



**TPC Benchmark™ H
Full Disclosure Report
DELL PowerEdge 2900/Quad-Core Intel® Xeon™
X5355/2.66GHz
8MB L2 Cache
Using
Microsoft Windows Server 2003 Enterprise x64 Edition™
SP1
and SQL Server 2005 Enterprise x64 Edition™ SP1**



Second Edition

Submitted for Review

June 7, 2007

Dell Inc. PowerEdge 2900 Server with Microsoft Windows Server 2003 Enterprise x64 Edition SP1 and SQL Server 2005 Enterprise x64 Edition SP1

Second Printing June 2007

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Abstract

This report document the methodology and results of the TPC Benchmark H test conducted on a PowerEdge 2900 Server using Microsoft SQL Server 2005 Enterprise x64 Edition SP1 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 SP1. The application was written in C and compiled using the Visual Studio Professional Edition compiler.

Hardware	Software	Total System Cost
Dell PowerEdge 2900 with Dual Intel® Xeon™ X5355 QC 2.66GHz w/ 8M Cache Dell PowerVault MD1000 Storage Enclosures	Microsoft Windows Server 2003 Enterprise x64 Edition™ SP1 SQL Server 2005 Enterprise x64 Edition™ SP1	\$117,022

TPC-H Power@100GB	TPC-H Throughput@100GB	<u>QphH@100GB</u>	\$/QphH@100GB
20,587.9	12,009.1	15,723.9	\$7.45

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 2900
 with SQL Server 2005 Enterprise
 x64 Edition™ SP1

