&PID_0001&MI_00\7&1C418F1D&0&0000
Number of Function Keys	12
Driver	c:\windows\system32\drivers\hidusb.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 18.50 KB (18,944 bytes), 3/25/2005 6:00 AM)

[Pointing Device]

Item	Value
Hardware Type	HID-compliant mouse
Number of Buttons	3
Status	OK
PNP Device ID	HID\VID_0518&PID_0001&MI_01&COL01\8&51CEA19&0&000
Power Management Supported	No
Double Click Threshold	6
Handedness	Right Handed Operation
Driver	c:\windows\system32\drivers\mouhid.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 19.00 KB (19,456 bytes), 3/24/2005 11:21 AM)

[Modem]

Item	Value
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[Network]

[Adapter]

Item	Value
Name	[00000001] RAS Async Adapter
Adapter Type	Not Available
Product Type	RAS Async Adapter
Installed	Yes
PNP Device ID	Not Available
Last Reset	10/14/2006 1:19 PM
Index	1
Service Name	AsyncMac
IP Address	Not Available
IP Subnet	Not Available
Default IP Gateway	Not Available
DHCP Enabled	No
DHCP Server	Not Available
DHCP Lease Expires	Not Available
DHCP Lease Obtained	Not Available
MAC Address	Not Available
Name	[00000002] WAN Miniport (L2TP)

Adapter Type Not Available
 Product Type WAN Miniport (L2TP)
 Installed Yes
 PNP Device ID ROOT\MS_L2TPMINIPORT\0000
 Last Reset 10/14/2006 1:19 PM
 Index 2
 Service Name Rasl2tp
 IP Address Not Available
 IP Subnet Not Available
 Default IP Gateway Not Available
 DHCP Enabled No
 DHCP Server Not Available
 DHCP Lease Expires Not Available
 DHCP Lease Obtained Not Available
 MAC Address Not Available
 Driver c:\windows\system32\drivers\rasl2tp.sys (5.2.3790.1830
 (srv03_sp1_rtm.050324-1447), 132.00 KB (135,168 bytes), 3/25/2005 6:00
 AM)

Name [00000003] WAN Miniport (PPTP)
 Adapter Type Wide Area Network (WAN)
 Product Type WAN Miniport (PPTP)
 Installed Yes
 PNP Device ID ROOT\MS_PPTPMINIPORT\0000
 Last Reset 10/14/2006 1:19 PM
 Index 3
 Service Name PptpMiniport
 IP Address Not Available
 IP Subnet Not Available
 Default IP Gateway Not Available
 DHCP Enabled No
 DHCP Server Not Available
 DHCP Lease Expires Not Available
 DHCP Lease Obtained Not Available
 MAC Address 50:50:54:50:30:30
 Driver c:\windows\system32\drivers\raspptp.sys (5.2.3790.1830
 (srv03_sp1_rtm.050324-1447), 117.50 KB (120,320 bytes), 3/25/2005 6:00
 AM)

Name [00000004] WAN Miniport (PPPOE)
 Adapter Type Wide Area Network (WAN)
 Product Type WAN Miniport (PPPOE)
 Installed Yes
 PNP Device ID ROOT\MS_PPPOEMINIPORT\0000
 Last Reset 10/14/2006 1:19 PM
 Index 4
 Service Name RasPppoe
 IP Address Not Available
 IP Subnet Not Available
 Default IP Gateway Not Available
 DHCP Enabled No
 DHCP Server Not Available
 DHCP Lease Expires Not Available
 DHCP Lease Obtained Not Available
 MAC Address 33:50:6F:45:30:30
 Driver c:\windows\system32\drivers\rasppoe.sys (5.2.3790.1830
 (srv03_sp1_rtm.050324-1447), 67.50 KB (69,120 bytes), 3/25/2005 6:00 AM)

Name [00000005] Direct Parallel
 Adapter Type Not Available
 Product Type Direct Parallel
 Installed Yes
 PNP Device ID ROOT\MS_PTMINIPORT\0000
 Last Reset 10/14/2006 1:19 PM
 Index 5
 Service Name Raspti
 IP Address Not Available
 IP Subnet Not Available
 Default IP Gateway Not Available
 DHCP Enabled No
 DHCP Server Not Available
 DHCP Lease Expires Not Available
 DHCP Lease Obtained Not Available

MAC Address Not Available
 Driver c:\windows\system32\drivers\raspti.sys (5.2.3790.1830
 (srv03_sp1_rtm.050324-1447), 30.50 KB (31,232 bytes), 3/25/2005 6:00 AM)

Name [00000006] WAN Miniport (IP)
 Adapter Type Not Available
 Product Type WAN Miniport (IP)
 Installed Yes
 PNP Device ID ROOT\MS_NDISWANIP\0000
 Last Reset 10/14/2006 1:19 PM
 Index 6
 Service Name NdisWan
 IP Address Not Available
 IP Subnet Not Available
 Default IP Gateway Not Available
 DHCP Enabled No
 DHCP Server Not Available
 DHCP Lease Expires Not Available
 DHCP Lease Obtained Not Available
 MAC Address Not Available
 Driver c:\windows\system32\drivers\ndiswan.sys (5.2.3790.1830
 (srv03_sp1_rtm.050324-1447), 157.50 KB (161,280 bytes), 3/25/2005 6:00
 AM)

Name [00000007] Broadcom BCM5708C NetXtreme II GigE (NDIS
 VBD Client)
 Adapter Type Not Available
 Product Type Broadcom BCM5708C NetXtreme II GigE (NDIS VBD
 Client)
 Installed Yes
 PNP Device ID
 B06BDRV\L2ND&PCI_164C14E4&SUBSYS_01EA1028&REV
 _12\6&272DC08&0&20050700
 Last Reset 10/14/2006 1:19 PM
 Index 7
 Service Name l2nd
 IP Address Not Available
 IP Subnet Not Available
 Default IP Gateway Not Available
 DHCP Enabled Yes
 DHCP Server Not Available
 DHCP Lease Expires Not Available
 DHCP Lease Obtained Not Available
 MAC Address Not Available
 Driver c:\windows\system32\drivers\bxnd52a.sys (2.6.14.0 built by:
 WinDDK, 78.00 KB (79,872 bytes), 4/3/2006 1:53 PM)

Name [00000008] Broadcom BCM5708C NetXtreme II GigE (NDIS
 VBD Client)
 Adapter Type Ethernet 802.3
 Product Type Broadcom BCM5708C NetXtreme II GigE (NDIS VBD
 Client)
 Installed Yes
 PNP Device ID
 B06BDRV\L2ND&PCI_164C14E4&SUBSYS_01EA1028&REV
 _12\6&51D5913&0&20050500
 Last Reset 10/14/2006 1:19 PM
 Index 8
 Service Name l2nd
 IP Address 192.2.2.69
 IP Subnet 255.255.255.0
 Default IP Gateway Not Available
 DHCP Enabled No
 DHCP Server Not Available
 DHCP Lease Expires Not Available
 DHCP Lease Obtained Not Available
 MAC Address 00:13:72:2D:93:3B
 Driver c:\windows\system32\drivers\bxnd52a.sys (2.6.14.0 built by:
 WinDDK, 78.00 KB (79,872 bytes), 4/3/2006 1:53 PM)

[Protocol]

Item Value

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

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

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

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

[WinSock]

Item Value
 File c:\windows\system32\wsock32.dll
 Size 24.50 KB (25,088 bytes)
 Version 5.2.3790.1830 (srv03_sp1_rtm.050324-1447)

[Ports]

[Serial]

Item Value
 Name Communications Port (COM1)
 Status OK
 PNP Device ID ACPI\PNP0501\1
 Maximum Input Buffer Size 0
 Maximum Output Buffer Size No
 Settable Baud Rate Yes
 Settable Data Bits Yes
 Settable Flow Control Yes
 Settable Parity Yes
 Settable Parity Check Yes
 Settable Stop Bits Yes
 Settable RLSD Yes
 Supports RLSD Yes
 Supports 16 Bit Mode No
 Supports Special Characters No
 Baud Rate 9600
 Bits/Byte 8
 Stop Bits 1
 Parity None
 Busy No
 Abort Read/Write on Error No
 Binary Mode Enabled Yes
 Continue Xmit on XOff No
 CTS Outflow Control No
 Discard NULL Bytes No
 DSR Outflow Control 0
 DSR Sensitivity 0
 DTR Flow Control Type Enable
 EOF Character 0
 Error Replace Character 0
 Error Replacement Enabled No
 Event Character 0
 Parity Check Enabled No
 RTS Flow Control Type Enable
 XOff Character 19
 XOffXmit Threshold 512
 XOn Character 17
 XOnXmit Threshold 2048
 XOnXOff InFlow Control 0
 XOnXOff OutFlow Control 0
 I/O Port 0x000003F8-0x000003FF
 IRQ Channel IRQ 4
 Driver c:\windows\system32\drivers\serial.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 118.50 KB (121,344 bytes), 3/25/2005 6:00 AM)

Name Communications Port (COM2)
 Status OK
 PNP Device ID ACPI\PNP0501\2
 Maximum Input Buffer Size 0
 Maximum Output Buffer Size No
 Settable Baud Rate Yes
 Settable Data Bits Yes
 Settable Flow Control Yes
 Settable Parity Yes
 Settable Parity Check Yes
 Settable Stop Bits Yes
 Settable RLSD Yes
 Supports RLSD Yes
 Supports 16 Bit Mode No

Supports Special Characters No
 Baud Rate 9600
 Bits/Byte 8
 Stop Bits 1
 Parity None
 Busy No
 Abort Read/Write on Error No
 Binary Mode Enabled Yes
 Continue XMit on XOff No
 CTS Outflow Control No
 Discard NULL Bytes No
 DSR Outflow Control 0
 DSR Sensitivity 0
 DTR Flow Control Type Enable
 EOF Character 0
 Error Replace Character 0
 Error Replacement Enabled No
 Event Character 0
 Parity Check Enabled No
 RTS Flow Control Type Enable
 XOff Character 19
 XOffXMit Threshold 512
 XOn Character 17
 XOnXMit Threshold 2048
 XOnXOff InFlow Control 0
 XOnXOff OutFlow Control 0
 I/O Port 0x000002F8-0x000002FF
 IRQ Channel IRQ 3
 Driver c:\windows\system32\drivers\serial.sys (5.2.3790.1830
 (srv03_sp1_rtm.050324-1447), 118.50 KB (121,344 bytes), 3/25/2005 6:00
 AM)

[Parallel]

Item Value

[Storage]

[Drives]

Item Value
 Drive C:
 Description Local Fixed Disk
 Compressed No
 File System NTFS
 Size 40.00 GB (42,952,376,320 bytes)
 Free Space 27.94 GB (30,000,930,816 bytes)
 Volume Name
 Volume Serial Number 7CEBA7A7

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

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

 Drive F:
 Description Local Fixed Disk
 Compressed Not Available

File System Not Available
 Size Not Available
 Free Space Not Available
 Volume Name Not Available
 Volume Serial Number Not Available

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

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

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

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

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

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

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

Drive Q:
 Description Local Fixed Disk
 Compressed Not Available
 File System Not Available

Size Not Available
Free Space Not Available
Volume Name Not Available
Volume Serial Number Not Available

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

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

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

Drive Y:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 2.01 GB (2,155,020,288 bytes)
Free Space 315.50 MB (330,825,728 bytes)
Volume Name
Volume Serial Number 7C73BC85

[Disks]

Item	Value
Description	Disk drive
Manufacturer	(Standard disk drives)
Model	DELL PERC 5/E Adapter SCSI Disk Device
Bytes/Sector	512
Media Loaded	Yes
Media Type	Fixed hard disk
Partitions	3
SCSI Bus	1
SCSI Logical Unit	0
SCSI Port	1
SCSI Target ID	0
Sectors/Track	63
Size	1,001.24 GB (1,075,076,997,120 bytes)
Total Cylinders	130,704
Total Sectors	2,099,759,760
Total Tracks	33,329,520
Tracks/Cylinder	255
Partition Disk #1, Partition #0	
Partition Size	63.50 GB (68,187,538,944 bytes)
Partition Starting Offset	32,256 bytes
Partition Disk #1, Partition #1	
Partition Size	30.76 GB (33,024,499,200 bytes)
Partition Starting Offset	68,187,571,200 bytes
Partition Disk #1, Partition #2	
Partition Size	906.98 GB (973,864,926,720 bytes)
Partition Starting Offset	101,212,070,400 bytes

Description Disk drive
Manufacturer (Standard disk drives)

Model DELL PERC 5/E Adapter SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 3
SCSI Bus 1
SCSI Logical Unit 0
SCSI Port 3
SCSI Target ID 0
Sectors/Track 63
Size 1,001.24 GB (1,075,076,997,120 bytes)
Total Cylinders 130,704
Total Sectors 2,099,759,760
Total Tracks 33,329,520
Tracks/Cylinder 255
Partition Disk #3, Partition #0
Partition Size 63.50 GB (68,187,538,944 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #3, Partition #1
Partition Size 30.76 GB (33,024,499,200 bytes)
Partition Starting Offset 68,187,571,200 bytes
Partition Disk #3, Partition #2
Partition Size 906.98 GB (973,864,926,720 bytes)
Partition Starting Offset 101,212,070,400 bytes

Description	Disk drive
Manufacturer	(Standard disk drives)
Model	DELL PERC 5/E Adapter SCSI Disk Device
Bytes/Sector	512
Media Loaded	Yes
Media Type	Fixed hard disk
Partitions	3
SCSI Bus	1
SCSI Logical Unit	0
SCSI Port	5
SCSI Target ID	0
Sectors/Track	63
Size	1,001.24 GB (1,075,076,997,120 bytes)
Total Cylinders	130,704
Total Sectors	2,099,759,760
Total Tracks	33,329,520
Tracks/Cylinder	255
Partition Disk #5, Partition #0	
Partition Size	63.50 GB (68,187,538,944 bytes)
Partition Starting Offset	32,256 bytes
Partition Disk #5, Partition #1	
Partition Size	30.76 GB (33,024,499,200 bytes)
Partition Starting Offset	68,187,571,200 bytes
Partition Disk #5, Partition #2	
Partition Size	906.98 GB (973,864,926,720 bytes)
Partition Starting Offset	101,212,070,400 bytes

Description	Disk drive
Manufacturer	(Standard disk drives)
Model	DELL PERC 5/E Adapter SCSI Disk Device
Bytes/Sector	512
Media Loaded	Yes
Media Type	Fixed hard disk
Partitions	3
SCSI Bus	1
SCSI Logical Unit	0
SCSI Port	6
SCSI Target ID	0
Sectors/Track	63
Size	1,001.24 GB (1,075,076,997,120 bytes)
Total Cylinders	130,704
Total Sectors	2,099,759,760
Total Tracks	33,329,520
Tracks/Cylinder	255
Partition Disk #6, Partition #0	
Partition Size	63.50 GB (68,187,538,944 bytes)
Partition Starting Offset	32,256 bytes
Partition Disk #6, Partition #1	

Partition Size 30.76 GB (33,024,499,200 bytes)
Partition Starting Offset 68,187,571,200 bytes
Partition Disk #6, Partition #2
Partition Size 906.98 GB (973,864,926,720 bytes)
Partition Starting Offset 101,212,070,400 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model DELL PERC 5/E Adapter SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 3
SCSI Bus 1
SCSI Logical Unit 0
SCSI Port 4
SCSI Target ID 0
Sectors/Track 63

Size 1,001.24 GB (1,075,076,997,120 bytes)
Total Cylinders 130,704
Total Sectors 2,099,759,760
Total Tracks 33,329,520
Tracks/Cylinder 255
Partition Disk #4, Partition #0
Partition Size 63.50 GB (68,187,538,944 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #4, Partition #1
Partition Size 30.76 GB (33,024,499,200 bytes)
Partition Starting Offset 68,187,571,200 bytes
Partition Disk #4, Partition #2
Partition Size 906.98 GB (973,864,926,720 bytes)
Partition Starting Offset 101,212,070,400 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model DELL PERC 5/E Adapter SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 4
SCSI Bus 1
SCSI Logical Unit 0
SCSI Port 0
SCSI Target ID 0
Sectors/Track 63
Size 1,001.24 GB (1,075,076,997,120 bytes)
Total Cylinders 130,704
Total Sectors 2,099,759,760
Total Tracks 33,329,520
Tracks/Cylinder 255
Partition Disk #0, Partition #0
Partition Size 63.50 GB (68,187,538,944 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #0, Partition #1
Partition Size 30.76 GB (33,024,499,200 bytes)
Partition Starting Offset 68,187,571,200 bytes
Partition Disk #0, Partition #2
Partition Size 2.01 GB (2,155,023,360 bytes)
Partition Starting Offset 101,212,070,400 bytes
Partition Disk #0, Partition #3
Partition Size 904.98 GB (971,709,903,360 bytes)
Partition Starting Offset 103,367,093,760 bytes

Description Disk drive
Manufacturer (Standard disk drives)
Model DELL PERC 5/i Adapter SCSI Disk Device
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 3
SCSI Bus 1
SCSI Logical Unit 0
SCSI Port 2

SCSI Target ID 0
Sectors/Track 63
Size 135.50 GB (145,488,752,640 bytes)
Total Cylinders 17,688
Total Sectors 284,157,720
Total Tracks 4,510,440
Tracks/Cylinder 255
Partition Disk #2, Partition #0
Partition Size 40.00 GB (42,952,379,904 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #2, Partition #1
Partition Size 60.00 GB (64,428,618,240 bytes)
Partition Starting Offset 42,952,412,160 bytes
Partition Disk #2, Partition #2
Partition Size 1.00 GB (1,077,511,680 bytes)
Partition Starting Offset 107,381,030,400 bytes

[SCSI]

Item Value
Name DELL PERC 5/E Adapter RAID Controller
Manufacturer DELL
Status OK
PNP Device ID
PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&69DEDD&0&700038
Memory Address 0xE80F0000-0xE80FFFFF
Memory Address 0xEE2E0000-0xEE2FFFFF
IRQ Channel IRQ 32
Driver c:\windows\system32\drivers\percsas.sys (1.20.0.64 built by: WinDDK, 26.50 KB (27,136 bytes), 9/29/2006 7:58 AM)

Name DELL PERC 5/I Adapter RAID Controller
Manufacturer DELL
Status OK
PNP Device ID
PCI\VEN_1028&DEV_0015&SUBSYS_1F021028&REV_00\5&1AB1F6F6&0&700050
Memory Address 0xE81F0000-0xE81FFFFF
Memory Address 0xEE4E0000-0xEE4FFFFF
IRQ Channel IRQ 35
Driver c:\windows\system32\drivers\percsas.sys (1.20.0.64 built by: WinDDK, 26.50 KB (27,136 bytes), 9/29/2006 7:58 AM)

Name DELL PERC 5/E Adapter RAID Controller
Manufacturer DELL
Status OK
PNP Device ID
PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&2224ECD9&0&700058
Memory Address 0xE82F0000-0xE82FFFFF
Memory Address 0xEE6E0000-0xEE6FFFFF
IRQ Channel IRQ 36
Driver c:\windows\system32\drivers\percsas.sys (1.20.0.64 built by: WinDDK, 26.50 KB (27,136 bytes), 9/29/2006 7:58 AM)

Name DELL PERC 5/E Adapter RAID Controller
Manufacturer DELL
Status OK
PNP Device ID
PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&1A8E8FE7&0&700038
Memory Address 0xDF4F0000-0xDF4FFFFF
Memory Address 0xDF9E0000-0xDF9FFFFF
IRQ Channel IRQ 38
Driver c:\windows\system32\drivers\percsas.sys (1.20.0.64 built by: WinDDK, 26.50 KB (27,136 bytes), 9/29/2006 7:58 AM)

Name DELL PERC 5/E Adapter RAID Controller
Manufacturer DELL
Status OK

PNP Device ID
 PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&
 29470E52&0&700040
 Memory Address 0xDF5F0000-0xDF5FFFFF
 Memory Address 0xDFBE0000-0xDFBFFFFF
 IRQ Channel IRQ 39
 Driver c:\windows\system32\drivers\percsas.sys (1.20.0.64 built by:
 WinDDK, 26.50 KB (27,136 bytes), 9/29/2006 7:58 AM)

Name DELL PERC 5/E Adapter RAID Controller
 Manufacturer DELL
 Status OK

PNP Device ID
 PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&
 2999E6BC&0&700048
 Memory Address 0xDF6F0000-0xDF6FFFFF
 Memory Address 0xDFDE0000-0xDFDFFFFF
 IRQ Channel IRQ 43
 Driver c:\windows\system32\drivers\percsas.sys (1.20.0.64 built by:
 WinDDK, 26.50 KB (27,136 bytes), 9/29/2006 7:58 AM)

Name DELL PERC 5/E Adapter RAID Controller
 Manufacturer DELL
 Status OK

PNP Device ID
 PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&
 1307B1EE&0&700050
 Memory Address 0xDF7F0000-0xDF7FFFFF
 Memory Address 0xDFFE0000-0xDFFFFFFFF
 IRQ Channel IRQ 41
 Driver c:\windows\system32\drivers\percsas.sys (1.20.0.64 built by:
 WinDDK, 26.50 KB (27,136 bytes), 9/29/2006 7:58 AM)

[IDE]

Item Value

[Printing]

Name Driver Port Name Server Name

[Problem Devices]

Device PNP Device ID Error Code
 Broadcom BCM5708C NetXtreme II GigE (NDIS VBD Client)
 B06BDRV\L2ND&PCI_164C14E4&SUBSYS_01EA1028&REV
 _12\6&272DC08&0&20050700 This device is disabled.

[USB]

Device PNP Device ID
 Standard OpenHCD USB Host Controller
 PCI\VEN_1166&DEV_0223&SUBSYS_01EA1028&REV_01\3&
 13C0B0C5&0&18
 Standard OpenHCD USB Host Controller
 PCI\VEN_1166&DEV_0223&SUBSYS_01EA1028&REV_01\3&
 13C0B0C5&0&19
 Standard Enhanced PCI to USB Host Controller
 PCI\VEN_1166&DEV_0223&SUBSYS_01EA1028&REV_01\3&
 13C0B0C5&0&1A

[Software Environment]

[System Drivers]

Name	Description	File	Type	Started	Start Mode
	State	Status	Error Control	Accept	Pause
	Accept	Stop			
abiosdsk	Abiosdsk	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Ignore	No

acpi	Microsoft ACPI Driver	c:\windows\system32\drivers\acpi.sys	Kernel Driver		
	Yes	Boot	Running	OK	Normal
	Yes				No
acpiec	ACPIEC	c:\windows\system32\drivers\acpiec.sys	Kernel		
Driver	No	Disabled	Stopped	OK	Normal
	No				No
adpu160m	adpu160m	Not Available	Kernel Driver		No
	Disabled	Stopped	OK	Normal	No
adpu320	adpu320	Not Available	Kernel Driver		No
	Disabled	Stopped	OK	Normal	No
afd	AFD	c:\windows\system32\drivers\afd.sys	Kernel		
Driver	Yes	System	Running	OK	Normal
	Yes				No
aic78u2	aic78u2	Not Available	Kernel Driver		No
	Disabled	Stopped	OK	Normal	No
aic78xx	aic78xx	Not Available	Kernel Driver		No
	Disabled	Stopped	OK	Normal	No
aliide	AliIde	Not Available	Kernel Driver		No
	Disabled	Stopped	OK	Normal	No
amdide	AmdIde	Not Available	Kernel Driver		No
	Disabled	Stopped	OK	Normal	No
arc	arc	Not Available	Kernel Driver		No
	Disabled	Stopped	OK	Normal	No
asynmac	RAS Asynchronous Media Driver	c:\windows\system32\drivers\asynmac.sys	Kernel Driver		
	No	Manual	Stopped	OK	Normal
	No				No
atapi	Standard IDE/ESDI Hard Disk Controller	c:\windows\system32\drivers\atapi.sys	Kernel Driver		
	Yes	Boot	Running	OK	Normal
	Yes				No
atdisk	Atdisk	Not Available	Kernel Driver		No
	Disabled	Stopped	OK	Ignore	No
atmarpc	ATM ARP Client Protocol	c:\windows\system32\drivers\atmarpc.sys	Kernel Driver		
	No	Manual	Stopped	OK	Normal
	No				No
audstub	Audio Stub Driver	c:\windows\system32\drivers\audstub.sys	Kernel Driver		
	Yes	Manual	Running	OK	
	Normal	No	Yes		
b06bdrv	Broadcom NetXtreme II VBD	c:\windows\system32\drivers\bxvbda.sys	Kernel Driver		
	Yes	Boot	Running	OK	Normal
	Yes				No
beep	Beep	c:\windows\system32\drivers\beep.sys	Kernel		
Driver	Yes	System	Running	OK	Normal
	Yes				No
cdac15ba	CdaC15BA	c:\windows\system32\drivers\cdac15ba.sys	Kernel Driver		
	Normal	No	Yes	Auto	Running
	Normal	No	Yes		OK
cdad10ba	CdaD10BA	c:\windows\system32\drivers\cdad10ba.sys	Kernel Driver		
	Normal	No	Yes	Auto	Running
	Normal	No	Yes		OK
cdfs	Cdfs	c:\windows\system32\drivers\cdfs.sys	File		
System Driver	No	No	Disabled	Stopped	OK
	No	No			Normal
cdrom	CD-ROM Driver	c:\windows\system32\drivers\cdrom.sys	Kernel Driver		
	Normal	No	No	System	Stopped
	Normal	No	No		OK
changer	Changer	Not Available	Kernel Driver		No
	System	Stopped	OK	Ignore	No
	System	Stopped	OK	Ignore	No
clusdisk	Cluster Disk Driver	c:\windows\system32\drivers\clusdisk.sys	Kernel Driver		
	Normal	No	No	Disabled	Stopped
	Normal	No	No		OK
cmdide	CmdIde	Not Available	Kernel Driver		No
	Disabled	Stopped	OK	Normal	No
cpqciism	cpqciism	Not Available	Kernel Driver		No
	Disabled	Stopped	OK	Normal	No
crdisk	CRC Disk Filter Driver	c:\windows\system32\drivers\crdisk.sys	Kernel Driver		
	Yes	Boot	Running	OK	Normal
	Yes				No

dfsdriver	DfsDriver	c:\windows\system32\drivers\dfs.sys	File	No	Manual	Stopped	OK	Normal	No
System Driver	Yes	Boot	Running	OK	Normal				
	No	Yes							
disk	Disk Driver	c:\windows\system32\drivers\disk.sys							
	Kernel Driver	Yes	Boot	Running	OK				
	Normal	No	Yes						
dmboot	dmboot	c:\windows\system32\drivers\dmboot.sys	Kernel						
Driver	No	Disabled	Stopped	OK	Normal	No			
	No								
dmio	Logical Disk Manager Driver								
	c:\windows\system32\drivers\dmio.sys		Kernel Driver						
	Yes	Boot	Running	OK	Normal	No			
	Yes								
dmload	dmload	c:\windows\system32\drivers\dmload.sys	Kernel						
Driver	Yes	Boot	Running	OK	Normal	No			
	Yes								
dpti2o	dpti2o	Not Available	Kernel Driver			No			
	Disabled	Stopped	OK	Normal	No	No			
elxstor	elxstor	Not Available	Kernel Driver			No			
	Disabled	Stopped	OK	Normal	No	No			
fastfat	Fastfat	c:\windows\system32\drivers\fastfat.sys	File						
System Driver	No	Disabled	Stopped	OK	Normal				
	No								
fdc	Floppy Disk Controller Driver								
	c:\windows\system32\drivers\fdc.sys		Kernel Driver						
	Yes	Manual	Running	OK	Normal	No			
	Yes								
fips	Fips	c:\windows\system32\drivers\fips.sys	Kernel						
Driver	Yes	System	Running	OK	Normal	No			
	Yes								
flpydisk	Floppy Disk Driver	c:\windows\system32\drivers\flpydisk.sys							
	Kernel Driver	No	Manual	Stopped	OK				
	Normal	No	No						
fltMgr	FltMgr	c:\windows\system32\drivers\fltMgr.sys	File						
System Driver	Yes	Boot	Running	OK	Normal				
	No	Yes							
ftdisk	Volume Manager Driver								
	c:\windows\system32\drivers\ftdisk.sys		Kernel Driver						
	Yes	Boot	Running	OK	Normal	No			
	Yes								
gpc	Generic Packet Classifier								
	c:\windows\system32\drivers\msgpc.sys		Kernel Driver						
	Yes	Manual	Running	OK	Normal	No			
	Yes								
hidusb	Microsoft HID Class Driver								
	c:\windows\system32\drivers\hidusb.sys		Kernel Driver						
	Yes	Manual	Running	OK	Ignore	No			
	Yes								
hpcisss	hpcisss	Not Available	Kernel Driver			No			
	Disabled	Stopped	OK	Normal	No	No			
http	HTTP	c:\windows\system32\drivers\http.sys	Kernel						
Driver	Yes	Manual	Running	OK	Normal	No			
	Yes								
i2omgmt	i2omgmt	Not Available	Kernel Driver			No			
	System	Stopped	OK	Normal	No	No			
i8042prt	i8042prt	c:\windows\system32\drivers\i8042prt.sys	Kernel						
Driver	No	System	Stopped	OK	Ignore	No			
	No								
iirsp	iirsp	Not Available	Kernel Driver			No			
	Disabled	Stopped	OK	Normal	No	No			
imapi	CD-Burning Filter Driver								
	c:\windows\system32\drivers\imapi.sys		Kernel Driver						
	No	System	Stopped	OK	Normal	No			
	No								
intelide	IntelIde	Not Available	Kernel Driver			No			
	Disabled	Stopped	OK	Normal	No	No			
ip6fw	IPv6 Windows Firewall Driver								
	c:\windows\system32\drivers\ip6fw.sys		Kernel Driver						
	No	Manual	Stopped	OK	Normal	No			
	No								
ipfilterdriver	IP Traffic Filter Driver								
	c:\windows\system32\drivers\ipfltdrv.sys		Kernel Driver						
ipinip	IP in IP Tunnel Driver			c:\windows\system32\drivers\ipinip.sys					
	Kernel Driver	No	Manual	Stopped	OK				
	Normal	No	No						
ipnat	IP Network Address Translator								
	c:\windows\system32\drivers\ipnat.sys		Kernel Driver						
	No	Manual	Stopped	OK	Normal	No			
	No								
ipsec	IPSEC driver	c:\windows\system32\drivers\ipsec.sys							
	Kernel Driver	Yes	System	Running	OK				
	Normal	No	Yes						
isapnp	PnP ISA/EISA Bus Driver								
	c:\windows\system32\drivers\isapnp.sys		Kernel Driver						
	Yes	Boot	Running	OK	Critical	No			
	Yes								
kbdclass	Keyboard Class Driver								
	c:\windows\system32\drivers\kbdclass.sys		Kernel Driver						
	Yes	System	Running	OK	Normal	No			
	Yes								
kbdhid	Keyboard HID Driver			c:\windows\system32\drivers\kbdhid.sys					
	Kernel Driver	Yes	System	Running	OK				
	Ignore	No	Yes						
ksecdd	KSecDD	c:\windows\system32\drivers\ksecdd.sys	Kernel						
Driver	Yes	Boot	Running	OK	Normal	No			
	Yes								
ksthunk	Kernel Streaming WOW64 Thunk Service								
	c:\windows\system32\drivers\ksthunk.sys		Kernel Driver						
	Yes	Manual	Running	OK	Normal	No			
	Yes								
l2nd	Broadcom NetXtreme II BXND								
	c:\windows\system32\drivers\bxd52a.sys		Kernel Driver						
	Yes	Manual	Running	OK	Normal	No			
	Yes								
Ip6nds35	Ip6nds35	Not Available	Kernel Driver			No			
	Disabled	Stopped	OK	Normal	No	No			
mnmdd	mnmdd	c:\windows\system32\drivers\mnmdd.sys	Kernel						
Driver	Yes	System	Running	OK	Ignore	No			
	Yes								
modem	Modem	c:\windows\system32\drivers\modem.sys	Kernel						
Driver	No	Manual	Stopped	OK	Ignore	No			
	No								
mouclass	Mouse Class Driver	c:\windows\system32\drivers\mouclass.sys							
	Kernel Driver	Yes	System	Running	OK				
	Normal	No	Yes						
mouhid	Mouse HID Driver	c:\windows\system32\drivers\mouhid.sys							
	Kernel Driver	Yes	Manual	Running	OK				
	Ignore	No	Yes						
mountmgr	Mount Point Manager	c:\windows\system32\drivers\mountmgr.sys							
	Kernel Driver	Yes	Boot	Running	OK				
	Normal	No	Yes						
mraid35x	mraid35x	Not Available	Kernel Driver			No			
	Disabled	Stopped	OK	Normal	No	No			
mrxdav	WebDav Client Redirector								
	c:\windows\system32\drivers\mrxdav.sys		File System Driver						
	No	Manual	Stopped	OK	Normal	No			
	No								
mrxsmb	MRXSMB	c:\windows\system32\drivers\mrxsmb.sys	File						
System Driver	Yes	System	Running	OK	Normal				
	No	Yes							
msfs	Msfs	c:\windows\system32\drivers\msfs.sys	File						
System Driver	Yes	System	Running	OK	Normal				
	No	Yes							
mssmbios	Microsoft System Management BIOS Driver								
	c:\windows\system32\drivers\mssmbios.sys		Kernel Driver						
	Yes	Manual	Running	OK	Normal	No			
	Yes								
mup	Mup	c:\windows\system32\drivers\mup.sys	File						
System Driver	Yes	Boot	Running	OK	Normal				
	No	Yes							
ndis	NDIS System Driver	c:\windows\system32\drivers\ndis.sys							
	Kernel Driver	Yes	Boot	Running	OK				
	Normal	No	Yes						

ndistapi	Remote Access NDIS TAPI Driver	c:\windows\system32\drivers\ndistapi.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
ndisuio	NDIS Usermode I/O Protocol	c:\windows\system32\drivers\ndisuio.sys	Kernel Driver	No	Manual	Stopped	OK	Normal	No
ndiswan	Remote Access NDIS WAN Driver	c:\windows\system32\drivers\ndiswan.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
ndproxy	NDIS Proxy	c:\windows\system32\drivers\ndproxy.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
netbios	NetBIOS Interface File System Driver	c:\windows\system32\drivers\netbios.sys	System Driver	Yes	System	Running	OK	Normal	No
netbt	NetBios over Tcpip	c:\windows\system32\drivers\netbt.sys	Kernel Driver	Yes	System	Running	OK	Normal	No
nfrd960	nfrd960	Not Available	Kernel Driver	Disabled	Stopped	OK		Normal	No
npfs	Npfs	c:\windows\system32\drivers\npfs.sys	System Driver	Yes	System	Running	OK	Normal	No
ntfs	Ntfs	c:\windows\system32\drivers\ntfs.sys	System Driver	Yes	Disabled	Running	OK	Normal	No
null	Null	c:\windows\system32\drivers\null.sys	Kernel Driver	Yes	System	Running	OK	Normal	No
parport	Parport	c:\windows\system32\drivers\parport.sys	Kernel Driver	No	Manual	Stopped	OK	Ignore	No
partmgr	Partition Manager	c:\windows\system32\drivers\partmgr.sys	Kernel Driver	Yes	Boot	Running	OK	Normal	No
pci	PCI Bus Driver	c:\windows\system32\drivers\pci.sys	Kernel Driver	Yes	Boot	Running	OK	Critical	No
pciide	PCIIde	c:\windows\system32\drivers\pciide.sys	Kernel Driver	Yes	Boot	Running	OK	Normal	No
pcmcia	Pcmcia	c:\windows\system32\drivers\pcmcia.sys	Kernel Driver	No	Disabled	Stopped	OK	Normal	No
pdcomp	PDCOMP	Not Available	Kernel Driver	Manual	Stopped	OK		Ignore	No
pdframe	PDFRAME	Not Available	Kernel Driver	No	Manual	Stopped	OK	Ignore	No
pdreli	PDRELI	Not Available	Kernel Driver	Manual	Stopped	OK		Ignore	No
pdrframe	PDRFRAME	Not Available	Kernel Driver	No	Manual	Stopped	OK	Ignore	No
percsas	percsas	c:\windows\system32\drivers\percsas.sys	Kernel Driver	Yes	Boot	Running	OK	Normal	No
pptpminiport	WAN Miniport (PPTP)	c:\windows\system32\drivers\raspppt.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
processor	Processor Driver	c:\windows\system32\drivers\processr.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
ptilink	Direct Parallel Link Driver	c:\windows\system32\drivers\ptilink.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
ql2300	ql2300	Not Available	Kernel Driver	Disabled	Stopped	OK		Normal	No
rasacd	Remote Access Auto Connection Driver	c:\windows\system32\drivers\rasacd.sys	Kernel Driver	Yes	System	Running	OK	Normal	No
rasl2tp	WAN Miniport (L2TP)	c:\windows\system32\drivers\rasl2tp.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
rasppoe	Remote Access PPPOE Driver	c:\windows\system32\drivers\rasppoe.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
raspti	Direct Parallel	c:\windows\system32\drivers\raspti.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
rdbss	Rdbss	c:\windows\system32\drivers\rdbss.sys	System Driver	Yes	System	Running	OK	File	Normal
rdpcdd	RDPCDD	c:\windows\system32\drivers\rdpcdd.sys	Kernel Driver	Yes	System	Running	OK	Ignore	No
rdpdr	Terminal Server Device Redirector Driver	c:\windows\system32\drivers\rdpdr.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
rdpwd	RDPWD	c:\windows\system32\drivers\rdpwd.sys	Kernel Driver	Yes	Manual	Running	OK	Ignore	No
redbook	Digital CD Audio Playback Filter Driver	c:\windows\system32\drivers\redbook.sys	Kernel Driver	No	System	Stopped	OK	Normal	No
secdrv	Security Driver	c:\windows\system32\drivers\secdrv.sys	Kernel Driver	Yes	Auto	Running	OK	Normal	No
serenum	Serenum Filter Driver	c:\windows\system32\drivers\serenum.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
serial	Serial port driver	c:\windows\system32\drivers\serial.sys	Kernel Driver	Yes	System	Running	OK	Ignore	No
sfloppy	Sfloppy	c:\windows\system32\drivers\sfloppy.sys	Kernel Driver	No	System	Stopped	OK	Ignore	No
simbad	Simbad	Not Available	Kernel Driver	Disabled	Stopped	OK		Normal	No
srv	Srv	c:\windows\system32\drivers\srv.sys	System Driver	No	Manual	Stopped	OK	File	Normal
swenum	Software Bus Driver	c:\windows\system32\drivers\swenum.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
symc8xx	symc8xx	Not Available	Kernel Driver	Disabled	Stopped	OK		Normal	No
symmpi	symmpi	Not Available	Kernel Driver	Disabled	Stopped	OK		Normal	No
sym_hi	sym_hi	Not Available	Kernel Driver	Disabled	Stopped	OK		Normal	No
sym_u3	sym_u3	Not Available	Kernel Driver	Disabled	Stopped	OK		Normal	No
tcpip	TCP/IP Protocol Driver	c:\windows\system32\drivers\tcpip.sys	Kernel Driver	Yes	System	Running	OK	Normal	No
tdpipe	TDPIPE	c:\windows\system32\drivers\tdpipe.sys	Kernel Driver	No	Manual	Stopped	OK	Ignore	No
tdtcp	TDTCP	c:\windows\system32\drivers\tdtcp.sys	Kernel Driver	Yes	Manual	Running	OK	Ignore	No
termdd	Terminal Device Driver	c:\windows\system32\drivers\termdd.sys	Kernel Driver						

	Yes	System	Running	OK	Normal	No	Terminal Server Mouse Driver	No	SYSTEM	5.2.3790.1830		
	Yes						10/1/2002 (Standard system devices)				machine.inf	
toside	TosIde	Not Available		Kernel Driver		No	Not Available		ROOT\RDP_MOU\0000			
	Disabled	Stopped	OK	Normal	No	No	Terminal Server Keyboard Driver	No	SYSTEM			
udfs	Udfs	c:\windows\system32\drivers\udfs.sys		Kernel Driver		File	5.2.3790.1830	10/1/2002 (Standard system devices)				
System Driver		No	Disabled	Stopped	OK	Normal	machine.inf					
	No	No					ROOT\RDP_KBD\0000					
ultra	ultra	Not Available		Kernel Driver		No	Terminal Server Device Redirector	No	SYSTEM			
	Disabled	Stopped	OK	Normal	No	No	5.2.3790.1830	10/1/2002 (Standard system devices)				
update	Microcode Update Driver							machine.inf				ROOT\RDPDR\0000
				c:\windows\system32\drivers\update.sys		Kernel Driver						
	Yes	Manual	Running	OK		Normal	Microsoft netrasi.inf		Not Available			
	Yes						ROOT\MS_PTMINIPORT\0000					
usbccgp	Microsoft USB Generic Parent Driver							WAN Miniport (PPTP)	No	NET	5.2.3790.1830	
				c:\windows\system32\drivers\usbccgp.sys		Kernel Driver	10/1/2002 Microsoft netrasi.inf		Not Available			
	Yes	Manual	Running	OK		Normal	ROOT\MS_PPTPMINIPORT\0000					
	Yes											
usbhci	Microsoft USB 2.0 Enhanced Host Controller Miniport Driver							WAN Miniport (PPPOE)	No	NET	5.2.3790.1830	
				c:\windows\system32\drivers\usbhci.sys		Kernel Driver	10/1/2002 Microsoft netrasi.inf		Not Available			
	Yes	Manual	Running	OK		Normal	ROOT\MS_PPPOEMINIPORT\0000					
	Yes											
usbhub	Microsoft USB Standard Hub Driver							WAN Miniport (IP)	No	NET	5.2.3790.1830	10/1/2002
				c:\windows\system32\drivers\usbhub.sys		Kernel Driver	Microsoft netrasi.inf		Not Available			
	Yes	Manual	Running	OK		Normal	ROOT\MS_NDISWANIP\0000					
	Yes											
usbhcci	Microsoft USB Open Host Controller Miniport Driver							WAN Miniport (L2TP)	No	NET	5.2.3790.1830	
				c:\windows\system32\drivers\usbhcci.sys		Kernel Driver	10/1/2002 Microsoft netrasi.inf		Not Available			
	Yes	Manual	Running	OK		Normal	ROOT\MS_L2TPMINIPORT\0000					
	Yes											
usbstor	USB Mass Storage Driver							Video Codecs	No	MEDIA	5.2.3790.1830	10/1/2002
				c:\windows\system32\drivers\usbstor.sys		Kernel Driver	(Standard system devices)			wave.inf		Not Available
	No	Manual	Stopped	OK		Normal	ROOT\MEDIA\MS_MMVID					
	No											
vga	vga	c:\windows\system32\drivers\vgapnp.sys		Kernel			Legacy Video Capture Devices	No	MEDIA	5.2.3790.1830		
Driver	Yes	Manual	Running	OK		Ignore	10/1/2002 (Standard system devices)			wave.inf		Not Available
	Yes						Available					
vgasave	VGA Display Controller.							Media Control Devices	No	MEDIA	5.2.3790.1830	
				c:\windows\system32\drivers\vgasave.sys		Kernel Driver	10/1/2002 (Standard system devices)			wave.inf		Not Available
	No	System	Stopped	OK		Ignore	Available					
	No						ROOT\MEDIA\MS_MMVCD					
viaide	ViaIde	Not Available		Kernel Driver		No	Legacy Audio Drivers	No	MEDIA	5.2.3790.1830	10/1/2002	
	Disabled	Stopped	OK	Normal	No	No	(Standard system devices)			wave.inf		Not Available
							ROOT\MEDIA\MS_MMDRV					
volsnap	Storage volumes							Audio Codecs	No	MEDIA	5.2.3790.1830	10/1/2002
				c:\windows\system32\drivers\volsnap.sys		Kernel Driver	(Standard system devices)			wave.inf		Not Available
	Kernel Driver		Yes	Boot	Running	OK	ROOT\MEDIA\MS_MMCI					
	Normal	No	Yes									
wanarp	Remote Access IP ARP Driver							Remote Access IP ARP Driver				LEGACYDRIVER
				c:\windows\system32\drivers\wanarp.sys		Kernel Driver	Not Available					Not Available
	Yes	Manual	Running	OK		Normal	ROOT\LEGACY_WANARP\0000					
	Yes											
wdica	WDICA	Not Available		Kernel Driver		No	volsnap	Not Available		LEGACYDRIVER		Not Available
	Manual	Stopped	OK	Ignore	No	No	Not Available					LEGACYDRIVER
wlbs	Network Load Balancing							Not Available				Not Available
				c:\windows\system32\drivers\wlbs.sys		Kernel Driver	ROOT\LEGACY_VOLSNAP\0000					
	No	Manual	Stopped	OK		Normal	TDTCP	Not Available		LEGACYDRIVER		Not Available
	No						Not Available					Not Available
							Not Available					Not Available
							ROOT\LEGACY_TDCIP\0000					
							Security Driver			LEGACYDRIVER		Not Available
							Available					Not Available
							Not Available					Not Available
[Signed Drivers]							Not Available			ROOT\LEGACY_SECDRV\0000		
							RDPWD	Not Available		LEGACYDRIVER		Not Available
							Not Available					Not Available
Device Name	Signed			Device Class		Driver Version	Not Available					Not Available
	Driver Date			Manufacturer		INF Name	Not Available					Driver
Name	Device ID						Root\LEGACY_RDPWD\0000					
Microsoft System Management BIOS Driver	No			SYSTEM			RDPDCC	Not Available		LEGACYDRIVER		Not Available
5.2.3790.1830				10/1/2002 (Standard system devices)			Not Available					Not Available
machine.inf							Not Available					Not Available
							ROOT\LEGACY_RDPDCC\0000					
Microcode Update Device	No			SYSTEM		5.2.3790.1830	Remote Access Auto Connection Driver					Not Available
10/1/2002 (Standard system devices)							LEGACYDRIVER					Not Available
							Not Available					Not Available
							ROOT\LEGACY_RASACD\0000					
Plug and Play Software Device Enumerator	No			SYSTEM			PCIide	Not Available		LEGACYDRIVER		Not Available
5.2.3790.1830				10/1/2002 (Standard system devices)			Not Available					Not Available
machine.inf							Not Available					Not Available
							ROOT\LEGACY_PCIDE\0000					
							Partition Manager			LEGACYDRIVER		Not Available
							Available					Not Available
							Not Available					Not Available
							Not Available			ROOT\LEGACY_PARTMGR\0000		

Null	Not Available	LEGACYDRIVER	Not Available	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available	Not Available		Microsoft	volume.inf Not Available	
	Not Available	ROOT\LEGACY_NULL\0000			STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD59	
NetBios over Tcpi	Not Available	LEGACYDRIVER	Not Available	OFFSET1790B5A200	LENGTH	THE2BEDF7E00	
Available	Not Available	Not Available	Not Available	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	ROOT\LEGACY_NETBT\0000			Microsoft	volume.inf Not Available	
NDProxy	Not Available	LEGACYDRIVER	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD59	
	Not Available	Not Available	Not Available	OFFSETFE04BC400	LENGTH	7B069DE00	
	Not Available	ROOT\LEGACY_NDPROXY\0000		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
NDIS Usermode I/O Protocol	Not Available	LEGACYDRIVER			Microsoft	volume.inf Not Available	
	Not Available	Not Available	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD59	
	Not Available	Not Available	Not Available	OFFSETE00	LENGTH	F0E04B4600	
	Not Available	ROOT\LEGACY_NDISUIO\0000		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
Remote Access NDIS TAPI Driver	Not Available				Microsoft	volume.inf Not Available	
	LEGACYDRIVER	Not Available	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD58	
	Not Available	Not Available	Not Available	OFFSET1790B5A200	LENGTH	THE2BEDF7E00	
	Not Available	ROOT\LEGACY_NDISTAPI\0000		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
NDIS System Driver	Not Available	LEGACYDRIVER	Not Available		Microsoft	volume.inf Not Available	
Available	Not Available	Not Available	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD58	
	Not Available	ROOT\LEGACY_NDIS\0000		OFFSETFE04BC400	LENGTH	7B069DE00	
mountmgr	Not Available	LEGACYDRIVER	Not Available	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available	Not Available		Microsoft	volume.inf Not Available	
	Not Available	ROOT\LEGACY_MOUNTMGR\0000			STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD58	
mmdd	Not Available	LEGACYDRIVER	Not Available	OFFSET7E00	LENGTH	F0E04B4600	
	Not Available	Not Available	Not Available	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	ROOT\LEGACY_MNMD\0000			Microsoft	volume.inf Not Available	
ksecdd	Not Available	LEGACYDRIVER	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD55	
	Not Available	Not Available	Not Available	OFFSET1790B5A200	LENGTH	THE2BEDF7E00	
	Not Available	ROOT\LEGACY_KSECDD\0000		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
IPSEC driver	Not Available	LEGACYDRIVER	Not Available		Microsoft	volume.inf Not Available	
Available	Not Available	Not Available	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD55	
	Not Available	ROOT\LEGACY_IPSEC\0000		OFFSETFE04BC400	LENGTH	7B069DE00	
IP Network Address Translator	Not Available	LEGACYDRIVER		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available	Not Available		Microsoft	volume.inf Not Available	
	Not Available	Not Available	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD55	
	Not Available	ROOT\LEGACY_IPNAT\0000		OFFSETE00	LENGTH	F0E04B4600	
HTTP	Not Available	LEGACYDRIVER	Not Available	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available	Not Available		Microsoft	volume.inf Not Available	
	Not Available	ROOT\LEGACY_HTTP\0000			STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD57	
Generic Packet Classifier	Not Available	LEGACYDRIVER		OFFSET1790B5A200	LENGTH	THE2BEDF7E00	
	Not Available	Not Available	Not Available	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available	Not Available		Microsoft	volume.inf Not Available	
	Not Available	ROOT\LEGACY_GPC\0000			STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD57	
Fips	Not Available	LEGACYDRIVER	Not Available	OFFSETE04BC400	LENGTH	7B069DE00	
	Not Available	Not Available	Not Available	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	ROOT\LEGACY_FIPS\0000			Microsoft	volume.inf Not Available	
dmload	Not Available	LEGACYDRIVER	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD57	
	Not Available	Not Available	Not Available	OFFSETE00	LENGTH	F0E04B4600	
	Not Available	ROOT\LEGACY_DMLOAD\0000		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
dmboot	Not Available	LEGACYDRIVER	Not Available		Microsoft	volume.inf Not Available	
	Not Available	Not Available	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD5B	
	Not Available	ROOT\LEGACY_DMBOOT\0000		OFFSET1790B5A200	LENGTH	THE2BEDF7E00	
CRC Disk Filter Driver	Not Available	LEGACYDRIVER		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available	Not Available		Microsoft	volume.inf Not Available	
	Not Available	Not Available	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD5B	
	Not Available	ROOT\LEGACY_CRCDISK\0000		OFFSETE04BC400	LENGTH	7B069DE00	
CdaD10BA	Not Available	LEGACYDRIVER	Not Available	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
Available	Not Available	Not Available	Not Available		Microsoft	volume.inf Not Available	
	Not Available	ROOT\LEGACY_CDAD10BA\0000			STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD5B	
CdaC15BA	Not Available	LEGACYDRIVER	Not Available	OFFSET7E00	LENGTH	F0E04B4600	
Available	Not Available	Not Available	Not Available	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	ROOT\LEGACY_CDAC15BA\0000			Microsoft	volume.inf Not Available	
Beep	Not Available	LEGACYDRIVER	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATUREB575B575	
	Not Available	Not Available	Not Available	OFFSET1900687E00	LENGTH	40398600	
	Not Available	ROOT\LEGACY_BEEP\0000		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
Standard IDE/ESDI Hard Disk Controller	Not Available				Microsoft	volume.inf Not Available	
	LEGACYDRIVER	Not Available	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATUREB575B575	
	Not Available	Not Available	Not Available	OFFSETA0029CC00	LENGTH	F003EB200	
	Not Available	ROOT\LEGACY_ATAPI\0000		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
AFD	Not Available	LEGACYDRIVER	Not Available		Microsoft	volume.inf Not Available	
	Not Available	Not Available	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATUREB575B575	
	Not Available	ROOT\LEGACY_AFD\0000		OFFSETE00	LENGTH	HA00294E00	

Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002	Disk drive No	DISKDRIVE	5.2.3790.1830	10/1/2002
Microsoft volume.inf	Not Available			(Standard disk drives) disk.inf	Not Available		
STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD5F			SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV			
OFFSET181128AE00	LENGTH23E6C7200			_1.00\6&1A2CFC4D&0&100			
Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002	DELL PERC 5/E Adapter RAID Controller	No	SCSIADAPTER	
Microsoft volume.inf	Not Available			1.20.0.64	12/9/2005	DELL oem1.inf	Not Available
STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD5F			PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&			
OFFSET1790B5A200	LENGTH80730C00			2999E6BC&0&700048			
Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002	PCI standard PCI-to-PCI bridge	No	SYSTEM 5.2.3790.1830	
Microsoft volume.inf	Not Available			10/1/2002 (Standard system devices)		machine.inf	
STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD5F			Not Available			
OFFSETE04BC400	LENGTH7B069DE00			PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\4&			
Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002	34889F00&0&0048			
Microsoft volume.inf	Not Available			PCI standard PCI-to-PCI bridge	No	SYSTEM 5.2.3790.1830	
STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1E5BD5F			10/1/2002 (Standard system devices)		machine.inf	
OFFSET7E00	LENGTHFE04B4600			Not Available			
Volume Manager	No	SYSTEM 5.2.3790.1830	10/1/2002	PCI\VEN_1166&DEV_0144&SUBSYS_00000000&REV_A2\3&			
(Standard system devices)		machine.inf	Not	1E390A02&0&48			
Available	ROOT\FTDISK\0000			PCI standard PCI-to-PCI bridge	No	SYSTEM 5.2.3790.1830	
Logical Disk Manager	No	SYSTEM 5.2.3790.1830	10/1/2002	10/1/2002 (Standard system devices)		machine.inf	
(Standard system devices)		machine.inf	Not	Not Available			
Available	ROOT\DMIO\0000			PCI\VEN_8086&DEV_0372&SUBSYS_00000000&REV_00\4&			
ACPI Fixed Feature Button	No	SYSTEM 5.2.3790.1830		2CE9DEA&0&0240			
10/1/2002 (Standard system devices)		machine.inf		RAID Virtual Device	No	SYSTEM 5.2.3790.1830	10/1/2002
Not Available	ACPI\FIXEDBUTTON\2&DABA3FF&0			American Megatrends, Inc.	scsidev.inf	Not Available	
High precision event timer	No	SYSTEM 5.2.3790.1830		SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&RE			
10/1/2002 (Standard system devices)		machine.inf		V_0001\6&2751A29C&0&1400			
Not Available	ACPI\PNP0103\0			Disk drive No	DISKDRIVE	5.2.3790.1830	10/1/2002
Motherboard resources	No	SYSTEM 5.2.3790.1830		(Standard disk drives) disk.inf	Not Available		
10/1/2002 (Standard system devices)		machine.inf		SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV			
Not Available	ACPI\PNP0C02\1			_1.00\6&2751A29C&0&100			
PCI standard PCI-to-PCI bridge	No	SYSTEM 5.2.3790.1830		DELL PERC 5/E Adapter RAID Controller	No	SCSIADAPTER	
10/1/2002 (Standard system devices)		machine.inf		1.20.0.64	12/9/2005	DELL oem1.inf	Not Available
Not Available				PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&			
PCI\VEN_1166&DEV_0144&SUBSYS_00000000&REV_A2\3&				29470E52&0&700040			
1E390A02&0&58				PCI standard PCI-to-PCI bridge	No	SYSTEM 5.2.3790.1830	
PCI standard PCI-to-PCI bridge	No	SYSTEM 5.2.3790.1830		10/1/2002 (Standard system devices)		machine.inf	
10/1/2002 (Standard system devices)		machine.inf		Not Available			
Not Available				PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\4&			
PCI\VEN_8086&DEV_0372&SUBSYS_00000000&REV_00\4&				2CE9DEA&0&0040			
125D4C0A&0&0250				PCI standard PCI-to-PCI bridge	No	SYSTEM 5.2.3790.1830	
RAID Virtual Device	No	SYSTEM 5.2.3790.1830	10/1/2002	10/1/2002 (Standard system devices)		machine.inf	
American Megatrends, Inc.	scsidev.inf	Not Available		Not Available			
SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&RE				PCI\VEN_1166&DEV_0142&SUBSYS_00000000&REV_A2\3&			
V_0001\6&17C0C939&0&1400				1E390A02&0&40			
Disk drive No	DISKDRIVE	5.2.3790.1830	10/1/2002	PCI standard PCI-to-PCI bridge	No	SYSTEM 5.2.3790.1830	
(Standard disk drives) disk.inf	Not Available			10/1/2002 (Standard system devices)		machine.inf	
SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV				Not Available			
_1.00\6&17C0C939&0&100				PCI\VEN_8086&DEV_0372&SUBSYS_00000000&REV_00\4&			
DELL PERC 5/E Adapter RAID Controller	No	SCSIADAPTER		1EB55056&0&0238			
1.20.0.64	12/9/2005	DELL oem1.inf	Not Available	DELL PERC RAID Virtual Device	No	SYSTEM 1.20.0.64	
PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&				12/9/2005	DELL oem0.inf	Not Available	
1307B1EE&0&700050				SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&RE			
PCI standard PCI-to-PCI bridge	No	SYSTEM 5.2.3790.1830		V_0001\6&38657EDF&0&1400			
10/1/2002 (Standard system devices)		machine.inf		Disk drive No	DISKDRIVE	5.2.3790.1830	10/1/2002
Not Available				(Standard disk drives) disk.inf	Not Available		
PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\4&				SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV			
125D4C0A&0&0050				_1.00\6&38657EDF&0&100			
PCI standard PCI-to-PCI bridge	No	SYSTEM 5.2.3790.1830		DELL PERC 5/E Adapter RAID Controller	No	SCSIADAPTER	
10/1/2002 (Standard system devices)		machine.inf		1.20.0.64	12/9/2005	DELL oem1.inf	Not Available
Not Available				PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&			
PCI\VEN_1166&DEV_0142&SUBSYS_00000000&REV_A2\3&				1A8E8FE7&0&700038			
1E390A02&0&50				PCI standard PCI-to-PCI bridge	No	SYSTEM 5.2.3790.1830	
PCI standard PCI-to-PCI bridge	No	SYSTEM 5.2.3790.1830		10/1/2002 (Standard system devices)		machine.inf	
10/1/2002 (Standard system devices)		machine.inf		Not Available			
Not Available				PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\4&			
PCI\VEN_8086&DEV_0372&SUBSYS_00000000&REV_00\4&				1EB55056&0&0038			
34889F00&0&0248				PCI standard PCI-to-PCI bridge	No	SYSTEM 5.2.3790.1830	
RAID Virtual Device	No	SYSTEM 5.2.3790.1830	10/1/2002	10/1/2002 (Standard system devices)		machine.inf	
American Megatrends, Inc.	scsidev.inf	Not Available		Not Available			
SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&RE				PCI\VEN_1166&DEV_0140&SUBSYS_00000000&REV_A2\3&			
V_0001\6&1A2CFC4D&0&1400				1E390A02&0&38			

PCI bus system devices)	No	SYSTEM	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf	Not Available		
ACPI\PNP0A03\99									
AMD Miscellaneous Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1103&SUBSYS_00000000&REV_00\3&13C0B0C5&0&DB									
AMD DRAM and HyperTransport(tm) Trace Mode Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1102&SUBSYS_00000000&REV_00\3&13C0B0C5&0&DA									
AMD Address Map Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1101&SUBSYS_00000000&REV_00\3&13C0B0C5&0&D9									
AMD HyperTransport(tm) Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1100&SUBSYS_00000000&REV_00\3&13C0B0C5&0&D8									
AMD Miscellaneous Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1103&SUBSYS_00000000&REV_00\3&13C0B0C5&0&D3									
AMD DRAM and HyperTransport(tm) Trace Mode Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1102&SUBSYS_00000000&REV_00\3&13C0B0C5&0&D2									
AMD Address Map Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1101&SUBSYS_00000000&REV_00\3&13C0B0C5&0&D1									
AMD HyperTransport(tm) Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1100&SUBSYS_00000000&REV_00\3&13C0B0C5&0&D0									
AMD Miscellaneous Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1103&SUBSYS_00000000&REV_00\3&13C0B0C5&0&CB									
AMD DRAM and HyperTransport(tm) Trace Mode Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1102&SUBSYS_00000000&REV_00\3&13C0B0C5&0&CA									
AMD Address Map Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1101&SUBSYS_00000000&REV_00\3&13C0B0C5&0&C9									
AMD HyperTransport(tm) Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1100&SUBSYS_00000000&REV_00\3&13C0B0C5&0&C8									
AMD Miscellaneous Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1103&SUBSYS_00000000&REV_00\3&13C0B0C5&0&C3									
AMD DRAM and HyperTransport(tm) Trace Mode Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1102&SUBSYS_00000000&REV_00\3&13C0B0C5&0&C2									
AMD Address Map Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1101&SUBSYS_00000000&REV_00\3&13C0B0C5&0&C1									
AMD HyperTransport(tm) Configuration	No	SYSTEM	5.2.3790.1830	10/1/2002	AMD	machine.inf	Not Available		
PCI\VEN_1022&DEV_1100&SUBSYS_00000000&REV_00\3&13C0B0C5&0&C0									
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf	Not Available		
PCI\VEN_8086&DEV_0372&SUBSYS_00000000&REV_00\4&19807B1&0&0258									
RAID Virtual Device	No	SYSTEM	5.2.3790.1830	10/1/2002	American Megatrends, Inc.	scsidev.inf	Not Available		
SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&REV_0001\6&6E875DA&0&1400									
Disk drive	No	DISKDRIVE	5.2.3790.1830	10/1/2002	(Standard disk drives)	disk.inf	Not Available		
SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV_1.00\6&6E875DA&0&100									
DELL PERC 5/E Adapter RAID Controller	No	SCSIADAPTER	1.20.0.64	12/9/2005	DELL	oem1.inf	Not Available		
PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&2224ECD9&0&700058									
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf	Not Available		
PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\4&19807B1&0&0058									
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf	Not Available		
PCI\VEN_1166&DEV_0144&SUBSYS_00000000&REV_A2\3&13C0B0C5&0&58									
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf	Not Available		
PCI\VEN_8086&DEV_0372&SUBSYS_00000000&REV_00\4&335208C7&0&0250									
DELL PERC RAID Virtual Device	No	SYSTEM	1.20.0.64	12/9/2005	DELL	oem0.inf	Not Available		
SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&REV_0001\6&3247D859&0&1400									
Disk drive	No	DISKDRIVE	5.2.3790.1830	10/1/2002	(Standard disk drives)	disk.inf	Not Available		
SCSI\DISK&VEN_DELL&PROD_PERC_5/I_ADAPTER&REV_1.00\6&3247D859&0&100									
DELL PERC 5/I Adapter RAID Controller	No	SCSIADAPTER	1.20.0.64	12/9/2005	DELL	oem1.inf	Not Available		
PCI\VEN_1028&DEV_0015&SUBSYS_1F021028&REV_00\5&1AB1F6F6&0&700050									
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf	Not Available		
PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\4&335208C7&0&0050									
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf	Not Available		
PCI\VEN_1166&DEV_0142&SUBSYS_00000000&REV_A2\3&13C0B0C5&0&50									
Broadcom BCM5708C NetXtreme II GigE (NDIS VBD Client)	No	NET	2.6.14.0	4/3/2006	Broadcom Corporation	oem3.inf	Not Available		
B06BDRV\L2ND&PCI_164C14E4&SUBSYS_01EA1028&REV_12\6&272DC08&0&20050700									
Broadcom BCM5708C NetXtreme II GigE	No	SYSTEM	2.6.17.0	4/21/2006	Broadcom Corporation	oem5.inf	Not Available		
Available									

PCI\VEN_14E4&DEV_164C&SUBSYS_01EA1028&REV_12\5 &10CC02FD&0&000048					Generic USB Hub	No	USB	5.2.3790.1830	10/1/2002
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830		(Generic USB Hub)	usb.inf	Not Available		
10/1/2002 (Standard system devices)			machine.inf		USB\VID_413C&PID_A001\5&94CC308&0&4				
Not Available					HID-compliant consumer control device	No	HIDCLASS		
PCI\VEN_1166&DEV_0103&SUBSYS_00000000&REV_C3\4& 1126B5D1&0&0048					5.2.3790.1830	10/1/2002	Microsoft	hidserv.inf	Not Available
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830		Available				
10/1/2002 (Standard system devices)			machine.inf		HID\VID_0518&PID_0001&MI_01&COL03\8&51CEA19&0&0				
Not Available					HID-compliant device	No	HIDCLASS	5.2.3790.1830	
PCI\VEN_1166&DEV_0144&SUBSYS_00000000&REV_A2\3& 13C0B0C5&0&48					10/1/2002 (Standard system devices)			input.inf	Not Available
Broadcom BCM5708C NetXtreme II GigE (NDIS VBD Client)	No	SYSTEM	2.6.17.0		Available				
NET 2.6.14.0 4/3/2006 Broadcom Corporation			oem5.inf		HID\VID_0518&PID_0001&MI_01&COL02\8&51CEA19&0&0				
oem3.inf Not Available					HID-compliant mouse	No	MOUSE	5.2.3790.1830	10/1/2002
B06BDRV\L2ND&PCI_164C14E4&SUBSYS_01EA1028&REV_12\6&51D5913&0&20050500					Microsoft	msmouse.inf	Not Available		
Broadcom BCM5708C NetXtreme II GigE	No	SYSTEM	2.6.17.0		HID\VID_0518&PID_0001&MI_01&COL01\8&51CEA19&0&0				
4/21/2006 Broadcom Corporation			oem5.inf		000				
Not Available					USB Human Interface Device	No	HIDCLASS		
PCI\VEN_14E4&DEV_164C&SUBSYS_01EA1028&REV_12\5 &1EAABEA2&0&000040					5.2.3790.1830	10/1/2002	(Standard system devices)		
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830		input.inf	Not Available			
10/1/2002 (Standard system devices)			machine.inf		USB\VID_0518&PID_0001&MI_01\7&1C418F1D&0&0001				
Not Available					HID Keyboard Device	No	KEYBOARD		
PCI\VEN_1166&DEV_0103&SUBSYS_00000000&REV_C3\4& 745ECE0&0&0040					5.2.3790.1830	10/1/2002	(Standard keyboards)		
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830		keyboard.inf	Not Available			
10/1/2002 (Standard system devices)			machine.inf		HID\VID_0518&PID_0001&MI_00\8&1CE0765E&0&0000				
Not Available					USB Human Interface Device	No	HIDCLASS		
PCI\VEN_1166&DEV_0142&SUBSYS_00000000&REV_A2\3& 13C0B0C5&0&40					5.2.3790.1830	10/1/2002	(Standard system devices)		
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830		input.inf	Not Available			
10/1/2002 (Standard system devices)			machine.inf		USB\VID_0518&PID_0001&MI_00\7&1C418F1D&0&0000				
Not Available					USB Composite Device	No	USB	5.2.3790.1830	
PCI\VEN_8086&DEV_0372&SUBSYS_00000000&REV_00\4& 26FA047B&0&0238					10/1/2002 (Standard USB Host Controller)			usb.inf	Not Available
DELL PERC RAID Virtual Device	No	SYSTEM	1.20.0.64		Available				
12/9/2005 DELL			oem0.inf		USB\VID_0518&PID_0001\6&3249B3D3&0&1				
oem0.inf Not Available					Generic USB Hub	No	USB	5.2.3790.1830	10/1/2002
SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&RE V_0001\6&A37944&0&1400					(Generic USB Hub)	usb.inf	Not Available		
Disk drive	No	DISKDRIVE	5.2.3790.1830	10/1/2002	USB\VID_04B4&PID_6560\5&94CC308&0&3				
(Standard disk drives)			disk.inf		USB Root Hub	No	USB	5.2.3790.1830	10/1/2002
Not Available					(Standard USB Host Controller)			usbport.inf	Not Available
SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV_1.00\6&A37944&0&100					USB\ROOT_HUB20\4&2F0E5074&0				
DELL PERC 5/E Adapter RAID Controller	No	SCSIADAPTER	1.20.0.64	12/9/2005 DELL	Standard Enhanced PCI to USB Host Controller	No	USB		
oem1.inf Not Available					5.2.3790.1830	10/1/2002	(Standard USB Host Controller)		
PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5& 69DEDD&0&700038					usbport.inf	Not Available			
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830		PCI\VEN_1166&DEV_0223&SUBSYS_01EA1028&REV_01\3& 13C0B0C5&0&1A				
10/1/2002 (Standard system devices)			machine.inf		USB Root Hub	No	USB	5.2.3790.1830	10/1/2002
Not Available					(Standard USB Host Controller)			usbport.inf	Not Available
PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\4& 26FA047B&0&0038					USB\ROOT_HUB\4&3B242A64&0				
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830		Standard OpenHCD USB Host Controller	No	USB		
10/1/2002 (Standard system devices)			machine.inf		5.2.3790.1830	10/1/2002	(Standard USB Host Controller)		
Not Available					usbport.inf	Not Available			
PCI\VEN_1166&DEV_0140&SUBSYS_00000000&REV_A2\3& 13C0B0C5&0&38					PCI\VEN_1166&DEV_0223&SUBSYS_01EA1028&REV_01\3& 13C0B0C5&0&19				
Default Monitor	No	MONITOR	5.2.3790.1830		USB Root Hub	No	USB	5.2.3790.1830	10/1/2002
10/1/2002 (Standard monitor types)			monitor.inf		(Standard USB Host Controller)			usbport.inf	Not Available
Not Available					USB\ROOT_HUB\4&286A79BF&0				
DISPLAY\DEFAULT_MONITOR\4&2C27D292&0&12345678& 00&04					Standard OpenHCD USB Host Controller	No	USB		
Standard VGA Graphics Adapter	No	DISPLAY	5.2.3790.1830		5.2.3790.1830	10/1/2002	(Standard USB Host Controller)		
10/1/2002 (Standard display types)			display.inf		usbport.inf	Not Available			
Not Available					PCI\VEN_1166&DEV_0223&SUBSYS_01EA1028&REV_01\3& 13C0B0C5&0&12				
Available					Motherboard resources	No	SYSTEM	5.2.3790.1830	
PCI\VEN_1002&DEV_515E&SUBSYS_01EA1028&REV_02\3 &13C0B0C5&0&20					10/1/2002 (Standard system devices)			machine.inf	
Generic USB Hub	No	USB	5.2.3790.1830	10/1/2002	Not Available			ACPI\PNP0C02\0	
(Generic USB Hub)	usb.inf	Not Available			System board	No	SYSTEM	5.2.3790.1830	10/1/2002
USB\VID_04B4&PID_6560\6&2A8060C0&0&1					(Standard system devices)			machine.inf	Not Available
					Available			ACPI\IPI0001\5	
					System board	No	SYSTEM	5.2.3790.1830	10/1/2002
					(Standard system devices)			machine.inf	Not Available
					Available			ACPI\PNP0C01\0	

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Communications Port No PORTS 5.2.3790.1830 10/1/2002
(Standard port types) msports.inf Not Available
ACPI\PNP0501\2
Communications Port No PORTS 5.2.3790.1830 10/1/2002
(Standard port types) msports.inf Not Available
ACPI\PNP0501\1
Standard floppy disk controller No FDC 5.2.3790.1830
10/1/2002 (Standard floppy disk controllers) fdc.inf
Not Available ACPI\PNP0700\4&4446BA&0
System CMOS/real time clock No SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available ACPI\PNP0B00\4&4446BA&0
System timer No SYSTEM 5.2.3790.1830 10/1/2002
(Standard system devices) machine.inf Not
Available ACPI\PNP0100\4&4446BA&0
System speaker No SYSTEM 5.2.3790.1830 10/1/2002
(Standard system devices) machine.inf Not
Available ACPI\PNP0800\4&4446BA&0
Programmable interrupt controller No SYSTEM
5.2.3790.1830 10/1/2002 (Standard system devices)
machine.inf Not Available
ACPI\PNP0000\4&4446BA&0
Numeric data processor No SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available ACPI\PNP0C04\4&4446BA&0
Direct memory access controller No SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available ACPI\PNP0200\4&4446BA&0
PCI standard host CPU bridge No SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_1166&DEV_0205&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&10
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_1166&DEV_0104&SUBSYS_00000000&REV_C0\4&
386B597B&0&6808
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_1166&DEV_0036&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&08
PCI bus No SYSTEM 5.2.3790.1830 10/1/2002 (Standard
system devices) machine.inf Not Available
ACPI\PNP0A03\1
Processor No PROCESSOR 5.2.3790.1830 10/1/2002
(Standard processor types) cpu.inf Not Available
ACPI\AUTHENTICAMD_-
_AMD64_FAMILY_15_MODEL_65\7
Processor No PROCESSOR 5.2.3790.1830 10/1/2002
(Standard processor types) cpu.inf Not Available
ACPI\AUTHENTICAMD_-
_AMD64_FAMILY_15_MODEL_65\6
Processor No PROCESSOR 5.2.3790.1830 10/1/2002
(Standard processor types) cpu.inf Not Available
ACPI\AUTHENTICAMD_-
_AMD64_FAMILY_15_MODEL_65\5
Processor No PROCESSOR 5.2.3790.1830 10/1/2002
(Standard processor types) cpu.inf Not Available
ACPI\AUTHENTICAMD_-
_AMD64_FAMILY_15_MODEL_65\4
Processor No PROCESSOR 5.2.3790.1830 10/1/2002
(Standard processor types) cpu.inf Not Available
ACPI\AUTHENTICAMD_-
_AMD64_FAMILY_15_MODEL_65\3
Processor No PROCESSOR 5.2.3790.1830 10/1/2002
(Standard processor types) cpu.inf Not Available
ACPI\AUTHENTICAMD_-
_AMD64_FAMILY_15_MODEL_65\2
Processor No PROCESSOR 5.2.3790.1830 10/1/2002
(Standard processor types) cpu.inf Not Available

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ACPI\AUTHENTICAMD_-
_AMD64_FAMILY_15_MODEL_65\1
Processor No PROCESSOR 5.2.3790.1830 10/1/2002
(Standard processor types) cpu.inf Not Available
ACPI\AUTHENTICAMD_-
_AMD64_FAMILY_15_MODEL_65\0
Microsoft ACPI-Compliant System No SYSTEM
5.2.3790.1830 10/1/2002 Microsoft acpi.inf Not
Available ACPI_HAL\PNP0C08\0
ACPI Multiprocessor x64-based PC No COMPUTER
5.2.3790.1830 10/1/2002 (Standard computers) hal.inf
Not Available ROOT\ACPI_HAL\0000
Not Available Not Available Not Available Not
Available Not Available Not Available Not Available
Not Available Not Available HTREE\ROOT\0

```

[Environment Variables]

```

Variable Value User Name
ClusterLog C:\WINDOWS\Cluster\cluster.log
<SYSTEM>
ComSpec %SystemRoot%\system32\cmd.exe <SYSTEM>
FP_NO_HOST_CHECK NO <SYSTEM>
NUMBER_OF_PROCESSORS 8 <SYSTEM>
OS Windows_NT <SYSTEM>
Path
%SystemRoot%\system32;%SystemRoot%;%SystemRoot%\Syste
m32\Wbem;C:\Program Files (x86)\Microsoft SQL
Server\80\Tools\Binn\;C:\Program Files\Microsoft SQL
Server\90\Tools\bin\;C:\Program Files (x86)\Microsoft SQL
Server\90\Tools\bin\;C:\Program Files (x86)\Microsoft SQL
Server\90\DTS\Binn\;C:\Program Files (x86)\Microsoft SQL
Server\90\Tools\Binn\VSShell\Common7\IDE\;C:\Program Files\Microsoft
SQL Server\MSSQL.1\MSSQL\Binn\; <SYSTEM>
PATHEXT
.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH
<SYSTEM>
PROCESSOR_ARCHITECTURE AMD64 <SYSTEM>
PROCESSOR_IDENTIFIER AMD64 Family 15 Model 65 Stepping 2,
AuthenticAMD <SYSTEM>
PROCESSOR_LEVEL 15 <SYSTEM>
PROCESSOR_REVISION 4102 <SYSTEM>
TEMP %SystemRoot%\TEMP <SYSTEM>
TMP %SystemRoot%\TEMP <SYSTEM>
windir %SystemRoot% <SYSTEM>
TEMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\SYSTEM
TMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\SYSTEM
TEMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\NETWORK SERVICE
TMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\NETWORK SERVICE
TEMP %USERPROFILE%\Local Settings\Temp
PE6950\Administrator
TMP %USERPROFILE%\Local Settings\Temp
PE6950\Administrator

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[Print Jobs]

Document	Size	Owner	Notify	Status	Time Submitted
					Pages Printed
					Print Processor

[Network Connections]

Local Name	Remote Name	Type	Status	User Name
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[Running Tasks]

Name	Path	Process ID	Priority	Min Working Set	Max Working Set	Start Time	Version	Size	File Date
system idle process	Not Available	0	0	0	Not Available	10/14/2006 1:21 PM	2005.090.2047.00	37.44 MB	(39,263,520 bytes)
Available	Not Available	Not Available	Not Available	Not Available	Not Available	10/14/2006 1:21 PM	2004	8	Not Available
system	Not Available	4	8	0	1413120	10/14/2006 1:30 PM	2060	4	Not Available
smss.exe	Not Available	460	11	204800	1413120	10/14/2006 1:20 PM	Not Available	Not Available	Not Available
csrss.exe	Not Available	540	13	Not Available	Not Available	10/14/2006 1:20 PM	Not Available	Not Available	Not Available
winlogon.exe	c:\windows\system32\winlogon.exe	13	204800	1413120	10/14/2006 1:20 PM	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	14.00 KB (14,336 bytes)	580	901.00 KB
services.exe	c:\windows\system32\services.exe	9	204800	1413120	10/14/2006 1:20 PM	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	14.00 KB (14,336 bytes)	624	216.50 KB
lsass.exe	c:\windows\system32\lsass.exe	644	9	204800	1413120	10/14/2006 1:20 PM	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	14.00 KB (14,336 bytes)	3/25/2005 6:00 AM
svchost.exe	c:\windows\system32\svchost.exe	8	204800	1413120	10/14/2006 1:20 PM	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	14.00 KB (14,336 bytes)	812	24.50 KB
svchost.exe	Not Available	Not Available	900	8	Not Available	10/14/2006 1:20 PM	Not Available	Not Available	Not Available
svchost.exe	c:\windows\system32\svchost.exe	8	204800	1413120	10/14/2006 1:20 PM	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	14.00 KB (14,336 bytes)	956	24.50 KB
msdtc.exe	Not Available	1124	8	Not Available	Not Available	10/14/2006 1:20 PM	Not Available	Not Available	Not Available
inetinfo.exe	c:\windows\system32\inetrv\inetinfo.exe	8	204800	1413120	10/14/2006 1:20 PM	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	9/29/2006 2:15 PM	1344	17.50 KB
svchost.exe	c:\windows\system32\svchost.exe	8	204800	1413120	10/14/2006 1:20 PM	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM	1488	24.50 KB
svchost.exe	c:\windows\system32\svchost.exe	8	204800	1413120	10/14/2006 1:20 PM	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM	1712	24.50 KB
csrss.exe	Not Available	1016	13	Not Available	Not Available	10/14/2006 1:21 PM	Not Available	Not Available	Not Available
winlogon.exe	c:\windows\system32\winlogon.exe	13	204800	1413120	10/14/2006 1:21 PM	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM	1048	901.00 KB
rdpclip.exe	c:\windows\system32\rdpclip.exe	1704	8	204800	1413120	10/14/2006 1:21 PM	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	99.00 KB (101,376 bytes)	9/29/2006 1:29 PM
explorer.exe	c:\windows\explorer.exe	204800	1413120	10/14/2006 1:21 PM	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	1.30 MB (1,364,480 bytes)	3/25/2005 6:00 AM	1864	8
cmd.exe	c:\windows\system32\cmd.exe	440	8	204800	1413120	10/14/2006 1:21 PM	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	538.50 KB (551,424 bytes)	3/25/2005 6:00 AM
sqlservr.exe	c:\program files\microsoft sql server\mssql.1\mssql\bin\sqlservr.exe	452	13	204800	1413120	10/14/2006 1:21 PM	2005.090.2047.00	37.44 MB	(39,263,520 bytes)

Name	Version	Size	File Date	Manufacturer	Path
winlogon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	901.00 KB (922,624 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\winlogon.exe
ntdll	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.20 MB (1,257,472 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\ntdll.dll
kernel32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.43 MB (1,500,160 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\kernel32.dll
advapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.00 MB (1,051,136 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\advapi32.dll
rpert4	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.63 MB (1,714,176 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\rpert4.dll
crypt32	5.131.3790.1830 (srv03_sp1_rtm.050324-1447)	1.36 MB (1,428,992 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\crypt32.dll
msasn1	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	152.50 KB (156,160 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\msasn1.dll
msvcrt	7.0.3790.1830 (srv03_sp1_rtm.050324-1447)	508.00 KB (520,192 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\msvcrt.dll
user32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.04 MB (1,085,952 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\user32.dll
gdi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	592.00 KB (606,208 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\gdi32.dll
nddeapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	25.00 KB (25,600 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\nddeapi.dll
profmap	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.00 KB (36,864 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\profmap.dll
netapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	589.00 KB (603,136 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\netapi32.dll
userenv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.02 MB (1,069,056 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\userenv.dll
psapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	29.00 KB (29,696 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\psapi.dll
regapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	108.50 KB (111,104 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\regapi.dll

secur32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	120.00 KB	wlnotify	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	148.00 KB
(122,880 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(151,552 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\secur32.dll			c:\windows\system32\wlnotify.dll	
setupapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.45 MB	mpr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	115.00 KB
(1,523,200 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(117,760 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\setupapi.dll			c:\windows\system32\mpr.dll	
version	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	28.00 KB	oleaut32	5.2.3790.1830	1.06 MB (1,116,160 bytes)
(28,672 bytes)	3/25/2005 6:00 AM Microsoft Corporation		6:00 AM	Microsoft Corporation	3/25/2005
	c:\windows\system32\version.dll			c:\windows\system32\oleaut32.dll	
winsta	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	89.00 KB	winspool	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	247.00 KB
(91,136 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(252,928 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\winsta.dll			c:\windows\system32\winspool.drv	
ws_23	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	176.50 KB	comctl32	5.82 (srv03_sp1_rtm.050324-1447)	934.50 KB (956,928 bytes)
(180,736 bytes)	3/25/2005 6:00 AM Microsoft Corporation		9/29/2006 8:10 AM	Microsoft Corporation	
	c:\windows\system32\ws_23.dll			c:\windows\winsxs\amd64_microsoft.windows.common-controls_6595b64144ccf1df_5.82.3790.1830_x-ww_4d792d2a\comctl32.dll	
ws2help	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.50 KB	uxtheme	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	494.50 KB
(31,232 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(506,368 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ws2help.dll			c:\windows\system32\uxtheme.dll	
msgina	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.14 MB	clbcatq	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	865.00 KB
(1,193,472 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(885,760 bytes)	9/29/2006 1:29 PM Microsoft Corporation	
	c:\windows\system32\msgina.dll			c:\windows\system32\clbcatq.dll	
shsvcs	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	193.50 KB	comres	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	779.50 KB
(198,144 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(798,208 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\shsvcs.dll			c:\windows\system32\comres.dll	
shlwapi	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	606.50 KB	wbemprox	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	38.00 KB
(621,056 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(38,912 bytes)	9/29/2006 1:29 PM Microsoft Corporation	
	c:\windows\system32\shlwapi.dll			c:\windows\system32\wbem\wbemprox.dll	
sfc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.00 KB	wbemcomn	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	524.00 KB (536,576 bytes)
(6,144 bytes)	3/25/2005 6:00 AM Microsoft Corporation		Corporation	3/25/2005 6:00 AM Microsoft	
	c:\windows\system32\sfc.dll			c:\windows\system32\wbem\wbemcomn.dll	
sfc_os	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	183.50 KB	xpsp2res	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.77 MB
(187,904 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(2,899,456 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\sfc_os.dll			c:\windows\system32\xpsp2res.dll	
wintrust	5.131.3790.1830 (srv03_sp1_rtm.050324-1447)	297.50 KB	wbemsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	58.00 KB
(304,640 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(59,392 bytes)	9/29/2006 1:29 PM Microsoft Corporation	
	c:\windows\system32\wintrust.dll			c:\windows\system32\wbem\wbemsvc.dll	
imagehlp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	57.50 KB	fastprox	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	866.50 KB
(58,880 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(887,296 bytes)	9/29/2006 1:29 PM Microsoft Corporation	
	c:\windows\system32\imagehlp.dll			c:\windows\system32\wbem\fastprox.dll	
ole32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.43 MB	msvcp60	7.0.3790.1830 (srv03_sp1_rtm.050324-1447)	919.50 KB
(2,543,616 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(941,568 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ole32.dll			c:\windows\system32\msvcp60.dll	
comctl32	6.0 (srv03_sp1_rtm.050324-1447)	1.51 MB (1,584,128 bytes)	ntdsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	127.50 KB
	9/29/2006 8:10 AM Microsoft Corporation		(130,560 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\winsxs\amd64_microsoft.windows.common-controls_6595b64144ccf1df_6.0.3790.1830_x-ww_aced72af\comctl32.dll			c:\windows\system32\ntdsapi.dll	
winscard	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	230.00 KB	dnsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	297.50 KB
(235,520 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(304,640 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\winscard.dll			c:\windows\system32\dnsapi.dll	
wtsapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	29.00 KB	services	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	216.50 KB
(29,696 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(221,696 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wtsapi32.dll			c:\windows\system32\services.exe	
winmm	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	303.50 KB	ncobjapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	80.00 KB
(310,784 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(81,920 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\winmm.dll			c:\windows\system32\ncobjapi.dll	
sxs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.91 MB	scserv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	594.50 KB
(2,003,968 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(608,768 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\sxs.dll			c:\windows\system32\scserv.dll	
shell32	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	10.01 MB	authz	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	167.00 KB
(10,492,416 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(171,008 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\shell32.dll			c:\windows\system32\authz.dll	
rsaenh	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	241.96 KB	umpnpmgr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	205.00 KB
(247,768 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(209,920 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\rsaenh.dll			c:\windows\system32\umpnpmgr.dll	
wldap32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	390.00 KB	eventlog	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	127.00 KB
(399,360 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(130,048 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wldap32.dll			c:\windows\system32\eventlog.dll	
cscdll	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	151.50 KB	lsass	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	14.00 KB
(155,136 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(14,336 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\cscdll.dll			c:\windows\system32\lsass.exe	
dimsntfy	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	28.00 KB	lsasrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.50 MB
(28,672 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(1,568,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\dimsntfy.dll			c:\windows\system32\lsasrv.dll	

samlib	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	69.00 KB	dssenh	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	226.96 KB
(70,656 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(232,408 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\samlib.dll			c:\windows\system32\dssenh.dll	
samsrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.01 MB	svchost	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB
(1,059,328 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(25,088 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\samsrv.dll			c:\windows\system32\svchost.exe	
cryptdll	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	47.00 KB	rpscss	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	672.00 KB
(48,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(688,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\cryptdll.dll			c:\windows\system32\rpscss.dll	
msprivs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	47.50 KB	ntmarta	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	222.50 KB
(48,640 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(227,840 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msprivs.dll			c:\windows\system32\ntmarta.dll	
kerberos	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	698.00 KB	wkssvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	221.00 KB
(714,752 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(226,304 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\kerberos.dll			c:\windows\system32\wkssvc.dll	
msv1_0	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	253.00 KB	wiarpc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	57.00 KB
(259,072 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(58,368 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msv1_0.dll			c:\windows\system32\wiarpc.dll	
iphlpapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	177.00 KB	aelupsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.50 KB
(181,248 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(32,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\iphlpapi.dll			c:\windows\system32\aelupsvc.dll	
netlogon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	666.00 KB	apphelp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	241.00 KB
(681,984 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(246,784 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\netlogon.dll			c:\windows\system32\apphelp.dll	
w32time	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	400.50 KB	es	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	357.00 KB
(410,112 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(365,568 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\w32time.dll			c:\windows\system32\es.dll	
schannel	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	248.00 KB	sens	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	63.50 KB
(253,952 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(65,024 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\schannel.dll			c:\windows\system32\sens.dll	
wdigest	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	130.50 KB	wmisvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	227.00 KB
(133,632 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(232,448 bytes)	9/29/2006 1:29 PM Microsoft Corporation	
	c:\windows\system32\wdigest.dll			c:\windows\system32\wbem\wmisvc.dll	
rassfm	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.00 KB	vssapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.26 MB
(36,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(1,320,960 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\rassfm.dll			c:\windows\system32\vssapi.dll	
kdcsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	409.00 KB	atl	3.05.2284 96.50 KB (98,816 bytes)	3/25/2005 6:00 AM
(418,816 bytes)	3/25/2005 6:00 AM Microsoft Corporation		Microsoft Corporation	c:\windows\system32\atl.dll	
	c:\windows\system32\kdcsvc.dll				
ntdsa	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.81 MB	comsvcs	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	2.06 MB
(2,948,096 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(2,156,544 bytes)	9/29/2006 1:29 PM Microsoft Corporation	
	c:\windows\system32\ntdsa.dll			c:\windows\system32\comsvcs.dll	
esent	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.26 MB	netman	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	457.00 KB
(2,366,976 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(467,968 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\esent.dll			c:\windows\system32\netman.dll	
ntdsatq	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	51.00 KB	mprapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	154.50 KB
(52,224 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(158,208 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ntdsatq.dll			c:\windows\system32\mprapi.dll	
mswsock	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	478.00 KB	activeds	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	348.50 KB
(489,472 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(356,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\mswsock.dll			c:\windows\system32\activeds.dll	
scecli	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	308.00 KB	adslsdp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	240.50 KB
(315,392 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(246,272 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\scecli.dll			c:\windows\system32\adslsdp.dll	
ws03res	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	794.00 KB	credui	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	202.00 KB
(813,056 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(206,848 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ws03res.dll			c:\windows\system32\credui.dll	
w3ssl	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	21.00 KB	rtutils	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	66.00 KB
(21,504 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(67,584 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\w3ssl.dll			c:\windows\system32\rtutils.dll	
strmfilt	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	131.50 KB	netshell	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.32 MB
(134,656 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(2,437,120 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\strmfilt.dll			c:\windows\system32\netshell.dll	
httpapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.50 KB	clusapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	127.00 KB
(37,376 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(130,048 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\httpapi.dll			c:\windows\system32\clusapi.dll	
hnetcfg	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	561.00 KB	rasapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	410.00 KB
(574,464 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(419,840 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\hnetcfg.dll			c:\windows\system32\rasapi32.dll	
wshtcpip	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	29.00 KB	rasman	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	95.50 KB
(29,696 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(97,792 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wshtcpip.dll			c:\windows\system32\rasman.dll	

tapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	332.50 KB	coadmin	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	100.50 KB
(340,480 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(102,912 bytes)	9/29/2006 2:16 PM Microsoft Corporation	
	c:\windows\system32\tapi32.dll			c:\windows\system32\inetsrv\coadmin.dll	
wininet	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	1.13 MB	admwprox	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	66.00 KB
(1,186,304 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(67,584 bytes)	9/29/2006 2:16 PM Microsoft Corporation	
	c:\windows\system32\wininet.dll			c:\windows\system32\admwprox.dll	
wzcsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	49.00 KB	iiscfg	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	1.24 MB
(50,176 bytes)	3/24/2005 11:35 AM Microsoft Corporation		(1,298,432 bytes)	9/29/2006 2:15 PM Microsoft Corporation	
	c:\windows\system32\wzcsapi.dll			c:\windows\system32\inetsrv\iiscfg.dll	
wzcsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	492.00 KB	metadata	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	342.00 KB
(503,808 bytes)	3/24/2005 11:35 AM Microsoft Corporation		(350,208 bytes)	9/29/2006 2:15 PM Microsoft Corporation	
	c:\windows\system32\wzcsvc.dll			c:\windows\system32\inetsrv\metadata.dll	
wmi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	5.50 KB	msxml3	8.70.1104.0	2.04 MB (2,141,184 bytes)
(5,632 bytes)	3/25/2005 6:00 AM Microsoft Corporation		6:00 AM	Microsoft Corporation	c:\windows\system32\msxml3.dll
	c:\windows\system32\wmi.dll		svcext	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	60.50 KB
dhcpcsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	219.00 KB	(61,952 bytes)	9/29/2006 2:15 PM Microsoft Corporation	
(224,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\inetsrv\svcext.dll	
	c:\windows\system32\dhcpcsvc.dll		security	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.00 KB
wbemcore	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.24 MB	(6,144 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(1,299,968 bytes)	9/29/2006 1:29 PM Microsoft Corporation			c:\windows\system32\security.dll	
	c:\windows\system32\wbem\wbemcore.dll		iismap	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	97.00 KB
esscli	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	626.50 KB	(99,328 bytes)	9/29/2006 2:16 PM Microsoft Corporation	
(641,536 bytes)	9/29/2006 1:29 PM Microsoft Corporation			c:\windows\system32\iismap.dll	
	c:\windows\system32\wbem\esscli.dll		wamreg	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	78.50 KB
wmiutils	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	171.00 KB	(80,384 bytes)	9/29/2006 2:16 PM Microsoft Corporation	
(175,104 bytes)	9/29/2006 1:29 PM Microsoft Corporation			c:\windows\system32\inetsrv\wamreg.dll	
	c:\windows\system32\wbem\wmiutils.dll		iisw3adm	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	305.00 KB
repdrvfs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	353.50 KB	(312,320 bytes)	9/29/2006 2:16 PM Microsoft Corporation	
(361,984 bytes)	9/29/2006 1:29 PM Microsoft Corporation			c:\windows\system32\inetsrv\iisw3adm.dll	
	c:\windows\system32\wbem\repdrvfs.dll		w3cache	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	27.50 KB
wmiprvsd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	743.00 KB	(28,160 bytes)	9/29/2006 2:16 PM Microsoft Corporation	
(760,832 bytes)	9/29/2006 1:29 PM Microsoft Corporation			c:\windows\system32\inetsrv\w3cache.dll	
	c:\windows\system32\wbem\wmiprvsd.dll		w3tp	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	16.00 KB
wbemess	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	532.50 KB	(16,384 bytes)	9/29/2006 2:16 PM Microsoft Corporation	
(545,280 bytes)	9/29/2006 1:29 PM Microsoft Corporation			c:\windows\system32\inetsrv\w3tp.dll	
	c:\windows\system32\wbem\wbemess.dll		lonsint	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	17.50 KB
rasdlg	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	859.50 KB	(17,920 bytes)	9/29/2006 2:15 PM Microsoft Corporation	
(880,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\inetsrv\lonsint.dll	
	c:\windows\system32\rasdlg.dll		termsrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	354.50 KB
rasadhlp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	12.00 KB	(363,008 bytes)	9/29/2006 1:29 PM Microsoft Corporation	
(12,288 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\termsrv.dll	
	c:\windows\system32\rasadhlp.dll		icaapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	27.50 KB
ncprov	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	73.00 KB	(28,160 bytes)	9/29/2006 1:29 PM Microsoft Corporation	
(74,752 bytes)	9/29/2006 1:29 PM Microsoft Corporation			c:\windows\system32\icaapi.dll	
	c:\windows\system32\wbem\ncprov.dll		mstlsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	187.00 KB
netcfgx	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.29 MB	(191,488 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(1,354,240 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\mstlsapi.dll	
	c:\windows\system32\netcfgx.dll		rdpwsx	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	170.13 KB
winipsec	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	52.50 KB	(174,216 bytes)	9/29/2006 1:29 PM Microsoft Corporation	
(53,760 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\rdpwsx.dll	
	c:\windows\system32\winipsec.dll		rdpsnd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	25.00 KB
pchsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	76.00 KB	(25,600 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(77,824 bytes)	9/29/2006 1:31 PM Microsoft Corporation			c:\windows\system32\rdpsnd.dll	
	c:\windows\pchealth\helpctr\binaries\pchsvc.dll		scredir	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	38.50 KB
wbemcons	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	65.50 KB	(39,424 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(67,072 bytes)	9/29/2006 1:29 PM Microsoft Corporation			c:\windows\system32\scredir.dll	
	c:\windows\system32\wbem\wbemcons.dll		cscui	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	441.00 KB
inetinfo	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	17.50 KB	(451,584 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(17,920 bytes)	9/29/2006 2:15 PM Microsoft Corporation			c:\windows\system32\cscui.dll	
	c:\windows\system32\inetsrv\inetinfo.exe		msacm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.00 KB
iisutil	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	316.50 KB	(31,744 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(324,096 bytes)	9/29/2006 2:15 PM Microsoft Corporation			c:\windows\system32\msacm32.drv	
	c:\windows\system32\inetsrv\iisutil.dll		msacm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	112.00 KB
rpcref	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	4.50 KB	(114,688 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(4,608 bytes)	9/29/2006 2:15 PM Microsoft Corporation			c:\windows\system32\msacm32.dll	
	c:\windows\system32\inetsrv\rpcref.dll		imaadp32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB
iisrtl	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	225.00 KB	(24,576 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(230,400 bytes)	9/29/2006 2:16 PM Microsoft Corporation			c:\windows\system32\imaadp32.acm	
	c:\windows\system32\iisrtl.dll		msadp32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	23.50 KB
iisadmin	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	30.00 KB	(24,064 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(30,720 bytes)	9/29/2006 2:15 PM Microsoft Corporation			c:\windows\system32\msadp32.acm	
	c:\windows\system32\inetsrv\iisadmin.dll				

msg711	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	13.50 KB	shdoclc	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	589.50 KB
(13,824 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(603,648 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msg711.acm			c:\windows\system32\shdoclc.dll	
msgsm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	34.50 KB	mydocs	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	101.00 KB
(35,328 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(103,424 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msgsm32.acm			c:\windows\system32\mydocs.dll	
tssoft32	1.01 13.50 KB (13,824 bytes)	3/25/2005 6:00 AM	zipfldr	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	449.50 KB
	DSP GROUP, INC. c:\windows\system32\tssoft32.acm		(460,288 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
tsd32	1.03 24.50 KB (25,088 bytes)	3/25/2005 6:00 AM		c:\windows\system32\zipfldr.dll	
	DSP GROUP, INC. c:\windows\system32\tsd32.dll		actxprxy	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	220.50 KB
rdpclip	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	99.00 KB	(225,792 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(101,376 bytes)	9/29/2006 1:29 PM Microsoft Corporation			c:\windows\system32\actxprxy.dll	
	c:\windows\system32\rdpclip.exe		cmd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	538.50 KB
wsock32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB	(551,424 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(25,088 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\cmd.exe	
	c:\windows\system32\wsock32.dll		sqlservr	2005.090.2047.00 37.44 MB (39,263,520 bytes)	4/14/2006
urlmon	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	1.02 MB	11:59 AM Microsoft Corporation	c:\program files\microsoft sql	
(1,074,176 bytes)	3/25/2005 6:00 AM Microsoft Corporation		server\mssql.1\mssql\bin\sqlservr.exe		
	c:\windows\system32\urlmon.dll		msvcpr80	8.00.50727.42 803.50 KB (822,784 bytes)	9/22/2005
explorer	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	1.30 MB	11:26 PM Microsoft Corporation		
(1,364,480 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\winsxs\amd64_microsoft.vc80.crt_1fc8b3b9a1e18e3b	
	c:\windows\explorer.exe			_8.0.50727.42_x-ww_3fea50ad\msvcpr80.dll	
browseui	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	1.53 MB	msvcpr80	8.00.50727.42 1.05 MB (1,097,728 bytes)	9/22/2005
(1,601,536 bytes)	3/25/2005 6:00 AM Microsoft Corporation		11:28 PM Microsoft Corporation		
	c:\windows\system32\browseui.dll			c:\windows\winsxs\amd64_microsoft.vc80.crt_1fc8b3b9a1e18e3b	
shdocvw	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	2.30 MB		_8.0.50727.42_x-ww_3fea50ad\msvcpr80.dll	
(2,416,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation		opends60	2005.090.1399.00 22.21 KB (22,744 bytes)	
	c:\windows\system32\shdocvw.dll		10/14/2005 2:31 PM Microsoft Corporation		c:\program
cryptui	5.131.3790.1830 (srv03_sp1_rtm.050324-1447)	705.50 KB	files\microsoft sql server\mssql.1\mssql\bin\opends60.dll		
(722,432 bytes)	3/25/2005 6:00 AM Microsoft Corporation		instapi	2005.090.1399.00 40.71 KB (41,688 bytes)	
	c:\windows\system32\cryptui.dll		10/14/2005 2:23 PM Microsoft Corporation		c:\program
themeui	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	530.50 KB	files\microsoft sql server\90\shared\instapi.dll		
(543,232 bytes)	3/25/2005 6:00 AM Microsoft Corporation		sqllevn70	2005.090.2047.00 1.58 MB (1,652,512 bytes)	4/14/2006
	c:\windows\system32\themeui.dll		11:53 AM Microsoft Corporation		c:\program files\microsoft sql
msimg32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.50 KB	server\mssql.1\mssql\bin\resources\1033\sqllevn70.rll		
(6,656 bytes)	3/25/2005 6:00 AM Microsoft Corporation		sqlos	2005.090.1399.00 15.71 KB (16,088 bytes)	
	c:\windows\system32\msimg32.dll		10/14/2005 2:35 PM Microsoft Corporation		c:\program
linkinfo	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.00 KB	files\microsoft sql server\mssql.1\mssql\bin\sqlos.dll		
(30,720 bytes)	3/25/2005 6:00 AM Microsoft Corporation		mscoree	2.0.50727.42 (RTM.050727-4200) 441.00 KB (451,584 bytes)	9/22/2005 11:37 PM Microsoft Corporation
	c:\windows\system32\linkinfo.dll				c:\windows\system32\mscoree.dll
ntshrui	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	184.00 KB	xolehlp	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	10.50 KB
(188,416 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(10,752 bytes)	9/29/2006 1:29 PM Microsoft Corporation	
	c:\windows\system32\ntshrui.dll			c:\windows\system32\xolehlp.dll	
webcheck	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	439.00 KB	msdtcprx	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	805.50 KB
(449,536 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(824,832 bytes)	9/29/2006 1:29 PM Microsoft Corporation	
	c:\windows\system32\webcheck.dll			c:\windows\system32\msdtcprx.dll	
stobject	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	142.50 KB	mtxclu	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	141.50 KB
(145,920 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(144,896 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\stobject.dll			c:\windows\system32\mtxclu.dll	
batmeter	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	41.50 KB	resutils	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	98.50 KB
(42,496 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(100,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\batmeter.dll			c:\windows\system32\resutils.dll	
powrprof	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	32.50 KB	winrnr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.00 KB
(33,280 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(30,720 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\powrprof.dll			c:\windows\system32\winrnr.dll	
drprov	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB	sqlncli	2005.090.2047.00 2.72 MB (2,854,744 bytes)	4/14/2006
(24,576 bytes)	3/25/2005 6:00 AM Microsoft Corporation		11:59 AM Microsoft Corporation		c:\windows\system32\sqlncli.dll
	c:\windows\system32\drprov.dll		comdlg32	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	446.50 KB
ntlanman	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	71.50 KB	(457,216 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(73,216 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\comdlg32.dll	
	c:\windows\system32\ntlanman.dll		sqlnclir	2005.090.1399.00 201.21 KB (206,040 bytes)	
netui0	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	130.00 KB	10/14/2005 2:31 PM Microsoft Corporation		c:\windows\system32\sqlnclir.rll
(133,120 bytes)	3/25/2005 6:00 AM Microsoft Corporation				
	c:\windows\system32\netui0.dll		helpctr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.30 MB
netui1	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	338.50 KB	(1,363,456 bytes)	9/29/2006 1:31 PM Microsoft Corporation	
(346,624 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\pchealth\helpctr\binaries\helpctr.exe	
	c:\windows\system32\netui1.dll		hcappres	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	7.50 KB
davclnt	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	38.00 KB	(7,680 bytes)	9/29/2006 1:31 PM Microsoft Corporation	
(38,912 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\pchealth\helpctr\binaries\hcappres.dll	
	c:\windows\system32\davclnt.dll		itss	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	208.00 KB
browsecl	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	63.00 KB	(212,992 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(64,512 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\itss.dll	
	c:\windows\system32/browsecl.dll				

pchshell 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 155.00 KB
 (158,720 bytes) 9/29/2006 1:31 PM Microsoft Corporation
 c:\windows\pchealth\helpctr\binaries\pchshell.dll
 mlang 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) 686.00 KB
 (702,464 bytes) 3/25/2005 6:00 AM Microsoft Corporation
 c:\windows\system32\mlang.dll
 mshtml 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) 5.65 MB
 (5,928,448 bytes) 3/25/2005 6:00 AM Microsoft Corporation
 c:\windows\system32\mshtml.dll
 msls31 3.10.349.0 357.00 KB (365,568 bytes) 3/25/2005 6:00 AM
 Microsoft Corporation c:\windows\system32\msls31.dll
 msimtf 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 380.50 KB
 (389,632 bytes) 3/25/2005 6:00 AM Microsoft Corporation
 c:\windows\system32\msimtf.dll
 msctf 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 617.50 KB
 (632,320 bytes) 3/25/2005 6:00 AM Microsoft Corporation
 c:\windows\system32\msctf.dll
 jscript 5.6.0.8827 974.50 KB (997,888 bytes) 3/25/2005 6:00 AM
 Microsoft Corporation c:\windows\system32\jscript.dll
 imm32 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 208.00 KB
 (212,992 bytes) 3/25/2005 6:00 AM Microsoft Corporation
 c:\windows\system32\imm32.dll
 mshtml 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) 905.50 KB
 (927,232 bytes) 3/25/2005 6:00 AM Microsoft Corporation
 c:\windows\system32\mshtml.dll
 vbscript 5.6.0.8827 646.50 KB (662,016 bytes) 3/25/2005 6:00 AM
 Microsoft Corporation c:\windows\system32\vbscript.dll
 msinfo 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 636.00 KB
 (651,264 bytes) 9/29/2006 1:31 PM Microsoft Corporation
 c:\windows\pchealth\helpctr\binaries\msinfo.dll
 mfc42u 6.50.9146.0 1.39 MB (1,462,272 bytes) 3/25/2005
 6:00 AM Microsoft Corporation c:\windows\system32\mfc42u.dll
 riched32 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 7.00 KB
 (7,168 bytes) 3/25/2005 6:00 AM Microsoft Corporation
 c:\windows\system32\riched32.dll
 riched20 5.31.23.1224 1.10 MB (1,157,120 bytes) 3/25/2005
 6:00 AM Microsoft Corporation
 c:\windows\system32\riched20.dll
 helpsvc 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 1.52 MB
 (1,591,296 bytes) 9/29/2006 1:31 PM Microsoft Corporation
 c:\windows\pchealth\helpctr\binaries\helpsvc.exe

[Services]

Display Name	Name	State	Start Mode	Service Type
Path	Error Control		Start Name	Tag ID
Application Experience Lookup Service	AeLookupSvc	Running		
	Auto	Share Process		
	c:\windows\system32\svchost.exe -k netsvcs	Normal		
	LocalSystem	0		
Alerter	Alerter	Stopped	Disabled	Share Process
	c:\windows\system32\svchost.exe -k localservice	Normal		
	NT AUTHORITY\LocalService	0		
Application Layer Gateway Service	ALG	Stopped	Manual	Share
	Own Process			
	c:\windows\system32\alg.exe	Normal		
	NT AUTHORITY\LocalService	0		
Application Management Process	AppMgmt	Stopped	Manual	Share
	c:\windows\system32\svchost.exe -k netsvcs	Normal		
	LocalSystem	0		
ASP.NET State Service	aspnet_state	Stopped	Manual	
	Own Process			
	c:\windows\microsoft.net\framework64\v2.0.50727\aspnet_state.exe	Normal		
	NT AUTHORITY\NetworkService	0		
Windows Audio	AudioSrv	Stopped	Disabled	Share Process
	c:\windows\system32\svchost.exe -k netsvcs	Normal		
	LocalSystem	0		
Background Intelligent Transfer Service	BITS	Stopped	Manual	
	Share Process			
	c:\windows\system32\svchost.exe -k netsvcs	Normal		
	LocalSystem	0		
Computer Browser	Browser	Stopped	Manual	Share Process
	c:\windows\system32\svchost.exe -k netsvcs	Normal		
	LocalSystem	0		

Indexing Service	CiSvc	Stopped	Disabled	Share Process
	c:\windows\system32\cisvc.exe	Normal		LocalSystem
	0			
ClipBook	ClipSrv	Stopped	Disabled	Own Process
	c:\windows\system32\clipsrv.exe	Normal		LocalSystem
	0			
.NET Runtime Optimization Service v2.0.50727_X86	clr_optimization_v2.0.50727_32	Stopped	Manual	Own
Process	c:\windows\microsoft.net\framework\v2.0.50727\mscorsvw.exe	Normal		
	Ignore	LocalSystem	0	
.NET Runtime Optimization Service v2.0.50727_x64	clr_optimization_v2.0.50727_64	Stopped	Manual	Own
Process	c:\windows\microsoft.net\framework64\v2.0.50727\mscorsvw.exe	Normal		
	Ignore	LocalSystem	0	
COM+ System Application	COMSysApp	Stopped	Manual	
	Own Process			
	c:\windows\system32\dlhhost.exe	Normal		
/processid:{02d4b3f1-fd88-11d1-96d0-00805fc79235}		Normal		
	LocalSystem	0		
Cryptographic Services	CryptSvc	Stopped	Manual	Share
Process	c:\windows\system32\svchost.exe -k netsvcs	Normal		
	LocalSystem	0		
DCOM Server Process Launcher	DcomLaunch	Running	Auto	
	Share Process			
	c:\windows\system32\svchost.exe -k	Normal		
	dcomlaunch	LocalSystem	0	
Distributed File System	Dfs	Stopped	Manual	Own
Process	c:\windows\system32\dfssvc.exe	Normal		
	LocalSystem	0		
DHCP Client	Dhcp	Stopped	Manual	Share Process
	c:\windows\system32\svchost.exe -k networkservice	Normal		
	NT AUTHORITY\NetworkService	0		
Logical Disk Manager Administrative Service			dmadmin	Stopped
	Manual	Share Process		
	c:\windows\system32\dmadmin.exe /com	Normal		
	LocalSystem	0		
Logical Disk Managerdmserver		Stopped	Manual	Share Process
	c:\windows\system32\svchost.exe -k netsvcs	Normal		
	LocalSystem	0		
DNS Client	Dnscache	Stopped	Manual	Share Process
	c:\windows\system32\svchost.exe -k networkservice	Normal		
	NT AUTHORITY\NetworkService	0		
Error Reporting Service	ERSvc	Stopped	Manual	Share
Process	c:\windows\system32\svchost.exe -k winerr	Ignore		
	LocalSystem	0		
Event Log	Eventlog	Running	Auto	Share Process
	c:\windows\system32\services.exe	Normal		
	LocalSystem	0		
COM+ Event System	EventSystem	Running	Auto	Share
Process	c:\windows\system32\svchost.exe -k netsvcs	Normal		
	LocalSystem	0		
Help and Support	helpsvc	Running	Manual	Share Process
	c:\windows\system32\svchost.exe -k netsvcs	Normal		
	LocalSystem	0		
HID Input Service	HidServ	Stopped	Manual	Share Process
	c:\windows\system32\svchost.exe -k netsvcs	Normal		
	LocalSystem	0		
HTTP SSLHTTPFilter		Running	Manual	Share Process
	c:\windows\system32\lsass.exe	Normal		
	LocalSystem	0		
IAS Jet Database Access	IASJet	Stopped	Manual	Share
Process	c:\windows\syswow64\svchost.exe -k iasjet	Normal		
	LocalSystem	0		
IIS Admin Service	IISADMIN	Running	Auto	Share
Process	c:\windows\system32\inetrv\inetinfo.exe	Normal		
	LocalSystem	0		
IMAPI CD-Burning COM Service			ImapiService	Stopped
	Disabled	Own Process		
	Normal	LocalSystem	0	
Intersite Messaging	Ismserv	Stopped	Disabled	Own Process
	c:\windows\system32\ismsserv.exe	Normal		
	LocalSystem	0		
Kerberos Key Distribution Center			kdc	Stopped
	Share Process			
	c:\windows\system32\lsass.exe	Normal		
	LocalSystem	0		

Server	lanmanserver	Stopped	Manual	Share Process	Remote Access Connection Manager	RasMan	Stopped	Manual
	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Share Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem
Workstation	lanmanworkstation	Running	Auto	Share Process	Remote Desktop Help Session Manager	RDSessMgr	Stopped	Manual
	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Manual	Own Process	c:\windows\system32\sessmgr.exe	Normal
License Logging	LicenseService	Stopped	Disabled	Own Process	Routing and Remote Access	RemoteAccess	Stopped	Disabled
	c:\windows\system32\llssrv.exe	Normal	NT AUTHORITY\NetworkService	0	Share Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem
TCP/IP NetBIOS Helper	LmHosts	Stopped	Manual	Share Process	Remote Registry	RemoteRegistry	Stopped	Manual
	c:\windows\system32\svchost.exe -k localservice	Normal	NT AUTHORITY\LocalService	0	Process	c:\windows\system32\svchost.exe -k regsvc	Normal	NT AUTHORITY\LocalService
Messenger	Messenger	Stopped	Disabled	Share Process	Remote Procedure Call (RPC) Locator	RpcLocator	Stopped	Manual
	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Manual	Own Process	c:\windows\system32\locator.exe	Normal
NetMeeting	Remote Desktop Sharing	Stopped	Disabled	Own Process	Remote Procedure Call (RPC)	RpcSs	Running	Auto
	c:\windows\system32\mnmsrv.exe	Normal	LocalSystem	0	Process	c:\windows\system32\svchost.exe -k rpss	Normal	NT AUTHORITY\NetworkService
Distributed Transaction Coordinator	MSDTC	Running	Auto	Own Process	Resultant Set of Policy Provider	RSOPProv	Stopped	Manual
	c:\windows\system32\msdtc.exe	Normal	NT AUTHORITY\NetworkService	0	Process	c:\windows\system32\rsopprov.exe	Normal	LocalSystem
Windows Installer	MSIServer	Stopped	Manual	Share Process	Special Administration Console Helper	sacsrv	Stopped	Manual
	c:\windows\system32\msiexec.exe /v	Normal	LocalSystem	0	Share Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem
SQL Server (MSSQLSERVER)	MSSQLSERVER	Stopped	Manual	Own Process	Security Accounts Manager	SamSs	Running	Auto
	"c:\program files\microsoft sql server\mssql.1\mssql\bin\sqlservr.exe" -smssqlserver	Normal	LocalSystem	0	Process	c:\windows\system32\lsass.exe	Normal	LocalSystem
SQL Server Active Directory Helper	MSSQLServerADHelper	Stopped	Disabled	Own Process	Smart Card	SCardSvr	Stopped	Manual
	"c:\program files\microsoft sql server\90\shared\sqladhlp90.exe"	Normal	NT AUTHORITY\NetworkService	0	c:\windows\system32\scardsvr.exe	Ignore	NT AUTHORITY\LocalService	0
Network DDE	NetDDE	Stopped	Disabled	Share Process	Task Scheduler	Schedule	Stopped	Manual
	c:\windows\system32\netdde.exe	Normal	LocalSystem	0	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0
Network DDE DSDM	NetDDEdsdm	Stopped	Disabled	Share Process	Secondary Logon	seclogon	Stopped	Manual
	c:\windows\system32\netdde.exe	Normal	LocalSystem	0	c:\windows\system32\svchost.exe -k netsvcs	Ignore	LocalSystem	0
Net Logon	Netlogon	Stopped	Manual	Share Process	System Event Notification	SENS	Running	Auto
	c:\windows\system32\lsass.exe	Normal	LocalSystem	0	Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem
Network Connections	Netman	Running	Manual	Share Process	Windows Firewall/Internet Connection Sharing (ICS)	SharedAccess	Stopped	Disabled
	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Share Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem
Network Location Awareness (NLA)	Nla	Running	Manual	Share Process	Shell Hardware Detection	ShellHWDetection	Running	Auto
	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Share Process	c:\windows\system32\svchost.exe -k netsvcs	Ignore	LocalSystem
File Replication	NtFrs	Stopped	Manual	Own Process	Print Spooler	Spooler	Stopped	Manual
	c:\windows\system32\ntfrs.exe	Ignore	LocalSystem	0	c:\windows\system32\spoolsv.exe	Normal	LocalSystem	0
NT LM Security Support Provider	NtLmSsp	Stopped	Manual	Share Process	SQL Server Browser	SQLBrowser	Stopped	Disabled
	c:\windows\system32\lsass.exe	Normal	LocalSystem	0	Process	"c:\program files (x86)\microsoft sql server\90\shared\sqlbrowser.exe"	Normal	LocalSystem
Removable Storage	NtmsSvc	Stopped	Manual	Share Process	SQL Server Agent (MSSQLSERVER)	SQLSERVERAGENT	Stopped	Manual
	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Own Process	"c:\program files\microsoft sql server\mssql.1\mssql\bin\sqlagent90.exe" -i mssqlserver	Normal	LocalSystem
Office Source Engine	ose	Stopped	Manual	Own Process	SQL Server VSS Writer	SQLWriter	Stopped	Manual
	"c:\program files (x86)\common files\microsoft shared\source engine\ose.exe"	Normal	LocalSystem	0	Process	"c:\program files\microsoft sql server\90\shared\sqlwriter.exe"	Normal	LocalSystem
Plug and Play	PlugPlay	Running	Auto	Share Process	Windows Image Acquisition (WIA)	stisvc	Stopped	Disabled
	c:\windows\system32\services.exe	Normal	LocalSystem	0	Share Process	c:\windows\system32\svchost.exe -k imgsvc	Normal	NT AUTHORITY\LocalService
IPSEC Services	PolicyAgent	Stopped	Manual	Share Process	Microsoft Software Shadow Copy Provider	swprv	Stopped	Manual
	c:\windows\system32\lsass.exe	Normal	LocalSystem	0	Own Process	c:\windows\system32\svchost.exe -k swprv	Normal	LocalSystem
Protected Storage	ProtectedStorage	Stopped	Manual	Share Process	Performance Logs and Alerts	SysmonLog	Stopped	Auto
	c:\windows\system32\lsass.exe	Normal	LocalSystem	0	Own Process	c:\windows\system32\smlogsvc.exe	Normal	NT Authority\NetworkService
Remote Access Auto Connection Manager	RasAuto	Stopped	Manual	Share Process	Telephony	Tapisrv	Stopped	Manual
	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	c:\windows\system32\svchost.exe -k tapisrv	Normal	LocalSystem	0

Terminal Services	TermService	Running	Manual	Share	
Process	c:\windows\system32\svchost.exe -k termsvcs			Normal	
	LocalSystem	0			
Themes	Themes	Stopped	Disabled	Share	Process
	c:\windows\system32\svchost.exe -k netsvcs			Normal	
	LocalSystem	0			
Telnet	TlntSvr	Stopped	Disabled	Own	Process
	c:\windows\system32\tlntsvr.exe			Normal	NT
	AUTHORITY\LocalService	0			
Distributed Link Tracking Server	TrkSvr	Stopped	Disabled	Share	
Process	c:\windows\system32\svchost.exe -k netsvcs			Normal	
	LocalSystem	0			
Distributed Link Tracking Client	TrkWks	Stopped	Manual	Share	
Process	c:\windows\system32\svchost.exe -k netsvcs			Normal	
	LocalSystem	0			
Terminal Services Session Directory	Tssdis	Stopped	Disabled		
	Own Process	c:\windows\system32\tssdis.exe		Normal	
	LocalSystem	0			
Windows User Mode Driver Framework	UMWdf	Stopped	Manual		
	Own Process	c:\windows\system32\wdmfr.exe		Normal	NT
	AUTHORITY\LocalService	0			
Uninterruptible Power Supply	UPS	Stopped	Manual	Own	
Process	c:\windows\system32\ups.exe			Normal	NT
	AUTHORITY\LocalService	0			
Virtual Disk Service	vds	Stopped	Manual	Own	Process
	c:\windows\system32\vds.exe			Normal	LocalSystem
	0				
Volume Shadow Copy	VSS	Stopped	Manual	Own	
Process	c:\windows\system32\vssvc.exe			Normal	LocalSystem
	0				
Windows Time	W32Time	Stopped	Manual	Share	Process
	c:\windows\system32\svchost.exe -k localservice			Normal	
	NT AUTHORITY\LocalService	0			
World Wide Web Publishing Service	W3SVC	Running	Auto		
	Share Process	c:\windows\system32\svchost.exe -k iisvcs		Normal	LocalSystem
	0				
WebClient	WebClient	Stopped	Disabled	Share	Process
	c:\windows\system32\svchost.exe -k localservice			Normal	
	NT AUTHORITY\LocalService	0			
WinHTTP Web Proxy Auto-Discovery Service	WinHttpAutoProxySvc	Stopped	Manual	Share	
Process	c:\windows\system32\svchost.exe -k localservice			Normal	
	NT AUTHORITY\LocalService	0			
Windows Management Instrumentation	winmgmt	Running	Auto		
	Share Process	c:\windows\system32\svchost.exe -k netsvcs		Normal	
	Ignore	LocalSystem	0		
Portable Media Serial Number Service	WmdmPmSN	Stopped			
	Manual	Share Process			
	c:\windows\system32\svchost.exe -k netsvcs			Normal	
	LocalSystem	0			
Windows Management Instrumentation Driver Extensions					Wmi
	Stopped	Manual	Share Process		
	c:\windows\system32\svchost.exe -k netsvcs			Normal	
	LocalSystem	0			
WMI Performance Adapter	WmiApSrv	Stopped	Manual		
	Own Process	c:\windows\system32\wbem\wmiapsrv.exe		Normal	LocalSystem
	0				
Automatic Updates	wuauerv	Stopped	Manual	Share	Process
	c:\windows\system32\svchost.exe -k netsvcs			Normal	
	LocalSystem	0			
Wireless Configuration	WZCSVC	Stopped	Manual	Share	
Process	c:\windows\system32\svchost.exe -k netsvcs			Normal	
	LocalSystem	0			
Network Provisioning Service	xmlprov	Stopped	Manual	Share	
Process	c:\windows\system32\svchost.exe -k netsvcs			Normal	
	LocalSystem	0			

Accessories\Entertainment	Default User:Accessories\Entertainment
Default User	
Startup	Default User:Startup
Default User	
Accessories	All Users:Accessories
All Users	
Accessories\Accessibility	All Users:Accessories\Accessibility
All Users	
Accessories\Communications	All Users:Accessories\Communications
All Users	
Accessories\Entertainment	All Users:Accessories\Entertainment
All Users	
Accessories\System Tools	All Users:Accessories\System Tools
All Users	
Administrative Tools	All Users:Administrative Tools
All Users	
Microsoft SQL Server 2005	All Users:Microsoft SQL Server 2005
All Users	
Microsoft SQL Server 2005\Analysis Services	All Users:Microsoft
SQL Server 2005\Analysis Services	All Users
Microsoft SQL Server 2005\Configuration Tools	All Users:Microsoft
SQL Server 2005\Configuration Tools	All Users
Microsoft SQL Server 2005\Documentation and Tutorials	All
Users:Microsoft SQL Server 2005\Documentation and Tutorials	All Users
Microsoft SQL Server 2005\Documentation and Tutorials\Tutorials	
All Users:Microsoft SQL Server 2005\Documentation and	
Tutorials\Tutorials	All Users
Microsoft SQL Server 2005\Performance Tools	All Users:Microsoft
SQL Server 2005\Performance Tools	All Users
Startup	All Users:Startup
All Users	
Accessories	NT AUTHORITY\SYSTEM:Accessories
NT	
AUTHORITY\SYSTEM	
Accessories\Accessibility	NT
AUTHORITY\SYSTEM:Accessories\Accessibility	NT
AUTHORITY\SYSTEM	
Accessories\Entertainment	NT
AUTHORITY\SYSTEM:Accessories\Entertainment	NT
AUTHORITY\SYSTEM	
Startup	NT AUTHORITY\SYSTEM:Startup
NT	
AUTHORITY\SYSTEM	
Accessories	PE6950\Administrator:Accessories
PE6950\Administrator	
Accessories\Accessibility	
PE6950\Administrator:Accessories\Accessibility	
PE6950\Administrator	
Accessories\Entertainment	
PE6950\Administrator:Accessories\Entertainment	
PE6950\Administrator	
Administrative Tools	PE6950\Administrator:Administrative Tools
PE6950\Administrator	
Startup	PE6950\Administrator:Startup
PE6950\Administrator	

[Startup Programs]

Program	Command	User Name	Location
desktop	desktop.ini	NT AUTHORITY\SYSTEM	Startup
desktop	desktop.ini	PE6950\Administrator	Startup
desktop	desktop.ini	.DEFAULT	Startup
desktop	desktop.ini	All Users	Common Startup

[OLE Registration]

Object	Local Server
Sound (OLE2)	sndrec32.exe
Media Clip	mplay32.exe
Video Clip	mplay32.exe /avi
MIDI Sequence	mplay32.exe /mid
Sound	Not Available
Media Clip	Not Available
WordPad Document	"%programfiles%\windows
	nt\accessories\wordpad.exe"
Bitmap Image	mspaint.exe

[Windows Error Reporting]

Time	Type	Details
------	------	---------

[Program Groups]

Group Name	Name	User Name
Accessories	Default User:Accessories	Default User
Accessories\Accessibility	Default User:Accessories\Accessibility	
	Default User	

[Internet Settings]

[Internet Explorer]

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

Item	Value
Version	6.0.3790.1830
Build	63790.1830
Application Path	C:\Program Files\Internet Explorer
Language	English (United States)
Active Printer	Not Available
Cipher Strength	128-bit
Content Advisor	Disabled
IEAK Install	No

[File Versions]

File	Version	Size	Date	Path	Company
actxprxy.dll	6.0.3790.1830	221 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
actxprxy.dll	6.0.3790.1830	221 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
advpack.dll	6.0.3790.1830	146 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
advpack.dll	6.0.3790.1830	146 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
asctrls.ocx	6.0.3790.1830	147 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
asctrls.ocx	6.0.3790.1830	147 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
browsecl.dll	6.0.3790.1830	63 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
browsecl.dll	6.0.3790.1830	63 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
browseui.dll	6.0.3790.1830	1,564 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
browseui.dll	6.0.3790.1830	1,564 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
cdfview.dll	6.0.3790.1830	216 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
cdfview.dll	6.0.3790.1830	216 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
comctl32.dll	5.82.3790.1830	935 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
comctl32.dll	5.82.3790.1830	935 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
dxttrans.dll	6.3.3790.1830	320 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
dxttrans.dll	6.3.3790.1830	320 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
dxtmsft.dll	6.3.3790.1830	549 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
dxtmsft.dll	6.3.3790.1830	549 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iecont.dll	<File Missing>	Not Available	Not Available		
iecont.dll	<File Missing>	Not Available	Not Available		
iecontc.dll	<File Missing>	Not Available	Not Available		
iecontc.dll	<File Missing>	Not Available	Not Available		
iedkcs32.dll	16.0.3790.1830	417 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iedkcs32.dll	16.0.3790.1830	417 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iepeers.dll	6.0.3790.1830	361 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iepeers.dll	6.0.3790.1830	361 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation

iesetup.dll	6.0.3790.1830	71 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iesetup.dll	6.0.3790.1830	71 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
ieunit.inf	Not Available	24 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Not Available
ieunit.inf	Not Available	24 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Not Available
ieexplore.exe	6.0.3790.1830	94 KB	3/25/2005 7:00:00 AM	C:\Program Files\Internet Explorer	Microsoft Corporation
imgutil.dll	6.0.3790.1830	61 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
imgutil.dll	6.0.3790.1830	61 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inetctl.cpl	6.0.3790.1830	428 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inetctl.cpl	6.0.3790.1830	428 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inetctl.dll	6.0.3790.1830	110 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inetctl.dll	6.0.3790.1830	110 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inseng.dll	6.0.3790.1830	147 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inseng.dll	6.0.3790.1830	147 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mlang.dll	6.0.3790.1830	686 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mlang.dll	6.0.3790.1830	686 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msencode.dll	<File Missing>	Not Available	Not Available		
mshta.exe	6.0.3790.1830	38 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshta.exe	6.0.3790.1830	38 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtml.dll	6.0.3790.1830	5,790 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtml.dll	6.0.3790.1830	5,790 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtml.tb	6.0.3790.1830	1,320 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtml.tb	6.0.3790.1830	1,320 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtml.dll	6.0.3790.1830	906 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtml.dll	6.0.3790.1830	906 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtmlr.dll	6.0.3790.1830	56 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtmlr.dll	6.0.3790.1830	56 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msident.dll	6.0.3790.1830	69 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msident.dll	6.0.3790.1830	69 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msidntld.dll	6.0.3790.1830	16 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msidntld.dll	6.0.3790.1830	16 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msieft.dll	6.0.3790.1830	369 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msieft.dll	6.0.3790.1830	369 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msrating.dll	6.0.3790.1830	240 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msrating.dll	6.0.3790.1830	240 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mstime.dll	6.0.3790.1830	878 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mstime.dll	6.0.3790.1830	878 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation

```

occache.dll 6.0.3790.1830 126 KB 3/25/2005 7:00:00
AM C:\WINDOWS\system32 Microsoft Corporation
occache.dll 6.0.3790.1830 126 KB 3/25/2005 7:00:00
AM . Microsoft Corporation
proctexe.ocx <File Missing> Not Available Not
Available Not Available Not Available
sendmail.dll 6.0.3790.1830 64 KB 3/25/2005 7:00:00
AM C:\WINDOWS\system32 Microsoft Corporation
sendmail.dll 6.0.3790.1830 64 KB 3/25/2005 7:00:00
AM . Microsoft Corporation
shdoclc.dll 6.0.3790.1830 590 KB 3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
shdoclc.dll 6.0.3790.1830 590 KB 3/25/2005 7:00:00 AM
. Microsoft Corporation
shdocv.w.dll 6.0.3790.1830 2,360 KB 3/25/2005 7:00:00
AM C:\WINDOWS\system32 Microsoft Corporation
shdocv.w.dll 6.0.3790.1830 2,360 KB 3/25/2005 7:00:00
AM . Microsoft Corporation
shfolder.dll 6.0.3790.1830 34 KB 3/25/2005 7:00:00
AM C:\WINDOWS\system32 Microsoft Corporation
shfolder.dll 6.0.3790.1830 34 KB 3/25/2005 7:00:00
AM . Microsoft Corporation
shlwapi.dll 6.0.3790.1830 607 KB 3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
shlwapi.dll 6.0.3790.1830 607 KB 3/25/2005 7:00:00 AM
. Microsoft Corporation
tdc.ocx 1.3.0.3130 91 KB 3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
tdc.ocx 1.3.0.3130 91 KB 3/25/2005 7:00:00 AM
. Microsoft Corporation
url.dll 6.0.3790.1830 40 KB 3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
url.dll 6.0.3790.1830 40 KB 3/25/2005 7:00:00 AM
. Microsoft Corporation
urlmon.dll 6.0.3790.1830 1,049 KB 3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
urlmon.dll 6.0.3790.1830 1,049 KB 3/25/2005 7:00:00 AM
. Microsoft Corporation
webcheck.dll 6.0.3790.1830 439 KB 3/25/2005 7:00:00
AM C:\WINDOWS\system32 Microsoft Corporation
webcheck.dll 6.0.3790.1830 439 KB 3/25/2005 7:00:00
AM . Microsoft Corporation
wininet.dll 6.0.3790.1830 1,159 KB 3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
wininet.dll 6.0.3790.1830 1,159 KB 3/25/2005 7:00:00 AM
. Microsoft Corporation

```

Available Cache Size Not Available

[List of Objects]

Program File Status CodeBase
No cached object information available

[Content]

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

Item Value
Content Advisor Disabled

[Personal Certificates]

Issued To Issued By Validity Signature Algorithm
No personal certificate information available

[Other People Certificates]

Issued To Issued By Validity Signature Algorithm
No other people certificate information available

[Publishers]

Name
No publisher information available

[Security]

Zone Security Level
My Computer Custom
Local intranet Custom
Trusted sites Custom
Internet High
Restricted sites Custom

[Connectivity]

Item Value
Connection Preference Never dial

LAN Settings

AutoConfigProxy wininet.dll
AutoProxyDetectMode Disabled
AutoConfigURL
Proxy Disabled
ProxyServer
ProxyOverride

[Cache]

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

Item Value
Page Refresh Type Automatic
Temporary Internet Files Folder C:\Documents and
Settings\Administrator\Local Settings\Temporary Internet Files
Total Disk Space Not Available
Available Disk Space Not Available
Maximum Cache Size Not Available

Appendix A

Appendix B: Database Build Scripts

Appendix B

```
-- CreateDatabase
-- for use with StepMaster
-- Uses FileGroups

--
--      Drop the existing database
--
if exists (select name from sysdatabases where name =
'%DBNAME%')
    drop database %DBNAME%

CREATE DATABASE %DBNAME%
ON PRIMARY
(
    NAME          = %DBNAME%_root,
    FILENAME      = "C:\%DBNAME%_root.mdf",
    SIZE          = 7MB,
    FILEGROWTH    = 0),
FILEGROUP LINEITEM_FG
(
    NAME          = %DBNAME%_li_1,
    FILENAME      = "F:",
    SIZE          = 65016MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_li_2,
    FILENAME      = "G:",
    SIZE          = 65016MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_li_3,
    FILENAME      = "H:",
    SIZE          = 65016MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_li_4,
    FILENAME      = "I:",
    SIZE          = 65016MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_li_5,
    FILENAME      = "J:",
    SIZE          = 65016MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_li_6,
    FILENAME      = "K:",
    SIZE          = 65016MB,
    FILEGROWTH    = 0),
FILEGROUP GENERAL_FG
(
    NAME          = %DBNAME%_gen_1,
    FILENAME      = "O:",
    SIZE          = 31304MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_gen_2,
    FILENAME      = "P:",
    SIZE          = 31304MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_gen_3,
    FILENAME      = "Q:",
    SIZE          = 31304MB,
```

```
FILEGROWTH = 0),
(
    NAME          = %DBNAME%_gen_4,
    FILENAME      = "R:",
    SIZE          = 31304MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_gen_5,
    FILENAME      = "S:",
    SIZE          = 31304MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_gen_6,
    FILENAME      = "T:",
    SIZE          = 31304MB,
    FILEGROWTH    = 0)
LOG ON
(
    NAME          = %DBNAME%_log,
    FILENAME      = "E:",
    SIZE          = 61400MB,
    FILEGROWTH    = 0)
```

```
-- File:  CREATETABLES.SQL
--      Microsoft TPC-H Benchmark Kit Ver. 1.00
--      Copyright Microsoft, 1999
--
```

```
create table PART
(P_PARTKEY int not null,
P_TYPE varchar(25) not null,
P_SIZE int not null,
P_BRAND char(10) not null,
P_NAME varchar(55) not null,
P_CONTAINER char(10) not null,
P_MFGR char(25) not null,
P_RETAILPRICE float not null,
P_COMMENT varchar(23) not null)
on GENERAL_FG
```

```
create table SUPPLIER
(S_SUPPKEY int not null,
S_NATIONKEY int not null,
S_NAME char(25) not null,
S_ADDRESS varchar(40) not null,
S_PHONE char(15) not null,
S_ACCTBAL float not null,
S_COMMENT varchar(101) not null,)
on GENERAL_FG
```

```
create table PARTSUPP
(PS_PARTKEY int not null,
PS_SUPPKEY int not null,
PS_SUPPLYCOST float not null,
PS_AVAILQTY int not null,
PS_COMMENT varchar(199) not null)
on GENERAL_FG
```

```
create table CUSTOMER
```

Appendix B

```

(C_CUSTKEY int not null,
C_MKTSEGMENT char(10) not null,
C_NATIONKEY int not null,
C_NAME varchar(25) not null,
C_ADDRESS varchar(40) not null,
C_PHONE char(15) not null,
C_ACCTBAL float not null,
C_COMMENT varchar(117) not null)
on GENERAL_FG

create table ORDERS
(O_ORDERDATE datetime not null,
O_ORDERKEY bigint not null,
O_CUSTKEY int not null,
O_ORDERPRIORITY char(15) not null,
O_SHIPRIORITY int not null,
O_CLERK char(15) not null,
O_ORDERSTATUS char(1) not null,
O_TOTALPRICE float not null,
O_COMMENT varchar(79) not null)
on GENERAL_FG

create table LINEITEM
(L_SHIPDATE datetime not null,
L_ORDERKEY bigint not null,
L_DISCOUNT float not null,
L_EXTENDEDPRICE float not null,
L_SUPPKEY int not null,
L_QUANTITY float not null,
L_RETURNFLAG char(1) not null,
L_PARTKEY int not null,
L_LINestatus char(1) not null,
L_TAX float not null,
L_COMMITDATE datetime not null,
L_RECEIPTDATE datetime not null,
L_SHIPMODE char(10) not null,
L_LINENUMBER int not null,
L_SHIPINSTRUCT char(25) not null,
L_COMMENT varchar(44) not null)
on LINEITEM_FG

create table NATION
(N_NATIONKEY int not null,
N_NAME char(25) not null,
N_REGIONKEY int not null,
N_COMMENT varchar(152) not null)
on GENERAL_FG

create table REGION
(R_REGIONKEY int not null,
R_NAME char(25) not null,
R_COMMENT varchar(152) not null)
on GENERAL_FG

-- File: CREATEINDEXESSTREAM2.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 1.00
-- Copyright Microsoft, 1999
--

alter table NATION add constraint PK_N_NATIONKEY
primary key (N_NATIONKEY)
ON GENERAL_FG

alter table REGION add constraint PK_R_REGIONKEY
primary key (R_REGIONKEY)
ON GENERAL_FG

create index N_REGIONKEY_IDX
on NATION(N_REGIONKEY)
with fillfactor=100, SORT_IN_TEMPDB
on GENERAL_FG

alter table PART add constraint PK_P_PARTKEY primary
key (P_PARTKEY)
ON GENERAL_FG

alter table SUPPLIER add constraint PK_S_SUPPKEY
primary key (S_SUPPKEY)
ON GENERAL_FG

create index S_NATIONKEY_IDX
on SUPPLIER(S_NATIONKEY)
with fillfactor=100, SORT_IN_TEMPDB
on GENERAL_FG

alter table CUSTOMER add constraint PK_C_CUSTKEY
primary key (C_CUSTKEY)
ON GENERAL_FG

alter table PARTSUPP add constraint
PK_PS_PARTKEY_PS_SUPPKEY primary key
(PS_PARTKEY, PS_SUPPKEY)
ON GENERAL_FG

create clustered index O_ORDERDATE_CLUIDX
on ORDERS(O_ORDERDATE)
with FILLFACTOR=95,SORT_IN_TEMPDB
on GENERAL_FG

alter table ORDERS add constraint PK_O_ORDERKEY
primary key (O_ORDERKEY)
WITH (FILLFACTOR = 95)
ON GENERAL_FG

-- File: CREATEINDEXESSTREAM2.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 1.00
-- Copyright Microsoft, 1999
--

create index PS_SUPPKEY_IDX
on PARTSUPP(PS_SUPPKEY)
with fillfactor=100, SORT_IN_TEMPDB
on GENERAL_FG

-- File: CREATECLUSTEREDINDEXES.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 1.00
-- Copyright Microsoft, 1999

```

Appendix B

```
create clustered index L_SHIPDATE_CLUIDX
  on LINEITEM(L_SHIPDATE)
  with FILLFACTOR=95,SORT_IN_TEMPDB
  on GENERAL_FG

create index L_ORDERKEY_IDX
  on LINEITEM(L_ORDERKEY)
  with FILLFACTOR=95,SORT_IN_TEMPDB
  on GENERAL_FG

create index L_PARTKEY_IDX
  on LINEITEM(L_PARTKEY)
  with FILLFACTOR=95,SORT_IN_TEMPDB
  on GENERAL_FG

-- create FK
alter table SUPPLIER add constraint FK_S_NATIONKEY
foreign key (S_NATIONKEY) references
NATION(N_NATIONKEY)

alter table PARTSUPP add constraint FK_PS_PARTKEY
foreign key (PS_PARTKEY) references
PART(P_PARTKEY)

alter table PARTSUPP add constraint FK_PS_SUPPKEY
foreign key (PS_SUPPKEY) references
SUPPLIER(S_SUPPKEY)

alter table CUSTOMER add constraint FK_C_NATIONKEY
foreign key (C_NATIONKEY) references NATION
(N_NATIONKEY)

alter table ORDERS add constraint FK_O_CUSTKEY foreign
key (O_CUSTKEY) references CUSTOMER
(C_CUSTKEY)

alter table NATION add constraint FK_N_REGIONKEY
foreign key (N_REGIONKEY) references REGION
(R_REGIONKEY)

alter table LINEITEM add constraint FK_L_ORDERKEY
foreign key (L_ORDERKEY) references ORDERS
(O_ORDERKEY)

alter table LINEITEM add constraint FK_L_PARTKEY
foreign key (L_PARTKEY) references PART
(P_PARTKEY)

alter table LINEITEM add constraint FK_L_SUPPKEY
foreign key (L_SUPPKEY) references SUPPLIER
(S_SUPPKEY)

alter table LINEITEM add constraint
FK_L_PARTKEY_SUPPKEY foreign key
(L_PARTKEY,L_SUPPKEY) references
PARTSUPP(PS_PARTKEY, PS_SUPPKEY)

-- Drop the LOAD_FG
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load1
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load2
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load3
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load4
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load5
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load6
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load7
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load8
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load9
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load10
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load11
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load12
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load13
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load14
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load15
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load16
go
ALTER DATABASE %DBNAME% REMOVE
FILEGROUP LOAD_FG
Go

-- File:  CREATEBACKUPDEVICES.SQL
--        Microsoft TPC-H Benchmark Kit Ver. 2.00
--        Copyright Microsoft, 1999
--
```

Appendix B

Copyright Microsoft, 1999

```
if exists (select name from sysdevices where name =
'BackupDev1')
    exec sp_dropdevice BackupDev1
GO

if exists (select name from sysdevices where name =
'BackupDev2')
    exec sp_dropdevice BackupDev2
GO

if exists (select name from sysdevices where name =
'BackupDev3')
    exec sp_dropdevice BackupDev3
GO

if exists (select name from sysdevices where name =
'BackupDev4')
    exec sp_dropdevice BackupDev4
GO

if exists (select name from sysdevices where name =
'BackupDev5')
    exec sp_dropdevice BackupDev5
GO

sp_addumpdevice 'disk', 'BackupDev1',
'C:\B\O\TPCHbackup1'
GO
sp_addumpdevice 'disk', 'BackupDev2',
'C:\B\P\TPCHbackup2'
GO
sp_addumpdevice 'disk', 'BackupDev3',
'C:\B\Q\TPCHbackup3'
GO
sp_addumpdevice 'disk', 'BackupDev4',
'C:\B\R\TPCHbackup4'
GO
sp_addumpdevice 'disk', 'BackupDev5',
'C:\B\S\TPCHbackup5'
GO

--      File:      BACKUPDATABASE.SQL
--      Microsoft TPC-H Benchmark Kit Version
2.00
--      Copyright Microsoft, 1999
--

backup database %DBNAME% to BackupDev1,
BackupDev2, BackupDev3, BackupDev4, BackupDev5 with
init, stats=10

--      File:      RESTOREDATABASE.SQL
--      Microsoft TPC-H Benchmark Kit Version
2.00
```

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```
--
--
restore database tpch from BackupDev1, BackupDev2,
BackupDev3, BackupDev4, BackupDev5 with replace,
stats=1

--
--
-- MoveTemp.sql
--

alter database tempdb modify file
(name='tempdev',filename='C:\B\O\TempdB.mdf')

alter database tempdb modify file
(name='templog',filename='C:\B\P\Templog.ldf')

alter database tempdb modify file
(name=tempdev,
filename='C:\B\O\TempdB.mdf',size=30000mb)
alter database tempdb modify file
(name=templog,
filename='C:\B\O\Templog.ldf',size=30000mb)
alter database tempdb add file
(name=tempdev2,
filename='C:\B\P\tempdev_2',size=15000mb),
(name=tempdev3,
filename='C:\B\P\tempdev_3',size=15000mb),
(name=tempdev4,
filename='C:\B\Q\tempdev_4',size=15000mb),
(name=tempdev5,
filename='C:\B\Q\tempdev_5',size=15000mb),
(name=tempdev6,
filename='C:\B\R\tempdev_6',size=15000mb),
(name=tempdev7,
filename='C:\B\R\tempdev_7',size=15000mb),
(name=tempdev8,
filename='C:\B\S\tempdev_8',size=15000mb),
(name=tempdev9,
filename='C:\B\S\tempdev_9',size=15000mb),
(name=tempdev10,
filename='C:\B\T\tempdev_10',size=15000mb),
(name=tempdev11,
filename='C:\B\T\tempdev_11',size=15000mb)

-- Drop the LOAD_FG

ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load1
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load2
go
```

Appendix B

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load3
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load4
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load5
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load6
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load7
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load8
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load9
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load10
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load11
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load12
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load13
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load14
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load15
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load16
go
ALTER DATABASE %DBNAME% REMOVE
FILEGROUP LOAD_FG
go
```

Appendix C: ACID Scripts

Appendix C

```

-- ACID_DUR_TRAN.SQL
--
-- TPC-H Version 1.01 ACID Transaction
--
-- Implemented trunc(x,2) as ROUND(x,2,1) See SQL Server
7.0 Online Documentation
--

if exists ( select name from sysobjects where name =
'acid_dur_tran_com' )
    drop procedure acid_dur_tran_com
go

create proc acid_dur_tran_com
    @o_key      int,
    @l_key      int,
    @delta      int
as
declare @ototal    money,
        @new_ototal money,
        @quantity  money,
        @extprice  money,
        @new_extprice money,
        @pkey      int,
        @skey      int,
        @tax       money,
        @disc      money,
        @cost      money,
        @rprice    money

begin
    begin tran T

        select @ototal =
O_TOTALPRICE
        from ORDERS
        where O_ORDERKEY = @o_key

        select @quantity =
L_QUANTITY,
        @extprice =
L_EXTENDEDPRICE,
        @pkey = L_PARTKEY,
        @skey = L_SUPPKEY,
        @tax = L_TAX,
        @disc = L_DISCOUNT
        from LINEITEM
        where L_ORDERKEY = @o_key and
L_LINENUMBER =
@l_key

        select @ototal = @ototal -
ROUND((ROUND((@extprice * (1 - @disc)),2,1) * (1 +
@tax)),2,1),
        @rprice =
ROUND((@extprice/@quantity),2,1),
        @cost =
ROUND((@rprice * @delta),2,1),
        @new_extprice = @extprice +
@cost,
        @new_ototal =
ROUND((@new_extprice * (1.0 - @disc)),2,1),
        @new_ototal =
ROUND((@new_ototal * (1.0 + @tax)),2,1),
        @new_ototal = @ototal +
@new_ototal

        update LINEITEM
        set L_EXTENDEDPRICE =
@new_extprice,
        L_QUANTITY = @quantity +
@delta
        where L_ORDERKEY = @o_key and
L_LINENUMBER =
@l_key

        update ORDERS
        set O_TOTALPRICE =
@new_ototal
        where O_ORDERKEY = @o_key

        insert into HISTORY_DUR values(
            @pkey,
            @skey,
            @l_key,
            @delta,
            getdate())

-- ACID BEGIN
-- Wait to ensure that transactions are in flight
waitfor DELAY '00:00:02'
print ''
print 'Timestamp before commit:'
select convert(char(30), getdate(),9)
-- ACID END

        commit transaction T

        select @rprice 'RPrice',
        @quantity 'Quantity',
        @tax 'Tax',
        @disc 'Discount',
        @extprice 'Extended Price',
        @ototal 'Total'

    end
go

-- File: ACID_HIST.SQL

```

Appendix C

```
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1999
-- Purpose: Creates HISTORY tables for TPC-H ACID tests
--
```

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

```
create table HISTORY_ACI
(
    H_P_KEY          int,
    H_S_KEY          int,
    H_O_KEY          int,
    H_L_KEY          int,
    H_DELTA          tinyint,
    H_DATE_T        datetime
)
```

GO

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

```
create table HISTORY_DUR
(
    H_P_KEY          int,
    H_S_KEY          int,
    H_O_KEY          int,
    H_L_KEY          int,
    H_DELTA          tinyint,
    H_DATE_T        datetime
)
```

GO

```
-- File: ACID_table.SQL
-- Microsoft TPC-H Benchmark Kit Version
2.00
-- Copyright Microsoft, 1998
--
-- Purpose: This script creates a table (acid_values) that
will contain
-- a set of random values to be use for the
ACID tests of
-- the TPC-H benchmark. The table is
populated by a call to a
-- stored procedure. The ACID procedures
read this table
-- to guarantee random and valid input. This
table includes a unique
-- clustered index to guarantee that all values
are unique
-- for each stage of the ACI tests. If an
attempt is made to insert
-- a value that currently exists in the table, the
insert errors out and
-- the values are recalculated and another
insert is attempted.
```

```
--
-- Check for pre-existing table
if exists ( select name from sysobjects where name =
'acid_values' )
    drop table acid_values
```

```
create table acid_values(
acid_testchar(25),
acid_o_key      int,
acid_l_key      int,
acid_delta      tinyint,
acid_part       int,
acid_supp       int,
seq_num         int)

create unique clustered index acid_values_c1
on acid_values(acid_test,acid_o_key,acid_l_key)
```

-- ACID_TRAN.SQL

```
--
-- TPC-H Version 1.01 ACID Transaction
--
-- Implemented trunc(x,2) as ROUND(x,2,1) See SQL Server
7.0 Online Documentation
--
```

```
if exists ( select name from sysobjects where name =
'acid_tran_com' )
    drop procedure acid_tran_com
```

go

```
create proc acid_tran_com
    @o_key      int,
    @l_key      int,
    @delta      int
```

as

```
declare @ototal      money,
        @new_ototal  money,
        @quantity    money,
        @extprice    money,
        @new_extprice money,
        @pkey        int,
        @skey        int,
        @tax         money,
        @disc        money,
        @cost        money,
        @rprice      money
```

begin

```
begin tran T

select @ototal =
O_TOTALPRICE
from ORDERS
where O_ORDERKEY = @o_key
```

Appendix C

```

select  @quantity      =                                @ototal 'Total'
L_QUANTITY,
        @extprice      =                                end
L_EXTENDEDPRICE,
        @pkey          = L_PARTKEY,                    go
        @skey          = L_SUPPKEY,
        @tax           = L_TAX,
        @disc          = L_DISCOUNT
from    LINEITEM
where   L_ORDERKEY = @o_key and
        L_LINENUMBER =
@l_key

select  @ototal        = @ototal -
ROUND((ROUND((@extprice * (1 - @disc)),2,1) * (1 +
@tax)),2,1),
        @rprice        =
ROUND((@extprice/@quantity),2,1),
        @cost          =
ROUND((@rprice * @delta),2,1),
        @new_extprice  = @extprice +
@cost,
        @new_ototal    =
ROUND((@new_extprice * (1.0 - @disc)),2,1),
        @new_ototal    =
ROUND((@new_ototal * (1.0 + @tax)),2,1),
        @new_ototal    = @ototal +
@new_ototal

update  LINEITEM
set     L_EXTENDEDPRICE =
@new_extprice,
        L_QUANTITY     = @quantity +
@delta
where   L_ORDERKEY = @o_key and
        L_LINENUMBER =
@l_key

update  ORDERS
set     O_TOTALPRICE =
@new_ototal
where   O_ORDERKEY = @o_key

insert into HISTORY_ACI values( @pkey,
                                @skey,
@o_key,
                                @l_key,
                                @delta,
getdate())

commit transaction T

select  @rprice 'RPrice',
        @quantity 'Quantity',
        @tax 'Tax',
        @disc 'Discount',
        @extprice 'Extended Price',