TPC-H Revision 2.3.0

Report Date: **Nov 27, 2006**

Revision Date: **Jun 7, 2007**

Total System Cost
\$117,022 USD

TPC-H Composite Query per Hour
15,723.9 QphH@100GB

Price/Performance
\$7.45 USD/ QphH@100GB

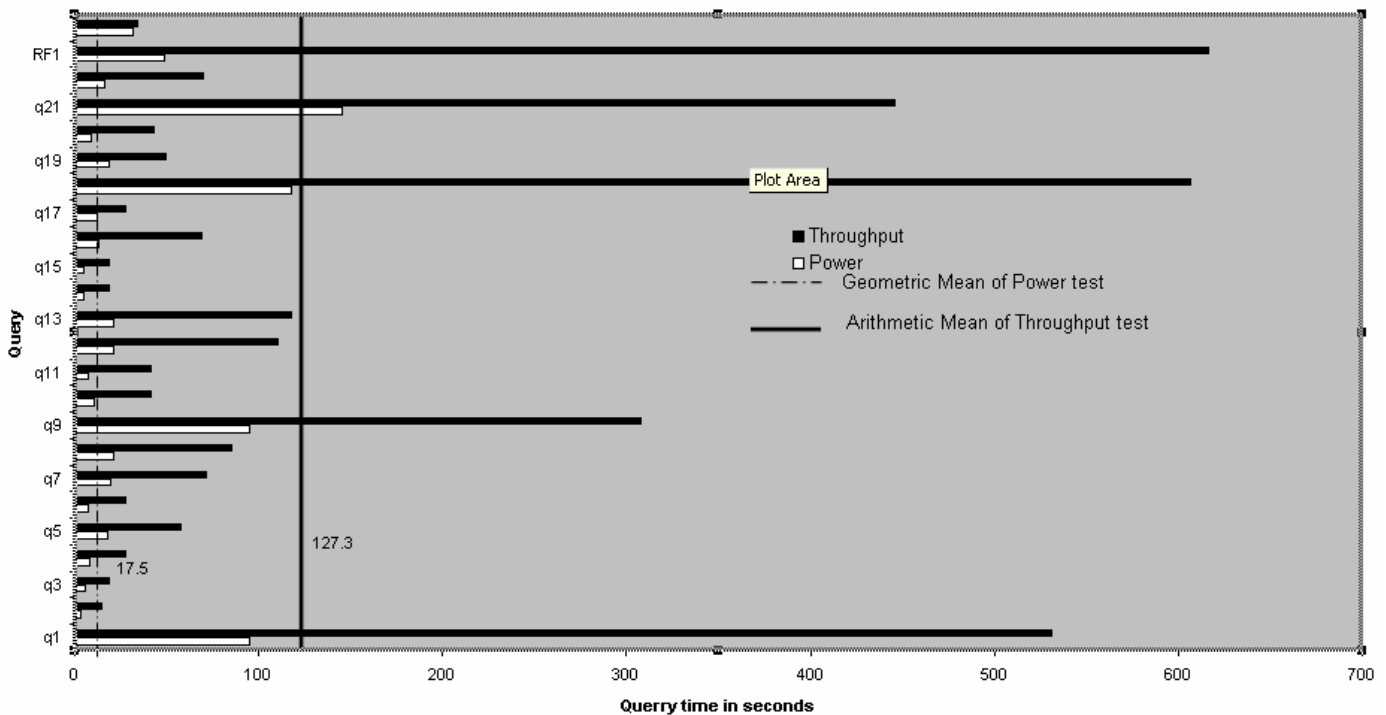
Database Size
100GB

Database Manager
 SQL Server 2005 Enterprise x64
 Edition™ SP1

Operating System
 Microsoft Windows Server
 2003 Enterprise x64
 Edition™ SP1

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

Availability Date
Dec 31, 2006



Database Load Time
 0:56:13

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) : 2x Intel® Xeon™ X5355 QC 2.66GHz w/ 8M Cache
Memory: (per node): 48GB RAM
Disk Drives: 180 – 36GB 15k SAS HDD, & 4 – 73GB 10k SAS HDD
 Copyright 2006 Dell Inc.

“Database Size includes only raw data (e.g., no temp, index, redundant storage space, etc.)”

Dell		PowerEdge PE2900			TPC-H REV 2.3 EXECUTIVE SUMMARY		
		Server			Report Date: 27-Nov-06		
					Revision Date: 07-June-07		
Description	Part Number	Third Party	Unit Price	Qty	Extended Price	3 yr. Maint. Price	
		Brand	Pricing				
Server Hardware							
PE2900,QC XEON X5355,8MB,2.66GZ	222-7262		1,452.00	1	\$1,452.00	\$320.00	
& 2 Broadcom NICs							
DUAL XEON X5355,8MB,2.66GZ	311-6941		1,399.00	1	\$1,399.00		
48GB 667MHz(12x4GB),2R	311-6328		11,798.00	1	\$11,798.00		
PERC5/i,Integrated	341-3018		\$299.00	1	\$299.00		
PERC5/E SAS RAID, 2X4 EXTERNAL	341-3023		\$799.00	4	\$3,196.00		
73GB,3GBPS,SAS,3.5IN,10K	341-3028		\$299.00	4	\$1,196.00		
DELL E157FP,15 IN,15.0 VIS	320-5090		\$189.00	1	\$189.00		
				Subtotal	\$19,529.00	\$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	\$8,487.00		
SQL Server 2005 Client Licence **	359-01911	Microsoft	1	156	\$3,900.00		
Windows Server 2003 Enterprise x64 Server **	P72-00274	Microsoft	1	\$2,334.00	\$2,334.00		
Visual C++ Standard Edition **	254-00170	Microsoft	1	\$109.00	\$109.00		
Visual Basic 2003 .Net Professional	046-00856	Microsoft	1	\$109.00	\$109.00		
Professional Support (1 Incident)		Microsoft	1	\$245.00		\$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%)		\$19,397.59		
				Total	\$96,680	\$20,341	
Notes: * Maint. included in PowerVault MD1000 disk pod			Three-Year Cost of Ownership:		\$117,022	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		15,723.9		
Pricing may be verified by calling 1-800-BUY-DELL and referencing quote # 365085964							
as a complex quote.							
Audited by Lorna Livingtree, Performance Metrics Inc.			\$ / QphH@100G:		\$7.45	USD	
<i>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.</i>							



DELL
PowerEdge 2900
w/ SQL Server 2005 Enterprise
x64 Edition™ SP1

TPC-H Revision 2.3.0

Report Date: **Nov 27, 2006**

Revision Date: **Jun 7, 2007**

Numerical Quantities Summary

Measurement Results:

Database Scale Factor	100
Total Data Storage/Database Size	62.8
Start of Database Load	2006-11-20 12:15:26
End of Database Load	2006-11-20 13:11:39
Database Load Time	0:56:13
Query Streams for Throughput Test	5
TPC-H Power	20,587.9
TPC-H Throughput	12,009.1
TPC-H Composite Query-per-Hour Metric (QphH@100GB)	15,723.9
Total System Price Over 3 Years	\$117,022
TPC-H Price Performance Metric (\$/QphH@100GB)	\$7.45

Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 3,297.5 seconds

Duration of stream execution:

	Seed	Start Date/Time	End Date/Time	Duration
Stream00	1120131139	11/20/06 15:19:35	11/20/06 15:30:57	0:11:22
Stream01	1120131140	11/20/06 15:31:31	11/20/06 16:18:37	0:47:05
Stream02	1120131141	11/20/06 15:31:32	11/20/06 16:19:33	0:48:01
Stream03	1120131142	11/20/06 15:31:32	11/20/06 16:18:36	0:47:05
Stream04	1120131143	11/20/06 15:31:32	11/20/06 16:17:03	0:45:31
Stream05	1120131144	11/20/06 15:31:32	11/20/06 16:17:13	0:45:41
Refresh00		11/20/06 15:18:45	11/20/06 15:19:34	0:00:49
		11/20/06 15:30:58	11/20/06 15:31:29	0:00:32
Refresh01		11/20/06 15:31:31	11/20/06 16:20:51	0:49:20
Refresh02		11/20/06 16:20:57	11/20/06 16:22:16	0:01:19
Refresh03		11/20/06 16:22:22	11/20/06 16:23:41	0:01:20
Refresh04		11/20/06 16:23:46	11/20/06 16:25:03	0:01:17
Refresh05		11/20/06 16:25:12	11/20/06 16:26:29	0:01:17



Numerical Quantities Summary

Timing Intervals in Seconds:

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Stream00	94.9	2.9	5.7	7.8	17.5	7.1	19.8	21.0
Stream01	519.1	14.6	19.5	12.7	51.0	24.3	70.3	90.2
Stream02	515.8	13.7	20.8	33.2	51.9	40.6	69.5	78.6
Stream03	552.3	12.3	10.4	36.3	62.0	29.4	81.5	102.6
Stream04	530.4	16.3	23.6	26.2	70.6	21.3	67.0	86.3
Stream05	536.9	16.5	20.4	29.8	53.1	22.3	69.7	67.9
Min Qi	515.8	12.3	10.4	12.7	51.0	21.3	67.0	67.9
Max Qi	552.3	16.5	23.6	36.3	70.6	40.6	81.5	102.6
Avg Qi	530.9	14.7	18.9	27.6	57.7	27.6	71.6	85.1
Query	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Stream00	95.2	10.3	7.2	21.0	30.8	4.5	4.8	13.1
Stream01	278.4	41.2	41.6	120.5	118.5	17.5	16.1	126.4
Stream02	536.5	45.0	43.8	136.0	117.8	22.5	17.5	61.8
Stream03	239.8	33.3	35.8	65.8	128.1	18.3	16.0	43.8
Stream04	228.6	44.1	44.9	114.3	114.2	19.5	21.2	58.3
Stream05	257.0	41.5	40.0	115.8	108.5	16.8	19.0	56.7
Min Qi	228.6	33.3	35.8	65.8	108.5	16.8	16.0	43.8
Max Qi	536.5	45.0	44.9	136.0	128.1	22.5	21.2	126.4
Avg Qi	308.1	41.0	41.2	110.5	117.4	18.9	18.0	69.4
Query	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream00	11.8	117.5	18.4	8.7	145.2	16.5	48.8	31.5
Stream01	24.1	578.4	44.9	40.9	514.2	60.9	2922.5	32.6
Stream02	31.3	573.5	55.1	45.0	300.6	70.8	40.2	35.2
Stream03	27.3	738.4	52.3	41.8	430.4	66.7	41.2	34.9
Stream04	28.2	568.6	48.1	40.0	471.7	88.0	40.3	32.8
Stream05	25.5	574.5	48.2	46.1	513.7	60.8	38.5	34.7
Min Qi	24.1	568.6	44.9	40.0	300.6	60.8	38.5	32.6
Max Qi	31.3	738.4	55.1	46.1	514.2	88.0	2922.5	35.2
Avg Qi	27.3	606.7	49.7	42.8	446.1	69.4	616.5	34.0

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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 2900 Server, depicted in the next diagram consists of:

- 2 - Intel® Xeon™ X5355 QC 2.66GHz 8MB L2 Cache.
- 48GB RAM.
- 4 - 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.