```

```

-- File: ACID_VALUES.SQL
-- Microsoft TPC-H Benchmark Kit Version
2.00
-- Copyright Microsoft, 1999
--
-- Purpose: This script creates a stored procedure that,
when called with the
-- number of desired streams, will populate the
acid_values table.
-- The ACID procedures read this table to
guarantee random and valid input.
-- This table includes a unique clustered index
to guarantee that all values
-- are unique for each stage of the ACI tests.
If an attempt is made to insert
-- a value that currently exists in the table, the
insert errors out and
-- the values are recalculated and another
insert is attempted.
--
-- The first 10 rows, seq_num, are for
atomicity and isolation. The remaining
-- x * 200 rows are for consistency and
durability, where x is the number of streams desired.
--
if exists ( select name from sysobjects where name =
'tpch_acid_values' )
drop procedure tpch_acid_values
go

create proc tpch_acid_values @num_streams int
as

declare @acid_test char(25),
        @rand_o_key int,
        @rand_l_key int,
        @rand_deltatinyint,
        @rand_part_key int,
        @rand_supp_key int,
        @cnt int,
        @multiplier int,
        @counter int,
        @found_one tinyint,
        @cons_rows int

-- set initial values for loop controls
select @found_one = 0,
        @counter = 1,
        @cnt = 0,
        @cons_rows = @num_streams * 200

```

Appendix C

```

--      loop to populate table for ACID
while (@counter <= (@cons_rows + 10) )
begin

--      Set ACI test name based on counter
select @acid_test = case      @counter
      when 1 then 'Atomicity_Commit'
      when 2 then 'Atomicity_Rollback'
      when 3 then 'Isolation 1'
      when 4 then 'Isolation 2'
      when 5 then 'Isolation 3'
      when 6 then 'Isolation 3'
      when 7 then 'Isolation 4'
      when 8 then 'Isolation 4'
      when 9 then 'Isolation 5'
      when 10 then 'Isolation 6'
      else 'Consistency_Durability'
end

--      loop here until valid values of O_KEY and L_KEY
are found
while (@found_one = 0)
begin
      select @rand_o_key = ROUND((RAND()+
(RAND())*10),0,1)

      select @multiplier
= case @rand_o_key
      when 0 then 1
      when 1 then 10
      when 2 then 100
      when 3 then 1000
      when 4 then 10000
      when 5 then 100000
      when 6 then 10000
      when 7 then 1000
      when 8 then 100
      when 9 then 10
      when 10 then 1
end

      if (@counter = 9)
begin
      while (@cnt =
0)
begin

```

```

      @rand_part_key = ROUND(((RAND() *
(@multiplier+9))/5),0)

      select
      select
      from
      WHERE
      PS_PARTKEY = @rand_part_key
      end
      set
      rowcount @cnt

      select
      @rand_supp_key= PS_SUPPKEY
      from
      PARTSUPP
      where
      PS_PARTKEY = @rand_part_key
      set
      rowcount 0
      end
      else
      begin
      select
      @rand_part_key = 0,
      @rand_supp_key = 0
      end

      select @rand_o_key
= ROUND((RAND() * @multiplier),0,1)

      select @cnt
= (count(*) + 1)/2
      from LINEITEM
      where L_ORDERKEY
= @rand_o_key

      if (@cnt > 0) select
      @found_one = 1
      end

      set rowcount @cnt

      select TOP 1
      @rand_l_key = L_LINENUMBER
      from LINEITEM
      where L_ORDERKEY = @rand_o_key

      set rowcount 0

      select @rand_delta = (RAND()*100)

--      Insert @rand_o_key, @rand_o_key, and
@rand_delta into acid_values table

```

Appendix C

```

insert into acid_values
values(@acid_test,
      @rand_o_key,
      @rand_l_key,
      @rand_delta,
      @rand_part_key,
      @rand_supp_key,
      @counter)

-- If a duplicate was found, repeat the search for valid
keys
-- @error 2601 indicates an attempt to insert a duplicate
if (@@error = 2601)
    begin
        select @counter
        = @counter,
        @found_one
        = 0,
        @cnt
        = 0
        end
    else
        begin
            select @counter
            = @counter + 1,
            @found_one
            = 0,
            @cnt
            = 0
            end
        end

-- File: CLEANUP.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1998

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

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

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

```

```

if exists ( select name from sysobjects where name =
'acid_tran_com' )
    drop procedure acid_tran_com
go

if exists ( select name from sysobjects where name =
'tran_w_com' )
    drop procedure tran_w_com
go

if exists ( select name from sysobjects where name =
'tran_w_rb' )
    drop procedure tran_w_rb
go

if exists ( select name from sysobjects where name =
'iso3_ver' )
    drop procedure iso3_ver
go

if exists ( select name from sysobjects where name =
'iso5_parts' )
    drop procedure iso5_parts
go

if exists ( select name from sysobjects where name =
'iso_query' )
    drop procedure iso_query
go

-- File: CONS_TRAN.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1999

if exists ( select name from sysobjects where name =
'cons_tran' )
    drop procedure cons_tran
go

create proc cons_tran @counter int
as

declare @acid_test char(25),
        @rand_o_key int,
        @rand_l_key int,
        @rand_delta tinyint

-- Get random values based on the counter passed to the
stored proc
select @rand_o_key = acid_o_key,
        @rand_l_key = acid_l_key,
        @rand_delta = acid_delta
from acid_values
where acid_test= "Consistency_Durability" and
seq_num = @counter

```

Appendix C

```

select  "Random Values Used",
        @rand_o_key "@RAND_O_KEY",
        @rand_l_key "@RAND_L_KEY",
        @rand_delta "@RAND_DELTA",
        @counter  "SEQ NUMBER"

exec    acid_tran_com  @rand_o_key,
                   @rand_l_key,
                   @rand_delta

go
-- File:  DUR_TRAN.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1999

if exists ( select name from sysobjects where name = 'dur_tran'
)
        drop procedure dur_tran

go

create proc dur_tran      @counter      int

as

declare @acid_test      char(25),
        @rand_o_key     int,
        @rand_l_key     int,
        @rand_delta     tinyint

-- Get random values based on the counter passed to the
stored proc
select  @rand_o_key     = acid_o_key,
        @rand_l_key     = acid_l_key,
        @rand_delta     = acid_delta

from    acid_values
where   acid_test= "Consistency_Durability" and
        seq_num       = @counter

select  "Random Values Used",
        @rand_o_key "@RAND_O_KEY",
        @rand_l_key "@RAND_L_KEY",
        @rand_delta "@RAND_DELTA",
        @counter  "SEQ NUMBER"

exec    acid_dur_tran_com      @rand_o_key,
                               @rand_l_key,
                               @rand_delta

go
-- iso34_tran_w_com.sql
--
-- TPC-H Version 1.01 ACID Transaction
--
-- Implemented trunc(x,2) as ROUND(x,2,1) See SQL Server
7.0 Online Documentation
--

```

```

if exists ( select name from sysobjects where name =
'iso34_tran_w_com' )
        drop procedure iso34_tran_w_com

go

create proc iso34_tran_w_com
        @o_key      int,
        @l_key      int,
        @delta      int

as

declare @ototal      money,
        @new_ototal  money,
        @quantity    money,
        @extprice    money,
        @new_extprice money,
        @pkey        int,
        @skey        int,
        @tax         money,
        @disc        money,
        @cost        money,
        @rprice      money

begin

        begin tran T

--        ACID CODE BEGIN
print " "
print "TPC-H ACID Transaction Start:"
select convert(char(30), getdate(),9)
print " "
print "O_TOTALPRICE from Orders Table before updates:"
select  O_TOTALPRICE
from    ORDERS
where   O_ORDERKEY = @o_key
print " "
--        ACID CODE END

        select  @ototal      =
O_TOTALPRICE
        from    ORDERS
        where   O_ORDERKEY = @o_key

--        ACID CODE BEGIN
print " "
print "Data from LINEITEM before updates:"
select  L_QUANTITY  'L_QUANTITY',
        L_EXTENDEDPRICE 'L_EXTENDEDPRICE',
        L_PARTKEY    'L_PARTKEY',
        L_SUPPKEY    'L_SUPPKEY',
        L_TAX        'L_TAX',
        L_DISCOUNT  'L_DISCOUNT'
from    LINEITEM
where   L_ORDERKEY = @o_key and
        L_LINENUMBER = @l_key

print " "
--        ACID CODE END

```

Appendix C

```

select @quantity =
L_QUANTITY,
@extprice =
L_EXTENDEDPRICE,
@pkey = L_PARTKEY,
@skkey = L_SUPPKEY,
@tax = L_TAX,
@disc = L_DISCOUNT
from LINEITEM
where L_ORDERKEY = @o_key and
L_LINENUMBER =
@l_key

select @ototal = @ototal -
ROUND((ROUND((@extprice * (1 - @disc)),2,1) * (1 +
@tax)),2,1),
@rprice =
ROUND((@extprice/@quantity),2,1),
@cost =
ROUND((@rprice * @delta),2,1),
@new_extprice = @extprice +
@cost,
@new_ototal =
ROUND((@new_extprice * (1.0 - @disc)),2,1),
@new_ototal =
ROUND((@new_ototal * (1.0 + @tax)),2,1),
@new_ototal
@new_extprice,
@delta
where L_ORDERKEY = @o_key and
L_LINENUMBER =
@l_key

update ORDERS
set O_TOTALPRICE =
@new_ototal
where O_ORDERKEY = @o_key

insert into HISTORY_ACI values( @pkey,
@skkey,
@o_key,
@l_key,
@delta,
getdate())

-- ACID CODE BEGIN
begin
print " "
print "Timestamp before commit of ACID transaction:"
select convert(char(30), getdate(), 9)
print " "
-- ACID CODE END

commit transaction T

-- ACID CODE BEGIN
print " "
print "Timestamp after commit of ACID transaction:"
select convert(char(30), getdate(), 9)
print " "
print "O_TOTALPRICE from Orders Table after commit:"
select O_TOTALPRICE
from ORDERS
where O_ORDERKEY = @o_key
print " "
print "Data from LINEITEM after commit:"
select L_QUANTITY 'L_QUANTITY',
L_EXTENDEDPRICE 'L_EXTENDEDPRICE',
L_PARTKEY 'L_PARTKEY',
L_SUPPKEY 'L_SUPPKEY',
L_TAX 'L_TAX',
L_DISCOUNT 'L_DISCOUNT'
from LINEITEM
where L_ORDERKEY = @o_key and
L_LINENUMBER = @l_key
print " "
print "Row from HISTORY:"
select *
from HISTORY_ACI
where H_O_KEY = @o_key and
H_L_KEY = @l_key
print " "
print "TPC-H ACID Transaction End:"
select convert(char(30), getdate(),9)
print " "
end

-- ACID CODE END

select @rprice 'RPrice',
@quantity 'Quantity',
@tax 'Tax',
@disc 'Discount',
@extprice 'Extended Price',
@ototal 'Total'

end

go

-- iso5_parts.sql
--
-- TPC-H Version 1.01 ACID Transaction
--
--
if exists ( select name from sysobjects where name =
'iso5_parts' )
drop procedure iso5_parts

go

```

Appendix C

```

create proc iso5_parts
    @ps_partkey1 int,
    @ps_suppkey1 int
as
begin
    begin tran P

--      ACID CODE BEGIN
print " "
print "TPC-H ACID Transaction Start:"
select convert(char(30), getdate(),9)
print " "
print "Read from PARTSUPP Table:"
--      ACID CODE END

        select *
        from PARTSUPP
        where PS_PARTKEY = @ps_partkey1
and
            PS_SUPPKEY = @ps_suppkey1

        commit transaction P

--      ACID CODE BEGIN
print " "
print "Timestamp after Read/Commit from PARTSUPP
table:"
select convert(char(30), getdate(),9)
print " "
--      ACID CODE END

end

go

-- tran_w_com.sql
--
-- TPC-H Version 1.01 ACID Transaction
--
-- Implemented trunc(x,2) as ROUND(x,2,1) See SQL Server
7.0 Online Documentation
--

if exists ( select name from sysobjects where name =
'iso6_tran_w_com' )
    drop procedure iso6_tran_w_com
go

create proc iso6_tran_w_com
    @o_key int,
    @l_key int,
    @delta int
as

```

```

declare @ototal money,
        @new_ototal money,
        @quantity money,
        @extprice money,
        @new_extprice money,
        @pkey int,
        @skey int,
        @tax money,
        @disc money,
        @cost money,
        @rprice money

begin
    begin tran T

--      ACID CODE BEGIN
print " "
print "TPC-H ACID Transaction Start:"
select convert(char(30), getdate(),9)
print " "
print "O_TOTALPRICE from Orders Table before updates:"
select O_TOTALPRICE
from ORDERS
where O_ORDERKEY = @o_key
print " "
--      ACID CODE END

        select @ototal =
O_TOTALPRICE
        from ORDERS
        where O_ORDERKEY = @o_key

--      ACID CODE BEGIN
print " "
print "Data from LINEITEM before updates:"
select L_QUANTITY 'L_QUANTITY',
        L_EXTENDEDPRICE 'L_EXTENDEDPRICE',
        L_PARTKEY 'L_PARTKEY',
        L_SUPPKEY 'L_SUPPKEY',
        L_TAX 'L_TAX',
        L_DISCOUNT 'L_DISCOUNT'
from LINEITEM
where L_ORDERKEY = @o_key and
L_LINENUMBER = @l_key
print " "
--      ACID CODE END

        select @quantity =
L_QUANTITY,
        @extprice =
L_EXTENDEDPRICE,
        @pkey = L_PARTKEY,
        @skey = L_SUPPKEY,
        @tax = L_TAX,
        @disc = L_DISCOUNT
        from LINEITEM
        where L_ORDERKEY = @o_key and

```


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```

        L_LINENUMBER      =
@l_key

        select  @ototal      = @ototal -
ROUND((ROUND((@extprice * (1 - @disc)),2,1) * (1 +
@tax)),2,1),
        @rprice      =
ROUND((@extprice/@quantity),2,1),
        @cost      =
ROUND((@rprice * @delta),2,1),
        @new_extprice = @extprice +
@cost,
        @new_ototal  =
ROUND((@new_extprice * (1.0 - @disc)),2,1),
        @new_ototal  =
ROUND((@new_ototal * (1.0 + @tax)),2,1),
        @new_ototal  = @ototal +

        update  LINEITEM
set  L_EXTENDEDPRICE =
@new_extprice,
        L_QUANTITY = @quantity +
@delta
where  L_ORDERKEY = @o_key and
L_LINENUMBER =
@l_key

        update  ORDERS
set  O_TOTALPRICE =
@new_ototal
where  O_ORDERKEY = @o_key

        insert into HISTORY_ACI values( @pkey,
        @skey,
        @o_key,
        @l_key,
        @delta,
        getdate())
-- ACID CODE BEGIN
begin
print " "
print "Timestamp before commit of ACID transaction:"
select convert(char(30), getdate(), 9)
print " "
-- ACID CODE END

        commit transaction T

-- ACID CODE BEGIN
print " "
print "Timestamp after commit of ACID transaction:"
select convert(char(30), getdate(), 9)
print " "
print "O_TOTALPRICE from Orders Table after commit:"
select  O_TOTALPRICE
from  ORDERS
where  O_ORDERKEY = @o_key
print " "
print "Data from LINEITEM after commit:"
select  L_QUANTITY  'L_QUANTITY',
L_EXTENDEDPRICE 'L_EXTENDEDPRICE',
L_PARTKEY  'L_PARTKEY',
L_SUPPKEY  'L_SUPPKEY',
L_TAX      'L_TAX',
L_DISCOUNT 'L_DISCOUNT'
from  LINEITEM
where  L_ORDERKEY = @o_key and
L_LINENUMBER = @l_key
print " "
print "Row from HISTORY:"
select  *
from  HISTORY_ACI
where  H_O_KEY = @o_key and
H_L_KEY = @l_key
print " "
print "TPC-H ACID Transaction End:"
select convert(char(30), getdate(),9)
print " "
end
-- ACID CODE END

        select  @rprice 'RPrice',
        @quantity 'Quantity',
        @tax 'Tax',
        @disc 'Discount',
        @extprice 'Extended Price',
        @ototal 'Total'

end

go

-- ACIDQ.SQL
--
-- TPC-H Version 1.01 ACID Query
--
-- Implemented trunc(x,2) as (cast(x*100) as int / 100)
--
if exists ( select name from sysobjects where name =
'iso_query' )
        drop procedure iso_query
go

create proc iso_query          @o_key          int
as

-- ACID CODE BEGIN
print " "
print "Start Time for TPC-H ACID Query:"
select convert(char(30),getdate(),9)

```

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```

print " "
print "TPC-H Query Data"
--      ACID CODE END

select  SUM(ROUND((ROUND((L_EXTENDEDPRICE *
(1 - L_DISCOUNT)),2,1) * (1 + L_TAX)),2,1))
from    LINEITEM
where   L_ORDERKEY = @o_key

--      ACID CODE BEGIN
print " "
print "End Time for TPC-H ACID Query:"
select  convert(char(30),getdate(),9)
print " "
--      ACID CODE END

go
-- tran_w_com.sql
--
-- TPC-H Version 1.01 ACID Transaction
--
-- Implemented trunc(x,2) as ROUND(x,2,1) See SQL Server
7.0 Online Documentation
--

if exists ( select name from sysobjects where name =
'tran_w_com' )
        drop procedure tran_w_com
go

create proc tran_w_com
        @o_key      int,
        @l_key      int,
        @delta      int
as
declare  @ototal    money,
        @new_ototal money,
        @quantity   money,
        @extprice   money,
        @new_extprice money,
        @pkey       int,
        @skey       int,
        @tax        money,
        @disc       money,
        @cost       money,
        @rprice     money

begin
        begin tran T

--      ACID CODE BEGIN
print " "
print "TPC-H ACID Transaction Start:"
select  convert(char(30), getdate(),9)
print " "
print "O_TOTALPRICE from Orders Table before updates:"
select  O_TOTALPRICE
from    ORDERS
where   O_ORDERKEY = @o_key

print " "
print "Data from LINEITEM before updates:"
select  L_QUANTITY   'L_QUANTITY',
        L_EXTENDEDPRICE 'L_EXTENDEDPRICE',
        L_PARTKEY     'L_PARTKEY',
        L_SUPPKEY     'L_SUPPKEY',
        L_TAX         'L_TAX',
        L_DISCOUNT   'L_DISCOUNT'
from    LINEITEM
where   L_ORDERKEY = @o_key and
        L_LINENUMBER = @l_key

print " "
--      ACID CODE END

        select  @quantity   =
L_QUANTITY,
                @extprice   =
L_EXTENDEDPRICE,
                @pkey       = L_PARTKEY,
                @skey       = L_SUPPKEY,
                @tax        = L_TAX,
                @disc       = L_DISCOUNT
        from    LINEITEM
        where   L_ORDERKEY = @o_key and
                L_LINENUMBER =
                @l_key

        select  @ototal    = @ototal -
ROUND((ROUND((@extprice * (1 - @disc)),2,1) * (1 +
@tax)),2,1),
                @rprice     =
ROUND((@extprice/@quantity),2,1),
                @cost       =
ROUND((@rprice * @delta),2,1),
                @new_extprice = @extprice +
                @cost,
                @new_ototal =
ROUND((@new_extprice * (1.0 - @disc)),2,1),
                @new_ototal =
ROUND((@new_ototal * (1.0 + @tax)),2,1),
                @new_ototal = @ototal +
                @new_ototal

        update  LINEITEM
        set     L_EXTENDEDPRICE =
                @new_extprice,
                L_QUANTITY   = @quantity +
                @delta
        where   L_ORDERKEY = @o_key and

```

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```

@l_key          L_LINENUMBER      =      select convert(char(30), getdate(),9)
                                                    print " "
                                                    end
                                                    --      ACID CODE END

update  ORDERS
set     O_TOTALPRICE      =

@new_ototal

where   O_ORDERKEY = @o_key

insert into HISTORY_ACI values( @pkey,
                                @skey,

                                @o_key,

                                @l_key,
                                @delta,

                                getdate())

--      ACID CODE BEGIN
begin
print " "
print "Timestamp before commit delay of ACID transaction:"
select convert(char(30), getdate(), 9)
print " "
waitfor delay "00:00:20"
print "Timestamp after commit delay of ACID transaction:"
select convert(char(30), getdate(), 9)
print " "
--      ACID CODE END

commit transaction T

--      ACID CODE BEGIN
print " "
print "Timestamp after commit of ACID transaction:"
select convert(char(30), getdate(), 9)
print " "
print "O_TOTALPRICE from Orders Table after commit:"
select  O_TOTALPRICE
from    ORDERS
where   O_ORDERKEY = @o_key
print " "
print "Data from LINEITEM after commit:"
select  L_QUANTITY  'L_QUANTITY',
        L_EXTENDEDPRICE 'L_EXTENDEDPRICE',
        L_PARTKEY   'L_PARTKEY',
        L_SUPPKEY   'L_SUPPKEY',
        L_TAX       'L_TAX',
        L_DISCOUNT 'L_DISCOUNT'
from    LINEITEM
where   L_ORDERKEY = @o_key and
        L_LINENUMBER      = @l_key
print " "
print "Row from HISTORY:"
select  *
from    HISTORY_ACI
where   H_O_KEY = @o_key and
        H_L_KEY = @l_key
print " "
print "TPC-H ACID Transaction End:"

-- tran_w_rb.sql
--
-- TPC-H Version 1.01 ACID Transaction
--
-- Implemented trunc(x,2) as ROUND(x,2,1) See SQL Server
7.0 Online Documentation
--
if exists ( select name from sysobjects where name =
'tran_w_rb' )
drop procedure tran_w_rb
go

create proc tran_w_rb
        @o_key      int,
        @l_key      int,
        @delta      int
as
declare @ototal      money,
        @new_ototal  money,
        @quantity    money,
        @extprice    money,
        @new_extprice money,
        @pkey        int,
        @skey        int,
        @tax         money,
        @disc        money,
        @cost        money,
        @rprice      money

begin

begin tran T

--      ACID CODE BEGIN
print " "
print "TPC-H ACID Transaction Start:"
select convert(char(30), getdate(),9)
print " "
print "O_TOTALPRICE from Orders Table before updates:"
select  O_TOTALPRICE
from    ORDERS

```

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```

where O_ORDERKEY = @o_key
print " "
-- ACID CODE END

select @ototal =
O_TOTALPRICE
from ORDERS
where O_ORDERKEY = @o_key

-- ACID CODE BEGIN
print " "
print "Data from LINEITEM before updates:"
select L_QUANTITY 'L_QUANTITY',
       L_EXTENDEDPRICE 'L_EXTENDEDPRICE',
       L_PARTKEY 'L_PARTKEY',
       L_SUPPKEY 'L_SUPPKEY',
       L_TAX 'L_TAX',
       L_DISCOUNT 'L_DISCOUNT'
from LINEITEM
where L_ORDERKEY = @o_key and
      L_LINENUMBER = @l_key
print " "
-- ACID CODE END

select @quantity =
L_QUANTITY,
       @extprice =
L_EXTENDEDPRICE,
       @pkey = L_PARTKEY,
       @skey = L_SUPPKEY,
       @tax = L_TAX,
       @disc = L_DISCOUNT
from LINEITEM
where L_ORDERKEY = @o_key and
      L_LINENUMBER =
@l_key

select @ototal = @ototal -
ROUND((ROUND((@extprice * (1 - @disc)),2,1) * (1 +
@tax)),2,1),
       @rprice =
ROUND((@extprice/@quantity),2,1),
       @cost =
ROUND((@rprice * @delta),2,1),
       @new_extprice = @extprice +
@cost,
       @new_ototal =
ROUND((@new_extprice * (1.0 - @disc)),2,1),
       @new_ototal =
ROUND((@new_ototal * (1.0 + @tax)),2,1),
       @new_ototal = @ototal +
@new_extprice,
       @delta

update LINEITEM
set L_EXTENDEDPRICE =
L_QUANTITY = @quantity +
@delta
where L_ORDERKEY = @o_key and
      L_LINENUMBER =
@l_key

update ORDERS
set O_TOTALPRICE =
@new_ototal
where O_ORDERKEY = @o_key

insert into HISTORY_ACI values( @pkey,
                               @skey,
                               @o_key,
                               @l_key,
                               @delta,
                               getdate())

-- ACID CODE BEGIN
begin
print " "
print "Timestamp before rollback delay of ACID transaction
(T1):"
select convert(char(30), getdate(), 9)
print " "
waitfor delay "00:00:20"
print "Timestamp after rollback delay of ACID transaction
(T1):"
select convert(char(30), getdate(), 9)
print " "
-- ACID CODE END

rollback transaction T

-- ACID CODE BEGIN
print " "
print "Timestamp after rollback of ACID transaction (T1):"
select convert(char(30), getdate(), 9)
print " "
print "O_TOTALPRICE from Orders Table after rollback:"
select O_TOTALPRICE
from ORDERS
where O_ORDERKEY = @o_key
print " "
print "Data from LINEITEM after rollback:"
select L_QUANTITY 'L_QUANTITY',
       L_EXTENDEDPRICE 'L_EXTENDEDPRICE',
       L_PARTKEY 'L_PARTKEY',
       L_SUPPKEY 'L_SUPPKEY',
       L_TAX 'L_TAX',
       L_DISCOUNT 'L_DISCOUNT'
from LINEITEM
where L_ORDERKEY = @o_key and
      L_LINENUMBER = @l_key
print " "
print "Row from HISTORY:"
select *
from HISTORY_ACI
where H_O_KEY = @o_key and
      H_L_KEY = @l_key

```

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```
print " "
print " "
print "TPC-H ACID Transaction End:"
select convert(char(30), getdate(),9)
print " "
end
--      ACID CODE END

select  @rprice 'RPrice',
        @quantity 'Quantity',
        @tax 'Tax',
        @disc 'Discount',
        @extprice 'Extended Price',
        @ototal 'Total'

end

go

-- File:  ISOL1_1.SQL
--      Microsoft TPC-H Benchmark Kit Ver. 2.00
--      Copyright Microsoft, 1999

declare @acid_test      char(25),
        @rand_o_key    int,
        @rand_l_key    int,
        @rand_delta    tinyint

select  @rand_o_key    = acid_o_key,
        @rand_l_key    = acid_l_key,
        @rand_delta    = acid_delta

from    acid_values

where   acid_test= 'Isolation 1'

select  'Random Values Used',
        @rand_o_key '@RAND_O_KEY',
        @rand_l_key '@RAND_L_KEY',
        @rand_delta '@RAND_DELTA'

exec tran_w_com @rand_o_key,
               @rand_l_key,
               @rand_delta

GO

-- File:  ISOL1_2.SQL
--      Microsoft TPC-H Benchmark Kit Ver. 2.00
--      Copyright Microsoft, 1998

-- ACID CODE BEGIN
-- Wait for 5 seconds to allow ISOL1_1 to execute
WAITFOR DELAY '00:00:05'
-- ACID CODE END

declare @acid_test      char(25),
        @rand_o_key    int
```

```
select  @rand_o_key    = acid_o_key
from    acid_values
where   acid_test= 'Isolation 1'

select  'Random Values Used',
        @rand_o_key '@RAND_O_KEY'

exec iso_query  @rand_o_key
GO

-- File:  ISOL2_1.SQL
--      Microsoft TPC-H Benchmark Kit Ver. 2.00
--      Copyright Microsoft, 1999

declare @acid_test      char(25),
        @rand_o_key    int,
        @rand_l_key    int,
        @rand_delta    tinyint

select  @rand_o_key    = acid_o_key,
        @rand_l_key    = acid_l_key,
        @rand_delta    = acid_delta

from    acid_values

where   acid_test= 'Isolation 2'

select  'Random Values Used',
        @rand_o_key "@RAND_O_KEY",
        @rand_l_key "@RAND_L_KEY",
        @rand_delta "@RAND_DELTA"

exec tran_w_rb  @rand_o_key,
               @rand_l_key,
               @rand_delta

GO

-- File:  ISOL2_2.SQL
--      Microsoft TPC-H Benchmark Kit Ver. 2.00
--      Copyright Microsoft, 1999

-- ACID CODE BEGIN
-- Wait for 5 seconds to allow ISOL2_1 to execute
WAITFOR DELAY '00:00:05'
-- ACID CODE END

declare @acid_test      char(25),
        @rand_o_key    int

select  @rand_o_key    = acid_o_key
from    acid_values
where   acid_test= 'Isolation 2'

select  'Random Values Used',
        @rand_o_key "@RAND_O_KEY"

exec iso_query  @rand_o_key
GO

-- File:  ISOL3_1.SQL
```

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```
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1999
```

```
declare @acid_test char(25),
        @rand_o_key int,
        @rand_l_key int,
        @rand_delta tinyint

select top 1
  @rand_o_key = acid_o_key,
  @rand_l_key = acid_l_key,
  @rand_delta = acid_delta
from acid_values
where acid_test= 'Isolation 3'
order by seq_num asc

select 'Random Values Used',
  @rand_o_key "@RAND_O_KEY",
  @rand_l_key "@RAND_L_KEY",
  @rand_delta "@RAND_DELTA"

exec tran_w_com @rand_o_key,
               @rand_l_key,
               @rand_delta
```

GO

```
-- File: ISOL3_2.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1999
```

```
-- ACID CODE BEGIN
-- Wait for 5 seconds to allow ISOL3_1 to execute
WAITFOR DELAY '00:00:05'
-- ACID CODE END
```

```
declare @acid_test char(25),
        @rand_o_key int,
        @rand_l_key int,
        @rand_delta tinyint

select top 1
  @rand_o_key = acid_o_key,
  @rand_l_key = acid_l_key
from acid_values
where acid_test= 'Isolation 3'
order by seq_num asc

select top 1
  @rand_delta = acid_delta
from acid_values
where acid_test= 'Isolation 3'
order by seq_num desc

select 'Random Values Used',
  @rand_o_key "@RAND_O_KEY",
  @rand_l_key "@RAND_L_KEY",
  @rand_delta "@RAND_DELTA"
```

```
exec iso34_tran_w_com @rand_o_key,
```

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```
@rand_l_key,
@rand_delta
```

GO

```
-- File: ISOL4_1.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1999
```

```
declare @acid_test char(25),
        @rand_o_key int,
        @rand_l_key int,
        @rand_delta tinyint

select top 1
  @rand_o_key = acid_o_key,
  @rand_l_key = acid_l_key,
  @rand_delta = acid_delta
from acid_values
where acid_test= 'Isolation 4'
order by seq_num asc

select 'Random Values Used',
  @rand_o_key "@RAND_O_KEY",
  @rand_l_key "@RAND_L_KEY",
  @rand_delta "@RAND_DELTA"
```

```
exec tran_w_rb @rand_o_key,
               @rand_l_key,
               @rand_delta
```

GO

```
-- File: ISOL4_2.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1999
```

```
-- ACID CODE BEGIN
-- Wait for 5 seconds to allow ISOL4_1 to execute
WAITFOR DELAY '00:00:05'
-- ACID CODE END
```

```
declare @acid_test char(25),
        @rand_o_key int,
        @rand_l_key int,
        @rand_delta tinyint

select top 1
  @rand_o_key = acid_o_key,
  @rand_l_key = acid_l_key
from acid_values
where acid_test= 'Isolation 4'
order by seq_num asc

select top 1
  @rand_delta = acid_delta
from acid_values
where acid_test= 'Isolation 4'
order by seq_num desc
```

```
select 'Random Values Used',
```

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```
@rand_o_key "@RAND_O_KEY",
@rand_l_key "@RAND_L_KEY",
@rand_delta "@RAND_DELTA"

exec iso34_tran_w_com @rand_o_key,
                    @rand_l_key,
                    @rand_delta

GO

-- File: ISOL5_1.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1999

declare @acid_test char(25),
        @rand_o_key int,
        @rand_l_key int,
        @rand_delta tinyint

select @rand_o_key = acid_o_key,
       @rand_l_key = acid_l_key,
       @rand_delta = acid_delta

from acid_values
where acid_test= 'Isolation 5'

select 'Random Values Used',
       @rand_o_key "@RAND_O_KEY",
       @rand_l_key "@RAND_L_KEY",
       @rand_delta "@RAND_DELTA"

exec tran_w_com @rand_o_key,
               @rand_l_key,
               @rand_delta

GO

-- File: ISOL5_2.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1999

-- ACID CODE BEGIN
-- Wait for 5 seconds to allow ISOL5_1 to execute
WAITFOR DELAY '00:00:05'
-- ACID CODE END

declare @acid_test char(25),
        @rand_part int,
        @rand_supp int

select @rand_part = acid_part,
       @rand_supp = acid_supp

from acid_values
where acid_test= 'Isolation 5'

select 'Random Values Used',
       @rand_part "@RAND_PART",
       @rand_supp "@RAND_SUPP"

exec iso5_parts @rand_part,
               @rand_supp

GO

-- File: ISOL6_2.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1999
```

```
GO
-- acid_qry1.sql
--
-- TPC-H Version 2.00 ACID Transaction
--
-- Implemented trunc(x,2) as ROUND(x,2,1) See SQL Server
7.0 Online Documentation
--
-- Currently the DELTA is 0 to maximize the runtime for the
query.
-- Modify the 'WHERE' clause to use a different value.
--
-- ACID CODE BEGIN
print ''
print 'TPC-H ACID Query Start:'
select convert(char(30), getdate(),9)
print ''
-- ACID CODE END

SELECT          L_RETURNFLAG,
                L_LINESTATUS,
                SUM(L_QUANTITY)
                AS SUM_QTY,
                SUM(L_EXTENDEDPRICE)
                AS SUM_BASE_PRICE,
                SUM(L_EXTENDEDPRICE*(1-L_DISCOUNT))
                AS SUM_DISC_PRICE,
                SUM(L_EXTENDEDPRICE*(1-
L_DISCOUNT)*(1+L_TAX)) AS SUM_CHARGE,
                AVG(L_QUANTITY )
                AS AVG_QTY,
                AVG(L_EXTENDEDPRICE)
                AS AVG_PRICE,
                AVG(L_DISCOUNT)
                AS AVG_DISC,
                COUNT(*)
                AS COUNT_ORDER
FROM LINEITEM
WHERE L_SHIPDATE <= dateadd(dd, 0, '1998/12/01')
GROUP BY L_RETURNFLAG,
         L_LINESTATUS
ORDER BY L_RETURNFLAG,
         L_LINESTATUS

-- ACID CODE BEGIN
print ''
print 'TPC-H ACID Query End:'
select convert(char(30), getdate(),9)
print ''
-- ACID CODE END

GO

-- File: ISOL6_2.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1999
```

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```

declare @acid_test      char(25),
        @rand_o_key    int,
        @rand_l_key    int,
        @rand_delta    tinyint

select  @rand_o_key    = acid_o_key,
        @rand_l_key    = acid_l_key,
        @rand_delta    = acid_delta
from    acid_values
where   acid_test= 'Isolation 6'

select  'Random Values Used',
        @rand_o_key "@RAND_O_KEY",
        @rand_l_key "@RAND_L_KEY",
        @rand_delta "@RAND_DELTA"

exec iso6_tran_w_com    @rand_o_key,
                        @rand_l_key,
                        @rand_delta

GO

-- acid_qry1.sql
--
-- TPC-H Version 2.00 ACID Transaction
--
-- Implemented trunc(x,2) as ROUND(x,2,1) See SQL Server
7.0 Online Documentation
--
--
--      ACID CODE BEGIN
print ''
print 'TPC-H ACID Query Start:'
select convert(char(30), getdate(),9)
print ''
--      ACID CODE END

SELECT      L_RETURNFLAG,
            L_LINESTATUS,
            SUM(L_QUANTITY)
            AS SUM_QTY,
            SUM(L_EXTENDEDPRICE)
            AS SUM_BASE_PRICE,
            SUM(L_EXTENDEDPRICE*(1-L_DISCOUNT))
            AS SUM_DISC_PRICE,
            SUM(L_EXTENDEDPRICE*(1-
L_DISCOUNT)*(1+L_TAX))    AS SUM_CHARGE,
            AVG(L_QUANTITY    )
            AS AVG_QTY,
            AVG(L_EXTENDEDPRICE)
            AS AVG_PRICE,
            AVG(L_DISCOUNT)
            AS AVG_DISC,
            COUNT(*)
            AS COUNT_ORDER
FROM  LINEITEM
WHEREL_SHIPDATE <= dateadd(dd, 2000, '1998/12/01')
GROUP BY L_RETURNFLAG,

```

```

            L_LINESTATUS
ORDER BY L_RETURNFLAG,
            L_LINESTATUS

--      ACID CODE BEGIN
print ''
print 'TPC-H ACID Query End:'
select convert(char(30), getdate(),9)
print ''
--      ACID CODE END

GO

-- File:  ATOM_RB.SQL
--      Microsoft TPC-H Benchmark Kit Ver. 2.00
--      Copyright Microsoft, 1999
-- Purpose: Atomicity rollback test

declare @acid_test      char(25),
        @rand_o_key    int,
        @rand_l_key    int,
        @rand_delta    tinyint

select  @rand_o_key    = acid_o_key,
        @rand_l_key    = acid_l_key,
        @rand_delta    = acid_delta
from    acid_values
where   acid_test= 'Atomicity_Rollback'

select  'Random Values Used',
        @rand_o_key "@RAND_O_KEY",
        @rand_l_key "@RAND_L_KEY",
        @rand_delta "@RAND_DELTA"

exec tran_w_rb    @rand_o_key,
                  @rand_l_key,
                  @rand_delta

GO

--
--      Insert your values in the "between" clause below
--
--      These selects should result in Zero rows found
--
-- Durability Stream 1
select  *
from    acid_values
where   seq_num between 11 and 210 and
        not exists (
            select  *
            from    HISTORY_DUR
            where   H_O_KEY = acid_o_key

and

            H_L_KEY = acid_l_key

and

```


Appendix C

```

)
-- Durability Stream 2
select *
from acid_values
where seq_num between 211 and 410 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- Durability Stream 3
select *
from acid_values
where seq_num between 411 and 610 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- Durability Stream 4
select *
from acid_values
where seq_num between 611 and 810 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- Durability Stream 5
select *
from acid_values
where seq_num between 811 and 1010 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- Durability Stream 6
select *
from acid_values
where seq_num between 1011 and 1210 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- Durability Stream 1
select *
from acid_values
where seq_num between 11 and 210 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- Durability Stream 2
select *
from acid_values
where seq_num between 211 and 410 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- Durability Stream 3
select *
from acid_values
where seq_num between 411 and 610 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- Durability Stream 4
select *
from acid_values
where seq_num between 611 and 810 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- Durability Stream 5
select *
from acid_values
where seq_num between 811 and 1010 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- Durability Stream 6
select *
from acid_values
where seq_num between 1011 and 1210 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- Durability Stream 1
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- These selects should result in Zero or One row(s)
found
--
-- Durability Stream 1
select *
from acid_values
where seq_num between 11 and 210 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- Durability Stream 2
select *
from acid_values
where seq_num between 211 and 410 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- Durability Stream 3
select *
from acid_values
where seq_num between 411 and 610 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

-- Durability Stream 4
select *
from acid_values
where seq_num between 611 and 810 and
not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
H_L_KEY = acid_l_key
and
H_DELTA = acid_delta
)

```

Appendix C

```

and          where  H_O_KEY = acid_o_key                (      o_orderkey
int,
and          H_L_KEY = acid_l_key                      o_totalprice
money,
and          H_DELTA = acid_delta                      l_orderkey
int,
)                                                    lineitem_sum
money
)
-- Durability Stream 5
select *
from acid_values
where seq_num between 811 and 1010 and
      not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
      H_L_KEY = acid_l_key
and
      H_DELTA = acid_delta
)
-- Durability Stream 6
select *
from acid_values
where seq_num between 1011 and 1210 and
      not exists (
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
and
      H_L_KEY = acid_l_key
and
      H_DELTA = acid_delta
)
-- File: DUR_VERIFY1.SQL
-- Microsoft TPC-H Kit Ver. 2.00
-- Copyright Microsoft, 1999
--
-- Durability Verification test 1
-- -----
--
-- Comment: ORDERS.O_TOTALPRICE should equal
LINEITEM sums
print ''
print 'Timestamp for Pre-Failure Durability Verification 1
start:'
select convert(char(30), getdate(),9)
print ''
select count(*) from HISTORY_DUR
GO
if exists ( select name from sysobjects where name =
'temp_dur1_output' )
      drop table temp_dur1_output
GO
CREATE TABLE temp_dur1_output
INSERT INTO temp_dur1_output
SELECT DISTINCT(o.O_ORDERKEY),
o.O_TOTALPRICE,
I.L_ORDERKEY,
SUM(ROUND((ROUND((L_EXTENDEDPRICE *
(1 - L_DISCOUNT)),2,1) * (1 + L_TAX)),2,1))
FROM acid_values a INNER JOIN ORDERS o
ON a.acid_o_key = o.O_ORDERKEY JOIN
LINEITEM I
ON o.O_ORDERKEY = I.L_ORDERKEY
WHERE a.acid_test = 'Consistency_Durability'
GROUP BY o.O_ORDERKEY, o.O_TOTALPRICE,
I.L_ORDERKEY
ORDER BY o.O_ORDERKEY ASC
-- Select data from temporary table...
print ''
print 'Select all rows from temporary table'
print ''
SELECT o_orderkey 'O_OrderKey',
o_totalprice 'O_TotalPrice',
l_orderkey 'L_OrderKey',
lineitem_sum 'LineItem Sum'
FROM temp_dur1_output
print ''
print 'Select any rows where o_totalprice is not equal to
lineitem_sum'
print ''
SELECT *
FROM temp_dur1_output
WHERE o_totalprice <> lineitem_sum
print ''
print 'Timestamp for Durability 1 end:'
select convert(char(30), getdate(),9)
print ''
if exists ( select name from sysobjects where name =
'temp_dur1_output' )
      drop table temp_dur1_output
GO
-- File: DUR_VERIFY2.SQL

```

Appendix C

```

-- Microsoft TPC-H Kit Ver. 2.00
-- Copyright Microsoft, 1999
--
-- Durability Verification test 2
-- -----
--
-- Comment: ORDERS.O_TOTALPRICE should equal
LINEITEM sums

print ''
print 'Timestamp for Pre-Failure Durability Verification 2
start:'
select convert(char(30), getdate(),9)
print ''

select count(*) from HISTORY_DUR
GO

if exists ( select name from sysobjects where name =
'temp_dur2_output' )
drop table temp_dur2_output
GO

CREATE TABLE temp_dur2_output
(
o_orderkey
int,
o_totalprice
money,
l_orderkey
int,
lineitem_sum
money
)

INSERT INTO temp_dur2_output
SELECT DISTINCT(o.O_ORDERKEY),
o.O_TOTALPRICE,
l.L_ORDERKEY,
SUM(ROUND((ROUND((L_EXTENDEDPRICE *
(1 - L_DISCOUNT)),2,1) * (1 + L_TAX)),2,1))
FROM acid_values a INNER JOIN ORDERS o
ON a.acid_o_key = o.O_ORDERKEY JOIN
LINEITEM l
ON o.O_ORDERKEY = l.L_ORDERKEY
WHERE a.acid_test = 'Consistency_Durability'
GROUP BY o.O_ORDERKEY, o.O_TOTALPRICE,
l.L_ORDERKEY
ORDER BY o.O_ORDERKEY ASC

-- Select data from temporary table...
print ''
print 'Select all rows from temporary table'
print ''
SELECT o_orderkey 'O_OrderKey',
o_totalprice 'O_TotalPrice',
l_orderkey 'L_OrderKey',
lineitem_sum 'LineItem Sum'
FROM temp_dur2_output

print ''
print 'Select any rows where o_totalprice is not equal to
lineitem_sum'
print ''
SELECT *
FROM temp_dur2_output
WHERE o_totalprice <> lineitem_sum

print ''
print 'Timestamp for Durability 2 end:'
select convert(char(30), getdate(),9)
print ''

if exists ( select name from sysobjects where name =
'temp_dur2_output' )
drop table temp_dur2_output
GO

-- File: ATOM_C.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1999
-- Purpose: Atomicity commit test

declare @acid_test char(25),
@rand_o_key int,
@rand_l_key int,
@rand_delta tinyint

select @rand_o_key = acid_o_key,
@rand_l_key = acid_l_key,
@rand_delta = acid_delta
from acid_values
where acid_test= 'Atomicity_Commit'

select 'Random Values Used',
@rand_o_key "@RAND_O_KEY",
@rand_l_key "@RAND_L_KEY",
@rand_delta "@RAND_DELTA"

exec tran_w_com @rand_o_key,
@rand_l_key,
@rand_delta

GO

-- File: CON1.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1999
--
-- Consistency test 1
-- -----

```

Appendix C

```
--
-- Comment: ORDERS.O_TOTALPRICE should equal
LINEITEM sums

print ''
print 'Timestamp for Consistency 1 start:'
select convert(char(30), getdate(),9)
print ''

if exists ( select name from sysobjects where name =
'temp_con1_output' )
    drop table temp_con1_output

CREATE        TABLE temp_con1_output
              (
                o_orderkey
                int,
                o_totalprice
                money,
                l_orderkey
                int,
                lineitem_sum
                money
              )

INSERT INTO temp_con1_output
SELECT DISTINCT(o.O_ORDERKEY),
               cast(o.O_TOTALPRICE as decimal(20,3)),
               l.L_ORDERKEY,
               cast(sum(cast( cast(
cast(cast(cast(cast(L_EXTENDEDPRICE as
decimal(20,3))*100 as integer) as decimal(20,3)) * (1-
cast(L_DISCOUNT as decimal(20,3))) as integer) * (1 +
cast(L_TAX as decimal(20,3))) as integer) as
decimal(20,3))/100) as decimal(20,3))
FROM   acid_values a INNER JOIN ORDERS o
      ON a.acid_o_key = o.O_ORDERKEY JOIN LINEITEM
l
      ON o.O_ORDERKEY = l.L_ORDERKEY
WHERE  a.acid_test = 'Consistency_Durability'
GROUP BY o.O_ORDERKEY, o.O_TOTALPRICE,
l.L_ORDERKEY
ORDER BY o.O_ORDERKEY ASC

-- Select data from temporary table...
print ''
print 'Select all rows from temporary table'
print ''
SELECT        o_orderkey 'O_OrderKey',
               o_totalprice 'O_TotalPrice',
               l_orderkey 'L_OrderKey',
               lineitem_sum 'LineItem Sum'
FROM   temp_con1_output

print ''
print 'Select any rows where o_totalprice is not equal to
lineitem_sum'
print ''
SELECT        *
FROM   temp_con1_output
```

```
WHERE o_totalprice <> lineitem_sum

print ''
print 'Timestamp for Consistency 1 end:'
select convert(char(30), getdate(),9)
print ''

if exists ( select name from sysobjects where name =
'temp_con1_output' )
    drop table temp_con1_output
GO
-- File:  CON2.SQL
--      Microsoft TPC-H Benchmark Kit Ver. 2.00
--      Copyright Microsoft, 1999
--
-- Consistency test 2
-- -----
--
-- Comment: ORDERS.O_TOTALPRICE should equal
LINEITEM sums

print ''
print 'Timestamp for Consistency 2 start:'
select convert(char(30), getdate(),9)
print ''

if exists ( select name from sysobjects where name =
'temp_con2_output' )
    drop table temp_con2_output
GO

CREATE        TABLE temp_con2_output
              (
                o_orderkey
                int,
                o_totalprice
                money,
                l_orderkey
                int,
                lineitem_sum
                money
              )

INSERT INTO temp_con2_output
SELECT DISTINCT(o.O_ORDERKEY),
               cast(o.O_TOTALPRICE as decimal(20,3)),
               l.L_ORDERKEY,
               cast(sum(cast( cast(
cast(cast(cast(cast(L_EXTENDEDPRICE as
decimal(20,3))*100 as integer) as decimal(20,3)) * (1-
cast(L_DISCOUNT as decimal(20,3))) as integer) * (1 +
cast(L_TAX as decimal(20,3))) as integer) as
decimal(20,3))/100) as decimal(20,3))
FROM   acid_values a INNER JOIN ORDERS o
      ON a.acid_o_key = o.O_ORDERKEY JOIN LINEITEM
l
      ON o.O_ORDERKEY = l.L_ORDERKEY
WHERE  a.acid_test = 'Consistency_Durability'
```

Appendix C

```
GROUP BY o.O_ORDERKEY, o.O_TOTALPRICE,  
l.L_ORDERKEY  
ORDER BY o.O_ORDERKEY ASC
```

```
-- Select data from temporary table...
```

```
print ''
```

```
print 'Select all rows from temporary table'
```

```
print ''
```

```
SELECT      o_orderkey 'O_OrderKey',  
            o_totalprice 'O_TotalPrice',  
            l_orderkey 'L_OrderKey',  
            lineitem_sum 'LineItem Sum'  
FROM temp_con2_output
```

```
print ''
```

```
print 'Select any rows where o_totalprice is not equal to  
lineitem_sum'
```

```
print ''
```

```
SELECT      *  
FROM temp_con2_output  
WHERE o_totalprice <> lineitem_sum
```

```
print ''
```

```
print 'Timestamp for Consistency 1 end:'
```

```
select convert(char(30), getdate(),9)
```

```
print ''
```

```
if exists ( select name from sysobjects where name =  
'temp_con2_output' )
```

```
drop table temp_con2_output
```

```
GO
```

Appendix D: Query text and Output

Appendix D

(4 row(s) affected)

-- using default substitutions

/* TPC_H Query 2 - Minimum Cost Supplier */

```

SELECT      TOP 100
            S_ACCTBAL,
            S_NAME,
            N_NAME,
            P_PARTKEY,
            P_MFGR,
            S_ADDRESS,
            S_PHONE,
            S_COMMENT
FROM PART,
SUPPLIER,
PARTSUPP,
NATION,
REGION
WHERE P_PARTKEY = PS_PARTKEY AND
S_SUPPKEY = PS_SUPPKEY AND
P_SIZE = 15 AND
P_TYPE LIKE '%%BRASS' AND
S_NATIONKEY = N_NATIONKEY AND
N_REGIONKEY = R_REGIONKEY AND
R_NAME = 'EUROPE' AND
PS_SUPPLYCOST = ( SELECT
MIN(PS_SUPPLYCOST)
FROM PARTSUPP,
SUPPLIER,
NATION,
REGION
WHERE P_PARTKEY
= PS_PARTKEY AND
S_SUPPKEY
= PS_SUPPKEY AND
S_NATIONKEY
= N_NATIONKEY AND
N_REGIONKEY
= R_REGIONKEY AND
R_NAME
= 'EUROPE'
)
ORDER BY S_ACCTBAL DESC,
N_NAME,
S_NAME,
P_PARTKEY
S_ACCTBAL      S_NAME      N_NAME
P_PARTKEY P_MFGR      S_ADDRESS
S_PHONE      S_COMMENT
-----
9938.530000      Supplier#000005359      UNITED
KINGDOM      185358      Manufacturer#4
QKuHYh,vZGiwu2FWEJLDx04      33-429-790-

```

-- using default substitutions

/* TPC_H Query 1 - Pricing Summary Report */

```

SELECT      L_RETURNFLAG,
            L_LINESTATUS,
            SUM(L_QUANTITY)
            AS SUM_QTY,
            SUM(L_EXTENDEDPRICE)
            AS SUM_BASE_PRICE,
            SUM(L_EXTENDEDPRICE*(1-L_DISCOUNT))
            AS SUM_DISC_PRICE,
            SUM(L_EXTENDEDPRICE*(1-
L_DISCOUNT)*(1+L_TAX)) AS SUM_CHARGE,
            AVG(L_QUANTITY)
            AS AVG_QTY,
            AVG(L_EXTENDEDPRICE)
            AS AVG_PRICE,
            AVG(L_DISCOUNT)
            AS AVG_DISC,
            COUNT_BIG(*)
            AS COUNT_ORDER
FROM LINEITEM
WHERE L_SHIPDATE <= dateadd(dd, -90, '1998-12-01')
GROUP BY L_RETURNFLAG,
L_LINESTATUS
ORDER BY L_RETURNFLAG,
L_LINESTATUS

L_RETURNFLAG L_LINESTATUS SUM_QTY
SUM_BASE_PRICE      SUM_DISC_PRICE
SUM_CHARGE      AVG_QTY
AVG_PRICE      AVG_DISC
COUNT_ORDER
-----
-----
A      F      37734107.000000
56586554400.730270      53758257134.870018
55909065222.827507      25.522006      38273.129735
0.049985      1478493
N      F      991417.000000      1487504710.380001
1413082168.054100      1469649223.194374      25.516472
38284.467761      0.050093      38854
N      O      74476040.000000
111701729697.739430      106118230307.605160
110367043872.497770      25.502227      38249.117989
0.049997      2920374
R      F      37719753.000000
56568041380.899864      53741292684.604149
55889619119.832291      25.505794      38250.854626
0.050009      1478870

```

Appendix D

6131 blithely silent pinto beans are furiously. slyly final deposits across			packages across the ironic accounts grow slyly after the furiously
9937.840000	Supplier#000005969	ROMANIA	9739.860000
108438	Manufacturer#1		138357
ANDENSOSmk,miq23Xfb5RWt6dvUcvt6Qa		29-520-692-3537	carefully slow deposits use furiously. slyly ironic theodolites hag
692-3537			9721.950000
platelets above the ironic			KINGDOM
9936.220000	Supplier#000005250	UNITED	156241
KINGDOM	249	Manufacturer#4	Atg6GnM4dT2
B3rqp0xbSEim4Mpy2RH J		33-320-228-2957	33-821-407-2995
blithely special packages are. stealthily express deposits around the caref			even dolphins above the furiously ironic foxes sleep slyly
across the closely final instructi			9681.330000
9923.770000	Supplier#000002324	GERMANY	78405
29821	Manufacturer#4	y3OD9UywSTOk	Manufacturer#1
17-779-299-1839		quickly express packages breach quiet pinto beans. requ	.qUuXcftUI
9871.220000	Supplier#000006373	GERMANY	32-139-873-8571
43868	Manufacturer#5	J8fcXWstQm	furiously even deposits affix thinly special theodolites. furiou
17-813-485-8637		never silent deposits integrate furiously blit	9643.550000
9870.780000	Supplier#000001286	GERMANY	107617
81285	Manufacturer#2		Manufacturer#1
YKA,E2fjiVd7eUrzp2Ef8j1QxGo2DFnosaTEH		17-516-924-4574	kt4ciVFslx9z4s79p Js825
924-4574		final theodolites cajole slyly special,	29-252-617-4850
9870.780000	Supplier#000001286	GERMANY	doggedly even ideas boost furiously against the furiously express
181285	Manufacturer#4		9624.820000
YKA,E2fjiVd7eUrzp2Ef8j1QxGo2DFnosaTEH		17-516-924-4574	Supplier#000001816
924-4574		final theodolites cajole slyly special,	FRANCE
9852.520000	Supplier#000008973	RUSSIA	34306
18972	Manufacturer#2		Manufacturer#3
t5L67YdBYH6o,Vz24jpDyQ9		32-188-594-7038	e7vab91vLJPWxxZnewmnDBpDmxYHrb
quickly regular instructions wake-- carefully unusual braids into the expres			16-392-237-6726
9847.830000	Supplier#000008097	RUSSIA	blithely regular accounts cajole furiously. regular
130557	Manufacturer#2	xMe97bpE69NzdwLoX	9624.780000
32-375-640-3593		slyly regular dependencies sleep slyly furiously express dep	Supplier#000009658
9847.570000	Supplier#000006345	FRANCE	ROMANIA
86344	Manufacturer#1		189657
VSt3rzk3qG698u6ld8HhOByvrTcSTSvQIDQDag		16-886-766-7945	Manufacturer#1
766-7945		silent pinto beans should have to snooze carefully along the final reques	oE9uBgEfSS4opIcepXyAYM,x
9847.570000	Supplier#000006345	FRANCE	29-748-876-2014
173827	Manufacturer#2		regular deposits haggle. furiously express asympto
VSt3rzk3qG698u6ld8HhOByvrTcSTSvQIDQDag		16-886-766-7945	9612.940000
766-7945		silent pinto beans should have to snooze carefully along the final reques	Supplier#000003228
9836.930000	Supplier#000007342	RUSSIA	ROMANIA
4841	Manufacturer#4	JOIK7C1,7xrEZSSOw	120715
32-399-414-5385		final accounts haggle. bold accounts are furiously dugouts. furiously silent asymptotes are slyly	Manufacturer#2
9817.100000	Supplier#000002352	RUSSIA	KDdpNKN3cWu7ZSrbdq7AfSLxx,qWB
124815	Manufacturer#2	4LfoHUZjgEbAKw	29-325-784-8187
TgdKcgOc4D4uCYw		32-551-831-1437	carefully pending accounts serve. furiously close deposits boost slyly. q
packages across the ironic accounts grow slyly after the furiously			9612.940000
9817.100000	Supplier#000002352	RUSSIA	Supplier#000003228
152351	Manufacturer#3	4LfoHUZjgEbAKw	ROMANIA
TgdKcgOc4D4uCYw		32-551-831-1437	198189
blithely pending			Manufacturer#4
			KDdpNKN3cWu7ZSrbdq7AfSLxx,qWB
			29-325-784-8187
			carefully pending accounts serve. furiously close deposits boost slyly. q
			9571.830000
			Supplier#000004305
			ROMANIA
			179270
			Manufacturer#2
			qNHZ7WmCzygwMPRDO9Ps
			29-973-481-1831
			furiously final deposits
			9558.100000
			Supplier#000003532
			UNITED
			KINGDOM
			88515
			Manufacturer#4
			EOeuiOn21OVpTIGguufFDFsbN1p0lhpXHp
			33-152-301-2164
			daring, sly accounts breach about th
			9492.790000
			Supplier#000005975
			GERMANY
			25974
			Manufacturer#5
			S6mliCTx82z7IV
			17-992-579-4839
			always pending packages boost slyly.
			9461.050000
			Supplier#000002536
			UNITED
			KINGDOM
			20033
			Manufacturer#1
			8mmGbyzaU 7ZS2wJumTibypncu9pNkDc4FYA
			33-556-973-5522
			even foxes are quickly furiously express requests. packages
			9453.010000
			Supplier#000000802
			ROMANIA
			175767
			Manufacturer#1
			.6HYXb4uaHITmtMBj4Ak57Pd
			29-342-882-6463
			final, regular packages across the slowly regular packag
			9408.650000
			Supplier#000007772
			UNITED
			KINGDOM
			117771
			Manufacturer#4

Appendix D

AiC5YAH, gdu0i7	33-152-491-1126	blithely	9104.830000	Supplier#000008520	GERMANY
final ideas sleep carefully. requests are			150974	Manufacturer#4	RqRVDgD0ER J9
9359.610000	Supplier#000004856	ROMANIA	b41vR2,3		17-728-804-1793 deposits sleep
62349	Manufacturer#5	HYogcF3Jb yhl			carefully e
29-334-870-9731		carefully unusual packages sleep carefully	9101.000000	Supplier#000005791	ROMANIA
even ideas. dogged accoun			128254	Manufacturer#5	
9357.450000	Supplier#000006188	UNITED	zub2zCV,jhHPPQqi,P2INAjE1zI n66cOEoXFG		29-549-
KINGDOM	138648	Manufacturer#1	251-5384		carefully ironic packages after the
g801,ssP8wpTk4Hm		33-583-607-1633	9094.570000	Supplier#000004582	RUSSIA
carefully regular deposits wake carefully furiously even i			39575	Manufacturer#1	WB0XkCSG3r,mnQ
9352.040000	Supplier#000003439	GERMANY	n,h9Vixjir9ARHFvKgMDf		32-587-577-1351 asymptotes
170921	Manufacturer#4	qYPDgoiBGhCYxjgC			above the slyly even requests haggle furiously about the
17-128-996-4650		fluffily regular pinto beans wake. unusual,			regular accounts
final ideas c			8996.870000	Supplier#000004702	FRANCE
9312.970000	Supplier#000007807	RUSSIA	102191	Manufacturer#5	8XVcQK23akp
90279	Manufacturer#5		16-811-269-8946		stealthy requests haggle c
oGYMPCk9XHGB2PBfKRnHA		32-673-872-	8996.140000	Supplier#000009814	ROMANIA
5854		unusual asymptotes above the	139813	Manufacturer#2	
9312.970000	Supplier#000007807	RUSSIA	af0O5pg83IPU4IDVmEylXZVqYZQzSDIYLA mR		29-995-
100276	Manufacturer#5		571-8781		ironic theodolites are evenly unusual requests--
oGYMPCk9XHGB2PBfKRnHA		32-673-872-			pending pinto beans across the in
5854		unusual asymptotes above the	8968.420000	Supplier#000010000	ROMANIA
9280.270000	Supplier#000007194	ROMANIA	119999	Manufacturer#5	aTGLEusCiL4F
47193	Manufacturer#3	zhRUQkBSrFYxIAXTfInj	PDBdv665XBjHPyCOB0i		29-578-432-2146 furiously
vyGRQjeK		29-318-454-2133			final ideas believe furiously. furiously final ideas
despite the unusual ins			8936.820000	Supplier#000007043	UNITED
9274.800000	Supplier#000008854	RUSSIA	KINGDOM	109512	Manufacturer#1
76346	Manufacturer#3		FVajceZInZdbJE6Z9XsRUxrUEpiwHDrOXi,1Rz		33-784-
1xhLoOUM7I3mZ1mKnerw OSqdbb4QbGa		32-524-	177-8208		furiously regular excuses wake after the blithely
148-5221		ruthlessly ironic instructions along the regular,			special pinto beans? even instructions sl
furious requests integrate car			8929.420000	Supplier#000008770	FRANCE
9249.350000	Supplier#000003973	FRANCE	173735	Manufacturer#4	R7cG26TtXrHAP9
26466	Manufacturer#1		HckhfRi		16-242-746-9248 final accounts sleep
d18GiDsL6Wm2IsGXM,RZfljCsgZAOjNYVThTRP4		16-			furiously. blithely ironic foxes wake boldly across the
722-866-1658		quickly ironic sauternes use b			furiously s
9249.350000	Supplier#000003973	FRANCE	8920.590000	Supplier#000003967	ROMANIA
33972	Manufacturer#1		26460	Manufacturer#1	eHoAXe62SY9
d18GiDsL6Wm2IsGXM,RZfljCsgZAOjNYVThTRP4		16-	29-194-731-3944		quickly even requests should have to affix
722-866-1658		quickly ironic sauternes use b			blithely-- fur
9208.700000	Supplier#000007769	ROMANIA	8920.590000	Supplier#000003967	ROMANIA
40256	Manufacturer#5	rsimdze 5o9P Ht7xS	173966	Manufacturer#2	eHoAXe62SY9
29-964-424-9649		furiously ruthless epitaphs among the	29-194-731-3944		quickly even requests should have to affix
furiously regular accounts use slowly fluffily ev					blithely-- fur
9201.470000	Supplier#000009690	UNITED	8913.960000	Supplier#000004603	UNITED
KINGDOM	67183	Manufacturer#5	KINGDOM	137063	Manufacturer#2
BnUTlmi5zdeEl7R7		33-121-267-9529	OUzlvMUr7n,utLxmpNeYKsf3T24OXskxB5		33-789-
unusual accounts integrate slyly. platelets			255-7342		slyly ironic packages detect furious accounts. ironic
9192.100000	Supplier#000000115	UNITED	de		
KINGDOM	85098	Manufacturer#3	8877.820000	Supplier#000007967	FRANCE
2t0f7Ve,wL1,6WzGBJLNUCKIsV		33-597-248-1220	167966	Manufacturer#5	
slyly bold pinto beans boost across the furiously regular			A3pi1BARM4nx6R,qrwFoRPU		16-442-147-9345
packages. carefully regu					final deposits after the silent deposits ha
9189.980000	Supplier#000001226	GERMANY	8862.240000	Supplier#000003323	ROMANIA
21225	Manufacturer#4	qsLCqSvLyZfuXIpjz	73322	Manufacturer#3	W9 IYcsC9FwBqk3ItL
17-725-903-1381		final, express instruction	29-736-951-3710		unusual, pending theodolites integrate
9128.970000	Supplier#000004311	RUSSIA			furiously slyly even pinto beans. unusual sheaves sleep befor
146768	Manufacturer#5		8841.590000	Supplier#000005750	ROMANIA
I8IjnXd7NSJR594RxsRR0		32-155-440-7120	100729	Manufacturer#5	
regular pinto beans sleep ca			ErX3lAgu0g62iaHF9x50uMH4EgeN9hEG		29-344-502-

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5481 excuses after the blithely regular packages mold
carefully deposits. regular a
8781.710000 Supplier#000003121 ROMANIA
13120 Manufacturer#5
wNqTogx238ZYCamFb,50v,bj 4IbNFW9Bvw1xP 29-707-
291-5144 packages are quickly after the final, even packages.
furiously regular
8754.240000 Supplier#000009407 UNITED
KINGDOM 179406 Manufacturer#4
CHRCbkaWcf5B 33-903-970-9604 regular
dependencies haggle across the carefully bold
8691.060000 Supplier#000004429 UNITED
KINGDOM 126892 Manufacturer#2
k,BQms5UhoAF1B2Asi,fLib 33-964-337-5038
quickly special foxes against the furiously silent platelets
wake quickly after t
8655.990000 Supplier#000006330 RUSSIA
193810 Manufacturer#2
UozlaENR0ytKe2w6CeIEWFWn iO3S8Rae7Ou 32-561-
198-3705 blithely even packages alongside
8638.360000 Supplier#000002920 RUSSIA
75398 Manufacturer#1 Je2a8bszf3L
32-122-621-7549 express deposits wake. furiously silent
requests wake carefully silent instru
8638.360000 Supplier#000002920 RUSSIA
170402 Manufacturer#3 Je2a8bszf3L
32-122-621-7549 express deposits wake. furiously silent
requests wake carefully silent instru
8607.690000 Supplier#000006003 UNITED
KINGDOM 76002 Manufacturer#2
EH9wADcEiuenM0NR08zDwMidw,52Y2RyILEiA 33-
416-807-5206 always special foxes wake slyly bold, ironic
accounts. ironic instructions affix carefull
8569.520000 Supplier#000005936 RUSSIA
5935 Manufacturer#5
jXaNZ6vwnEWJ2ksLZJpjtgt0bY2a3AU 32-644-251-
7916 packages sleep furiously. special requests about the
fluffily even accounts detect
8564.120000 Supplier#000000033 GERMANY
110032 Manufacturer#1
gfeKpYw3400L0SDywXA6Ya1Qmq1w6YB9f3R 17-138-
897-9374 ironic instructions are. special pearls above
8553.820000 Supplier#000003979 ROMANIA
143978 Manufacturer#4
BfmVhCAnCMY3zpjUMy4CNWs9 HzpdQR7INJU 29-
124-646-4897 express, ironic pinto beans cajole around the
express, even packages. qu
8517.230000 Supplier#000009529 RUSSIA
37025 Manufacturer#5 e44R8o7JAIS9iMcr
32-565-297-8775 furiously silent requests cajole furiously
furiously ironic foxes. slyly express p
8517.230000 Supplier#000009529 RUSSIA
59528 Manufacturer#2 e44R8o7JAIS9iMcr
32-565-297-8775 furiously silent requests cajole furiously
furiously ironic foxes. slyly express p
8503.700000 Supplier#000006830 RUSSIA
44325 Manufacturer#4 BC4WFCYRUZyalgchU
4S 32-147-878-5069 quickly regular excuses
detect evenly around

8457.090000 Supplier#000009456 UNITED
KINGDOM 19455 Manufacturer#1
7SBhZs8gP1cJtT0Qf433YBk 33-858-440-4349
carefully final accounts sleep blithely special foxes. slyly
regular pinto beans alon
8441.400000 Supplier#000003817 FRANCE
141302 Manufacturer#2 hU3fz3xL78
16-339-356-5115 blithely blithe ideas are
8432.890000 Supplier#000003990 RUSSIA
191470 Manufacturer#1
wehBBp1RQbfxAyDASS75MsywmsKHRVdkrvNe6m 32-
839-509-9301 final requests along the blithely ironic packages
kindle against the carefully fina
8431.400000 Supplier#000002675 ROMANIA
5174 Manufacturer#1
HJFStOu9R5NGPOegKhgzbzBdyvrG2yh8w 29-474-643-
1443 express, final deposits cajole carefully. stealthily unusual
requests
8407.040000 Supplier#000005406 RUSSIA
162889 Manufacturer#4 j7 gYF5RW8DC5UrkKC
32-626-152-4621 quickly final sheaves boost. car
8386.080000 Supplier#000008518 FRANCE
36014 Manufacturer#3
2jqzqqAVe9crMVGp,n9nTsQXulNLTUYoJjEDcqWV 16-
618-780-7481 slyly ironic theodolites are slyly. dogged,
pendin
8376.520000 Supplier#000005306 UNITED
KINGDOM 190267 Manufacturer#5 9t8Y8
QqSIsoADPt6NLdk,TP5zyRx41oBUlgoGc9 33-632-514-
7931 furiously even instructions integrate during the furiously
regular re
8348.740000 Supplier#000008851 FRANCE
66344 Manufacturer#4 nWxi7GwEbjhw1
16-796-240-2472 ironic instructions nag slyly against the
slyly even theodolites. requests alongside of
8338.580000 Supplier#000007269 FRANCE
17268 Manufacturer#4 ZwhJSwABUoiB04,3
16-267-277-4365 ruthlessly regular asymptotes a
8328.460000 Supplier#000001744 ROMANIA
69237 Manufacturer#5
oLo3fV64q2,FKHa3p,qHnS7Yzv,ps8 29-330-728-5873
blithely silent excuses are slyly above the furiously even
courts
8307.930000 Supplier#000003142 GERMANY
18139 Manufacturer#1 dqblvV8dCNAorGIJ
17-595-447-6026 theodolites sleep blithely carefully regular
warhorses. slyly regular ins
8231.610000 Supplier#000009558 RUSSIA
192000 Manufacturer#2 mcdgen,yT1iJDHDS5fv
32-762-137-5858 slyly regular theodolites sleep fluffily
express depos
8152.610000 Supplier#000002731 ROMANIA
15227 Manufacturer#4 nluXJCuY1tu
29-805-463-2030 gifts use. slyly silent ideas are carefully
beneath the silent instructions. slyly sil
8109.090000 Supplier#000009186 FRANCE
99185 Manufacturer#1
wgfosrVPexI9pEXWyaqlBMDYYf 16-668-570-

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1402 quickly pending requests are blithely along the ironic, final requests; instr
 8102.620000 Supplier#000003347 UNITED
 KINGDOM 18344 Manufacturer#5 m
 CtXS2S16i 33-454-274-8532 packages
 grow special orbits. regular theodolites about the carefully pe
 8046.070000 Supplier#000008780 FRANCE
 191222 Manufacturer#3 AczzuE0UK9osj ,Lx0Jmh
 16-473-215-6395 regular epitaphs integrate slyly.
 8042.090000 Supplier#000003245 RUSSIA
 135705 Manufacturer#4
 Dh8IkG39onrbOL4DyTfGw8a9oKUX3d9Y 32-836-132-
 8872 carefully regular instructions integrate blithely silent
 foxes. furiously express instructions hagg
 8042.090000 Supplier#000003245 RUSSIA
 150729 Manufacturer#1
 Dh8IkG39onrbOL4DyTfGw8a9oKUX3d9Y 32-836-132-
 8872 carefully regular instructions integrate blithely silent
 foxes. furiously express instructions hagg
 7992.400000 Supplier#000006108 FRANCE
 118574 Manufacturer#1 8tBydnTDwUqfBfFV413
 16-974-998-8937 regular pinto beans are after
 7980.650000 Supplier#000001288 FRANCE
 13784 Manufacturer#4 zE,7HgVPrCn
 16-646-464-8247 unusual pinto beans cajole furiously
 according t
 7950.370000 Supplier#000008101 GERMANY
 33094 Manufacturer#5 kkYvL6IuvojJgTNG
 IKkaXQDYgx8ILohj 17-627-663-8014 quickly regular
 requests are furiously. pending deposits wake
 7937.930000 Supplier#000009012 ROMANIA
 83995 Manufacturer#2
 iUiTziH,Ek3i4lwSgunXMgrcTzwdb 29-250-925-9690
 blithely bold ideas haggle quickly final, regular request
 7914.450000 Supplier#000001013 RUSSIA
 125988 Manufacturer#2
 riRcntps4KEDtYScjpMIWeYF6mNnR 32-194-698-
 3365 final, ironic theodolites alongside of the ironic
 7912.910000 Supplier#000004211 GERMANY
 159180 Manufacturer#5
 2wQRVovHrm3,v03IKzfTd,1PYsFXQFFOG 17-266-
 947-7315 final requests integrate slyly above the silent, even
 7912.910000 Supplier#000004211 GERMANY
 184210 Manufacturer#4
 2wQRVovHrm3,v03IKzfTd,1PYsFXQFFOG 17-266-
 947-7315 final requests integrate slyly above the silent, even
 7894.560000 Supplier#000007981 GERMANY
 85472 Manufacturer#4 NSJ96vMROAbeXP
 17-963-404-3760 regular, even theodolites integrate carefully.
 bold, special theodolites are slyly fluffily iron
 7887.080000 Supplier#000009792 GERMANY
 164759 Manufacturer#3
 Y28ITVeYriT3kiGdV2K8fSZ V2UqT5H1Otz 17-988-
 938-4296 pending, ironic packages sleep among the carefully
 ironic accounts. quickly final accounts
 7871.500000 Supplier#000007206 RUSSIA
 104695 Manufacturer#1 3w
 fNCnrVmvJjE95sgWZzvW 32-432-452-7731

furiously dogged pinto beans cajole. bold, express notornis
 until the slyly pending
 7852.450000 Supplier#000005864 RUSSIA
 8363 Manufacturer#4 WCNfBPZeSXh3h,c
 32-454-883-3821 blithely regular deposits
 7850.660000 Supplier#000001518 UNITED
 KINGDOM 86501 Manufacturer#1
 ONda3YJiHKJOC 33-730-383-3892
 furiously final accounts wake carefully idle requests. even
 dolphins wake acc
 7843.520000 Supplier#000006683 FRANCE
 11680 Manufacturer#4
 2Z0JGkiv01Y00oCFwUGfviIbhzcDy 16-464-517-
 8943 carefully bold accounts doub

(100 row(s) affected)

-- using default substitutions

/* TPC_H Query 3 - Shipping Priority */

```

SELECT      TOP 10
            L_ORDERKEY,
            SUM(L_EXTENDEDPRICE*(1-L_DISCOUNT))
            AS REVENUE,
            O_ORDERDATE,
            O_SHIPPRIORITY
FROM        CUSTOMER,
            ORDERS,
            LINEITEM
WHERE      C_MKTSEGMENT = 'BUILDING' AND
            C_CUSTKEY = O_CUSTKEY AND
            L_ORDERKEY = O_ORDERKEY AND
            O_ORDERDATE < '1995-03-15' AND
            L_SHIPDATE > '1995-03-15'
GROUP BY   L_ORDERKEY,
            O_ORDERDATE,
            O_SHIPPRIORITY
ORDER BY   REVENUE DESC,
            O_ORDERDATE
L_ORDERKEY REVENUE
O_ORDERDATE O_SHIPPRIORITY
-----
2456423      406181.011100      1995-03-05
00:00:00.000 0
3459808      405838.698900      1995-03-04
00:00:00.000 0
492164      390324.061000      1995-02-19
00:00:00.000 0
1188320      384537.935900      1995-03-09
00:00:00.000 0
2435712      378673.055800      1995-02-26
00:00:00.000 0
4878020      378376.795200      1995-03-12
00:00:00.000 0
5521732      375153.921500      1995-03-13
00:00:00.000 0

```

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```

2628192      373133.309400      1995-02-22
00:00:00.000 0
993600      371407.459500      1995-03-05
00:00:00.000 0
2300070      367371.145200      1995-03-13
00:00:00.000 0

```

(10 row(s) affected)

-- using default substitutions

/* TPC_H Query 4 - Order Priority Checking */

```

SELECT      O_ORDERPRIORITY,
            COUNT(*)          AS ORDER_COUNT
FROM  ORDERS
WHERE O_ORDERDATE >= '1993-07-01' AND
      O_ORDERDATE < dateadd (mm, 3, '1993-
07-01') AND
      EXISTS (
        SELECT      *
        FROM  LINEITEM
        WHERE L_ORDERKEY
              = O_ORDERKEY AND
              L_COMMITDATE < L_RECEIPTDATE
      )
GROUP BY   O_ORDERPRIORITY
ORDER BY   O_ORDERPRIORITY
           O_ORDERPRIORITY ORDER_COUNT

```

```

-----
1-URGENT      10594
2-HIGH        10476
3-MEDIUM     10410
4-NOT SPECIFIED 10556
5-LOW         10487

```

(5 row(s) affected)

-- using default substitutions

/* TPC_H Query 5 - Local Supplier Volume */

```

SELECT      N_NAME,
            SUM(L_EXTENDEDPRI*(1-L_DISCOUNT))
            AS REVENUE
FROM  CUSTOMER,
      ORDERS,
      LINEITEM,
      SUPPLIER,
      NATION,
      REGION
WHERE C_CUSTKEY = O_CUSTKEY AND
      L_ORDERKEY = O_ORDERKEY AND
      L_SUPPKEY = S_SUPPKEY AND
      C_NATIONKEY = S_NATIONKEY AND
      S_NATIONKEY = N_NATIONKEY AND
      N_REGIONKEY = R_REGIONKEY AND
      R_NAME = 'ASIA' AND
      O_ORDERDATE >= '1994-01-01' AND

```

```

O_ORDERDATE < DATEADD(YY, 1,
'1994-01-01')
GROUP BY   N_NAME
ORDER BY   REVENUE DESC
N_NAME     REVENUE

```

```

-----
INDONESIA    55502041.169700
VIETNAM     55295086.996700
CHINA       53724494.256600
INDIA       52035512.000200
JAPAN       45410175.695400

```

(5 row(s) affected)

-- using default substitutions

/* TPC_H Query 6 - Forecasting Revenue Change */

```

SELECT      SUM(L_EXTENDEDPRI*L_DISCOUNT)
            AS REVENUE
FROM  LINEITEM
WHERE L_SHIPDATE >= '1994-01-01' AND
      L_SHIPDATE < dateadd (yy, 1, '1994-01-01')
AND
      L_DISCOUNT BETWEEN .06 - 0.01 AND .06 +
0.01 AND
      L_QUANTITY < 24
REVENUE

```

```

-----
123141078.228300

```

(1 row(s) affected)

-- using default substitutions

/* TPC_H Query 7 - Volume Shipping */

```

SELECT      SUPP_NATION,
            CUST_NATION,
            L_YEAR,
            SUM(VOLUME) AS REVENUE
FROM  (
        SELECT      N1.N_NAME
        AS SUPP_NATION,
                   N2.N_NAME
        AS CUST_NATION,
                   datepart(yy,L_SHIPDATE)
        AS L_YEAR,
                   L_EXTENDEDPRI*(1-
L_DISCOUNT) AS VOLUME
        FROM  SUPPLIER,
              LINEITEM,
              ORDERS,
              CUSTOMER,
              NATION N1,
              NATION N2
        WHERE S_SUPPKEY = L_SUPPKEY
      )
AND

```

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```

O_ORDERKEY =
L_ORDERKEY AND
AND
S_NATIONKEY =
N1.N_NATIONKEY AND
C_NATIONKEY=
N2.N_NATIONKEY AND
( (N1.N_NAME =
'FRANCE' AND N2.N_NAME = 'GERMANY')
OR
(N1.N_NAME =
'GERMANY' AND N2.N_NAME = 'FRANCE')
) AND
L_SHIPDATE BETWEEN
'1995-01-01' AND '1996-12-31'
) AS SHIPPING
GROUP BY SUPP_NATION,
CUST_NATION,
L_YEAR
ORDER BY SUPP_NATION,
CUST_NATION,
L_YEAR
SUPP_NATION CUST_NATION L_YEAR
REVENUE
-----

```

```

FRANCE GERMANY 1995
54639732.733600
FRANCE GERMANY 1996
54633083.307600
GERMANY FRANCE 1995
52531746.669700
GERMANY FRANCE 1996
52520549.022400

```

(4 row(s) affected)

-- using default substitutions

/* TPC_H Query 8 - National Market Share */

```

SELECT O_YEAR,
SUM(CASE WHEN NATION =
'BRAZIL'
THEN VOLUME
ELSE 0
END) / SUM(VOLUME) AS
MKT_SHARE
FROM ( SELECT
datepart(yy,O_ORDERDATE) AS
O_YEAR,
L_EXTENDEDPRICE * (1-
L_DISCOUNT) AS VOLUME,
N2.N_NAME
AS NATION
FROM PART,
SUPPLIER,
LINEITEM,

```

```

ORDERS,
CUSTOMER,
NATION N1,
NATION N2,
REGION
WHEREP_PARTKEY = L_PARTKEY
AND
S_SUPPKEY = L_SUPPKEY
AND
L_ORDERKEY =
O_ORDERKEY AND
O_CUSTKEY = C_CUSTKEY
AND
C_NATIONKEY=
N1.N_NATIONKEY AND
N1.N_REGIONKEY =
R_REGIONKEY AND
R_NAME =
'AMERICA' AND
S_NATIONKEY =
N2.N_NATIONKEY AND
O_ORDERDATE
BETWEEN '1995-01-01' AND '1996-12-31' AND
P_TYPE = 'ECONOMY

```

```

ANODIZED STEEL'
) AS ALL_NATIONS
GROUP BY O_YEAR
ORDER BY O_YEAR
O_YEAR MKT_SHARE
-----

```

```

1995 0.034436
1996 0.041486

```

(2 row(s) affected)

-- using default substitutions

/* TPC_H Query 9 - Product Type Profit Measure */

```

SELECT NATION,
O_YEAR,
SUM(AMOUNT) AS SUM_PROFIT
FROM ( SELECT N_NAME
AS NATION,
datepart(yy, O_ORDERDATE)
AS O_YEAR,
L_EXTENDEDPRICE*(1-
L_DISCOUNT)-PS_SUPPLYCOST*L_QUANTITY
AS AMOUNT
FROM PART,
SUPPLIER,
LINEITEM,
PARTSUPP,
ORDERS,
NATION
WHERE S_SUPPKEY = L_SUPPKEY
AND
PS_SUPPKEY = L_SUPPKEY
AND

```

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AND	PS_PARTKEY = L_PARTKEY		ETHIOPIA	1998	28040717.267400
			ETHIOPIA	1997	47455009.866400
AND	P_PARTKEY = L_PARTKEY		ETHIOPIA	1996	46491097.572900
			ETHIOPIA	1995	46804449.300900
L_ORDERKEY AND	O_ORDERKEY =		ETHIOPIA	1994	48516143.917000
			ETHIOPIA	1993	46551891.562900
N_NATIONKEY AND	S_NATIONKEY =		ETHIOPIA	1992	44934648.642800
			FRANCE	1998	32226407.839200
	P_NAME	LIKE	FRANCE	1997	47121485.860200
'%%green%%'			FRANCE	1996	47263135.496000
)	AS PROFIT		FRANCE	1995	47275997.570700
GROUP BY	NATION,		FRANCE	1994	47067209.331500
	O_YEAR		FRANCE	1993	51163370.106200
ORDER BY	NATION,		FRANCE	1992	47846235.331300
	O_YEAR	DESC	GERMANY	1998	28624942.659800
NATION	O_YEAR	SUM_PROFIT	GERMANY	1997	49309074.877300
-----			GERMANY	1996	49918683.168400
ALGERIA	1998	31342867.234500	GERMANY	1995	52650718.724200
ALGERIA	1997	57138193.023300	GERMANY	1994	50346900.422600
ALGERIA	1996	56140140.133000	GERMANY	1993	50991895.805900
ALGERIA	1995	53051469.653400	GERMANY	1992	48274126.099100
ALGERIA	1994	53867582.128600	INDIA	1998	29943144.354400
ALGERIA	1993	54942718.132400	INDIA	1997	50665453.231200
ALGERIA	1992	54628034.712700	INDIA	1996	50283092.291200
ARGENTINA	1998	30211185.708100	INDIA	1995	50006774.644600
ARGENTINA	1997	50805741.752300	INDIA	1994	48995190.755600
ARGENTINA	1996	51923746.575500	INDIA	1993	50286902.852500
ARGENTINA	1995	49298625.766600	INDIA	1992	50850329.402300
ARGENTINA	1994	50835610.109500	INDONESIA	1998	27672339.996500
ARGENTINA	1993	51646079.177500	INDONESIA	1997	50512145.725600
ARGENTINA	1992	50410314.994800	INDONESIA	1996	51653060.116600
BRAZIL	1998	27217924.383200	INDONESIA	1995	51508779.594000
BRAZIL	1997	48378669.198900	INDONESIA	1994	52817950.321800
BRAZIL	1996	50482870.357200	INDONESIA	1993	47959994.955100
BRAZIL	1995	47623383.634900	INDONESIA	1992	51776605.032300
BRAZIL	1994	47840165.725600	IRAN	1998	29065736.238100
BRAZIL	1993	49054694.035100	IRAN	1997	50042063.054500
BRAZIL	1992	48667639.084200	IRAN	1996	50926653.188100
CANADA	1998	30379833.768500	IRAN	1995	51249667.648500
CANADA	1997	50465052.311400	IRAN	1994	50337085.865000
CANADA	1996	52560501.390400	IRAN	1993	51730763.490200
CANADA	1995	52375332.809200	IRAN	1992	49955856.563400
CANADA	1994	52600364.658700	IRAQ	1998	31624551.001700
CANADA	1993	52644504.073500	IRAQ	1997	55121749.019500
CANADA	1992	53932871.697000	IRAQ	1996	55897663.793700
CHINA	1998	31075466.164900	IRAQ	1995	54815472.517000
CHINA	1997	50551874.449900	IRAQ	1994	54408516.126600
CHINA	1996	51039293.875400	IRAQ	1993	53633167.977000
CHINA	1995	49287534.616900	IRAQ	1992	55891939.339600
CHINA	1994	50851090.067400	JAPAN	1998	27934179.669500
CHINA	1993	54229629.833000	JAPAN	1997	44517162.546300
CHINA	1992	52400529.372000	JAPAN	1996	42545606.120400
EGYPT	1998	29054433.385600	JAPAN	1995	43749356.399600
EGYPT	1997	50627611.452400	JAPAN	1994	44840243.070000
EGYPT	1996	49542212.844600	JAPAN	1993	44660015.532800
EGYPT	1995	48311550.320700	JAPAN	1992	45410249.121600
EGYPT	1994	49790644.736000	JORDAN	1998	26901488.578100
EGYPT	1993	48904292.969200	JORDAN	1997	45471878.409900
EGYPT	1992	49434932.619200	JORDAN	1996	46794325.791800

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JORDAN	1995	45178828.576000
JORDAN	1994	45333636.507600
JORDAN	1993	47971496.097900
JORDAN	1992	44717239.177400
KENYA	1998	28597614.337000
KENYA	1997	47949733.727400
KENYA	1996	46886924.622900
KENYA	1995	46072338.755200
KENYA	1994	45772061.171100
KENYA	1993	46308728.234500
KENYA	1992	47257780.840600
MOROCCO	1998	26732115.580000
MOROCCO	1997	45637304.249900
MOROCCO	1996	45558221.745100
MOROCCO	1995	47851318.887400
MOROCCO	1994	46272172.944500
MOROCCO	1993	46764326.181800
MOROCCO	1992	48122783.583100
MOZAMBIQUE	1998	30712392.011200
MOZAMBIQUE	1997	50316528.762500
MOZAMBIQUE	1996	51640320.250900
MOZAMBIQUE	1995	50693774.506000
MOZAMBIQUE	1994	49253277.626000
MOZAMBIQUE	1993	49153016.536700
MOZAMBIQUE	1992	48247551.850300
PERU	1998	29326102.319600
PERU	1997	49753780.395100
PERU	1996	50935170.292700
PERU	1995	53309883.407200
PERU	1994	50643531.796800
PERU	1993	51584622.002000
PERU	1992	47523899.054700
ROMANIA	1998	30368667.399900
ROMANIA	1997	50365683.852600
ROMANIA	1996	49598999.014800
ROMANIA	1995	47537642.869700
ROMANIA	1994	51455283.009500
ROMANIA	1993	50407136.892200
ROMANIA	1992	48185385.128600
RUSSIA	1998	28322384.026600
RUSSIA	1997	50106685.182200
RUSSIA	1996	51753342.430200
RUSSIA	1995	49215820.364700
RUSSIA	1994	52205666.440700
RUSSIA	1993	51860230.034000
RUSSIA	1992	53251677.153000
SAUDI ARABIA	1998	31541259.810000
SAUDI ARABIA	1997	52438750.807600
SAUDI ARABIA	1996	52543737.819700
SAUDI ARABIA	1995	52938696.533100
SAUDI ARABIA	1994	51389601.966800
SAUDI ARABIA	1993	52937508.881800
SAUDI ARABIA	1992	54843459.641400
UNITED KINGDOM	1998	28494874.004000
UNITED KINGDOM	1997	49381810.898600
UNITED KINGDOM	1996	51386853.960400
UNITED KINGDOM	1995	51509586.788500
UNITED KINGDOM	1994	48086499.711500
UNITED KINGDOM	1993	49166827.223500

UNITED KINGDOM	1992	49349122.082500
UNITED STATES	1998	25126238.946100
UNITED STATES	1997	50077306.418600
UNITED STATES	1996	48048649.470300
UNITED STATES	1995	48809032.422600
UNITED STATES	1994	49296747.182700
UNITED STATES	1993	48029946.801400
UNITED STATES	1992	48671944.498300
VIETNAM	1998	30442736.059400
VIETNAM	1997	50309179.794200
VIETNAM	1996	50488161.410000
VIETNAM	1995	49658284.612500
VIETNAM	1994	50596057.260700
VIETNAM	1993	50953919.151900
VIETNAM	1992	49613838.315100

(175 row(s) affected)

-- using default substitutions

/* TPC_H Query 10 - Returned Item Reporting */

```

SELECT      TOP 20
            C_CUSTKEY,
            C_NAME,
            SUM(L_EXTENDEDPRICE*(1-L_DISCOUNT))
            AS REVENUE,
            C_ACCTBAL,
            N_NAME,
            C_ADDRESS,
            C_PHONE,
            C_COMMENT
FROM        CUSTOMER,
            ORDERS,
            LINEITEM,
            NATION
WHERE      C_CUSTKEY = O_CUSTKEY           AND
            L_ORDERKEY = O_ORDERKEY
            AND
            O_ORDERDATE >= '1993-10-01'
            AND
            O_ORDERDATE < dateadd(mm, 3, '1993-
10-01') AND
            L_RETURNFLAG = 'R'
            AND
            C_NATIONKEY = N_NATIONKEY
GROUP BY   C_CUSTKEY,
            C_NAME,
            C_ACCTBAL,
            C_PHONE,
            N_NAME,
            C_ADDRESS,
            C_COMMENT
ORDER BY   REVENUE      DESC
            C_CUSTKEY  C_NAME      REVENUE
            C_ACCTBAL  N_NAME      C_ADDRESS
            C_PHONE    C_COMMENT
-----
-----

```

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```

-----
57040 Customer#000057040 734235.245500
632.870000 JAPAN Eioyzjf4pp
22-895-641-3466 requests sleep blithely about the furiously i
143347 Customer#000143347 721002.694800
2557.470000 EGYPT 1aReFYv,Kw4
14-742-935-3718 fluffily bold excuses haggle finally after the
u
60838 Customer#000060838 679127.307700
2454.770000 BRAZIL
64EaJ5vMAHWJIBOXJklpNc2RJiWE 12-913-494-
9813 furiously even pinto beans integrate under the ruthless
foxes; ironic, even dolphins across the slyl
101998 Customer#000101998 637029.566700
3790.890000 UNITED KINGDOM
01c9CILnNtfOQYmZj 33-593-865-6378
accounts doze blithely! enticing, final deposits sleep blithely
special accounts. slyly express accounts pla
125341 Customer#000125341 633508.086000
4983.510000 GERMANY
S29ODD6bceU8QSuueJznkNaK 17-582-695-5962
quickly express requests wake quickly blithely
25501 Customer#000025501 620269.784900
7725.040000 ETHIOPIA
W556MXuoiaYCCZamJI,Rn0B4ACUGdkQ8DZ 15-874-
808-6793 quickly special requests sleep evenly among the
special deposits. special deposi
115831 Customer#000115831 596423.867200
5098.100000 FRANCE rFeBbEEYk dl
ne7zV5fDrmiq1oK09wV7pxqCgIc 16-715-386-3788
carefully bold excuses sleep alongside of the thinly idle
84223 Customer#000084223 594998.023900
528.650000 UNITED KINGDOM
nAVZCs6BaWap rrM27N 2qBnzc5WBauxbA 33-442-
824-8191 pending, final ideas haggle final requests. unusual,
regular asymptotes affix according to the even foxes.
54289 Customer#000054289 585603.391800
5583.020000 IRAN
vXCxocsU0Bad5JQI ,oobkZ 20-834-292-4707
express requests sublata blithely regular requests. regular,
even ideas solve.
39922 Customer#000039922 584878.113400
7321.110000 GERMANY
Zgy4s50I2GKN4pLDPBU8m342gIw6R 17-147-757-
8036 even pinto beans haggle. slyly bold accounts inte
6226 Customer#000006226 576783.760600
2230.090000 UNITED KINGDOM
8gPu8,NPGkfyQQ0hcIYUGPIBwC,ybP5g, 33-657-701-
3391 quickly final requests against the regular instructions
wake blithely final instructions. pa
922 Customer#000000922 576767.533300
3869.250000 GERMANY
Az9RFaut7NkPnc5zSD2PwHgVwr4jRzq 17-945-916-
9648 boldly final requests cajole blith
147946 Customer#000147946 576455.132000
2030.130000 ALGERIA
iANyZHjqhy7Ajah0pTrYyhJ 10-886-956-3143
furiously even accounts are blithely above the furiousl
-----
115640 Customer#000115640 569341.193300
6436.100000 ARGENTINA Vtgfia9qI
7EpHgecU1X 11-411-543-4901 final instructions
are slyly according to the
73606 Customer#000073606 568656.857800
1785.670000 JAPAN
xuR0Tro5yChDfOCrjkd2ol 22-437-653-6966
furiously bold orbits about the furiously busy requests wake
across the furiously quiet theodolites. d
110246 Customer#000110246 566842.981500
7763.350000 VIETNAM 7KzflgX
MDOq7sOkI 31-943-426-9837 dolphins sleep
blithely among the slyly final
142549 Customer#000142549 563537.236800
5085.990000 INDONESIA
ChqEoK43OysjdHbtKCp6dKqjNyvvi9 19-955-562-
2398 regular, unusual dependencies boost slyly; ironic
attainments nag fluffily into the unusual packages?
146149 Customer#000146149 557254.986500
1791.550000 ROMANIA s87fvzFQpU
29-744-164-6487 silent, unusual requests detect quickly slyly
regul
52528 Customer#000052528 556397.350900
551.790000 ARGENTINA
NFztyTOR10UOJ 11-208-192-3205 unusual
requests detect. slyly dogged theodolites use slyly. deposit
23431 Customer#000023431 554269.536000
3381.860000 ROMANIA
HgiV0phqhaIa9aydNoIib 29-915-458-2654
instructions nag quickly. furiously bold accounts cajol

(20 row(s) affected)

-- using default substitutions

/* TPC_H Query 11 - Important Stock Identification */
SELECT PS_PARTKEY,
SUM(PS_SUPPLYCOST*PS_AVAILQTY)
AS VALUE
FROM PARTSUPP,
SUPPLIER,
NATION
WHEREPS_SUPPKEY = S_SUPPKEY AND
S_NATIONKEY = N_NATIONKEY AND
N_NAME = 'GERMANY'
GROUP BY PS_PARTKEY
HAVING
SUM(PS_SUPPLYCOST*PS_AVAILQTY) >
(
SELECT
SUM(PS_SUPPLYCOST*PS_AVAILQTY) *
0.0001000000
FROM PARTSUPP,
SUPPLIER,
NATION
WHEREPS_SUPPKEY =
S_SUPPKEY AND
S_NATIONKEY =
N_NATIONKEY AND

```


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```

= 'GERMANY'
)
ORDER BY VALUE DESC
PS_PARTKEY VALUE
-----

```

```

129760 17538456.860000
166726 16503353.920000
191287 16474801.970000
161758 16101755.540000
34452 15983844.720000
139035 15907078.340000
9403 15451755.620000
154358 15212937.880000
38823 15064802.860000
85606 15053957.150000
33354 14408297.400000
154747 14407580.680000
82865 14235489.780000
76094 14094247.040000
222 13937777.740000
121271 13908336.000000
55221 13716120.470000
22819 13666434.280000
76281 13646853.680000
85298 13581154.930000
85158 13554904.000000
139684 13535538.720000
31034 13498025.250000
87305 13482847.040000
10181 13445148.750000
62323 13411824.300000
26489 13377256.380000
96493 13339057.830000
56548 13329014.970000
55576 13306843.350000
159751 13306614.480000
92406 13287414.500000
182636 13223726.740000
199969 13135288.210000
62865 13001926.940000
7284 12945298.190000
197867 12944510.520000
11562 12931575.510000
75165 12916918.120000
97175 12911283.500000
140840 12896562.230000
65241 12890600.460000
166120 12876927.220000
9035 12863828.700000

```

..... Additional Rows Deleted

```

146699 7929167.400000
92387 7928972.670000
186289 7928786.190000
95952 7927972.780000
196514 7927180.700000

```

```

N_NAME 4403 7925729.040000
2267 7925649.370000
45924 7925047.680000
11493 7916722.230000
104478 7916253.600000
166794 7913842.000000
161995 7910874.270000
23538 7909752.060000
41093 7909579.920000
112073 7908617.570000
92814 7908262.500000
88919 7907992.500000
79753 7907933.880000
108765 7905338.980000
146530 7905336.600000
71475 7903367.580000
36289 7901946.500000
61739 7900794.000000
52338 7898638.080000
194299 7898421.240000
105235 7897829.940000
77207 7897752.720000
96712 7897575.270000
10157 7897046.250000
171154 7896814.500000
79373 7896186.000000
113808 7893353.880000
27901 7892952.000000
128820 7892882.720000
25891 7890511.200000
122819 7888881.020000
154731 7888301.330000
101674 7879324.600000
51968 7879102.210000
72073 7877736.110000
5182 7874521.730000

```

(1048 row(s) affected)

-- using default substitutions

/* TPC_H Query 12 - Shipping Modes and Order Priority */

```

SELECT      L_SHIPMODE,
            SUM( CASE WHEN O_ORDERPRIORITY =
'1-URGENT' OR
                O_ORDERPRIORITY = '2-
HIGH'
                THEN 1
                ELSE 0
            END) AS HIGH_LINE_COUNT,
            SUM( CASE WHEN O_ORDERPRIORITY <>
'1-URGENT' AND
                O_ORDERPRIORITY <> '2-
HIGH'
                THEN 1
                ELSE 0
            END) AS LOW_LINE_COUNT
FROM ORDERS,

```

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```

LINEITEM
WHERE O_ORDERKEY = L_ORDERKEY
AND
L_SHIPMODE IN ('MAIL','SHIP')
AND
L_COMMITDATE < L_RECEIPTDATE
AND
L_SHIPDATE < L_COMMITDATE
AND
L_RECEIPTDATE >= '1994-01-01'
AND
L_RECEIPTDATE < dateadd(yy, 1, '1994-01-

```

```

21 4217
22 3730
6 3334
23 3129
24 2622
25 2079
5 1972
26 1593
27 1185
4 1033
28 869
29 559

```

```

01')
GROUP BY L_SHIPMODE
ORDER BY L_SHIPMODE
L_SHIPMODE HIGH_LINE_COUNT LOW_LINE_COUNT
-----
MAIL 6202 9324
SHIP 6200 9262

```

```

3 398
30 373
31 235
2 144
32 128
33 71
34 48
35 33

```

(2 row(s) affected)

```

1 23
36 17

```

-- using default substitutions

```

37 7
40 4

```

/* TPC_H Query 13 - Customer Distribution */

```

38 4
39 2
41 1

```

```

SELECT C_COUNT,
COUNT(*) AS CUSTDIST
FROM ( SELECT C_CUSTKEY,
COUNT(O_ORDERKEY)
FROM CUSTOMER left outer join
ORDERS on

```

(42 row(s) affected)

```

C_CUSTKEY = O_CUSTKEY
AND

```

-- using default substitutions

```

O_COMMENT not like
'%%special%%requests%%'