PE2900

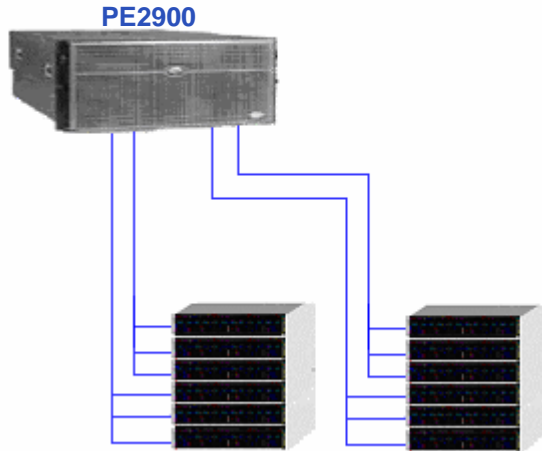
2-Intel® Xeon™ X5355 QC 2.66GHz
8MB L2 Cache
48GB Memory
4xPERC 5/E Controllers
4x73GB, 3GBPS, 10k SAS

DBMS

SQL Server 2005 Enterprise
x64 Edition SP1

OS

Microsoft Windows Server
2003 Enterprise x64 Edition SP1



Storage

12xMD1000
180x36GB, 15K, 3GBPS
SAS

12xMD1000

Measured Configuration

PE2900

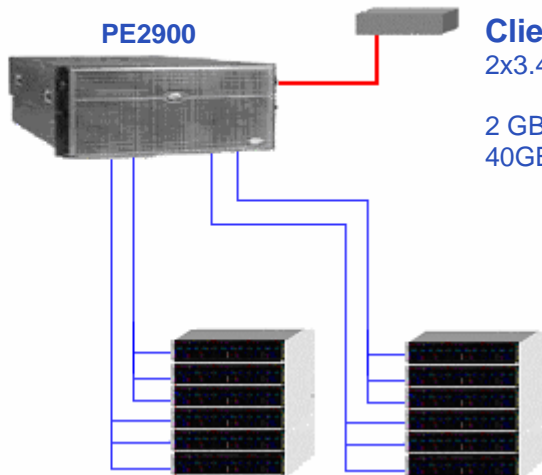
2-Intel® Xeon™ X5355 QC 2.66GHz
8MB L2 Cache
48GB Memory
4xPERC 5/E Controllers
4x73GB, 3GBPS, 10k SAS

DBMS

SQL Server 2005 Enterprise
x64 Edition SP1

OS

Microsoft Windows Server
2003 Enterprise x64 Edition SP1



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:

- 4 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

8 logical volumes were configured each spanning 22 to 23 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 0 734.25 GB			Controller # 0				
Partition			Slot# 1		Channels		
1	2	3	SAS ID	A	B		
F: Lineitem_fg RAW 46.75 GB	O: General_fg RAW 22.5 GB	C:\B\O backup NTFS 665 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			
			9	A0-9			
			10	A0-10			
			11	A0-11			
			12	A0-12			
			13	A0-13			
			14	A0-14			
			15	A0-15			