```

/* TPC_H Query 14 - Promotion Effect */

```

GROUP BY C_CUSTKEY
) AS C_ORDERS (C_CUSTKEY,
C_COUNT)
GROUP BY C_COUNT
ORDER BY CUSTDIST DESC,
C_COUNT DESC
C_COUNT CUSTDIST
-----

```

```

SELECT 100.00 * SUM ( CASE WHEN
P_TYPE LIKE 'PROMO%%'
THEN
L_EXTENDEDPRICE*(1-L_DISCOUNT)
ELSE 0
END) /
SUM(L_EXTENDEDPRICE*(1-L_DISCOUNT)) AS
PROMO_REVENUE
FROM LINEITEM,
PART

```

```

0 50004
9 6641
10 6566
11 6058
8 5949
12 5553
13 4989
19 4748
7 4707
18 4625
15 4552
17 4530
14 4484
20 4461
16 4323

```

```

WHERE L_PARTKEY = P_PARTKEY AND
L_SHIPDATE >= '1995-09-01' AND
L_SHIPDATE < dateadd(mm, 1, '1995-09-01')
PROMO_REVENUE
-----

```

16.380779

(1 row(s) affected)

-- using default substitutions

/* TPC_H Query 15 - Create View for Top Supplier Query */

```

CREATE VIEW REVENUE0 (SUPPLIER_NO,
TOTAL_REVENUE)

```

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```

AS
SELECT      L_SUPPKEY,
            SUM(L_EXTENDEDPRICE*(1-L_DISCOUNT))
FROM LINEITEM
WHERE L_SHIPDATE >= '1996-01-01' AND
      L_SHIPDATE < dateadd(mm, 3, '1996-01-01')
GROUP BY   L_SUPPKEY
GO

```

/* TPC_H Query 15 - Top Supplier */

```

SELECT      S_SUPPKEY,
            S_NAME,
            S_ADDRESS,
            S_PHONE,
            TOTAL_REVENUE
FROM SUPPLIER,
      REVENUE0
WHERE S_SUPPKEY = SUPPLIER_NO AND
      TOTAL_REVENUE = ( SELECT
                        MAX(TOTAL_REVENUE)
                        FROM REVENUE0
                        )
ORDER BY   S_SUPPKEY

```

DROP VIEW REVENUE0

```

S_SUPPKEY S_NAME      S_ADDRESS
S_PHONE   TOTAL_REVENUE
-----

```

```

8449  Supplier#000008449  Wp34zim9qYFbVctdW
20-469-856-8873 1772627.208700

```

(1 row(s) affected)

-- using default substitutions

/* TPC_H Query 16 - Parts/Supplier Relationship */

```

SELECT      P_BRAND,
            P_TYPE,
            P_SIZE,
            COUNT(DISTINCT PS_SUPPKEY) AS
SUPPLIER_CNT
FROM PARTSUPP,
      PART
WHERE P_PARTKEY = PS_PARTKEY
      AND
      P_BRAND <> 'Brand#45'
      AND
      P_TYPE NOT LIKE 'MEDIUM
POLISHED%%'
      AND
      P_SIZE IN (49, 14, 23, 45, 19, 3, 36, 9)
      AND
      PS_SUPPKEY NOT IN ( SELECT
                          S_SUPPKEY
                          FROM
SUPPLIER

```

```

WHERE
S_COMMENT LIKE
'%%Customer%%Complaints%%'
)
GROUP BY   P_BRAND,
            P_TYPE,
            P_SIZE
ORDER BY   SUPPLIER_CNT DESC,
            P_BRAND,
            P_TYPE,
            P_SIZE

```

```

P_BRAND P_TYPE      P_SIZE
SUPPLIER_CNT
-----

```

```

Brand#41 MEDIUM BRUSHED TIN      3      28
Brand#54 STANDARD BRUSHED COPPER 14      27
Brand#11 STANDARD BRUSHED TIN     23      24
Brand#11 STANDARD BURNISHED BRASS 36      24
Brand#15 MEDIUM ANODIZED NICKEL   3      24
Brand#15 SMALL ANODIZED BRASS     45      24
Brand#15 SMALL BURNISHED NICKEL   19      24
Brand#21 MEDIUM ANODIZED COPPER   3      24
Brand#22 SMALL BRUSHED NICKEL     3      24
Brand#22 SMALL BURNISHED BRASS    19      24
Brand#25 MEDIUM BURNISHED COPPER  36      24
Brand#31 PROMO POLISHED COPPER    36      24
Brand#33 LARGE POLISHED TIN       23      24
Brand#33 PROMO POLISHED STEEL     14      24
Brand#35 PROMO BRUSHED NICKEL     14      24
Brand#41 ECONOMY BRUSHED STEEL    9      24
Brand#41 ECONOMY POLISHED TIN     19      24
Brand#41 LARGE PLATED COPPER      36      24
Brand#42 ECONOMY PLATED BRASS     3      24
Brand#42 STANDARD POLISHED TIN    49      24
Brand#43 PROMO BRUSHED TIN        3      24
Brand#43 SMALL ANODIZED COPPER    36      24
Brand#44 STANDARD POLISHED NICKEL 3      24
Brand#52 ECONOMY PLATED TIN       14      24
Brand#52 STANDARD BURNISHED NICKEL 3      24
Brand#53 MEDIUM ANODIZED STEEL   14      24
Brand#14 PROMO ANODIZED NICKEL   45      23
Brand#32 ECONOMY PLATED BRASS     9      23
Brand#52 SMALL ANODIZED COPPER    3      23
Brand#11 ECONOMY BRUSHED COPPER   45      20
Brand#11 ECONOMY PLATED BRASS     23      20
Brand#11 LARGE BRUSHED COPPER     49      20
Brand#11 LARGE POLISHED COPPER    49      20
Brand#12 STANDARD ANODIZED TIN    49      20
Brand#12 STANDARD PLATED BRASS    19      20
Brand#13 ECONOMY BRUSHED BRASS    9      20
Brand#13 ECONOMY BURNISHED STEEL  14      20
Brand#13 LARGE BURNISHED NICKEL   19      20
Brand#13 MEDIUM BURNISHED COPPER  36      20
Brand#13 SMALL BRUSHED TIN        45      20
Brand#13 STANDARD ANODIZED COPPER 3      20
Brand#13 STANDARD PLATED NICKEL   23      20
Brand#14 ECONOMY ANODIZED COPPER  14      20

```

..... Additional Rows Deleted

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				L_QUANTITY < (SELECT
				0.2 * AVG(L_QUANTITY)
Brand#55 STANDARD PLATED COPPER 45 4				FROM
Brand#55 STANDARD PLATED NICKEL 3 4				LINEITEM
Brand#55 STANDARD PLATED NICKEL 19 4				WHERE
Brand#55 STANDARD PLATED NICKEL 45 4				L_PARTKEY = P_PARTKEY
Brand#55 STANDARD PLATED STEEL 14 4)
Brand#55 STANDARD PLATED STEEL 23 4				AVG_YEARLY
Brand#55 STANDARD PLATED STEEL 49 4				-----
Brand#55 STANDARD PLATED TIN 9 4				348406.054286
Brand#55 STANDARD PLATED TIN 14 4				
Brand#55 STANDARD PLATED TIN 36 4				(1 row(s) affected)
Brand#55 STANDARD POLISHED BRASS 3 4				-- using default substitutions
Brand#55 STANDARD POLISHED BRASS 9 4				
Brand#55 STANDARD POLISHED BRASS 23 4				
Brand#55 STANDARD POLISHED COPPER 3 4				/* TPC_H Query 18 - Large Volume Customer */
Brand#55 STANDARD POLISHED COPPER 23 4				
Brand#55 STANDARD POLISHED COPPER 45 4				SELECT TOP 100
Brand#55 STANDARD POLISHED NICKEL 3 4				C_NAME,
Brand#55 STANDARD POLISHED NICKEL 23 4				C_CUSTKEY,
Brand#55 STANDARD POLISHED NICKEL 36 4				O_ORDERKEY,
Brand#55 STANDARD POLISHED NICKEL 45 4				O_ORDERDATE,
Brand#55 STANDARD POLISHED NICKEL 49 4				O_TOTALPRICE,
Brand#55 STANDARD POLISHED STEEL 14 4				SUM(L_QUANTITY)
Brand#55 STANDARD POLISHED STEEL 23 4				FROM CUSTOMER,
Brand#55 STANDARD POLISHED TIN 9 4				ORDERS,
Brand#55 STANDARD POLISHED TIN 19 4				LINEITEM
Brand#55 STANDARD POLISHED TIN 36 4				WHERE O_ORDERKEY IN (SELECT
Brand#11 SMALL BRUSHED TIN 19 3				L_ORDERKEY
Brand#15 LARGE PLATED NICKEL 45 3				FROM
Brand#15 LARGE POLISHED NICKEL 9 3				LINEITEM
Brand#21 PROMO BURNISHED STEEL 45 3				GROUP BY
Brand#22 STANDARD PLATED STEEL 23 3				L_ORDERKEY HAVING SUM(L_QUANTITY) >
Brand#25 LARGE PLATED STEEL 19 3				300
Brand#32 STANDARD ANODIZED COPPER 23 3) AND
Brand#33 SMALL ANODIZED BRASS 9 3				C_CUSTKEY = O_CUSTKEY AND
Brand#35 MEDIUM ANODIZED TIN 19 3				O_ORDERKEY = L_ORDERKEY
Brand#51 SMALL PLATED BRASS 23 3				GROUP BY C_NAME,
Brand#52 MEDIUM BRUSHED BRASS 45 3				C_CUSTKEY,
Brand#53 MEDIUM BRUSHED TIN 45 3				O_ORDERKEY,
Brand#54 ECONOMY POLISHED BRASS 9 3				O_ORDERDATE,
Brand#55 PROMO PLATED BRASS 19 3				O_TOTALPRICE
Brand#55 STANDARD PLATED TIN 49 3				ORDER BY O_TOTALPRICE DESC,
				O_ORDERDATE
(18314 row(s) affected)				C_NAME C_CUSTKEY O_ORDERKEY
				O_ORDERDATE O_TOTALPRICE
-- using default substitutions				-----
/* TPC_H Query 17 - Small-Quantity-Order Revenue */				-----
SELECT SUM(L_EXTENDEDPRICE)/7.0 AS				Customer#000128120 128120 4722021 1994-
AVG_YEARLY				04-07 00:00:00.000 544089.090000 323.000000
FROM LINEITEM,				Customer#000144617 144617 3043270 1997-
PART				02-12 00:00:00.000 530604.440000 317.000000
WHERE P_PARTKEY = L_PARTKEY AND				Customer#000013940 13940 2232932 1997-
P_BRAND = 'Brand#23'				04-13 00:00:00.000 522720.610000 304.000000
AND				Customer#000066790 66790 2199712 1996-
P_CONTAINER = 'MED BOX' AND				09-30 00:00:00.000 515531.820000 327.000000
				Customer#000046435 46435 4745607 1997-
				07-03 00:00:00.000 508047.990000 309.000000

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Customer#000015272	15272	3883783	1993-07-28 00:00:00.000	500241.330000	302.000000	Customer#000053029	53029	2662214	1993-08-13 00:00:00.000	446144.490000	302.000000
Customer#000146608	146608	3342468	1994-06-12 00:00:00.000	499794.580000	303.000000	Customer#000018188	18188	3037414	1995-01-25 00:00:00.000	443807.220000	308.000000
Customer#000096103	96103	5984582	1992-03-16 00:00:00.000	494398.790000	312.000000	Customer#000066533	66533	29158	1995-10-21 00:00:00.000	443576.500000	305.000000
Customer#000024341	24341	1474818	1992-11-15 00:00:00.000	491348.260000	302.000000	Customer#000037729	37729	4134341	1995-06-29 00:00:00.000	441082.970000	309.000000
Customer#000137446	137446	5489475	1997-05-23 00:00:00.000	487763.250000	311.000000	Customer#000003566	3566	2329187	1998-01-04 00:00:00.000	439803.360000	304.000000
Customer#000107590	107590	4267751	1994-11-04 00:00:00.000	485141.380000	301.000000	Customer#000045538	45538	4527553	1994-05-22 00:00:00.000	436275.310000	305.000000
Customer#000050008	50008	2366755	1996-12-09 00:00:00.000	483891.260000	302.000000	Customer#000081581	81581	4739650	1995-11-04 00:00:00.000	435405.900000	305.000000
Customer#000015619	15619	3767271	1996-08-07 00:00:00.000	480083.960000	318.000000	Customer#000119989	119989	1544643	1997-09-20 00:00:00.000	434568.250000	320.000000
Customer#000077260	77260	1436544	1992-09-12 00:00:00.000	479499.430000	307.000000	Customer#000003680	3680	3861123	1998-07-03 00:00:00.000	433525.970000	301.000000
Customer#000109379	109379	5746311	1996-10-10 00:00:00.000	478064.110000	302.000000	Customer#000113131	113131	967334	1995-12-15 00:00:00.000	432957.750000	301.000000
Customer#000054602	54602	5832321	1997-02-09 00:00:00.000	471220.080000	307.000000	Customer#000141098	141098	565574	1995-09-24 00:00:00.000	430986.690000	301.000000
Customer#000105995	105995	2096705	1994-07-03 00:00:00.000	469692.580000	307.000000	Customer#000093392	93392	5200102	1997-01-22 00:00:00.000	425487.510000	304.000000
Customer#000148885	148885	2942469	1992-05-31 00:00:00.000	469630.440000	313.000000	Customer#000015631	15631	1845057	1994-05-12 00:00:00.000	419879.590000	302.000000
Customer#000114586	114586	551136	1993-05-19 00:00:00.000	469605.590000	308.000000	Customer#000112987	112987	4439686	1996-09-17 00:00:00.000	418161.490000	305.000000
Customer#000105260	105260	5296167	1996-09-06 00:00:00.000	469360.570000	303.000000	Customer#000012599	12599	4259524	1998-02-12 00:00:00.000	415200.610000	304.000000
Customer#000147197	147197	1263015	1997-02-02 00:00:00.000	467149.670000	320.000000	Customer#000105410	105410	4478371	1996-03-05 00:00:00.000	412754.510000	302.000000
Customer#000064483	64483	2745894	1996-07-04 00:00:00.000	466991.350000	304.000000	Customer#000149842	149842	5156581	1994-05-30 00:00:00.000	411329.350000	302.000000
Customer#000136573	136573	2761378	1996-05-31 00:00:00.000	461282.730000	301.000000	Customer#000010129	10129	5849444	1994-03-21 00:00:00.000	409129.850000	309.000000
Customer#000016384	16384	502886	1994-04-12 00:00:00.000	458378.920000	312.000000	Customer#000069904	69904	1742403	1996-10-19 00:00:00.000	408513.000000	305.000000
Customer#000117919	117919	2869152	1996-06-20 00:00:00.000	456815.920000	317.000000	Customer#000017746	17746	6882	1997-04-09 00:00:00.000	408446.930000	303.000000
Customer#000012251	12251	735366	1993-11-24 00:00:00.000	455107.260000	309.000000	Customer#000013072	13072	1481925	1998-03-15 00:00:00.000	399195.470000	301.000000
Customer#000120098	120098	1971680	1995-06-14 00:00:00.000	453451.230000	308.000000	Customer#000082441	82441	857959	1994-02-07 00:00:00.000	382579.740000	305.000000
Customer#000066098	66098	5007490	1992-08-07 00:00:00.000	453436.160000	304.000000	Customer#000088703	88703	2995076	1994-01-30 00:00:00.000	363812.120000	302.000000
Customer#000117076	117076	4290656	1997-02-05 00:00:00.000	449545.850000	301.000000						
Customer#000129379	129379	4720454	1997-06-07 00:00:00.000	448665.790000	303.000000						
Customer#000126865	126865	4702759	1994-11-07 00:00:00.000	447606.650000	320.000000						
Customer#000088876	88876	983201	1993-12-30 00:00:00.000	446717.460000	304.000000						
Customer#000036619	36619	4806726	1995-01-17 00:00:00.000	446704.090000	328.000000						
Customer#000141823	141823	2806245	1996-12-29 00:00:00.000	446269.120000	310.000000						

(57 row(s) affected)

-- using default substitutions

/* TPC_H Query 19 - Discounted Revenue */

```

SELECT      SUM(L_EXTENDEDPRICE* (1 -
L_DISCOUNT)) AS REVENUE
FROM LINEITEM,
      PART
WHERE(      P_PARTKEY   = L_PARTKEY
AND
```

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```

P_BRAND          = 'Brand#12'
AND
P_CONTAINER IN ('SM CASE', 'SM
BOX', 'SM PACK', 'SM PKG')
L_QUANTITY >= 1
AND
L_QUANTITY <= 1 + 10
AND
P_SIZE BETWEEN 1 AND 5
AND
L_SHIPMODE IN ('AIR', 'AIR REG')
AND
L_SHIPINSTRUCT = 'DELIVER IN
PERSON'
)
OR
(
P_PARTKEY = L_PARTKEY
AND
P_BRAND          = 'Brand#23'
AND
P_CONTAINER IN ('MED BAG', 'MED
BOX', 'MED PKG', 'MED PACK')
L_QUANTITY >= 10
AND
L_QUANTITY <= 10 + 10
AND
P_SIZE BETWEEN 1 AND 10
AND
L_SHIPMODE IN ('AIR', 'AIR REG')
AND
L_SHIPINSTRUCT = 'DELIVER IN
PERSON'
)
OR
(
P_PARTKEY = L_PARTKEY
AND
P_BRAND          = 'Brand#34'
AND
P_CONTAINER IN ('LG CASE', 'LG
BOX', 'LG PACK', 'LG PKG')
L_QUANTITY >= 20
AND
L_QUANTITY <= 20 + 10
AND
P_SIZE BETWEEN 1 AND 15
AND
L_SHIPMODE IN ('AIR', 'AIR REG')
AND
L_SHIPINSTRUCT = 'DELIVER IN
PERSON'
)
REVENUE
-----
3083843.057800

(1 row(s) affected)

-- using default substitutions

```

```

/* TPC_H Query 20 - Potential Part Promotion */
SELECT      S_NAME,
            S_ADDRESS
FROM SUPPLIER,
            NATION
WHERE SUPPKEY IN (
SELECT
FROM
PARTSUPP
WHERE
SELECT
P_PARTKEY
FROM PART
WHERE REP_NAME like 'forest%'
)
AND
sum(L_QUANTITY)
> (
SELECT
PS_AVAILQTY
0.5 *
FROM LINEITEM
WHERE REL_PARTKEY = PS_PARTKEY
AND
L_SUPPKEY = PS_SUPPKEY
AND
L_SHIPDATE >= '1994-01-01'
AND
L_SHIPDATE <
dateadd(yy,1,'1994-01-01')
)
)
AND
S_NATIONKEY = N_NATIONKEY
AND
N_NAME = 'CANADA'
ORDER BY  S_NAME
S_NAME      S_ADDRESS
-----
Supplier#000000020  iybAE,RmTymrZVYaFZva2SH,j
Supplier#000000091
YV45D7TkfdQanOOZ7q9QxkyGUapU1oOWU6q3
Supplier#000000197
YC2Acon6kjY3zj3Fbxs2k4Vdf7X0cd2F
Supplier#000000226  83qOdU2EYRdPQAQhEtn GRZEd
Supplier#000000285  Br7e1nnt1yxrw6ImgpJ7YdhFDjuBf
Supplier#000000378  FfbhyCxWvcPrO8ltp9
Supplier#000000402
i9Sw4DoyMhzhKXCH9By,AYSgmD
Supplier#000000530  0qwCMwobKY
OcmLyfRXlagA8ukENJv,
Supplier#000000688  D
fw5ocppmZpYBBIPI718hCihLDZ5KhKX

```

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Supplier#00000710	f19YPvOyb	Supplier#000007968	
QoYwjKC,oPycpGfieBAcwKJo		DsF9UIZ2Fo6HXN9aErvyg1ikHoD582HSGZpP	
Supplier#00000736		Supplier#000007998	
l6i2nMwVuovfKnuVgaSGK2rDy65D1AFLegiL7		LnASFBfYRFOo9d6d,asBvVq9Lo2P	
Supplier#00000761		Supplier#000008168	aOa82a8ZbKCnfDLX
zISLelQUj2XrvTTFnv7WAcYZGvvMTx882d4		Supplier#000008231	IK7eGw Yj90sTdsp,vcqWxLB
Supplier#00000884	bmhEShejaS	Supplier#000008243	2AyePMkDqzmzVzjGTizXthFLo8h
Supplier#00000887	urEaTejH5POADP2ARrf	EiudCMxOmIIG	
Supplier#00000935	ij98czM	Supplier#000008275	B1bNDfWg,gpXKQILN
2KzWe7dDT0xB8sq0UfCdvRX		Supplier#000008323	75I18sZmASwm
Supplier#00000975	,AC e,tBpNwKb5xMUzeohxlRn,	POeheRMdj9tmpyeQ,BfCXN5BIAb	
hdZJo73gFQF8y		Supplier#000008366	
Supplier#000001263	rQWr6nf8ZhB2TAiIDivo5Io	h778cEj14BuW9OEKlvPTWq4iwASR6EBBXN7zeS8	
Supplier#000001399	LmrocNlMSyYOWuANx7	Supplier#000008423	
Supplier#000001446	lch9HMNU1R7a0LIybsUodVknk6	RQhKnkAhR0DAR3Ix4Q1weMMn00hNe Kq	
Supplier#000001454	TOpimingu2TVXIjhiL93h,	Supplier#000008480	4sSDA4ACReklNjEm5T6b
Supplier#000001500	wDmF5xLxtQch9ctVu,	Supplier#000008532	
Supplier#000001602	uKNWTeafaM644	Uc29q4,5xVdDOF87UZrxhr4xWS0ihEUXuh	
Supplier#000001626	UhxNRZuU1dtFmp0	Supplier#000008595	MH0iB73GQ3z UW3O DbCbqmc
Supplier#000001682	pXTkGxrTQVYH1Rr	Supplier#000008610	
Supplier#000001699	Q9C4rfJ26oijVPqqcqVXeRI	SgVgP90vP452sUNTgzL9zKwXHXAzV6tV	
Supplier#000001700	7hMlCof1Y5zLFg	Supplier#000008705	aE,trRNdPx,4yinTD9O3DebDIp
Supplier#000001726	TeRY7TtTH24sEword7yAaSkjx8	Supplier#000008742	HmPIQEzKCPEcTUL14,kKq
Supplier#000001730	Rc8e,1Pybn r6zo0VJIEiD0UD vhk	Supplier#000008841	I 85Lu1sekbq2xrSIzm0
Supplier#000001746		Supplier#000008895	
qWsendlOekQG1aW4uq06uQaCm51se8lirv7 hBRd		2cH4okfaLZTTg8sKRbbJQxkmeFu2Esj	
Supplier#000001752	Fra7outx41THYJaRThdOGiBk	Supplier#000008967	2kwEHyMG
Supplier#000001856		7FwozNImAUE6mH0hYtqYculJM	
jXcRgzYF0ah05iR8p6w5SbJJLcUGyYiURPvFwUWM		Supplier#000008972	w2vF6 D5YZO3visPXsqVfLADTK
Supplier#000001931	FpJbMU2h6ZR2eBv8I9NixF	Supplier#000009032	qK,trB6Sdy4Dz1BRUFNy
Supplier#000001939	Nrk,JA4bfReUs	Supplier#000009147	rOAuryHxpZ9eOvx
Supplier#000001990		Supplier#000009252	F7cZaPUHwh1
DSDJkCgBJzuPg1yuM,CUdLnsRliOxkkHezTCA		ZKyj3xmAVWC1XdP ue1p5m,i	
Supplier#000002020	jB6r1d7MxP6co	Supplier#000009278	RqYtZgxj93CLX 0mcYfCENOfD
Supplier#000002022	dwebGX7Id2pc25YvY33	Supplier#000009327	uoqMdf7e7Gj9dbQ53
Supplier#000002036	20ytTtVObjKUUI2WCB0A	Supplier#000009430	igRqmneFt
Supplier#000002204		Supplier#000009567	r4Wfx4c3xsEAjcGj71HHZByornl
uYmlr46C06udCqanj0KiRsoTQakZsEyssL		D9vrztXlv4	
Supplier#000002243	nSOEV3JeOU79	Supplier#000009601	51m637bO,Rw5DnHWFUvLacRx9
Supplier#000002245		Supplier#000009709	
hz2qWXWVjOyKhqPYMoEwz6zFkrTaDM		rRnCbHYgDgl9PZYnyWKVYSUW0vKg	
Supplier#000002282		Supplier#000009753	wLhVEcRmd7PkJF4FBnGK7Z
ES21K9dXoW1I1TzWCj7ekdlNwSWnv1Z 6mQ,BKn		Supplier#000009796	z,y4Idmr15DOvPUqYG
Supplier#000002303	nCoWfpB6YOymbgOht7ltfklpkHI	Supplier#000009799	4wNjXGa4OKW1
Supplier#000002373	RzHSxOTQmElCjxIBiVA52Z	Supplier#000009811	E3iuyq7UnZxU7oPZIE2Gu6
JB58rJhPRyIR		Supplier#000009812	
Supplier#000002419	qydBQd14I515mVXa4fYY	APFRMy3lCbGfGa53n5t9DxzFPQPgnjrGt32	
Supplier#000002481		Supplier#000009862	rJzweWeN58
nLKHUOn2MI9TOA06Znq9GEMcIIMO2		Supplier#000009868	ROjGgx5gvtkmnUUoeyy7v
Supplier#000002571	JZUugz04c iJFLrlGsz9O N,W	Supplier#000009869	
1rVHNIReyq		ucLqxzrpBTRMewGSM29t0rNTM30g1Tu3Xgg3mKag	
..... Additional Rows Deleted		Supplier#000009899	7XdPAHrzr1t,UQFZE
		Supplier#000009974	
		7wJ,J5DKcxSU4KplcQLpbcAvB5AsvKT	
Supplier#000007918	r,v9mBQ6LoEYyj1	(204 row(s) affected)	
Supplier#000007926	ErzCF80K9Uy	-- using default substitutions	
Supplier#000007957	ELwnio14ssoU1 dRyZIL OK3Vtzb		
Supplier#000007965	F7Un5IJ7p5hj		

Appendix D

```

/* TPC_H Query 21 - Suppliers Who Kept Orders Waiting */
SELECT      TOP 100
    S_NAME,
    COUNT(*) AS NUMWAIT
FROM SUPPLIER,
    LINEITEM L1,
    ORDERS,
    NATION
WHERE S_SUPPKEY = L1.L_SUPPKEY
    AND
    O_ORDERKEY = L1.L_ORDERKEY
    AND
    O_ORDERSTATUS = 'F'
    AND
    L1.L_RECEIPTDATE > L1.L_COMMITDATE
    AND
    EXISTS (
        SELECT *
        FROM LINEITEM L2
        WHERE L2.L_ORDERKEY
            = L1.L_ORDERKEY AND
            L2.L_SUPPKEY <>
            L1.L_SUPPKEY
    ) AND
    NOT EXISTS (
        SELECT *
        FROM LINEITEM L3
        WHERE
            L3.L_ORDERKEY =
            L1.L_ORDERKEY AND
            L3.L_SUPPKEY
            <> L1.L_SUPPKEY
            AND
            L3.L_RECEIPTDATE > L3.L_COMMITDATE
    ) AND
    S_NATIONKEY = N_NATIONKEY AND
    N_NAME = 'SAUDI ARABIA'
GROUP BY S_NAME
ORDER BY NUMWAIT DESC,
    S_NAME
S_NAME      NUMWAIT
-----
Supplier#000002829    20
Supplier#000005808    18
Supplier#000000262    17
Supplier#000000496    17
Supplier#000002160    17
Supplier#000002301    17
Supplier#000002540    17
Supplier#000003063    17
Supplier#000005178    17
Supplier#000008331    17
Supplier#000002005    16
Supplier#000002095    16
Supplier#000005799    16
Supplier#000005842    16
Supplier#000006450    16
Supplier#000006939    16
Supplier#000009200    16
Supplier#000009727    16
Supplier#000000486    15
Supplier#000000565    15
Supplier#000001046    15
Supplier#000001047    15
Supplier#000001161    15
Supplier#000001336    15
Supplier#000001435    15
Supplier#000003075    15
Supplier#000003335    15
Supplier#000005649    15
Supplier#000006027    15
Supplier#000006795    15
Supplier#000006800    15
Supplier#000006824    15
Supplier#000007131    15
Supplier#000007382    15
Supplier#000008913    15
Supplier#000009787    15
Supplier#000000633    14
Supplier#000001960    14
Supplier#000002323    14
Supplier#000002490    14
Supplier#000002993    14
Supplier#000003101    14
Supplier#000004489    14
Supplier#000005435    14
Supplier#000005583    14
Supplier#000005774    14
Supplier#000007579    14
Supplier#000008180    14
Supplier#000008695    14
Supplier#000009224    14
Supplier#000000357    13
Supplier#000000436    13
Supplier#000000610    13
Supplier#000000788    13
Supplier#000000889    13
Supplier#000001062    13
Supplier#000001498    13
Supplier#000002056    13
Supplier#000002312    13
Supplier#000002344    13
Supplier#000002596    13
Supplier#000002615    13
Supplier#000002978    13
Supplier#000003048    13
Supplier#000003234    13
Supplier#000003727    13
Supplier#000003806    13
Supplier#000004472    13
Supplier#000005236    13
Supplier#000005906    13
Supplier#000006241    13
Supplier#000006326    13
Supplier#000006384    13
Supplier#000006394    13
Supplier#000006624    13
Supplier#000006629    13
Supplier#000006682    13

```


Appendix D

Supplier#		GROUP BY	CNTRYCODE
Supplier#		ORDER BY	CNTRYCODE
Supplier#		CNTRYCODE	NUMCUST
Supplier#			TOTACCTBAL
Supplier#000006737	13		
Supplier#000006825	13		
Supplier#000007021	13		
Supplier#000007417	13		
Supplier#000007497	13	13	888
Supplier#000007602	13	17	861
Supplier#000008134	13	18	964
Supplier#000008234	13	23	892
Supplier#000009435	13	29	948
Supplier#000009436	13	30	909
Supplier#000009564	13	31	922
Supplier#000009896	13		
Supplier#000000379	12		
Supplier#000000673	12		
Supplier#000000762	12		
Supplier#000000811	12		
Supplier#000000821	12		
Supplier#000001337	12		
Supplier#000001916	12		
Supplier#000001925	12		
Supplier#000002039	12		
Supplier#000002357	12		
Supplier#000002483	12		

(7 row(s) affected)

(100 row(s) affected)

-- using default substitutions

/* TPC_H Query 22 - Global Sales Opportunity */

```

SELECT      CNTRYCODE,
            COUNT(*)      AS NUMCUST,
            SUM(C_ACCTBAL) AS TOTACCTBAL
FROM (      SELECT
            SUBSTRING(C_PHONE,1,2) AS
            CNTRYCODE,
            C_ACCTBAL
            FROM CUSTOMER
            WHERE SUBSTRING(C_PHONE,1,2)
            IN ('13', '31', '23', '29', '30', '18', '17') AND
            C_ACCTBAL >
            ( SELECT AVG(C_ACCTBAL)
            FROM CUSTOMER
            WHERE C_ACCTBAL > 0.00 AND
            SUBSTRING(C_PHONE,1,2) IN
            ('13', '31', '23', '29', '30', '18', '17')
            ) AND
            NOT EXISTS (
            SELECT *
            FROM
            ORDERS
            WHERE
            O_CUSTKEY = C_CUSTKEY
            )
            AS CUSTSALE

```

Appendix E: Seed and Input Parameters

Appendix E

Seed

1014115245

Stream0

1 75
 2 23 TIN ASIA
 3 MACHINERY 1995-03-16
 4 1995-06-01
 5 MIDDLE EAST 1995-01-01
 6 1995-01-01 0.07 24
 7 MOZAMBIQUE ALGERIA
 8 ALGERIA AFRICA SMALL
 ANODIZED TIN
 9 chocolate
 10 1993-08-01
 11 IRAN 0.0000010000
 12 TRUCK RAIL 1993-01-01
 13 pending packages
 14 1993-09-01
 15 1994-09-01
 16 Brand#15 LARGE POLISHED 43
 20 26 30 41 1 19
 15
 17 Brand#54 SM JAR
 18 314
 19 Brand#12 Brand#33 Brand#53
 4 17 27
 20 dodger 1995-01-01 IRAQ
 21 IRAQ
 22 23 32 10 19 31 29
 24

Stream1

21 CANADA
 3 BUILDING 1995-03-01
 18 315
 5 AFRICA 1995-01-01
 11 UNITED KINGDOM 0.0000010000
 7 INDIA PERU
 6 1995-01-01 0.04 25
 20 peru 1993-01-01 ARGENTINA
 17 Brand#15 SM PKG
 12 RAIL AIR 1997-01-01
 16 Brand#41 PROMO BRUSHED 6
 30 4 27 37 9 46
 18
 15 1997-04-01
 13 pending packages
 10 1994-05-01
 2 10 COPPER AFRICA

8 PERU AMERICA STANDARD POLISHED
 TIN
 14 1993-12-01
 19 Brand#14 Brand#11 Brand#42
 10 18 23
 9 blush
 22 26 31 14 32 15 29
 10
 1 83
 4 1993-03-01

Stream2

6 1995-01-01 0.02 24
 17 Brand#12 LG CASE
 14 1994-03-01
 16 Brand#31 MEDIUM BURNISHED 20
 43 38 33 34 2 8
 46
 19 Brand#21 Brand#54 Brand#41
 5 19 30
 10 1993-02-01
 9 azure
 2 48 STEEL ASIA
 15 1995-01-01
 8 INDONESIA ASIA STANDARD
 BURNISHED TIN
 5 AMERICA 1995-01-01
 22 11 21 14 33 15 34
 19
 12 AIR RAIL 1994-01-01
 7 ALGERIA INDONESIA
 13 pending packages
 18 313
 1 91
 4 1995-10-01
 20 blush 1997-01-01 MOZAMBIQUE
 3 MACHINERY 1995-03-18
 11 IRAQ 0.0000010000
 21 SAUDI ARABIA

Stream3

8 ARGENTINA AMERICA PROMO
 BRUSHED TIN
 5 ASIA 1996-01-01
 4 1993-07-01
 6 1996-01-01 0.07 24
 17 Brand#14 LG JAR
 7 PERU ARGENTINA
 1 99
 18 315
 22 32 19 21 34 18 22
 33
 14 1994-06-01

Appendix E

9	wheat					19	Brand#32	Brand#53	Brand#34
10	1993-12-01						1 12	30	
15	1997-07-01					18	314		
11	UNITED STATES	0.0000010000				14	1995-01-01		
20	maroon 1995-01-01	ETHIOPIA				22	13 30	27 16	11 28
2	36 BRASS AFRICA						29		
21	JAPAN					11	ALGERIA	0.0000010000	
19	Brand#23	Brand#32	Brand#31			13	unusual requests		
	10 20	26				3	AUTOMOBILE 1995-03-05		
13	pending requests					1	115		
16	Brand#11	ECONOMY PLATED	3			2	11 COPPER AFRICA		
	27 41	12 42 46	49			5	MIDDLE EAST 1996-01-01		
	50					8	IRAN MIDDLE EAST PROMO ANODIZED		
12	REG AIR	TRUCK 1994-01-01					NICKEL		
3	BUILDING	1995-03-03				20	green 1997-01-01 IRAN		
						12	MAIL TRUCK 1994-01-01		
						17	Brand#13 MED CASE		
						10	1993-06-01		
						9	sienna		

Stream4

5	EUROPE	1996-01-01			
21	ETHIOPIA				
14	1994-10-01				
19	Brand#25	Brand#25	Brand#35		
	5 10	23			
15	1995-04-01				
17	Brand#11	LG PKG			
12	SHIP TRUCK	1994-01-01			
6	1996-01-01	0.05 25			
4	1996-02-01				
9	steel				
8	CHINA ASIA	PROMO PLATED TIN			
16	Brand#41	STANDARD BRUSHED	38		
	30 11	42 8 46	3		
	23				
11	JAPAN 0.0000010000				
2	24 TIN	EUROPE			
10	1994-09-01				
18	312				
1	107				
13	pending requests				
7	INDONESIA	CHINA			
22	15 23	14 29	12 16		
	24				
3	HOUSEHOLD	1995-03-20			
20	tomato 1994-01-01	SAUDI ARABIA			

Stream5

21	RUSSIA				
15	1997-11-01				
4	1993-11-01				
6	1996-01-01	0.02 24			
7	ARGENTINA	IRAN			
16	Brand#31	LARGE ANODIZED	7		
	18 28	19 46 36	12		
	23				

Appendix F: Benchmark Scripts

print.c

```
/*
 * $Id: print.c,v 1.2 2005/01/03 20:08:59 jms Exp $
 *
 * Revision History
 * =====
 * $Log: print.c,v $
 * Revision 1.2 2005/01/03 20:08:59 jms
 * change line terminations
 *
 * Revision 1.1.1.1 2004/11/24 23:31:47 jms
 * re-establish external server
 *
 * Revision 1.4 2004/02/18 16:26:49 jms
 * 32/64 bit changes for overflow handling needed additional
 * changes when ported back to windows
 *
 * Revision 1.3 2004/02/18 14:05:53 jms
 * porting changes for LINUX and 64 bit RNG
 *
 * Revision 1.2 2004/01/22 05:49:29 jms
 * AIX porting (AIX 5.1)
 *
 * Revision 1.1.1.1 2003/08/07 17:58:34 jms
 * recreation after CVS crash
 *
 * Revision 1.2 2003/08/07 17:58:34 jms
 * Convery RNG to 64bit space as preparation for new large
 * scale RNG
 *
 * Revision 1.1.1.1 2003/04/03 18:54:21 jms
 * initial checkin
 *
 */
/* generate flat files for data load */
#include <stdio.h>
#ifdef VMS
#include <sys/types.h>
#endif
#ifdef SUN
#include <unistd.h>
#endif
#include <math.h>

#include "dss.h"
#include "dsstypes.h"
#include <string.h>

/*
 * Function Prototypes
 */
FILE *print_prep_PROTO((int table, int update));
int pr_drange_PROTO((int tbl, DSS_HUGE min, DSS_HUGE
cnt, long num));

FILE *
```

```
print_prep(int table, int update)
{
    char upath[128];
    FILE *res;

    if (updates)
        {
            if (update > 0) /* updates */
                if ( insert_segments )
                    {
                        int this_segment;

                        if(strcmp(tdefs[table].name,"orders.tbl"))

                            this_segment=++insert_orders_segment;
                        else

                            this_segment=++insert_lineitem_segment;
                        sprintf(upath,
"%s%c%s.u%d.%d",

                            env_config(PATH_TAG, PATH_DFLT),
                                PATH_SEP,
tdefs[table].name, update%10000,this_segment);
                    }
                else
                    {
                        sprintf(upath,
"%s%c%s.u%d",

                            env_config(PATH_TAG,
PATH_DFLT),
                                PATH_SEP,
tdefs[table].name, update);
                    }
                else /* deletes */
                    if ( delete_segments )
                        {
                            ++delete_segment;
                            sprintf(upath,
"%s%cdelete.u%d.%d",

                                env_config(PATH_TAG, PATH_DFLT),
                                    PATH_SEP, -update%10000,
                                        delete_segment);
                        }
                    else
                        {
                            sprintf(upath,
"%s%cdelete.%d",

                                env_config(PATH_TAG,
PATH_DFLT), PATH_SEP, -update);
                        }
                return(fopen(upath, "w"));
            }
        }
    res = tbl_open(table, "w");
    OPEN_CHECK(res, tdefs[table].name);
    return(res);
}
```

```

int
dbg_print(int format, FILE *target, void *data, int len, int sep)
{
    int dollars,
        cents;

    switch(format)
    {
    case DT_STR:
        if (columnar)
            fprintf(target, "%-*s", len, (char
*)data);
        else
            fprintf(target, "%s", (char *)data);
        break;
#ifdef MVS
        case DT_VSTR:
            /* note: only used in MVS, assumes
columnar output */
            fprintf(target, "%c%c%-*s",
                (len >> 8) & 0xFF, len & 0xFF,
len, (char *)data);
            break;
#endif /* MVS */
        case DT_INT:
            if (columnar)
                fprintf(target, "% 12ld", (long)data);
            else
                fprintf(target, "%ld", (long)data);
            break;
        case DT_HUGE:
            fprintf(target, HUGE_FORMAT,
*(DSS_HUGE *)data);
            break;
        case DT_KEY:
            fprintf(target, "%ld", (long)data);
            break;
        case DT_MONEY:
            cents = (int)*(DSS_HUGE *)data;
            if (cents < 0)
                {
                fprintf(target, "-");
                cents = -cents;
                }
            dollars = cents / 100;
            cents %= 100;
            if (columnar)
                fprintf(target, "% 12ld.%02ld",
dollars, cents);
            else
                fprintf(target, "%ld.%02ld",
dollars, cents);
            break;
        case DT_CHR:
            if (columnar)
                fprintf(target, "%c ", *(char
*)data);
            else
                fprintf(target, "%c", *(char *)data);

```

```

        break;
    }
#ifdef EOL_HANDLING
    if (sep)
#endif /* EOL_HANDLING */
    if (!columnar)
        fprintf(target, "%c", SEPARATOR);

    return(0);
}

int
pr_cust(customer_t *c, int mode)
{
    static FILE *fp = NULL;

    if (fp == NULL)
        fp = print_prep(CUST, 0);

    PR_STRT(fp);
    PR_HUGE(fp, &c->custkey);
    PR_STR(fp, c->mktsegment, C_MSEG_LEN);
    PR_HUGE(fp, &c->nation_code);
    PR_VSTR(fp, c->name, C_NAME_LEN);
    PR_VSTR(fp, c->address,
        (columnar)?(long)(ceil(C_ADDR_LEN *
V_STR_HGH)):c->alen);
    PR_STR(fp, c->phone, PHONE_LEN);
    PR_MONEY(fp, &c->acctbal);
    PR_VSTR_LAST(fp, c->comment,
        (columnar)?(long)(ceil(C_CMNT_LEN *
V_STR_HGH)):c->clen);
    PR_END(fp);

    return(0);
}

/*
 * print the numbered order
 */
int
pr_order(order_t *o, int mode)
{
    static FILE *fp_o = NULL;
    static int last_mode = 0;

    if (fp_o == NULL || mode != last_mode)
        {
        if (fp_o)
            fclose(fp_o);
        fp_o = print_prep(ORDER, mode);
        last_mode = mode;
        }
    PR_STRT(fp_o);
    PR_STR(fp_o, o->odate, DATE_LEN);
    PR_HUGE(fp_o, &o->okey);
    PR_HUGE(fp_o, &o->custkey);
    PR_STR(fp_o, o->opriority, O_OPRIO_LEN);

```

```

PR_INT(fp_o, o->spriority);
PR_STR(fp_o, o->clerk, O_CLRK_LEN);
PR_CHR(fp_o, &o->orderstatus);
PR_MONEY(fp_o, &o->totalprice);
PR_VSTR_LAST(fp_o, o->comment,
  (columnar)?(long)(ceil(O_CMNT_LEN *
V_STR_HGH)):o->cflen);
PR_END(fp_o);

return(0);
}

/*
 * print an order's lineitems
 */
int
pr_line(order_t *o, int mode)
{
  static FILE *fp_l = NULL;
  static int last_mode = 0;
  long i;

  if (fp_l == NULL || mode != last_mode)
  {
    if (fp_l)
      fclose(fp_l);
    fp_l = print_prep(LINE, mode);
    last_mode = mode;
  }

  for (i = 0; i < o->lines; i++)
  {
    PR_STRT(fp_l);
    PR_STR(fp_l, o->l[i].sdate, DATE_LEN);
    PR_HUGE(fp_l, &o->l[i].okey);
    PR_MONEY(fp_l, &o->l[i].discount);
    PR_MONEY(fp_l, &o->l[i].eprice);
    PR_HUGE(fp_l, &o->l[i].supkey);
    PR_HUGE(fp_l, &o->l[i].quantity);
    PR_CHR(fp_l, &o->l[i].rflag[0]);
    PR_HUGE(fp_l, &o->l[i].partkey);
    PR_CHR(fp_l, &o->l[i].lstatus[0]);
    PR_MONEY(fp_l, &o->l[i].tax);
    PR_STR(fp_l, o->l[i].cdate, DATE_LEN);
    PR_STR(fp_l, o->l[i].rdate, DATE_LEN);
    PR_STR(fp_l, o->l[i].shipmode, L_SMODE_LEN);
    PR_HUGE(fp_l, &o->l[i].lcnt);
    PR_STR(fp_l, o->l[i].shipinstruct, L_INST_LEN);
    PR_VSTR_LAST(fp_l, o->l[i].comment,
      (columnar)?(long)(ceil(L_CMNT_LEN *
V_STR_HGH)):o->l[i].cflen);
    PR_END(fp_l);
  }

  return(0);
}

```

```

/*
 * print the numbered order *and* its associated lineitems

```

```

*/
int
pr_order_line(order_t *o, int mode)
{
  tdefs[ORDER].name = tdefs[ORDER_LINE].name;
  pr_order(o, mode);
  pr_line(o, mode);

  return(0);
}

/*
 * print the given part
 */
int
pr_part(part_t *part, int mode)
{
  static FILE *p_fp = NULL;

  if (p_fp == NULL)
    p_fp = print_prep(PART, 0);

  PR_STRT(p_fp);
  PR_HUGE(p_fp, &part->partkey);
  PR_VSTR(p_fp, part->type,
    (columnar)?(long)P_TYPE_LEN:part->tlen);
  PR_HUGE(p_fp, &part->size);
  PR_STR(p_fp, part->brand, P_BRND_LEN);
  PR_VSTR(p_fp, part->name,
    (columnar)?(long)P_NAME_LEN:part->nlen);
  PR_STR(p_fp, part->container, P_CNTR_LEN);
  PR_STR(p_fp, part->mfgr, P_MFG_LEN);
  PR_MONEY(p_fp, &part->retailprice);
  PR_VSTR_LAST(p_fp, part->comment,
    (columnar)?(long)(ceil(P_CMNT_LEN *
V_STR_HGH)):part->cflen);
  PR_END(p_fp);
}

```

```

return(0);
}

/*
 * print the given part's suppliers
 */
int
pr_psupp(part_t *part, int mode)
{
  static FILE *ps_fp = NULL;
  long i;

  if (ps_fp == NULL)
    ps_fp = print_prep(PSUPP, mode);
}

```

```

for (i = 0; i < SUPP_PER_PART; i++)
{
  PR_STRT(ps_fp);
  PR_HUGE(ps_fp, &part->s[i].partkey);
  PR_HUGE(ps_fp, &part->s[i].supkey);
  PR_MONEY(ps_fp, &part->s[i].scost);
}

```



```

    PR_HUGE(ps_fp, &part->s[i].qty);
    PR_VSTR_LAST(ps_fp, part->s[i].comment,
        (columnar)?(long)(ceil(PS_CMNT_LEN *
V_STR_HGH)):part->s[i].clen);
    PR_END(ps_fp);
}

return(0);
}

/*
 * print the given part *and* its suppliers
 */
int
pr_part_psupp(part_t *part, int mode)
{
    tdefs[PART].name = tdefs[PART_PSUPP].name;
    pr_part(part, mode);
    pr_psupp(part, mode);

    return(0);
}

int
pr_supp(supplier_t *supp, int mode)
{
    static FILE *fp = NULL;

    if (fp == NULL)
        fp = print_prep(SUPP, mode);

    PR_START(fp);
    PR_HUGE(fp, &supp->suppkey);
    PR_HUGE(fp, &supp->nation_code);
    PR_STR(fp, supp->name, S_NAME_LEN);
    PR_VSTR(fp, supp->address,
        (columnar)?(long)(ceil(S_ADDR_LEN *
V_STR_HGH)):supp->alen);
    PR_STR(fp, supp->phone, PHONE_LEN);
    PR_MONEY(fp, &supp->acctbal);
    PR_VSTR_LAST(fp, supp->comment,
        (columnar)?(long)(ceil(S_CMNT_LEN *
V_STR_HGH)):supp->clen);
    PR_END(fp);

    return(0);
}

int
pr_nation(code_t *c, int mode)
{
    static FILE *fp = NULL;

    if (fp == NULL)
        fp = print_prep(NATION, mode);

    PR_START(fp);
    PR_HUGE(fp, &c->code);
    PR_STR(fp, c->text, NATION_LEN);

```

```

    PR_INT(fp, c->join);
    PR_VSTR_LAST(fp, c->comment,
        (columnar)?(long)(ceil(N_CMNT_LEN *
V_STR_HGH)):c->clen);
    PR_END(fp);

    return(0);
}

int
pr_region(code_t *c, int mode)
{
    static FILE *fp = NULL;

    if (fp == NULL)
        fp = print_prep(REGION, mode);

    PR_START(fp);
    PR_HUGE(fp, &c->code);
    PR_STR(fp, c->text, REGION_LEN);
    PR_VSTR_LAST(fp, c->comment,
        (columnar)?(long)(ceil(R_CMNT_LEN *
V_STR_HGH)):c->clen);
    PR_END(fp);

    return(0);
}

/*
 * NOTE: this routine does NOT use the BCD2_* routines. As
a result,
 * it WILL fail if the keys being deleted exceed 32 bits. Since
this
 * would require ~660 update iterations, this seems an
acceptable
 * oversight
 */
int
pr_drange(int tbl, DSS_HUGE min, DSS_HUGE cnt, long
num)
{
    static int last_num = 0;
    static FILE *dfp = NULL;
    DSS_HUGE child = -1;
    DSS_HUGE start, last, new;

    static DSS_HUGE rows_per_segment=0;
    static DSS_HUGE rows_this_segment=0;

    if (last_num != num)
    {
        if (dfp)
            fclose(dfp);
        dfp = print_prep(tbl, -num);
        if (dfp == NULL)
            return(-1);
        last_num = num;
        rows_this_segment=0;
    }

```

```

start = MK_SPARSE(min, num/ (10000 / refresh));
last = start - 1;
for (child=min; cnt > 0; child++, cnt--)
{
new = MK_SPARSE(child, num/ (10000 / refresh));
if (gen_rng == 1 && new - last == 1)
{
last = new;
continue;
}
if (gen_sql)
{
fprintf(dfp,
"delete from %s where %s between %ld and
%ld;\n",
tdefs[ORDER].name, "o_orderkey", start,
last);
fprintf(dfp,
"delete from %s where %s between %ld and
%ld;\n",
tdefs[LINE].name, "l_orderkey", start,
last);
fprintf(dfp, "commit work;\n");
}
else
if (gen_rng)
{
PR_STRT(dfp);
PR_HUGE(dfp, &start);
PR_HUGE(dfp, &last);
PR_END(dfp);
}
else
{
if (delete_segments)
{
if(rows_per_segment==0)

rows_per_segment = (cnt / delete_segments) + 1;

if(++rows_this_segment) > rows_per_segment)
{

fclose(dfp);
dfp =
print_prep(tbl, -num);
if (dfp
== NULL) return(-1);

last_num = num;

rows_this_segment=1;
}
}

PR_STRT(dfp);
PR_HUGE(dfp, &new);
PR_END(dfp);
}
}

}

return(0);
}

/*
* verify functions: routines which replace the pr_routines and
generate a pseudo checksum
* instead of generating the actual contents of the tables.
Meant to allow large scale data
* validation without requiring a large amount of storage
*/
int
vrf_cust(customer_t *c, int mode)
{
VRF_STRT(CUST);
VRF_INT(CUST, c->custkey);
VRF_STR(CUST, c->name);
VRF_STR(CUST, c->address);
VRF_INT(CUST, c->nation_code);
VRF_STR(CUST, c->phone);
VRF_MONEY(CUST, c->acctbal);
VRF_STR(CUST, c->mktsegment);
VRF_STR(CUST, c->comment);
VRF_END(CUST);

return(0);
}

/*
* print the numbered order
*/
int
vrf_order(order_t *o, int mode)
{
VRF_STRT(ORDER);
VRF_HUGE(ORDER, o->okey);
VRF_INT(ORDER, o->custkey);
VRF_CHR(ORDER, o->orderstatus);
VRF_MONEY(ORDER, o->totalprice);
VRF_STR(ORDER, o->odate);
VRF_STR(ORDER, o->opriority);
VRF_STR(ORDER, o->clerk);
VRF_INT(ORDER, o->spriority);
VRF_STR(ORDER, o->comment);
VRF_END(ORDER);

return(0);
}

```

```

}

/*
 * print an order's lineitems
 */
int
vrf_line(order_t *o, int mode)
{
    int i;

    for (i = 0; i < o->lines; i++)
    {
        VRF_STRT(LINE);
        VRF_HUGE(LINE, o->l[i].okey);
        VRF_INT(LINE, o->l[i].partkey);
        VRF_INT(LINE, o->l[i].suppkey);
        VRF_INT(LINE, o->l[i].lcnt);
        VRF_INT(LINE, o->l[i].quantity);
        VRF_MONEY(LINE, o->l[i].eprice);
        VRF_MONEY(LINE, o->l[i].discount);
        VRF_MONEY(LINE, o->l[i].tax);
        VRF_CHR(LINE, o->l[i].rflag[0]);
        VRF_CHR(LINE, o->l[i].lstatus[0]);
        VRF_STR(LINE, o->l[i].sdate);
        VRF_STR(LINE, o->l[i].cdate);
        VRF_STR(LINE, o->l[i].rdate);
        VRF_STR(LINE, o->l[i].shipinstruct);
        VRF_STR(LINE, o->l[i].shipmode);
        VRF_STR(LINE, o->l[i].comment);
        VRF_END(LINE);
    }

    return(0);
}

/*
 * print the numbered order *and* its associated lineitems
 */
int
vrf_order_line(order_t *o, int mode)
{
    vrf_order(o, mode);
    vrf_line(o, mode);

    return(0);
}

/*
 * print the given part
 */
int
vrf_part(part_t *part, int mode)
{
    VRF_STRT(PART);
    VRF_INT(PART, part->partkey);
    VRF_STR(PART, part->name);
    VRF_STR(PART, part->mfgr);
    VRF_STR(PART, part->brand);

    VRF_STR(PART, part->type);
    VRF_INT(PART, part->size);
    VRF_STR(PART, part->container);
    VRF_MONEY(PART, part->retailprice);
    VRF_STR(PART, part->comment);
    VRF_END(PART);

    return(0);
}

/*
 * print the given part's suppliers
 */
int
vrf_psupp(part_t *part, int mode)
{
    long i;

    for (i = 0; i < SUPP_PER_PART; i++)
    {
        VRF_STRT(PSUPP);
        VRF_INT(PSUPP, part->s[i].partkey);
        VRF_INT(PSUPP, part->s[i].suppkey);
        VRF_INT(PSUPP, part->s[i].qty);
        VRF_MONEY(PSUPP, part->s[i].scost);
        VRF_STR(PSUPP, part->s[i].comment);
        VRF_END(PSUPP);
    }

    return(0);
}

/*
 * print the given part *and* its suppliers
 */
int
vrf_part_psupp(part_t *part, int mode)
{
    vrf_part(part, mode);
    vrf_psupp(part, mode);

    return(0);
}

int
vrf_supp(supplier_t *supp, int mode)
{
    VRF_STRT(SUPP);
    VRF_INT(SUPP, supp->suppkey);
    VRF_STR(SUPP, supp->name);
    VRF_STR(SUPP, supp->address);
    VRF_INT(SUPP, supp->nation_code);
    VRF_STR(SUPP, supp->phone);
    VRF_MONEY(SUPP, supp->acctbal);
    VRF_STR(SUPP, supp->comment);
    VRF_END(SUPP);

    return(0);
}

```

```

int
vrf_nation(code_t *c, int mode)
{
    VRF_STRT(NATION);
    VRF_INT(NATION, c->code);
    VRF_STR(NATION, c->text);
    VRF_INT(NATION, c->join);
    VRF_STR(NATION, c->comment);
    VRF_END(NATION);

    return(0);
}

```

```

int
vrf_region(code_t *c, int mode)
{
    VRF_STRT(REGION);
    VRF_INT(REGION, c->code);
    VRF_STR(REGION, c->text);
    VRF_STR(REGION, c->comment);
    VRF_END(fp);

    return(0);
}

```

CreateRF1proc.sql

```

-- File:  CREATERF1PROC.SQL
--      Microsoft TPC-H Benchmark Kit Ver. 1.00
--      Copyright Microsoft, 1999
--
IF exists (SELECT name FROM sysobjects WHERE name =
'RF1')
    DROP PROCEDURE RF1
GO
--
-- Create a stored RefreshInsert procedure which will catch
the deadlock
-- victim abort and restart the insert transaction.
--
CREATE PROCEDURE RF1
    @current_execution INTEGER, @insert_sets INTEGER,
@parallel_executions INTEGER, @total_executions
INTEGER
AS
BEGIN

    DECLARE @startdate DATETIME
    DECLARE @enddate DATETIME
    DECLARE @edate DATETIME
    DECLARE @rangeStart INTEGER
    DECLARE @rangeSize INTEGER
    DECLARE @range INTEGER

    DECLARE @success INTEGER

```

```

DECLARE @index INTEGER
DECLARE @div INTEGER
DECLARE @mod INTEGER
DECLARE @skip INTEGER
DECLARE @i INTEGER
DECLARE @rangeSum INTEGER
DECLARE @totRangeSize INTEGER
DECLARE @stmt NCHAR(1000)
DECLARE @orderSql NCHAR(1000)
DECLARE @liSql NCHAR(1000)

```

```

SET @skip = @total_executions/@parallel_executions
SET @div = (@current_execution - 1)/@parallel_executions
SET @mod = (@current_execution - 1) - @div *
@parallel_executions
SET @index = @mod*@skip + @div + 1

--
-- Get the range for this execution
--
SET @stmt = N'SELECT @sdate = dateadd(day,-
1,min(O_ORDERDATE)), @edate = max(O_ORDERDATE)
FROM NEWORDERS'
EXEC sp_executesql @stmt,N'@sdate datetime output,
@edate datetime output',@startdate output, @enddate output

```

```

IF (@total_executions > @parallel_executions)
    BEGIN
        SET @div = (@index-1)/@skip
        SET @mod = (@index-1) - @div * @skip
        SET @rangeSize = datediff(day, @startdate,
@enddate)/@parallel_executions + 1
        SET @totRangeSize = @rangeSize
        SET @rangeSum = 0
        SET @rangeStart = @div * @rangeSize
        SET @i = @mod
        while (@i > 0)
            BEGIN
                SET @rangeSize = (@totRangeSize -
@rangeSum)/2
                SET @rangeSum = @rangeSum +
@rangeSize
                SET @rangeStart = @rangeStart +
@rangeSize
                SET @insert_sets = @insert_sets/2
                SET @i = @i - 1
            end

            IF (@mod + 1 = @skip) -- last allocation
                SET @rangeSize = @totRangeSize -
@rangeSum
            ELSE
                SET @rangeSize = (@totRangeSize -
@rangeSum)/2
            IF (@rangeSize < 0)
                SET @rangeSize = 0
            IF (@insert_sets <= 0)
                SET @insert_sets = 1
    END

```

```

end
ELSE
  BEGIN
    SET @rangeSize = datediff(day, @startdate,
@enddate)/@total_executions
    SET @rangeStart = @rangeSize * (@index - 1)
    end

SET @startdate = dateadd(day, @rangeStart, @startdate)
IF (@index < @total_executions)
  SET @enddate = dateadd(day, @rangeSize,
@startdate)

SET @range = datediff(day, @startdate, @enddate) /
@insert_sets

--
-- This handles the case when the max-min/insert_sets is less
that 1
--
IF @range = 0
  SET @range = 1

--
-- Generate the two insert statements
--
SET @edate = dateadd(day, @range, @startdate)
SET @orderSql = N'INSERT INTO ORDERS
(O_ORDERKEY, O_CUSTKEY, O_ORDERSTATUS,
O_TOTALPRICE,
O_ORDERDATE, O_ORDERPRIORITY, O_CLERK,
O_SHIPPRIORITY, O_COMMENT)
(SELECT O_ORDERKEY,
O_CUSTKEY, O_ORDERSTATUS, O_TOTALPRICE,
O_ORDERDATE, O_ORDERPRIORITY, O_CLERK,
O_SHIPPRIORITY, O_COMMENT
FROM NEWORDERS
WHERE O_ORDERDATE >
@startdate AND O_ORDERDATE <= @edate)
option (loop join)'
SET @liSql = N'INSERT INTO LINEITEM
(L_ORDERKEY,L_PARTKEY,L_SUPPKEY,L_LINENUM
BER,L_QUANTITY,
L_EXTENDEDPRICE,
L_DISCOUNT, L_TAX, L_RETURNFLAG,
L_LINESTATUS,
L_SHIPDATE,
L_COMMITDATE, L_RECEIPTDATE,
L_SHIPINSTRUCT, L_SHIPMODE, L_COMMENT)
(SELECT
L_ORDERKEY,L_PARTKEY,L_SUPPKEY,L_LINENUMB
ER,L_QUANTITY,
L_EXTENDEDPRICE,
L_DISCOUNT, L_TAX, L_RETURNFLAG,
L_LINESTATUS,

```

```

L_SHIPDATE,
L_COMMITDATE, L_RECEIPTDATE,
L_SHIPINSTRUCT, L_SHIPMODE, L_COMMENT
FROM NEWLINEITEM,
NEWORDERS
WHERE L_ORDERKEY =
O_ORDERKEY AND O_ORDERDATE > @startdate AND
O_ORDERDATE <= @edate)
option (loop join)'

--
-- Loop through the order keys inserting sets into the
-- ORDERS and LINTEITEM tables
--
WHILE @startdate < @enddate
  BEGIN
    --
    -- Insert into ORDERS and LINEITEM tables
    --
    INSERT_TRANS:
    SET @success = 1
    BEGIN TRANSACTION

    BEGIN TRY
      EXEC sp_executesql @orderSql,
N'@startdate datetime, @edate datetime', @startdate, @edate
      EXEC sp_executesql @liSql, N'@startdate
datetime, @edate datetime', @startdate, @edate
    END TRY
    BEGIN CATCH
      SET @success = 0
      IF (error_number() = 1205) --
deadlock victim
        PRINT 'Insert deadlock - restarting
RF1'
      ELSE
        BEGIN -- not a
deadlock
          PRINT 'Error - Not a deadlock'
          PRINT ERROR_NUMBER()
          PRINT ERROR_SEVERITY()
          PRINT ERROR_MESSAGE()
          PRINT ERROR_STATE()
          PRINT XACT_STATE()
          END
          IF (@@trancount>0)
            ROLLBACK TRANSACTION
        END CATCH

    IF (@success = 0) --
deadlock - redo the inserts
      GOTO INSERT_TRANS

    COMMIT TRANSACTION

    SET @startdate = @edate
    SET @edate = dateadd(day, @range, @edate)

```

```

IF (@edate > @enddate)
    SET @edate = @enddate
END
END
GO

```

CreateRF2proc.sql

```

-- File:  CREATERF2PROC.SQL
--      Microsoft TPC-H Benchmark Kit Ver. 1.00
--      Copyright Microsoft, 1999
--
IF exists (SELECT name FROM sysobjects WHERE name =
'RF2')
    DROP PROCEDURE RF2
GO
--
-- Create a stored Refresh Delete procedure which will catch
the deadlock
-- victim abort and restart the delete transaction.
--
CREATE PROCEDURE RF2
    @current_execution INTEGER, @delete_sets INTEGER,
@parallel_executions INTEGER, @total_executions
INTEGER
AS
BEGIN
DECLARE @startdate DATETIME
DECLARE @enddate DATETIME
DECLARE @edate DATETIME
DECLARE @rangeStart INTEGER
DECLARE @rangeSize INTEGER
DECLARE @range INTEGER
declare @success INTEGER
declare @index INTEGER
declare @div INTEGER
declare @mod INTEGER
declare @skip INTEGER
declare @i INTEGER
declare @rangeSum INTEGER
declare @totRangeSize INTEGER
declare @sql NCHAR(1000)
declare @orderSql NCHAR(1000)
declare @liSql NCHAR(1000)
SET @skip = @total_executions/@parallel_executions
SET @div = floor((@current_execution-
1)/@parallel_executions)
SET @mod = (@current_execution - 1) - @div *
@parallel_executions
SET @index = @mod*@skip + @div + 1

```

```

SET @sql = N'SELECT @sdate = dateadd(day,-
1,min(O_ORDERDATE)), @edate = max(O_ORDERDATE)
FROM MOD_OLDORDERS'
EXEC sp_executesql @sql,N'@sdate datetime output, @edate
datetime output',@startdate output, @enddate output

```

```

IF (@total_executions > @parallel_executions)
    BEGIN
        SET @div = (@index-1)/@skip
        SET @mod = (@index-1) - @div * @skip
        SET @rangeSize = datediff(day, @startdate,
@enddate)/@parallel_executions + 1
        SET @totRangeSize = @rangeSize
        SET @rangeSum = 0
        SET @rangeStart = @div * @rangeSize
        SET @i = @mod
        WHILE (@i > 0)
            BEGIN
                SET @rangeSize = (@totRangeSize -
@rangeSum)/2
                SET @rangeSum = @rangeSum +
@rangeSize
                SET @rangeStart = @rangeStart +
@rangeSize
                SET @delete_sets = @delete_sets/2
                SET @i = @i - 1
            END
        IF (@mod + 1 = @skip) -- last allocation
            SET @rangeSize = @totRangeSize -
@rangeSum
        ELSE
            SET @rangeSize = (@totRangeSize -
@rangeSum)/2
        IF (@rangeSize < 0)
            SET @rangeSize = 0
        IF (@delete_sets <= 0)
            SET @delete_sets = 1
        END
    ELSE
        BEGIN
            SET @rangeSize = datediff(day, @startdate,
@enddate)/@total_executions
            SET @rangeStart = @rangeSize * (@index - 1)
        END
        SET @startdate = dateadd(day, @rangeStart, @startdate)
        IF (@index < @total_executions)
            SET @enddate = dateadd(day, @rangeSize,
@startdate)
        SET @range = datediff(day, @startdate, @enddate) /
@delete_sets
--
-- This handles the case when the max-min/delete_sets is less
that 1
--

```

```

IF @range = 0
    SET @range = 1

--
-- Loop through the order keys deleting sets from orders
-- and lineitem tables
--
SET @edate = dateadd(day, @range, @startdate)
SET @liSql = N'DELETE FROM LINEITEM WHERE
L_ORDERKEY in
    (SELECT O_ORDERKEY FROM
MOD_OLDORDERS
    WHERE O_ORDERDATE >
@startdate AND O_ORDERDATE <= @edate)
option (loop join)'
SET @orderSql = N'DELETE FROM ORDERS WHERE
O_ORDERKEY in
    (SELECT O_ORDERKEY FROM
MOD_OLDORDERS
    WHERE O_ORDERDATE >
@startdate AND O_ORDERDATE <= @edate)
option (loop join)'

WHILE @startdate < @enddate
    BEGIN

        DELETE_TRANS:
        SET @success = 1
        BEGIN TRANSACTION

        BEGIN TRY
            EXEC sp_executesql @liSql, N'@startdate
datetime, @edate datetime', @startdate, @edate
            EXEC sp_executesql @orderSql,
N'@startdate datetime, @edate datetime', @startdate, @edate
        END TRY
        BEGIN CATCH
            SET @success = 0
            IF (error_number() = 1205) --
deadlock victim
                PRINT 'Insert deadlock - restarting
RF2'
            ELSE
                BEGIN -- not a
deadlock
                    PRINT 'Error - Not a deadlock'
                    PRINT ERROR_NUMBER()
                    PRINT ERROR_SEVERITY()
                    PRINT ERROR_MESSAGE()
                    PRINT ERROR_STATE()
                    PRINT XACT_STATE()
                    END
                    IF (@@trancount>0)
                        ROLLBACK TRANSACTION
                END CATCH

            IF (@success = 0) --
deadlock - redo the inserts
                GOTO DELETE_TRANS

```

COMMIT TRANSACTION

```

SET @startdate = @edate
SET @edate = dateadd(day, @range, @edate)

```

```

IF (@edate > @enddate)
    SET @edate = @enddate

```

END

END

GO

ErrHandling.bas

```

Attribute VB_Name = "ErrHandling"
' FILE:    ErrHandling.bas
'        Reporting Program for Microsoft TPC-H Kit Ver.
1.00
'        Copyright Microsoft, 1999
'        All Rights Reserved

```

```

' PURPOSE:  Error handling module for TPCHMetrics
report generation program
' Contact:  Reshma Tharamal (reshmat@microsoft.com)

```

Option Explicit

Public Sub DisplayErrors()

' Display error information such as error number, description, etc to the user

```

Dim strError As String
Dim errLoop As DAO.Error
Dim errCode As Long

```

If Err.Number <> 0 Then

' Visual Basic Error

If Err.Number > vbObjectError And Err.Number < (vbObjectError + 65536) Then

errCode = Err.Number - vbObjectError

Else

errCode = Err.Number

End If

strError = "Error # " & Str(errCode) & " was generated by " _

& Err.Source & Chr(13) & Err.Description

MsgBox strError, , "Error", Err.HelpFile,

Err.HelpContext

Else

' DAO Error

' Enumerate Errors collection and display properties of each Error object.

For Each errLoop In DAO.Errors

With errLoop

```

    If Err.Number > vbObjectError And Err.Number <
(vbObjectError + 65536) Then
        errCode = .Number - vbObjectError
    Else
        errCode = .Number
    End If
    strError = "Error #" & errCode & vbCrLf
    strError = strError & " " & .Description & vbCrLf
    strError = strError & _
        " (Source: " & .Source & ")" & vbCrLf
    End With

    MsgBox strError
Next
End If

```

```
End Sub
```

TPCHReports.bas

```

Attribute VB_Name = "TPCHReports"
' FILE: TPCHReports.bas
' Reporting Program for Microsoft TPC-H Kit Ver.
1.00
' Copyright Microsoft, 1999
' All Rights Reserved
'
' PURPOSE: This is the main module that contains the
report generation
' functions for TPCHMetrics
' Contact: Reshma Tharamal (reshmat@microsoft.com)
'
Option Explicit

' DAO workspace, database and recordset objects
Private mwrkJet As DAO.Workspace
Private mDB As DAO.Database
Private mrecDtls As DAO.Recordset

' Constants for Power and Throughput runs
' Must correspond to index for checkboxes, chkRun on
frmTPCHMetrics
Public Enum eRunType
    Power = 1
    Throughput = 2
End Enum

' Range of streams for which the Power/Throughput run
reports can be generated
Private Const miStreamIdMin As Integer = 0 ' Corresponds to
PowerRun
Private Const miStreamIdMax As Integer = 10

' Power Run corresponds to Stream 0
Private Const miStreamPowerRun As Integer =
miStreamIdMin

```

```

' Range of Power/Throughput run queries
Private Const miQueryIdMin As Integer = 1
Private Const miQueryIdMax As Integer = 24 ' Includes RF
functions

' Constant for Query 15 since it is split into view creation and
execution
' in the non-standard version of the kit
Private Const miQuery15 As Integer = 15

' Constants for refresh functions, RF1 and RF2
Private Const miQueryIdRF1 As Integer = 23
Private Const miQueryIdRF2 As Integer = 24

' Number of refresh functions
Private Const miRefreshFuncs As Integer = 2

' Constant for the first iterator value for the refresh functions
Private Const msFirstRFIterator As String = "1"

' Upper bound for Scale Factor (& number of streams) array
Private Const miSFUBound As Integer = 8

' Array of valid scale factors
Private marrSF(miSFUBound) As Single
' Array of minimum number of throughput streams for each
scale factor
Private marrStreams(miSFUBound) As Integer

' Default scale factor array location
Private Const miDefaultSF As Integer = 0

' Default number of insert segments per update set
Private Const miDefInsSegmentsPerUpdateSet As Integer =
16
' Default number of delete segments per update set
Private Const miDefDelSegmentsPerUpdateSet As Integer =
16

#If Not TPCH_KIT Then
    ' Default value for first update set for throughput run
    Private Const miDefUpdateSetFirst As Integer = 2
#End If

' Module-level variables for all report inputs
Private msDbFile As String ' Workspace definition file
name
Private msOutput As String ' Report file name
Private mbRunType(eRunType.Power To
eRunType.Throughput) As Boolean
' Array with Yes/No values for type of
report
' being generated
Private miStreamIdLo As Integer ' Will be initialized to 0 or 1,
depending on whether the
' PowerRun Metric is being generated or
not

```



```

Private miStreamIdHi As Integer ' Will be initialized to
number of throughput
    ' streams or 0, depending on whether the
    ' ThroughputRun Metric is being
generated or not
Private mlRunId As Long      ' Run identifier
Private mfSF As Single      ' Scale factor for the run
Private miInsSegmentsPerUpdateSet As Integer ' Number of
insert segments per update set
Private miDelSegmentsPerUpdateSet As Integer ' Number
of delete segments per update set

#If Not TPCH_KIT Then
    Private miUpdateSetFirst As Integer      ' First update set
for throughput run
#End If

' Constants for each of the dimensions (stream and query ) in
the arQuerySequence array
Private Const miDimensionStream As Integer = 1
Private Const miDimensionQuery As Integer = 2

' Array containing the sequence in which queries are executed,
excluding the refresh functions
Private arQuerySequence(miStreamIdMin To
miStreamIdMax, miQueryIdMin To miQueryIdMax -
miRefreshFuncs) As Integer

' Structure containing step execution statistics
Private Type StepExecutionDtls
    StartTime As Currency
    EndTime As Currency
    StartTimeNextStep As Currency
    ElapsedTime As Double
    ElapsedTpch As Double
    sStartTm As String
    sEndTm As String
    sStartNextTm As String
End Type

' Array containing step execution statistics for each query in
each stream
Private arExecutionDtls(miStreamIdMin To miStreamIdMax,
miQueryIdMin To miQueryIdMax) As StepExecutionDtls

' Constants used to format dates and timestamps
Private Const msDtSeparator As String = "-"
Private Const msTmSeparator As String = ":"
Private Const msMsSeparator As String = "."
Private Const msBlank As String = " "
Private Const msFmtMsPadWZeroes As String = "000"
Private Const msFmtYrPadWZeroes As String = "0000"

' Constants used to format stream and query identifiers
Private Const msFmtNumberWOZeroes As String = "##"
Private Const msFmtNumberPadWZeroes As String = "00"

' Constant used to format fractions
Private Const miNumDecimalPlaces As Integer = 1

```

```

' Constants used by the metrics calculation functions
Private Const mfMinElapsed As Single = 0.05
Private Const mfMinElapsedRound As Single = 0.1

' String constants for labels in workspace. Edit these labels if
the workspace is modified.
' Two versions of the workspace currently exist - the one in
the tpch kit and the
' one that Larry and Grace use
' PowerRun labels
#If TPCH_KIT Then
    Private Const msStartStepLabelPowerRF1 As String =
"Power - Execute RF1"
    Private Const msStartStepLabelPowerRF2 As String =
"Power - Execute RF2"
    Private Const msStartStepLabelPowerOther As String =
"Power - Execute Query "

    Private Const msEndStepLabelPowerRF1 As String =
"Power - Execute RF1"
    Private Const msEndStepLabelPowerRF2 As String =
"Power - Execute RF2"
#Else
    Private Const msStartStepLabelPowerRF1 As String =
"Execute RF1 in Parallel"
    Private Const msStartStepLabelPowerRF2 As String =
"Execute Query RF2 Thread"
    Private Const msStartStepLabelPower15 As String =
"Create REVENUE View"
    Private Const msStartStepLabelPowerOther As String =
"Execute Query "

    Private Const msEndStepLabelPowerRF1 As String =
"Execute RF1 in Parallel"
    Private Const msEndStepLabelPowerRF2 As String =
"Execute Query RF2 Thread"
    Private Const msEndStepLabelPower15 As String =
"Execute using REVENUE"
#End If

' ThroughputRun labels
#If TPCH_KIT Then
    Private Const msStartStepLabelThroughputRF1First As
String = "Throughput - Semaphore Loop for RF Delay"
    Private Const msEndStepLabelThroughputRF2Rest As
String = "Throughput - Stream - Increment Update Set"

    Private Const msLabelThroughputRF As String =
"Sequential Refresh Stream Execution"
    Private Const msLblThroughputRF12Mgr As String =
"Throughput - Refresh Streams"
    Private Const msLabelThroughputRF1 As String =
"Throughput - RF1 - Stream%STREAM_NUM%"
    Private Const msLabelThroughputRF2 As String =
"Throughput - RF2 - Stream%STREAM_NUM%"
    Private Const msLblThroughputRF1 As String =
"Throughput - Execute Stream%STREAM_NUM% RF1"

```

```
Private Const msLblThroughputRF2 As String =
"Throughput - Execute Stream%STREAM_NUM% RF2"
```

```
Private Const msStepLabelThroughputOther As String =
"Throughput - Query Stream "
#Else
```

```
Private Const msStartStepLabelThroughputRF1 As String =
"Wait for Throughput Run"
```

```
Private Const msStartStepLabelThroughputRF2 As String =
"Throughput RF2"
```

```
Private Const msStartStepLabelThroughputOther As String
= "Execute Query for Stream "
```

```
Private Const msEndStepLabelThroughputRF1 As String =
"Throughput RF1"
```

```
Private Const msLabelThroughputRF As String = "Refresh
Streams"
```

```
Private Const msLabelThroughputRFWithIt As String =
"Refresh Streams with Iterators"
```

```
Private Const msLabelThroughputRF1 As String = "RF1"
```

```
Private Const msLabelThroughputRF2 As String = "RF2"
```

```
Private Const msLabelThroughputRF12 As String = "RF1
post Throughput Queries"
```

```
#End If
```

```
Private Sub CalcElapsedTmAndPrint()
```

```
' This is the main function that computes the elapsed time
for each
```

```
' step, the Qpp for the Power and Throughput runs and the
composite
```

```
' QppH
```

```
Dim iStreamId As Integer
```

```
Dim iQueryId As Integer
```

```
Dim lMinElapsed As Double
```

```
Dim lMaxElapsed As Double
```

```
Dim fSigma As Double
```

```
Dim fQppPower As Double
```

```
Dim fQppThroughput As Double
```

```
Dim fQppH As Double
```

```
Dim cStart As Currency
```

```
Dim cEnd As Currency
```

```
Dim fElapsedThroughput As Double
```

```
Dim ftemp As Double
```

```
Dim sStartTm As String
```

```
Dim sEndTm As String
```

```
' Calculate the timing interval for each query in each stream
For iStreamId = miStreamIdLo To miStreamIdHi
```

```
For iQueryId = miQueryIdMin To miQueryIdMax Step 1
```

```
' Calculate the elapsed time for a query as the
difference
```

```
' between the end time and the start time for a step
arExecutionDtls(iStreamId, iQueryId).ElapsedTime =
```

```
-
```

```
(arExecutionDtls(iStreamId, iQueryId).EndTime -
-
arExecutionDtls(iStreamId,
iQueryId).StartTime) * 10
```

```
' If the timing interval for a query is less than 0.05
seconds,
' it must be rounded up to 0.1 second to avoid 0 values
' Refer to Section 5.3.7.5 of the TPC-H Spec Rev.
```

```
1.1.0
```

```
If (arExecutionDtls(iStreamId,
iQueryId).ElapsedTime) < mfMinElapsed Then
arExecutionDtls(iStreamId, iQueryId).ElapsedTime
= mfMinElapsedRound
```

```
Else
arExecutionDtls(iStreamId, iQueryId).ElapsedTime
= _
```

```
Round(arExecutionDtls(iStreamId,
iQueryId).ElapsedTime, miNumDecimalPlaces)
End If
```

```
' Calculate the timing interval for the TPC-H Metric as
the difference
```

```
' between the start time of the next step and the start
time for a step
```

```
arExecutionDtls(iStreamId, iQueryId).ElapsedTpch =
```

```
-
(arExecutionDtls(iStreamId,
iQueryId).StartTimeNextStep - _
arExecutionDtls(iStreamId,
iQueryId).StartTime) * 10
```

```
' If the timing interval for a query is less than 0.05
seconds,
' it must be rounded up to 0.1 second to avoid 0 values
' Refer to Section 5.3.7.5 of the TPC-H Spec Rev.
```

```
1.1.0
```

```
If (arExecutionDtls(iStreamId,
iQueryId).ElapsedTpch) < mfMinElapsed Then
arExecutionDtls(iStreamId, iQueryId).ElapsedTpch
= mfMinElapsedRound
```

```
Else
arExecutionDtls(iStreamId, iQueryId).ElapsedTpch
= _
```

```
Round(arExecutionDtls(iStreamId,
iQueryId).ElapsedTpch, miNumDecimalPlaces)
End If
```

```
Next iQueryId
```

```
Next iStreamId
```

```
If mbRunType(eRunType.Power) Then
lMinElapsed = arExecutionDtls(miStreamPowerRun,
miQueryIdMin).ElapsedTpch
lMaxElapsed = 0
```

```
' Determine minimum and maximum query timing
intervals for the PowerRun
```

```
For iQueryId = miQueryIdMin To miQueryIdMax -
miRefreshFuncs Step 1
```

```
    If arExecutionDtls(miStreamPowerRun,
iQueryId).ElapsedTpch > lMaxElapsed Then
        lMaxElapsed =
arExecutionDtls(miStreamPowerRun, iQueryId).ElapsedTpch
    End If
```

```
    If arExecutionDtls(miStreamPowerRun,
iQueryId).ElapsedTpch < lMinElapsed Then
        lMinElapsed =
arExecutionDtls(miStreamPowerRun, iQueryId).ElapsedTpch
    End If
```

```
Next iQueryId
```

```
' If the ratio between the longest query timing interval
and the shortest query
' timing interval in the PowerRun is greater than 1000,
then increase all query
' timing intervals which are smaller than
max[QI(i,0)]/1000 to max[QI(i,0)]/1000
' Refer to Section 5.4.1.4 of the TPC-H Spec Rev. 1.1.0
If lMaxElapsed / lMinElapsed > 1000 Then
    lMinElapsed = lMaxElapsed / 1000
```

```
For iQueryId = miQueryIdMin To miQueryIdMax
Step 1
```

```
    If arExecutionDtls(miStreamPowerRun,
iQueryId).ElapsedTpch > lMaxElapsed Then
        lMaxElapsed =
arExecutionDtls(miStreamPowerRun, iQueryId).ElapsedTpch
    End If
```

```
    If arExecutionDtls(miStreamPowerRun,
iQueryId).ElapsedTpch < (lMaxElapsed / 1000) Then
        arExecutionDtls(miStreamPowerRun,
iQueryId).ElapsedTpch = lMinElapsed
    End If
```

```
Next iQueryId
End If
```

```
' Determine the Power Metric
fSigma = 0
For iQueryId = miQueryIdMin To miQueryIdMax Step 1
    fSigma = fSigma +
Log(arExecutionDtls(miStreamPowerRun,
iQueryId).ElapsedTpch)
Next iQueryId
fSigma = fSigma * (-1 / 24)
fQppPower = Round(Exp(fSigma) * 3600 * mfSF,
miNumDecimalPlaces)
End If
```

```
If mbRunType(eRunType.Throughput) Then
' Determine the elapsed time for the throughput run
```

```
    cStart = arExecutionDtls(miStreamPowerRun + 1,
miQueryIdMin).StartTime
    cEnd = 0
```

```
For iStreamId = miStreamPowerRun + 1 To
miStreamIdHi
```

```
For iQueryId = miQueryIdMin To miQueryIdMax
Step 1
```

```
    If arExecutionDtls(iStreamId, iQueryId).StartTime
< cStart Then
        cStart = arExecutionDtls(iStreamId,
iQueryId).StartTime
    End If
```

```
    If arExecutionDtls(iStreamId, iQueryId).EndTime >
cEnd Then
        cEnd = arExecutionDtls(iStreamId,
iQueryId).EndTime
    End If
```

```
Next iQueryId
```

```
Next iStreamId
```

```
sStartTm = JulianToString(cStart)
sEndTm = JulianToString(cEnd)
```

```
fElapsedThroughput = Round((cEnd - cStart) * 10,
miNumDecimalPlaces)
fSigma = 3600 / fElapsedThroughput
fQppThroughput = Round(fSigma * miStreamIdHi * 22
* mfSF, miNumDecimalPlaces)
End If
```

```
' Compute the composite QppH value
fQppH = Round(Sqr(fQppPower * fQppThroughput),
miNumDecimalPlaces)
```

```
Call PrintStatistics(fQppPower, fElapsedThroughput,
fQppThroughput, fQppH, _
sStartTm, sEndTm)
```

```
End Sub
```

```
Private Sub CloseDbAndWsp()
' Close the database structures
```

```
On Error Resume Next
```

```
If Not mDB Is Nothing Then
    mDB.Close
    Set mDB = Nothing
End If
```

```
If Not mwrkJet Is Nothing Then
    mwrkJet.Close
    Set mwrkJet = Nothing
End If
```

```

End Sub

Public Sub NumStreamsEnabled(Index As Integer)
    ' Enables the number of throughput streams only if the
    throughput
    ' metric report is being generated

    If Index = eRunType.Throughput Then
        frmTPCHMetrics.cboStreams.Enabled = _

(frmTPCHMetrics.chkRun(eRunType.Throughput).Value =
vbChecked)
#If Not TPCH_KIT Then
    ' Enables the first throughput update set only if the
    throughput
    ' metric report is being generated
    frmTPCHMetrics.txtUpdateSetFirst.Enabled = _

(frmTPCHMetrics.chkRun(eRunType.Throughput).Value =
vbChecked)
#End If
    End If

End Sub

Private Function ParentInstId(iStreamId As Integer, iQueryId
As Integer) As Long
    ' Determines the parent instance identifier for the refresh
    functions
    ' Uses the refresh function label that marks the start of
    execution for
    ' the refresh function
    ' E.g. TPC-H Kit, Stream1, RF1: the start time for the
    refresh function
    ' is the start time for the step, 'Throughput - Semaphore
    Loop for RF Delay'
    ' but the end time for the refresh function is the end time for
    the step,
    ' 'Throughput - Execute Stream1 RF1'
    ' Similarly, in the HP version of the TPC-H Kit, RF1: the
    start time
    ' for the refresh function is the start time for the step,
    ' 'Wait for Throughput Run' but the end time for the refresh
    function
    ' is the end time for the step, 'Throughput RF1'

    Dim sLabel As String
    Dim sSql As String
    Dim sIt As String
    Dim lInstId As Long

    ParentInstId = 0

    ' Start at the top level step and work down to the parent of
    the refresh
    ' function. Initialize the step label and iterator values at
    every
    ' step, build a query and determine the instance identifier

```

```

sLabel = msLabelThroughputRF
sSql = "step_label = " & MakeStringFieldValid(sLabel)
mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
    MsgBox "Step " & "" & sLabel & "" & " not found! " &
-
    "The Throughput Run was not completely
    executed!"
    Exit Function
End If

lInstId = mrecDtls.Fields("instance_id").Value

#If TPCH_KIT Then
    If (iStreamId = miStreamPowerRun + 1) And iQueryId =
miQueryIdRF1 Then
        ParentInstId = lInstId
        Exit Function
    End If

    sLabel = msLblThroughputRF12Mgr
    sIt = CStr(iStreamId)
#Else
    sLabel = msLabelThroughputRFWithIt
    ' Stream 1 in Throughput run has iterator value first update
    set,
    ' Stream 2 in Throughput run has iterator value first update
    set + 1, ... and so on
    sIt = Format(iStreamId + miUpdateSetFirst - 1,
msFmtNumberWOZeroes)
#End If

sSql = "step_label = " & MakeStringFieldValid(sLabel) & _
" and parent_instance_id = " & CStr(lInstId) & _
" and iterator_value = " & MakeStringFieldValid(sIt)
mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
    MsgBox "Step " & "" & sLabel & "" & _
" not found for iterator " & "" & sIt & "" & ". " & _
"The Throughput Run was not completely
    executed!"
    Exit Function
End If

lInstId = mrecDtls.Fields("instance_id").Value

sLabel = IIf(iQueryId = miQueryIdRF1,
msLabelThroughputRF1, msLabelThroughputRF2)

sSql = "step_label = " & MakeStringFieldValid(sLabel) & _
" and parent_instance_id = " & CStr(lInstId)

mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
    MsgBox "Step " & "" & sLabel & "" & _
" not found for iterator " & "" & sIt & "" & ". " & _
"The Throughput Run was not completely
    executed!"

```

```

Exit Function
End If

ParentInstId = mrecDtls.Fields("instance_id").Value

End Function
Private Function ParentInstIdEnd(iStreamId As Integer,
iQueryId As Integer) As Long
' Determines the parent instance identifier for the refresh
functions
' Uses the refresh function label that marks the end of
execution for
' the refresh function
' E.g. TPC-H Kit, Stream1, RF1: the start time for the
refresh function
' is the start time for the step, 'Throughput - Semaphore
Loop for RF Delay'
' but the end time for the refresh function is the end time for
the step,
' 'Throughput - Execute Stream1 RF1'
' Similarly, in the HP version of the TPC-H Kit, RF1: the
start time
' for the refresh function is the start time for the step,
' 'Wait for Throughput Run' but the end time for the refresh
function
' is the end time for the step, 'Throughput RF1'

Dim sLabel As String
Dim sSql As String
Dim sIt As String
Dim IInstId As Long

' Start at the top level step and work down to the parent of
the refresh
' function. Initialize the step label and iterator values at
every
' step, build a query and determine the instance identifier

ParentInstIdEnd = 0

#If TPCH_KIT Then
sLabel = msLabelThroughputRF
sSql = "step_label = " & MakeStringFieldValid(sLabel)
mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
MsgBox "Step " & "" & sLabel & "" & " not found! " &
-
"The Throughput Run was not completely
executed!"
Exit Function
End If

IInstId = mrecDtls.Fields("instance_id").Value

sLabel = msLblThroughputRF12Mgr
sIt = CStr(iStreamId)
sSql = "step_label = " & MakeStringFieldValid(sLabel) & _
" and parent_instance_id = " & CStr(IInstId) & _
" and iterator_value = " & MakeStringFieldValid(sIt)

```

```

mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
MsgBox "Step " & "" & sLabel & "" & _
" not found for iterator " & "" & sIt & "" & ". " & _
"The Throughput Run was not completely
executed!"
Exit Function
End If

IInstId = mrecDtls.Fields("instance_id").Value

If iQueryId = miQueryIdRF2 And iStreamId <>
miStreamIdHi Then
ParentInstIdEnd = IInstId
Exit Function
End If

sLabel = IIf(iQueryId = miQueryIdRF1,
msLabelThroughputRF1, msLabelThroughputRF2)
sSql = "step_label = " & MakeStringFieldValid(sLabel) & _
" and parent_instance_id = " & CStr(IInstId)
mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
MsgBox "Step " & "" & sLabel & "" & " not found! " &
-
"The Throughput Run was not completely
executed!"
Exit Function
End If

ParentInstIdEnd = mrecDtls.Fields("instance_id").Value
#Else
sLabel = msLabelThroughputRF
sSql = "step_label = " & MakeStringFieldValid(sLabel)

mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
MsgBox "Step " & "" & sLabel & "" & _
" not found for iterator " & "" & sIt & "" & ". " & _
"The Throughput Run was not completely
executed!"
Exit Function
End If

IInstId = mrecDtls.Fields("instance_id").Value

' Stream 1 in Throughput run has iterator value first update
set,
' Stream 2 in Throughput run has iterator value first update
set + 1, ... and so on
sIt = Format(iStreamId + miUpdateSetFirst - 1,
msFmtNumberWOZeroes)
sLabel = msLabelThroughputRFWithIt
sSql = "step_label = " & MakeStringFieldValid(sLabel) & _
" and parent_instance_id = " & CStr(IInstId) & _
" and iterator_value = " & MakeStringFieldValid(sIt)

mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then

```

```

MsgBox "Step " & "" & sLabel & "" & _
    " not found for iterator " & "" & sIt & "" & ". " & _
    "The Throughput Run was not completely
executed!"
Exit Function
End If

IInstId = mrecDtls.Fields("instance_id").Value
sLabel = IIf(iQueryId = miQueryIdRF1,
msLabelThroughputRF1, msLabelThroughputRF2)

sSql = "step_label = " & MakeStringFieldValid(sLabel) & _
    " and parent_instance_id = " & CStr(IInstId)

mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
MsgBox "Step " & "" & sLabel & "" & _
    " not found for iterator " & "" & sIt & "" & ". " & _
    "The Throughput Run was not completely
executed!"
Exit Function
End If

IInstId = mrecDtls.Fields("instance_id").Value

If iQueryId = miQueryIdRF1 Then
sLabel = msLabelThroughputRF1

sSql = "step_label = " & MakeStringFieldValid(sLabel)
& _
    " and parent_instance_id = " & CStr(IInstId)

mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
MsgBox "Step " & "" & sLabel & "" & _
    " not found for iterator " & "" & sIt & "" & ". "
& _
    "The Throughput Run was not completely
executed!"
Exit Function
End If

IInstId = mrecDtls.Fields("instance_id").Value
End If

ParentInstIdEnd = IInstId

#End If

End Function
Public Sub Initialize()

' Initialize an array of valid scale factors
marrSF(0) = 0.1
marrSF(1) = 1
marrSF(2) = 10
marrSF(3) = 30
marrSF(4) = 100
marrSF(5) = 300

```

```

marrSF(6) = 1000
marrSF(7) = 3000
marrSF(8) = 10000

' and the number of streams for each scale factor
marrStreams(0) = 2
marrStreams(1) = 2
marrStreams(2) = 3
marrStreams(3) = 4
marrStreams(4) = 5
marrStreams(5) = 6
marrStreams(6) = 7
marrStreams(7) = 8
marrStreams(8) = 9

' Load the valid scale factors and number of streams for
each
' scale factor in the combo boxes on the form
Call LoadSFAndStreams(frmTPCHMetrics.cboSF,
frmTPCHMetrics.cboStreams)

' Initialize the number of insert and delete segments per
update
' set to default values
frmTPCHMetrics.txtInsertSegments.Text =
miDefInsSegmentsPerUpdateSet
frmTPCHMetrics.txtDeleteSegments.Text =
miDefDelSegmentsPerUpdateSet

#If TPCH_KIT Then
frmTPCHMetrics.lblFirstUpdateSet.Enabled = False
frmTPCHMetrics.txtUpdateSetFirst.Enabled = False
#Else
frmTPCHMetrics.lblFirstUpdateSet.Enabled = True
frmTPCHMetrics.txtUpdateSetFirst.Enabled = True
' Initialize the first update set for the throughput run
frmTPCHMetrics.txtUpdateSetFirst.Text =
miDefUpdateSetFirst
#End If

' Initialize the sequence in which queries are executed for
PowerRun
arQuerySequence(miStreamPowerRun, miQueryIdMin) =
14
arQuerySequence(miStreamPowerRun, miQueryIdMin + 1)
= 2
arQuerySequence(miStreamPowerRun, miQueryIdMin + 2)
= 9
arQuerySequence(miStreamPowerRun, miQueryIdMin + 3)
= 20
arQuerySequence(miStreamPowerRun, miQueryIdMin + 4)
= 6
arQuerySequence(miStreamPowerRun, miQueryIdMin + 5)
= 17
arQuerySequence(miStreamPowerRun, miQueryIdMin + 6)
= 18
arQuerySequence(miStreamPowerRun, miQueryIdMin + 7)
= 8

```

```

arQuerySequence(miStreamPowerRun, miQueryIdMin + 8)
= 21
arQuerySequence(miStreamPowerRun, miQueryIdMin + 9)
= 13
arQuerySequence(miStreamPowerRun, miQueryIdMin +
10) = 3
arQuerySequence(miStreamPowerRun, miQueryIdMin +
11) = 22
arQuerySequence(miStreamPowerRun, miQueryIdMin +
12) = 16
arQuerySequence(miStreamPowerRun, miQueryIdMin +
13) = 4
arQuerySequence(miStreamPowerRun, miQueryIdMin +
14) = 11
arQuerySequence(miStreamPowerRun, miQueryIdMin +
15) = 15
arQuerySequence(miStreamPowerRun, miQueryIdMin +
16) = 1
arQuerySequence(miStreamPowerRun, miQueryIdMin +
17) = 10
arQuerySequence(miStreamPowerRun, miQueryIdMin +
18) = 19
arQuerySequence(miStreamPowerRun, miQueryIdMin +
19) = 5
arQuerySequence(miStreamPowerRun, miQueryIdMin +
20) = 7
arQuerySequence(miStreamPowerRun, miQueryIdMin +
21) = 12

```

' Initialize the sequence in which throughput run queries are executed

```

arQuerySequence(miStreamPowerRun + 1, miQueryIdMin)
= 21
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 1) = 3
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 2) = 18
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 3) = 5
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 4) = 11
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 5) = 7
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 6) = 6
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 7) = 20
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 8) = 17
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 9) = 12
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 10) = 16
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 11) = 15
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 12) = 13
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 13) = 10

```

```

arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 14) = 2
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 15) = 8
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 16) = 14
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 17) = 19
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 18) = 9
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 19) = 22
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 20) = 1
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 21) = 4

arQuerySequence(miStreamPowerRun + 2, miQueryIdMin)
= 6
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 1) = 17
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 2) = 14
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 3) = 16
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 4) = 19
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 5) = 10
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 6) = 9
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 7) = 2
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 8) = 15
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 9) = 8
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 10) = 5
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 11) = 22
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 12) = 12
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 13) = 7
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 14) = 13
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 15) = 18
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 16) = 1
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 17) = 4
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 18) = 20
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 19) = 3
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 20) = 11

```


arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
 + 12) = 3
 arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
 + 13) = 1
 arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
 + 14) = 2
 arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
 + 15) = 5
 arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
 + 16) = 8
 arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
 + 17) = 20
 arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
 + 18) = 12
 arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
 + 19) = 17
 arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
 + 20) = 10
 arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
 + 21) = 9

 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin)
 = 10
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 1) = 3
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 2) = 15
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 3) = 13
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 4) = 6
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 5) = 8
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 6) = 9
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 7) = 7
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 8) = 4
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 9) = 11
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 10) = 22
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 11) = 18
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 12) = 12
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 13) = 1
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 14) = 5
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 15) = 16
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 16) = 2
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 17) = 14
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 18) = 19

arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 19) = 20
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 20) = 17
 arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
 + 21) = 21

 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin)
 = 18
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 1) = 8
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 2) = 20
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 3) = 21
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 4) = 2
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 5) = 4
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 6) = 22
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 7) = 17
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 8) = 1
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 9) = 11
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 10) = 9
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 11) = 19
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 12) = 3
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 13) = 13
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 14) = 5
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 15) = 7
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 16) = 10
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 17) = 16
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 18) = 6
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 19) = 14
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 20) = 15
 arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
 + 21) = 12

 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin)
 = 19
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 1) = 1
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 2) = 15

arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 3) = 17
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 4) = 5
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 5) = 8
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 6) = 9
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 7) = 12
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 8) = 14
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 9) = 7
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 10) = 4
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 11) = 3
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 12) = 20
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 13) = 16
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 14) = 6
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 15) = 22
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 16) = 10
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 17) = 13
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 18) = 2
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 19) = 21
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 20) = 18
 arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
 + 21) = 11

 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin)
 = 8
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 1) = 13
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 2) = 2
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 3) = 20
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 4) = 17
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 5) = 3
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 6) = 6
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 7) = 21
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 8) = 18
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 9) = 11

arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 10) = 19
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 11) = 10
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 12) = 15
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 13) = 4
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 14) = 22
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 15) = 1
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 16) = 7
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 17) = 12
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 18) = 9
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 19) = 14
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 20) = 5
 arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
 + 21) = 16

 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin) = 6
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 1) = 15
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 2) = 18
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 3) = 17
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 4) = 12
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 5) = 1
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 6) = 7
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 7) = 2
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 8) = 22
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 9) = 13
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 10) = 21
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 11) = 10
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 12) = 14
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 13) = 9
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 14) = 3
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 15) = 16
 arQuerySequence(miStreamPowerRun + 10,
 miQueryIdMin + 16) = 20

```

    arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 17) = 19
    arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 18) = 11
    arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 19) = 4
    arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 20) = 8
    arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 21) = 5

End Sub

Private Sub QueryRunDetails()
' Queries step execution records from the database

    Dim strSql As String

    On Error GoTo QueryRunDetailsErr

    Screen.MousePointer = vbHourglass

    Set mwrkJet = CreateWorkspace("tpch", "admin",
gsEmptyString, dbUseJet)

' Open database for exclusive access
    Set mDB = mwrkJet.OpenDatabase(msDbFile,
Options:=True)

    strSql = "select a.step_id, a.version_no, a.command, " & _
        " a.instance_id, a.parent_instance_id, a.iterator_value,
" & _
        " a.start_time, a.end_time, " & _
        " b.step_label, b.step_file_name, b.step_text, " & _
        " b.step_level, b.sequence_no, " & _
        " b.iterator_name " & _
        " from run_step_details a, att_steps b " & _
        " where a.step_id = b.step_id " & _
        " and a.version_no = b.version_no " & _
        " and a.run_id = " & CStr(mlRunId) & _
        " order by b.step_level, b.sequence_no, a.instance_id"

    Set mrecDtls = mDB.OpenRecordset(strSql,
dbOpenSnapshot)
    If mrecDtls.RecordCount = 0 Then
        Screen.MousePointer = vbDefault
        MsgBox "There are no records in the database for the run
identifier." & _
            " Unable to generate reports."
    Else
        Call CollectStats
    End If

    mrecDtls.Close
    CloseDbAndWsp

    Screen.MousePointer = vbDefault

Exit Sub

```

```

QueryRunDetailsErr:

    Screen.MousePointer = vbDefault
    DisplayErrors

    CloseDbAndWsp

End Sub
Public Sub GenerateSelected()
' Called when the user clicks on Generate on the
TPCHMetrics form.
' Validates all the user inputs and calls a function to
generate
' the reports if inputs are valid.
' Initializes module-level variables to the values input by the
user
    Dim sTemp As String

    On Error GoTo GenerateSelectedErr

' Initialize the enabled value for the type of report being
generated
    mbRunType(eRunType.Power) = _
        (frmTPCHMetrics.chkRun(eRunType.Power).Value =
vbChecked)
    mbRunType(eRunType.Throughput) = _
        (frmTPCHMetrics.chkRun(eRunType.Throughput).Value =
vbChecked)

    If (Not mbRunType(eRunType.Power) And Not
mbRunType(eRunType.Throughput)) Then
        MsgBox "Atleast one report type must be selected."
        Exit Sub
    End If

' Initialize the stream identifier bounds depending on the
type of
' report being generated
    miStreamIdLo = IIf(mbRunType(eRunType.Power),
miStreamPowerRun, miStreamPowerRun + 1)
    miStreamIdHi = IIf(mbRunType(eRunType.Throughput),
miStreamIdMax, miStreamPowerRun)
    If mbRunType(eRunType.Throughput) Then
        ' Initialize the number of throughput streams if a
throughput
        ' metric is being generated
        sTemp = Trim(frmTPCHMetrics.cboStreams.Text)
        If sTemp = gsEmptyString Then
            MsgBox "Please enter the number of throughput
streams that were executed."
            Exit Sub
        End If

        If IsNumeric(sTemp) = False Then
            MsgBox "The number of throughput streams must be
numeric."
            Exit Sub
        End If
    End If

```

```

End If

miStreamIdHi = CInt(sTemp)
If miStreamIdHi < 1 Or miStreamIdHi > miStreamIdMax
Then
    MsgBox "Number of throughput streams must range
from 1 to 10. " & _
        "Disable the throughput run checkbox if no
throughput streams were executed."
    Exit Sub
End If

' Initialize the run identifier
sTemp = Trim(frmTPCHMetrics.cboRunId.Text)
If sTemp = gsEmptyString Then
    MsgBox "Please enter the run identifier."
    Exit Sub
End If

If IsNumeric(sTemp) = False Then
    MsgBox "The run identifier must be numeric."
    Exit Sub
End If
mlRunId = CLng(sTemp)

' Initialize the scale factor for the run
sTemp = Trim(frmTPCHMetrics.cboSF.Text)
If sTemp = gsEmptyString Then
    MsgBox "Please enter the scale factor for the run."
    Exit Sub
End If

If IsNumeric(sTemp) = False Then
    MsgBox "The scale factor must be numeric."
    Exit Sub
End If
mfSF = CSng(sTemp)

' Initialize the workspace definition file
msDbFile = Trim(frmTPCHMetrics.txtDbFile)
If msDbFile = gsEmptyString Then
    MsgBox "Please enter the workspace definition file (.stp)
containing the run history."
    Exit Sub
End If

' Initialize the report file and ensure that it doesn't already
exist
msOutput = Trim(frmTPCHMetrics.txtReport)
If msOutput = gsEmptyString Then
    MsgBox "Please enter the output file name."
    Exit Sub
End If

msOutput = MakePathValid(msOutput)
If msOutput = gsEmptyString Then
    MsgBox "The output file path is not valid. Please enter a
valid path."