Windows 2003 Disk Administration			DELL PERC 5/E Configuration				
Disk 1 767.6 GB			Controller # 0				
Partition			Slot# 1		Channels		
1	2	3	SAS ID	A	B		
G: Lineitem_fg RAW 48.75 GB	P: General_fg RAW 23.5 GB	C:\B\P backup NTFS 695.35 GB	0	A0-1			
			1	A0-2			
			2	A0-3			
			3	A0-4			
			4	A0-5			
			5	A0-6			
			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 2 734.25 GB			Controller # 1				
Partition			Slot# 1		Channels		
1	2	3	SAS ID	A	B		
H: Lineitem_fg RAW 46.75 GB	Q: General_fg RAW 22.5 GB	C:\B\Q backup NTFS 665 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			
			9	A0-9			
			10	A0-10			
			11	A0-11			
			12	A0-12			
			13	A0-13			
			14	A0-14			
			15	A0-15			

Windows 2003 Disk Administration			DELL PERC 5/E Configuration					
Disk 3 767.6 GB			Controller # 1					
Partition			Slot# 1		Channels			
1	2	3	SAS ID	A	B			
I: Lineitem_fg RAW 48.75 GB	R: General_fg RAW 23.5 GB	C:\B\R backup NTFS 695.35 GB	0	A0-1				
			1	A0-2				
			2	A0-3				
			3	A0-4				
			4	A0-5				
			5	A0-6				
			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 4 734.25 GB			Controller # 2				
Partition			Slot# 1		Channels		
1	2	3	SAS ID	A	B		
J: Lineitem_fg RAW 46.75 GB	S: General_fg RAW 22.5 GB	C:\B\S backup NTFS 665 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			
			9	A0-9			
			10	A0-10			
			11	A0-11			
			12	A0-12			
			13	A0-13			
			14	A0-14			
			15	A0-15			

Windows 2003 Disk Administration			DELL PERC 5/E Configuration					
Disk 5 767.6 GB			Controller # 2					
Partition			Slot# 1		Channels			
1	2	3	SAS ID	A	B			
K: Lineitem_fg RAW 48.75 GB	T: General_fg RAW 23.5 GB	C:\B\T backup NTFS 695.35 GB	0	A0-1				
			1	A0-2				
			2	A0-3				
			3	A0-4				
			4	A0-5				
			5	A0-6				
			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 6 734.25 GB			Controller # 3					
Partition			Slot# 1	Channels				
1	2	3	SAS ID	A	B			
L: Lineitem_fg RAW 46.75 GB	U: General_fg RAW 22.5 GB	C:\B\U backup NTFS 665 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			
				9	A0-9			
				10	A0-10			
				11	A0-11			
				12	A0-12			
				13	A0-13			
				14	A0-14			
				15	A0-15			

Windows 2003 Disk Administration				DELL PERC 5/E Configuration				
Disk 7 767.6 GB				Controller # 3				
Partition				Slot# 1	Channels			
1	2	3		SAS ID	A	B		
M: Lineitem_fg RAW 48.75 GB	V: General_fg RAW 23.5 GB	Y: C:\B\V RF backup NTFS NTFS 2 GB 693.35 GB		0	A0-1			
				1	A0-2			
				2	A0-3			
				3	A0-4			
				4	A0-5			
				5	A0-6			
				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 0 hours 56 minutes 13 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