```

```

Exit Sub
End If

If Dir$(msOutput, vbNormal + vbHidden + vbReadOnly +
vbSystem) <> gsEmptyString Then
    MsgBox "The output file already exists. Please delete it
or enter a new one."
    Exit Sub
End If

' Initialize the number of insert and delete segments per
update set
sTemp = Trim(frmTPCHMetrics.txtInsertSegments.Text)
If sTemp = gsEmptyString Then
    MsgBox "Please enter the number of insert segments per
update set. (StepMaster parameter:
INSERT_SEGMENTS_PER_UPDATE_SET)"
    Exit Sub
End If

If IsNumeric(sTemp) = False Then
    MsgBox "The number of insert segments must be
numeric. (StepMaster parameter:
INSERT_SEGMENTS_PER_UPDATE_SET)"
    Exit Sub
End If
miInsSegmentsPerUpdateSet = CInt(sTemp)

sTemp = Trim(frmTPCHMetrics.txtDeleteSegments.Text)
If sTemp = gsEmptyString Then
    MsgBox "Please enter the number of delete segments per
update set. (StepMaster parameter:
DELETE_SEGMENTS_PER_UPDATE_SET)"
    Exit Sub
End If

If IsNumeric(sTemp) = False Then
    MsgBox "The number of delete segments must be
numeric. (StepMaster parameter:
DELETE_SEGMENTS_PER_UPDATE_SET)"
    Exit Sub
End If
miDelSegmentsPerUpdateSet = CInt(sTemp)

#If Not TPCH_KIT Then
If mbRunType(eRunType.Throughput) Then
    ' Initialize the value of the first update set
sTemp = Trim(frmTPCHMetrics.txtUpdateSetFirst.Text)
If sTemp = gsEmptyString Then
    MsgBox "Please enter the first update set for the
throughput run. (StepMaster parameter:
1ST_THRUPUT_UPDATE_SET)"
    Exit Sub
End If

If IsNumeric(sTemp) = False Then
    MsgBox "The first update set for the throughput run
must be numeric. (StepMaster parameter:
1ST_THRUPUT_UPDATE_SET)"

```

```

Exit Sub
End If
miUpdateSetFirst = CInt(sTemp)
End If
#End If

' The user inputs are valid. Call a procedure to query step
execution
' details and generate the TPCHEMetric report.
Call QueryRunDetails

Exit Sub

GenerateSelectedErr:
DisplayErrors

End Sub
Private Function LabelStartPower(iQueryId As Integer) As
String
' Returns the step label for the passed in power query
identifier
' Uses the label that marks the start of execution for the
query
' E.g. TPC-H Kit, Stream1, RF1: the start time for the
refresh function
' is the start time for the step, 'Throughput - Semaphore
Loop for RF Delay'
' but the end time for the refresh function is the end time for
the step,
' 'Throughput - Execute Stream1 RF1'
' Similarly, in the HP version of the TPC-H Kit, Throughput
Run, RF1:
' the start time for RF1 is the start time for the step,
' 'Wait for Throughput Run' but the end time for RF1 is the
end time
' for the step, 'Throughput RF1'
' E.g. in the HP version of the TPC-H Kit, query 15 is
executed in
' 2 parts. Therefore, the start time for query 15 is the start
time
' for the step, 'Create REVENUE View' but the end time for
query 15
' is the end time for the step, 'Execute using REVENUE'

Select Case iQueryId
Case miQueryIdRF1
LabelStartPower = msStartStepLabelPowerRF1

Case miQueryIdRF2
LabelStartPower = msStartStepLabelPowerRF2

#If Not TPCH_KIT Then
Case miQuery15
LabelStartPower = msStartStepLabelPower15
#End If

Case Else
LabelStartPower = msStartStepLabelPowerOther &
Format$(iQueryId, msFmtNumberPadWZeros)

```

```

End Select

End Function
Private Function LabelEndPower(iQueryId As Integer) As
String
' Returns the step label for the passed in power query
identifier
' Uses the label that marks the end of execution for the
query
' E.g. TPC-H Kit, Stream1, RF1: the start time for the
refresh function
' is the start time for the step, 'Throughput - Semaphore
Loop for RF Delay'
' but the end time for the refresh function is the end time for
the step,
' 'Throughput - Execute Stream1 RF1'
' Similarly, in the HP version of the TPC-H Kit, Throughput
Run, RF1:
' the start time for RF1 is the start time for the step,
' 'Wait for Throughput Run' but the end time for RF1 is the
end time
' for the step, 'Throughput RF1'
' E.g. in the HP version of the TPC-H Kit, query 15 is
executed in
' 2 parts. Therefore, the start time for query 15 is the start
time
' for the step, 'Create REVENUE View' but the end time for
query 15
' is the end time for the step, 'Execute using REVENUE'

#If TPCH_KIT Then
Debug.Assert iQueryId = miQueryIdRF1 Or iQueryId =
miQueryIdRF2
Select Case iQueryId
Case miQueryIdRF1
LabelEndPower = msEndStepLabelPowerRF1
Case miQueryIdRF2
LabelEndPower = msEndStepLabelPowerRF2
End Select
#Else
Debug.Assert iQueryId = miQueryIdRF1 Or iQueryId =
miQueryIdRF2 Or iQueryId = miQuery15
Select Case iQueryId
Case miQueryIdRF1
LabelEndPower = msEndStepLabelPowerRF1
Case miQueryIdRF2
LabelEndPower = msEndStepLabelPowerRF2
Case miQuery15
LabelEndPower = msEndStepLabelPower15
End Select
#End If

End Function
#If Not TPCH_KIT Then
Private Function GetEndStepIfThroughput(iQueryId As
Integer) As String
' Returns the iterator value for the passed in query identifier
' for the throughput run

```

```

' Returns the iterator value that marks the end of execution
for the query
' E.g. in the HP version of the TPC-H Kit, query 15 is
executed in
' 2 parts. Therefore, the iterator value for the start of query
15
' is 15V but the the iterator value for the end of query 15 is
15

```

```

Debug.Assert iQueryId = miQuery15
GetEndStepItThroughput = miQuery15

```

```

End Function
#End If

```

```

Private Function LabelStartThroughput(iStream As Integer, _
    iQuery As Integer) As String
' Returns the step label for the passed in query and stream in
the
' throughput run
' Returns the label that marks the start of execution for the
query
' E.g. TPC-H Kit, Stream1, RF1: the start time for the
refresh function
' is the start time for the step, 'Throughput - Semaphore
Loop for RF Delay'
' but the end time for the refresh function is the end time for
the step,
' 'Throughput - Execute Stream1 RF1'
' Similarly, in the HP version of the TPC-H Kit, Throughput
Run, RF1:
' the start time for RF1 is the start time for the step,
' 'Wait for Throughput Run' but the end time for RF1 is the
end time
' for the step, 'Throughput RF1'

```

```

#If TPCH_KIT Then
    Select Case iQuery
        Case miQueryIdRF1
            LabelStartThroughput = IIf(iStream =
miStreamPowerRun + 1, _
                msStartStepLabelThroughputRF1First, _
                msLblThroughputRF1)

        Case miQueryIdRF2
            LabelStartThroughput = msLblThroughputRF2

        Case Else
            LabelStartThroughput =
msStepLabelThroughputOther & _
                Format$(iStream, msFmtNumberWOZeroes)
    End Select
#Else
    Select Case iQuery
        Case miQueryIdRF1
            LabelStartThroughput =
msStartStepLabelThroughputRF1

        Case miQueryIdRF2

```

```

        LabelStartThroughput =
msStartStepLabelThroughputRF2

        Case Else
            LabelStartThroughput =
msStartStepLabelThroughputOther & _
                Format$(iStream, msFmtNumberPadWZeroes)
    End Select
#End If

```

```

End Function
Private Function LabelEndThroughput(iStream As Integer,
iQuery As Integer) As String
' Returns the step label for the passed in query and stream in
the
' throughput run
' Returns the label that marks the end of execution for the
query
' E.g. TPC-H Kit, Stream1, RF1: the start time for the
refresh function
' is the start time for the step, 'Throughput - Semaphore
Loop for RF Delay'
' but the end time for the refresh function is the end time for
the step,
' 'Throughput - Execute Stream1 RF1'
' Similarly, in the HP version of the TPC-H Kit, Throughput
Run, RF1:
' the start time for RF1 is the start time for the step,
' 'Wait for Throughput Run' but the end time for RF1 is the
end time
' for the step, 'Throughput RF1'

```

```

#If TPCH_KIT Then
    Select Case iQuery
        Case miQueryIdRF1
            LabelEndThroughput = msLblThroughputRF1

        Case miQueryIdRF2
            LabelEndThroughput = IIf(iStream = miStreamIdHi, _
                msLblThroughputRF2,
msEndStepLabelThroughputRF2Rest)

        Case Else
            Debug.Assert True
    End Select

```

```

#Else
    LabelEndThroughput = msEndStepLabelThroughputRF1
#End If

```

```

End Function

```

```

Private Function IteratorThroughput(iStream As Integer,
iQuery As Integer) As String
' Returns the iterator value for the passed in stream and
query
' for the throughput run
' Returns the iterator value that marks the start of execution
for the query

```

```

' E.g. in the HP version of the TPC-H Kit, query 15 is
executed in
' 2 parts. Therefore, the iterator value for the start of query
15
' is 15V but the the iterator value for the end of query 15 is
15

#If TPCH_KIT Then
    Dim iQIndex As Integer
#End If

Select Case iQuery
    Case miQueryIdRF1
        IteratorThroughput = msFirstRFIterator

    Case miQueryIdRF2
        IteratorThroughput = msFirstRFIterator

    Case Else
        #If TPCH_KIT Then
            ' The step iterates from 1 to 22 but the queries are
generated
            ' by qgen in the order that they should be executed
in.
            ' e.g. Stream1Q1.sql contains the query
corresponding to
            ' Stream 1, Query 21
            For iQIndex = miQueryIdMin To miQueryIdMax
Step 1
                If arQuerySequence(iStream, iQIndex) = iQuery
Then
                    Exit For
                End If
                Next iQIndex

                IteratorThroughput = Format$(iQIndex,
msFmtNumberWOZeroes)
            #Else
                IteratorThroughput = Format$(iQuery,
msFmtNumberWOZeroes)
                If iQuery = miQuery15 Then
                    ' Query 15 starts with the creation of the view
                    ' The query file is 15V + StreamId.sql and the
iterator
                    ' value is 15V
                    IteratorThroughput = IteratorThroughput & "V"
                End If
            #End If
        End Select

    End Function
Private Function IteratorPowerRF(iStream As Integer, iQuery
As Integer) As String
    ' Returns the iterator value for the passed in query in the
PowerRun

    Debug.Assert iQuery = miQueryIdRF1 Or iQuery =
miQueryIdRF2

```

```

Select Case iQuery
    Case miQueryIdRF1
        IteratorPowerRF = msFirstRFIterator

    Case miQueryIdRF2
        IteratorPowerRF = msFirstRFIterator

    End Select

End Function

Private Sub CollectStats()
    ' This function determines the start time, end time and start
time for
    ' the next step (if applicable) for each query in each stream

    Dim iStreamId As Integer
    Dim iParentInstId As Long
    Dim iQueryId As Integer
    Dim iNextQuery As Integer
    Dim iNextStream As Integer
    Dim sLabel As String
    Dim sIt As String
    Dim sSql As String
    Dim iUBound As Integer

    If mbRunType(eRunType.Power) Then
        ' Populate start and end times for the PowerRun
        iStreamId = miStreamPowerRun

        For iQueryId = miQueryIdMin To miQueryIdMax Step 1
label
            ' Determine the start time for the step using the step
            sLabel = LabelStartPower(iQueryId)

            sSql = "step_label = " &
            MakeStringFieldValid(sLabel)

            If (iQueryId = miQueryIdRF1 Or iQueryId =
miQueryIdRF2) Then
                sIt = IteratorPowerRF(iStreamId, iQueryId)
                sSql = sSql & " and iterator_value = " &
                MakeStringFieldValid(sIt)
            End If

            mrecDtls.FindFirst sSql
            If mrecDtls.NoMatch = True Then
                MsgBox "Step " & "" & sLabel & "" & " not found."
                " & _
                    "The PowerRun was not completely executed!"
            End Sub
        End If

        arExecutionDtls(iStreamId, iQueryId).StartTime =
mrecDtls.Fields("start_time").Value

        ' Determine the end time for the step

```

```

    If iQueryId = miQueryIdRF1 Or iQueryId =
miQueryIdRF2 Then
    ' RF1 and RF2, find the time at which the last
refresh function
    ' completed
    sLabel = LabelEndPower(iQueryId)
    arExecutionDtls(iStreamId, iQueryId).EndTime = 0

    iUBound = IIf(iQueryId = miQueryIdRF1,
miInsSegmentsPerUpdateSet, _
miDelSegmentsPerUpdateSet)

    For iNextQuery = msFirstRFIterator To iUBound
Step 1
    sSql = "step_label = " &
MakeStringFieldValid(sLabel) & _
" and iterator_value = "
    sIt = Format$(iNextQuery,
msFmtNumberWOZeros)
    sSql = sSql & MakeStringFieldValid(sIt)
mrecDtls.FindFirst sSql
    If mrecDtls.NoMatch = True Then
        MsgBox "Step " & "" & sLabel & "" & _
" not found for iterator " & "" & sIt & ""
& ". " & _
"The PowerRun was not completely
executed!"
        Exit Sub
    End If
    If mrecDtls.Fields("end_time").Value > _
arExecutionDtls(iStreamId,
iQueryId).EndTime Then
        arExecutionDtls(iStreamId,
iQueryId).EndTime = _
mrecDtls.Fields("end_time").Value
    End If
    Next iNextQuery
    #If Not TPCH_KIT Then
    ElseIf iQueryId = miQuery15 Then
        sLabel = LabelEndPower(iQueryId)
        sSql = "step_label = " &
MakeStringFieldValid(sLabel)
mrecDtls.FindFirst sSql
        If mrecDtls.NoMatch = True Then
            MsgBox "Step " & "" & sLabel & "" & " not
found. " & _
"The PowerRun was not completely
executed!"
            Exit Sub
        End If
        arExecutionDtls(iStreamId, iQueryId).EndTime =
mrecDtls.Fields("end_time").Value
    #End If
    Else
        arExecutionDtls(iStreamId, iQueryId).EndTime =
mrecDtls.Fields("end_time").Value
    End If

```

```

    ' The timing interval for a query is the time between
the start
    ' time of the next query and the start time of the query,
except
    ' for the last query of the set for which it is the time
between
    ' the end time of the query and the start time
    ' The timing interval for the execution of the refresh
function
    ' must be measured between the start time for the first
' refresh function and the end time for the last refresh
function
    ' Refer to Sections 5.3.7.2 and 5.3.7.3 of the TPC-H
Spec. Rev 1.1.0
    If NextStepExists(iStreamId, iQueryId, iNextQuery)
Then
        ' Determine the start time of the next step, if
applicable
        sLabel = LabelStartPower(iNextQuery)

        sSql = "step_label = " &
MakeStringFieldValid(sLabel)
mrecDtls.FindFirst sSql
        If mrecDtls.NoMatch = True Then
            MsgBox "Step " & "" & sLabel & "" & " not
found. " & _
"The PowerRun was not completely
executed!"
            Exit Sub
        End If

        arExecutionDtls(iStreamId,
iQueryId).StartTimeNextStep =
mrecDtls.Fields("start_time").Value
        Else
            ' Else, initialize start time for the next step to the end
time for the step
            arExecutionDtls(iStreamId,
iQueryId).StartTimeNextStep = _
arExecutionDtls(iStreamId,
iQueryId).EndTime
        End If

        ' Convert all the 64-bit timestamps to string values
arExecutionDtls(iStreamId, iQueryId).sStartTm =
JulianToString(arExecutionDtls(iStreamId,
iQueryId).StartTime)
arExecutionDtls(iStreamId, iQueryId).sEndTm =
JulianToString(arExecutionDtls(iStreamId,
iQueryId).EndTime)
arExecutionDtls(iStreamId, iQueryId).sStartNextTm =
JulianToString(arExecutionDtls(iStreamId,
iQueryId).StartTimeNextStep)
        Next iQueryId
    End If

    If mbRunType(eRunType.Throughput) Then
        ' Populate start and end times for the ThroughputRun
        For iStreamId = miStreamIdMin + 1 To miStreamIdHi

```



```

For iQueryId = miQueryIdMin To miQueryIdMax
Step 1
    ' Determine the start time for the step using the step
    label
    sLabel = LabelStartThroughput(iStreamId,
iQueryId)
    sSql = "step_label = " &
MakeStringFieldValid(sLabel)

    #If TPCH_KIT Then
        If (iQueryId <> miQueryIdRF1 Or iStreamId <>
miStreamPowerRun + 1) Then
            sIt = IteratorThroughput(iStreamId, iQueryId)
            sSql = sSql & " and iterator_value = " &
MakeStringFieldValid(sIt)
            End If
        #Else
            If iQueryId <> miQueryIdRF1 Then
                sIt = IteratorThroughput(iStreamId, iQueryId)
                sSql = sSql & " and iterator_value = " &
MakeStringFieldValid(sIt)
            End If
        #End If

    If iQueryId = miQueryIdRF1 Or iQueryId =
miQueryIdRF2 Then
        IParentInstId = ParentInstId(iStreamId, iQueryId)
        If IParentInstId = 0 Then Exit Sub
        sSql = sSql & " and parent_instance_id = " &
CStr(IParentInstId)
        End If

        mrecDtls.FindFirst sSql
        If mrecDtls.NoMatch = True Then
            MsgBox "Step " & "" & sLabel & "" & _
                " not found for iterator " & "" & sIt & "" &
                ". " & _
                "The Throughput Run was not completely
executed!"
            Exit Sub
        End If

        arExecutionDtls(iStreamId, iQueryId).StartTime =
mrecDtls.Fields("start_time").Value

        ' Determine the end time for the step

        If iQueryId = miQueryIdRF1 Or iQueryId =
miQueryIdRF2 Then
            ' RF1 and RF2, find the time at which the last
refresh
            ' function completed
            arExecutionDtls(iStreamId, iQueryId).EndTime =
0

            iUBound = IIf(iQueryId = miQueryIdRF1,
miInsSegmentsPerUpdateSet, _
miDelSegmentsPerUpdateSet)

```

```

#If TPCH_KIT Then
    sLabel = LabelEndThroughput(iStreamId,
iQueryId)
#Else
    If iQueryId = miQueryIdRF1 Then
        sLabel = LabelEndThroughput(iStreamId,
iQueryId)
    End If
#End If
IParentInstId = ParentInstIdEnd(iStreamId,
iQueryId)

#If TPCH_KIT Then
    If iQueryId = miQueryIdRF2 And iStreamId
<> miStreamIdHi Then
        sSql = "step_label = " &
MakeStringFieldValid(sLabel) & _
            " and parent_instance_id = " &
CStr(IParentInstId)

        mrecDtls.FindFirst sSql
        If mrecDtls.NoMatch = True Then
            MsgBox "Step " & "" & sLabel & "" & _
                " not found for iterator " & "" & sIt
                & "" & ". " & _
                "The Throughput run was not
completely executed!"
            Exit Sub
        End If
        arExecutionDtls(iStreamId,
iQueryId).EndTime = _
            mrecDtls.Fields("end_time").Value
        Else
        #End If

        ' Find the time at which the last refresh
function completed
        For iNextQuery = msFirstRFIterator To
iUBound Step 1
            sIt = Format$(iNextQuery,
msFmtNumberWOZeroes)
            sSql = "step_label = " &
MakeStringFieldValid(sLabel) & _
                " and iterator_value = " &
MakeStringFieldValid(sIt)
            sSql = sSql & " and parent_instance_id = "
& CStr(IParentInstId)

            mrecDtls.FindFirst sSql
            If mrecDtls.NoMatch = True Then
                MsgBox "Step " & "" & sLabel & "" & _
                    " not found for iterator " & "" & sIt
                    & "" & ". " & _
                    "The Throughput run was not
completely executed!"
                Exit Sub
            End If
            If mrecDtls.Fields("end_time").Value > _

```

```

        arExecutionDtls(iStreamId,
iQueryId).EndTime Then
        arExecutionDtls(iStreamId,
iQueryId).EndTime = _
            mrecDtls.Fields("end_time").Value
        End If
        Next iNextQuery

#If TPCH_KIT Then
    End If
#End If

#If Not TPCH_KIT Then
ElseIf iQueryId = miQuery15 Then
    sLabel = LabelStartThroughput(iStreamId,
iQueryId)
        sIt = GetEndStepIfThroughput(iQueryId)
        sSql = "step_label = " &
MakeStringFieldValid(sLabel) & _
            " and iterator_value = " &
MakeStringFieldValid(sIt)

        mrecDtls.FindFirst sSql
        If mrecDtls.NoMatch = True Then
            MsgBox "Step " & "" & sLabel & "" & _
                " not found for iterator " & "" & sIt &
"" & ". " & _
                "The Throughput run was not
completely executed!"
            Exit Sub
        End If
        arExecutionDtls(iStreamId,
iQueryId).EndTime = mrecDtls.Fields("end_time").Value
        #End If
    Else
        arExecutionDtls(iStreamId, iQueryId).EndTime =
mrecDtls.Fields("end_time").Value
        End If

' The timing interval for a query is the time between
the start
' time of the next query and the start time of the
query, except
' for the last query of the set for which it is the time
between
' the end time of the query and the start time
' The timing interval for the execution of the refresh
function
' must be measured between the start time for the
first
' refresh function and the end time for the last
refresh function
' Refer to Sections 5.3.7.2 and 5.3.7.3 of the TPC-H
Spec. Rev 1.1.0
If NextStepExists(iStreamId, iQueryId, iNextQuery)
Then
    ' Determine the start time of the next step, if
applicable
    iNextStream = iStreamId

```

```

        sLabel = LabelStartThroughput(iNextStream,
iNextQuery)
        sSql = "step_label = " &
MakeStringFieldValid(sLabel)
        #If TPCH_KIT Then
            sIt = IteratorThroughput(iNextStream,
iNextQuery)
            sSql = sSql & " and iterator_value = " &
MakeStringFieldValid(sIt)
        #Else
            sIt = IteratorThroughput(iNextStream,
iNextQuery)
            sSql = sSql & " and iterator_value = " &
MakeStringFieldValid(sIt)
        #End If

        If iQueryId = miQueryIdRF1 Or iQueryId =
miQueryIdRF2 Then
            IParentInstId = ParentInstId(iNextStream,
iNextQuery)
            If IParentInstId = 0 Then Exit Sub
            sSql = sSql & " and parent_instance_id = " &
CStr(IParentInstId)
        End If

        mrecDtls.FindFirst sSql
        If mrecDtls.NoMatch = True Then
            MsgBox "Step " & "" & sLabel & "" & _
                " not found for iterator " & "" & sIt & ""
& ". " & _
                "The Throughput run was not completely
executed!"
            Exit Sub
        End If

        arExecutionDtls(iStreamId,
iQueryId).StartTimeNextStep =
mrecDtls.Fields("start_time").Value
        Else
            ' Else, initialize start time for the next step to the
end time for the step
            arExecutionDtls(iStreamId,
iQueryId).StartTimeNextStep = arExecutionDtls(iStreamId,
iQueryId).EndTime
        End If

        ' Convert all the 64-bit timestamps to string values
        arExecutionDtls(iStreamId, iQueryId).sStartTm =
JulianToString(arExecutionDtls(iStreamId,
iQueryId).StartTime)
        arExecutionDtls(iStreamId, iQueryId).sEndTm =
JulianToString(arExecutionDtls(iStreamId,
iQueryId).EndTime)
        arExecutionDtls(iStreamId, iQueryId).sStartNextTm
= JulianToString(arExecutionDtls(iStreamId,
iQueryId).StartTimeNextStep)

        Next iQueryId
        Next iStreamId

```

```

End If

' Call a procedure to calculate the elapsed time for each step
and
' the Power and Throughput Metrics
Call CalcElapsedTmAndPrint

End Sub
Private Function JulianToString(cJTime As Currency)
' Converts the passed in 64-bit date to a formatted string
that can
' be printed in the report
' The format of date/time in reports is yyyy-mm-dd
hh:mm:ss.sss
' This format has these benefits:
' - is sortable, since all fields are arranged most to least
significant
' and all numeric
' - is directly interpreted by Excel as a time/date value
' - is fixed width
' - is Y2K compliant

Dim lYr As Long
Dim lMon As Long
Dim lDt As Long
Dim lHr As Long
Dim lMin As Long
Dim lSec As Long
Dim lMs As Long
Dim cJTemp As Currency

Call smtimelib.JulianToTime(cJTime, lYr, lMon, lDt, lHr,
lMin, lSec, lMs)
JulianToString = Format$(lYr, msFmtYrPadWZeroes) &
msDtSeparator & _
Format$(lMon, msFmtNumberPadWZeroes) &
msDtSeparator & _
Format$(lDt, msFmtNumberPadWZeroes) & msBlank
& _
Format$(lHr, msFmtNumberPadWZeroes) &
msTmSeparator & _
Format$(lMin, msFmtNumberPadWZeroes) &
msTmSeparator & _
Format$(lSec, msFmtNumberPadWZeroes) &
msMsSeparator & _
Format$(lMs, msFmtMsPadWZeroes)

End Function
Public Sub LoadRunIds(cboLoad As ComboBox, sDbFile As
String)
' Opens the passed in workspace definition file and loads all
the
' run identifiers in the passed in combo box

Dim strSql As String
Dim lRunId As Long

On Error GoTo LoadRunIdsErr

```

```

Screen.MousePointer = vbHourglass

Set mwrkJet = CreateWorkspace("tpch", "admin",
gsEmptyString, dbUseJet)

' Open database for exclusive access
Set mDB = mwrkJet.OpenDatabase(sDbFile,
Options:=True)

strSql = "select run_id from run_header order by run_id
desc"
Set mrecDtls = mDB.OpenRecordset(strSql,
dbOpenSnapshot)

cboLoad.Clear

If mrecDtls.RecordCount = 0 Then
Screen.MousePointer = vbDefault
MsgBox "There are no run records. Unable to load list of
run ids."
Else
mrecDtls.MoveFirst
While Not mrecDtls.EOF
' Add run identifier to the combo box
lRunId = mrecDtls.Fields("run_id").Value
cboLoad.AddItem CStr(lRunId)

mrecDtls.MoveNext
Wend
If cboLoad.ListCount > 0 Then
cboLoad.ListIndex = 0
End If
End If

mrecDtls.Close
CloseDbAndWsp

Screen.MousePointer = vbDefault

Exit Sub

LoadRunIdsErr:

Screen.MousePointer = vbDefault
DisplayErrors

CloseDbAndWsp

End Sub
Public Sub LoadSFAndStreams(cboSF As ComboBox,
cboStreams As ComboBox)
' Loads all the valid scale factors in cboSF
' Loads the number of throughput streams for each scale
factor in
' cboStreams
' This procedure assumes that the arrays, marrSF and
marrStreams have
' already been initialized.

```

```

Dim iIndex As Integer

On Error GoTo LoadSFAndStreamsErr

cboSF.Clear
cboStreams.Clear

For iIndex = LBound(marrSF) To UBound(marrSF)
    cboSF.AddItem CStr(marrSF(iIndex))
    cboSF.ItemData(iIndex) = iIndex

    cboStreams.AddItem CStr(marrStreams(iIndex))
    cboStreams.ItemData(iIndex) = iIndex
Next iIndex

cboSF.ListIndex = miDefaultSF
cboStreams.ListIndex = miDefaultSF

Exit Sub

LoadSFAndStreamsErr:

    DisplayErrors

End Sub

Private Function NextStepExists(iStream As Integer, iQuery
As Integer, _
    iNextQuery As Integer) As Boolean
    ' Returns False if this is the last step in the query stream
    ' If not, populates iNextQuery with the index of the next
    query

    Dim iQIndex As Integer

    If iQuery = miQueryIdRF1 Or iQuery = miQueryIdRF2
Then
        NextStepExists = False
    Else
        For iQIndex = LBound(arQuerySequence,
miDimensionQuery) _
            To UBound(arQuerySequence, miDimensionQuery)
Step 1
            If arQuerySequence(iStream, iQIndex) = iQuery Then
                Exit For
            End If
        Next iQIndex

        NextStepExists = (iQIndex < UBound(arQuerySequence,
miDimensionQuery))

        If NextStepExists Then
            iNextQuery = arQuerySequence(iStream, iQIndex + 1)
        End If
    End If

End Function

Private Sub PrintStatistics(fQppPower As Double,
fElapsedThroughput As Double, _

```

```

    fQppThroughput As Double, fQppH As Double,
sStartTm As String, _
    sEndTm As String)
    ' This function prints the execution statistics for each step
    ' and the Power and Throughput Metrics to the output file

    Dim iQIndex As Integer
    Dim iSIndex As Integer
    Dim sPrint As String
    Dim hOutputFile As Integer

    hOutputFile = 0

    hOutputFile = FreeFile
    Open msOutput For Output Shared As hOutputFile
    ' Header information
    Print #hOutputFile, "Workspace file:" & vbTab &
msDbFile
    Print #hOutputFile, "Run identifier:" & vbTab &
CStr(mlRunId)
    Print #hOutputFile, "Database Scale Factor:" & vbTab &
CStr(mfSF)
    Print #hOutputFile, "Query Streams for Throughput Test:"
& vbTab & CStr(miStreamIdHi)
    Print #hOutputFile, "Measurement Interval in Throughput
Test (Ts):" & vbTab & CStr(fElapsedThroughput) & vbTab &
vbTab & _
        "Start Time: " & vbTab & sStartTm & vbTab
& vbTab & _
        "End Time: " & vbTab & sEndTm
    Print #hOutputFile, "TPC-H Power:" & vbTab &
CStr(fQppPower)
    Print #hOutputFile, "TPC-H Throughput:" & vbTab &
CStr(fQppThroughput)
    Print #hOutputFile, "TPC-H Composite Query-Per-Hour
Rating (QphH):" & vbTab & CStr(fQppH)
    Print #hOutputFile,

    ' Print Query names in column header
    Print #hOutputFile, vbTab;

    For iQIndex = miQueryIdMin To miQueryIdRF1 - 1
        sPrint = "Q" & Format$(iQIndex,
msFmtNumberWOZeros) & vbTab
        Print #hOutputFile, sPrint;
    Next iQIndex

    For iQIndex = miQueryIdRF1 To miQueryIdRF2
        sPrint = "RF" & Format$(iQIndex - miQueryIdRF1 + 1,
msFmtNumberWOZeros) & vbTab
        Print #hOutputFile, sPrint;
    Next iQIndex

    Print #hOutputFile,

    ' Print TPC-H timing intervals for each query in timing grid
    For iSIndex = miStreamIdLo To miStreamIdHi

```

```

sPrint = "Stream " & Format$(iSIndex,
msFmtNumberPadWZeroes) & vbTab
Print #hOutputFile, sPrint;

For iQIndex = miQueryIdMin To miQueryIdMax Step 1

    sPrint = CStr(arExecutionDtls(iSIndex,
iQIndex).ElapsedTpch) & vbTab
    Print #hOutputFile, sPrint;
    Next iQIndex

Print #hOutputFile,

Next iSIndex

Print #hOutputFile,
Print #hOutputFile, "Elapsed times for each step"
Print #hOutputFile,

' Print elapsed times for each query in timing grid
For iSIndex = miStreamIdLo To miStreamIdHi

    sPrint = "Stream " & Format$(iSIndex,
msFmtNumberPadWZeroes) & vbTab
    Print #hOutputFile, sPrint;

    For iQIndex = miQueryIdMin To miQueryIdMax Step 1

        sPrint = CStr(arExecutionDtls(iSIndex,
iQIndex).ElapsedTime) & vbTab
        Print #hOutputFile, sPrint;
        Next iQIndex

    Print #hOutputFile,

Next iSIndex

Print #hOutputFile,
Print #hOutputFile, vbTab & "Query Id" & vbTab & "Start
Time" & vbTab & _
    "End Time" & vbTab & "Start Next Step" & vbTab &
"Step Delta" & vbTab & _
    "Official Query Elapsed" & vbTab & "Difference"

' Print step execution details, viz. start time, end time,
TPCH timing
' interval and elapsed times for each query
For iSIndex = miStreamIdLo To miStreamIdHi

    sPrint = "Stream " & Format$(iSIndex,
msFmtNumberPadWZeroes)
    Print #hOutputFile, sPrint;

    For iQIndex = miQueryIdMin To miQueryIdMax Step 1

        sPrint = vbTab & CStr(iQIndex) & vbTab & _
            arExecutionDtls(iSIndex, iQIndex).sStartTm &
vbTab & _

```

```

arExecutionDtls(iSIndex, iQIndex).sEndTm &
vbTab & _
            arExecutionDtls(iSIndex, iQIndex).sStartNextTm
& vbTab & _
            CStr(arExecutionDtls(iSIndex,
iQIndex).ElapsedTime) & vbTab & _
            CStr(arExecutionDtls(iSIndex,
iQIndex).ElapsedTpch) & vbTab & _
            Round(CStr(arExecutionDtls(iSIndex,
iQIndex).ElapsedTpch - arExecutionDtls(iSIndex,
iQIndex).ElapsedTime), miNumDecimalPlaces)
        Print #hOutputFile, sPrint
        Next iQIndex

    Print #hOutputFile,

Next iSIndex

Close hOutputFile
hOutputFile = 0

MsgBox "The report has been generated at " & gsSQ &
msOutput & gsSQ & "!"

Exit Sub

GenerateSelectedErr:
DisplayErrors

If hOutputFile <> 0 Then
    Close hOutputFile
End If

End Sub
Public Sub SFChanged()

    ' Called when the scale factor is changed - modifies the
number
    ' of streams depending on the scale factor
    frmTPCHMetrics.cboStreams.ListIndex =
frmTPCHMetrics.cboSF.ListIndex

End Sub

```

Utility.bas

```

Attribute VB_Name = "Utility"
' FILE: Utility.bas
' Reporting Program for Microsoft TPC-H Kit Ver.
1.00
' Copyright Microsoft, 1999
' All Rights Reserved
'
' PURPOSE: Utility functions for TPCHMetrics report
generation program
' Contact: Reshma Tharamal (reshmat@microsoft.com)

```

```

Option Explicit

Private Type OPENFILENAME
    lStructSize As Long
    hwndOwner As Long
    hInstance As Long
    lpstrFilter As String
    lpstrCustomFilter As String
    nMaxCustFilter As Long
    nFilterIndex As Long
    lpstrFile As String
    nMaxFile As Long
    lpstrFileName As String
    nMaxFileName As Long
    lpstrInitialDir As String
    lpstrTitle As String
    Flags As Long
    nFileOffset As Integer
    nFileExtension As Integer
    lpstrDefExt As String
    lCustData As Long
    lpfnHook As Long
    lpTemplateName As Long
End Type

Private Declare Function GetOpenFileName Lib
"COMDLG32" _
    Alias "GetOpenFileNameA" (file As OPENFILENAME)
As Long

Public Const MAX_PATH = 255
Public Const gsEmptyString As String = ""
Public Const gsSQ As String = """"
Public Const gsPeriod As String = "."
Public Const gsDefDBFileExt As String = ".stp"
Public Const gsFileSeparator = "\"
Public Const gsPipe = "|"
Public Const gsNullValue = "null"

Private Const ms_DLG_TITLE_OPEN = "Open"

Private Enum EOpenFile
    OFN_OVERWRITEPROMPT = &H2
    OFN_HIDEREADONLY = &H4
    OFN_FILEMUSTEXIST = &H1000
    OFN_EXPLORER = &H80000
End Enum

Private Const ml_FILE_DB_FLAGS =
OFN_FILEMUSTEXIST
' Note: The flag below is meaningless, since it doesn't work
for open file dialogs
Private Const ml_FILE_OUTPUT_FLAGS =
OFN_OVERWRITEPROMPT

Private Const ms_FILE_ALL_FILTER = "|All Files (*.*)*.*)"

Private Const ms_FILE_DB_FILTER = "Stepmaster
Workspace Files (*.*) & gsDefDBFileExt & ")*)* &
gsDefDBFileExt
Private Const ms_FILE_OUTPUT_FILTER = "Text Files
(*.txt)*.txt"
Public Function MakeStringFieldValid(strField As String) As
String
    ' Returns a string that can be appended to any insert
    ' or modify (sql) statement

    ' It checks whether the text is empty
    ' If so, it returns the string, "null"
    If strField = gsEmptyString Then
        MakeStringFieldValid = gsNullValue
    Else
        ' Single-quotes have to be replaced by two single-quotes,
        ' since a single-quote is the identifier delimiter
        ' character - call a procedure to do the replace
        MakeStringFieldValid = ReplaceSubString(strField,
gsSQ, gsSQ & gsSQ)

        ' Replace pipe characters with the corresponding chr
function
        MakeStringFieldValid = ReplaceSubString(strField,
gsPipe, "" & Chr(124) & "")

        ' Enclose the string in single quotes
        MakeStringFieldValid = gsSQ & strField & gsSQ
    End If
End Function

Public Function ReplaceSubString(ByVal MainString As
String, _
    ByVal ReplaceString As String, _
    ByVal ReplaceWith As String) As String

    ' Replaces all occurrences of ReplaceString in MainString
with ReplaceWith

    Dim intPos As Integer
    Dim strTemp As String

    strTemp = MainString

    intPos = InStr(strTemp, ReplaceString)
    Do While intPos <> 0
        strTemp = Left(strTemp, intPos - 1) & ReplaceWith & _
            Mid(strTemp, intPos + Len(ReplaceString))
        intPos = InStr(intPos + Len(ReplaceString) + 1, strTemp,
ReplaceString)
    Loop
    ReplaceSubString = strTemp
End Function

Public Function ShowFileDialog(ByVal strFilter As
String, _

```

```

    ByVal strDialogTitle As String, ByVal lngFlags As
Long, _
    Optional ByVal strOldFile As String = gsEmptyString)
As String

```

```

' Returns the file name selected by the user
Dim strInitDir As String
Dim intPos As Integer
Dim opfile As OPENFILENAME
Dim sFile As String

```

```

On Error GoTo ShowFileDialogErr

```

```

If Not strOldFile <> gsEmptyString Then
    intPos = InstrR(strOldFile, gsPeriod)
    If intPos > 0 Then
        strInitDir = Left$(strOldFile, intPos - 1)
    End If
End If

```

```

With opfile
    .StructSize = Len(opfile)
    .Flags = lngFlags
    .lpstrInitialDir = strInitDir
    .lpstrTitle = strDialogTitle
    .lpstrFilter = MakeWindowsFilter(strFilter)
    sFile = strOldFile & String$(MAX_PATH -

```

```

Len(strOldFile), 0)
    .lpstrFile = sFile
    .nMaxFile = MAX_PATH
End With

```

```

If GetOpenFileName(opfile) Then
    ShowFileDialog = Left$(opfile.lpstrFile,
InStr(opfile.lpstrFile, vbNullChar) - 1)
Else
    ShowFileDialog = strOldFile
End If

```

```

Exit Function

```

```

ShowFileDialogErr:
    Call DisplayErrors
    ' Reset the selection to the passed in file, if any
    ShowFileDialog = strOldFile

```

```

End Function

```

```

Public Function InstrR(strMain As String, _
    strSearch As String) As Integer
    ' Finds the last occurrence of the passed in string

```

```

    Dim intPos As Integer
    Dim intPrev As Integer

```

```

    intPrev = intPos
    intPos = InStr(1, strMain, strSearch)

```

```

Do While intPos > 0
    intPrev = intPos
    intPos = InStr(intPos + 1, strMain, strSearch)

```

```

Loop
InstrR = intPrev

```

```

End Function

```

```

Private Function MakeWindowsFilter(sFilter As String) As
String

```

```

    Dim s As String, ch As String, iTemp As Integer

```

```

    ' To make Windows-style filter, replace | and : with nulls
    For iTemp = 1 To Len(sFilter)
        ch = Mid$(sFilter, iTemp, 1)
        If ch = "|" Then
            s = s & vbNullChar
        Else
            s = s & ch
        End If
    Next iTemp

```

```

    ' Put double null at end
    s = s & vbNullChar & vbNullChar
    MakeWindowsFilter = s

```

```

End Function

```

```

Public Function BrowseStpFile(ByVal strDefaultFile As
String) As String

```

```

    ' This function initializes the values of the filter property,
    ' the dialog title and flags for the File Open dialog
    depending
    ' on the FileType passed in
    ' It then calls ShowFileDialog to set these properties
    and
    ' display the File Open dialog to the user

```

```

On Error GoTo BrowseStpFileErr

```

```

BrowseStpFile = ShowFileDialog( _
    ms_FILE_DB_FILTER & ms_FILE_ALL_FILTER, _
    ms_DLG_TITLE_OPEN, _
    ml_FILE_DB_FLAGS, _
    strDefaultFile)

```

```

Exit Function

```

```

BrowseStpFileErr:

```

```

    DisplayErrors
    BrowseStpFile = gsEmptyString

```

```

End Function

```

```

Public Function BrowseOutputFile(ByVal strDefaultFile As
String) As String

```

```

    ' This function initializes the values of the filter property,
    ' the dialog title and flags for the File Open dialog
    depending
    ' on the FileType passed in
    ' It then calls ShowFileDialog to set these properties
    and
    ' display the File Open dialog to the user

```

```

On Error GoTo BrowseOutputFileErr

BrowseOutputFile = ShowFileOpenDialog( _
    ms_FILE_OUTPUT_FILTER &
ms_FILE_ALL_FILTER, _
    ms_DLG_TITLE_OPEN, _
    ml_FILE_OUTPUT_FLAGS, _
    strDefaultFile)

Exit Function

BrowseOutputFileErr:
    DisplayErrors
    BrowseOutputFile = gsEmptyString

End Function
Public Function MakePathValid(strFileName As String) As
String
    ' Makes the passed in file path valid

    Dim strFileDir As String
    Dim strTempDir As String
    Dim strTempFile As String
    Dim sTemp As String
    Dim intPos As Integer
    Dim intStart As Integer

    strTempFile = strFileName
    intPos = InstrR(strFileName, gsFileSeparator)

    If intPos > 0 Then
        strFileDir = Left$(strTempFile, intPos - 1)
        If Dir$(strFileDir, vbDirectory) = "" Then
            ' Loop through the entire path starting at the root
            ' since Mkdir can create only one level of sub-directory
            ' at a time
            intStart = InStr(strFileDir, gsFileSeparator)
            If Mid(strFileDir, 2, 1) = ":" Then
                ' Remove drive from directory specification
                intStart = InStr(intStart + 1, strFileDir,
gsFileSeparator)
            End If

            Do While strTempDir <> strFileDir

                If intStart > 0 Then
                    strTempDir = Left$(strFileDir, intStart - 1)
                Else
                    strTempDir = strFileDir
                End If

                If Dir$(strTempDir, vbDirectory) <> "" Then
                    ' If the specified directory doesn't exist, try to
                    ' create it.
                    Mkdir strTempDir
                Else
                    ' The directory exists - go to it's sub-directory
                End If
            End If
        End If
    End If

```

```

        intStart = InStr(intStart + 1, strFileDir,
gsFileSeparator)
    Loop

    ' Sanity check
    If Dir$(strFileDir, vbDirectory) <> "" Then
        ' We were unable to create the file directory
        MsgBox "Unable to create directory " & strFileDir
        MakePathValid = gsEmptyString
    Else
        MakePathValid = strTempFile
    End If
Else
    ' The specified directory exists - we should be able
    ' to create the output file in it
    MakePathValid = strTempFile
End If
Else
    ' The user has only specified a filename - VB will try
    ' to create it in the current directory
    MakePathValid = strTempFile
End If

End Function

```

MoveTempDB.sql

```

--
--
-- MoveTemp.sql
--

alter database tempdb modify file
    (name='tempdev',filename='C:\B\O\TempdB.mdf')

alter database tempdb modify file
    (name='templog',filename='C:\B\O\Templog.ldf')

```

AddTempDB.sql

```

alter database tempdb modify file
    (name=tempdev,
    filename='C:\B\O\TempdB.mdf',size=30000mb)
alter database tempdb modify file
    (name=templog,
    filename='C:\B\O\Templog.ldf',size=30000mb)
alter database tempdb add file
    (name=tempdev2,
    filename='C:\B\P\tempdev_2',size=15000mb),
    (name=tempdev3,
    filename='C:\B\P\tempdev_3',size=15000mb),
    (name=tempdev4,
    filename='C:\B\Q\tempdev_4',size=15000mb),

```


(name=tempdev5,
filename='C:\B\Q\tempdev_5',size=15000mb),
(name=tempdev6,
filename='C:\B\R\tempdev_6',size=15000mb),
(name=tempdev7,
filename='C:\B\R\tempdev_7',size=15000mb),
(name=tempdev8,
filename='C:\B\S\tempdev_8',size=15000mb),
(name=tempdev9,
filename='C:\B\S\tempdev_9',size=15000mb),
(name=tempdev10,
filename='C:\B\T\tempdev_10',size=15000mb),
(name=tempdev11,
filename='C:\B\T\tempdev_11',size=15000mb)

Appendix G: Price Quotations

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

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

Microsoft

May 4, 2007

Dell
Gene Purdy
1 Dell Way
Round Rock, TX 78664

Mr. Purdy:

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

All pricing shown is in US Dollars (\$).

Part Number	Description	Unit Price	Quantity	Price
810-04793	SQL Server 2005 Enterprise x64 Edition <i>Server License with 25 CALs</i> <i>Discount Schedule: Open Program - No Level</i> <i>Unit Price reflects a 39% discount from the retail unit price of \$13,969.</i>	\$8,487	1	\$8,487
359-01911	SQL Server 2005 Client License <i>Discount Schedule: Open Program - No Level</i> <i>Unit Price reflects a 4% discount from the retail unit price of \$163.</i>	\$156	25	\$3,900
P72-00274	Windows Server 2003, Enterprise x64 Edition <i>Server License with 25 CALs</i> <i>Discount Schedule: Open Program - No Level</i> <i>Unit Price reflects a 41% discount from the retail unit price of \$3,999.</i>	\$2,334	1	\$2,334
254-00170	Visual C++ Standard Edition <i>No Discounts Applied</i>	\$109	1	\$109
046-00856	Visual Basic 2003 .Net Professional <i>No Discounts Applied</i>	\$109	1	\$109
N/A	Microsoft Problem Resolution Services <i>Professional Support</i> <i>(1 Incident)</i>	\$245	1	\$245

All products are currently orderable through Microsoft's normal distribution channels. A list of Microsoft's authorized resellers can be found at:
<http://www.microsoft.com/products/info/render.aspx?view=22&type=mpn&content=22/licensing>.

Defect support is included in the purchase price. Additional support is available from Microsoft PSS on an incident by incident basis at \$245 per call.

This quote is valid for the next 90 days.

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

Reference ID: PHGePu0705048325.

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