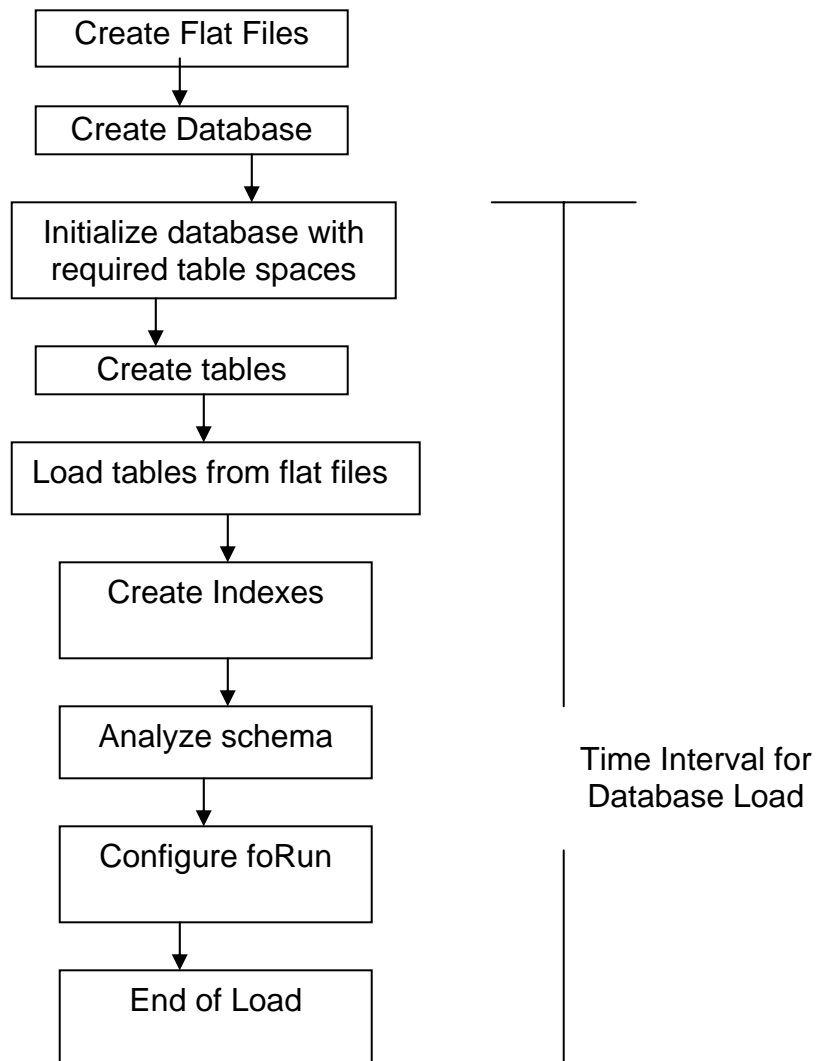
Disk Type	Number of Disks	Space per Disk	Subtotal Disk Space	Total Disk Storage	Data Storage Ratio
36GB 15k	180	33.37GB	6006.6GB		
73GB 10k	4	68.24GB	272.96GB		
				6279.56GB	62.8

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 3,297.5 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	20795.4	12068.8	15842.2
2	20,587.9	12,009.1	15,723.9
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
PE2900,QC XEON X5355,8MB,2.66GZ	222-7262	12/31/2006	1-800-BUY-DELL	Note 1
DUAL XEON X5355,8MB,2.66GZ PROCESSORS	311-6941	12/31/2006	1-800-BUY-DELL	Note 1

Note 1: These parts are 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



November 22, 2006

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

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

Platform: PowerEdge 2900
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
2 Intel EM64T @ 2.66 Ghz	48 GB	180 @ 36 GB 4 @ 73 GB	20,587.9	12,009.1	15,723.9

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					
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			
47104	47104				
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			
45056	45056				
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

```

System Directory C:\WINDOWS\system32
Boot Device      \Device\HarddiskVolume20
Locale          United States
Hardware Abstraction Layer Version = "5.2.3790.1830
(srv03_sp1_rtm.050324-1447)"
User Name       Not Available
Time Zone       Central Standard Time
Total Physical Memory 49,150.98 MB
Available Physical Memory 432.87 MB
Total Virtual Memory 50.19 GB
Available Virtual Memory 3.82 GB
Page File Space   3.43 GB
Page File        C:\pagefile.sys

[Hardware Resources]

[Conflicts/Sharing]

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

IRQ 20 Standard Universal PCI to USB Host Controller
IRQ 20 Standard Universal PCI to USB Host Controller

Memory Address 0xF8400000-0xF84FFFFFPCI standard PCI-to-PCI bridge
Memory Address 0xF8400000-0xF84FFFFFPCI standard PCI-to-PCI bridge

Memory Address 0xF8100000-0xF81FFFFFPCI standard PCI-to-PCI bridge
Memory Address 0xF8100000-0xF81FFFFFPCI standard PCI-to-PCI bridge

IRQ 21 Standard Universal PCI to USB Host Controller
IRQ 21 Standard Universal PCI to USB Host Controller
IRQ 21 Standard Enhanced PCI to USB Host Controller

Memory Address 0xD5E00000-0xD5FFFFFF PCI standard PCI-to-
PCI bridge
Memory Address 0xD5E00000-0xD5FFFFFF PCI standard PCI-to-
PCI bridge

Memory Address 0xDA000000-0xDDFFFFFF PCI standard PCI-to-
PCI bridge
Memory Address 0xDA000000-0xDDFFFFFF PCI standard PCI-to-
PCI bridge
Memory Address 0xDA000000-0xDDFFFFFF Broadcom
BCM5708C NetXtreme II GigE

Memory Address 0xF8200000-0xF82FFFFFPCI standard PCI-to-PCI bridge
Memory Address 0xF8200000-0xF82FFFFFPCI standard PCI-to-PCI bridge

Memory Address 0xD6000000-0xD9FFFFFF PCI standard PCI-to-
PCI bridge
Memory Address 0xD6000000-0xD9FFFFFF PCI standard PCI-to-
PCI bridge
Memory Address 0xD6000000-0xD9FFFFFF Broadcom
BCM5708C NetXtreme II GigE

IRQ 16 PCI standard host CPU bridge
IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 Broadcom BCM5708C NetXtreme II GigE
IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 PCI standard PCI-to-PCI bridge
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IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 PCI standard PCI-to-PCI bridge
IRQ 16 Broadcom BCM5708C NetXtreme II GigE

IRQ 18 RAID Controller

```

System Information

System Information report written at: 11/21/06 06:17:51
System Name: PE2900
[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	PE2900
System Manufacturer	Dell Inc.
System Model	PowerEdge 2900
System Type	x64-based PC
Processor	EM64T Family 6 Model 15 Stepping 7 GenuineIntel ~2660 Mhz
Processor	EM64T Family 6 Model 15 Stepping 7 GenuineIntel ~2660 Mhz
Processor	EM64T Family 6 Model 15 Stepping 7 GenuineIntel ~2660 Mhz
Processor	EM64T Family 6 Model 15 Stepping 7 GenuineIntel ~2660 Mhz
Processor	EM64T Family 6 Model 15 Stepping 7 GenuineIntel ~2660 Mhz
Processor	EM64T Family 6 Model 15 Stepping 7 GenuineIntel ~2660 Mhz
Processor	EM64T Family 6 Model 15 Stepping 7 GenuineIntel ~2660 Mhz
Processor	EM64T Family 6 Model 15 Stepping 7 GenuineIntel ~2660 Mhz
Processor	EM64T Family 6 Model 15 Stepping 7 GenuineIntel ~2660 Mhz
BIOS Version/Date	Dell Inc. 1.3.0, 10/14/2006
SMBIOS Version	2.4
Windows Directory	C:\WINDOWS

IRQ 18	RAID Controller	0x000003F6-0x000003F6	Primary IDE Channel	OK
IRQ 18	RAID Controller	0x00000170-0x00000177	Secondary IDE Channel	OK
		0x00000376-0x00000376	Secondary IDE Channel	OK

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

[IRQs]

Memory Address 0xF8000000-0xF80FFFFFFF PCI standard PCI-to-PCI bridge
Memory Address 0xF8000000-0xF80FFFFFFF PCI standard PCI-to-PCI bridge

Resource	Device	Status	
IRQ 9	Microsoft ACPI-Compliant System		OK
IRQ 16	PCI standard host CPU bridge		OK
IRQ 16	PCI standard PCI-to-PCI bridge		OK
IRQ 16	PCI standard PCI-to-PCI bridge		OK
IRQ 16	PCI standard PCI-to-PCI bridge		OK
IRQ 16	PCI standard PCI-to-PCI bridge		OK
IRQ 16	Broadcom BCM5708C NetXtreme II GigE		OK
IRQ 16	PCI standard PCI-to-PCI bridge		OK
IRQ 16	PCI standard PCI-to-PCI bridge		OK
IRQ 16	PCI standard PCI-to-PCI bridge		OK
IRQ 16	PCI standard PCI-to-PCI bridge		OK
IRQ 16	PCI standard PCI-to-PCI bridge		OK
IRQ 16	PCI standard PCI-to-PCI bridge		OK
IRQ 16	Broadcom BCM5708C NetXtreme II GigE		OK
IRQ 19	RAID Controller		OK
IRQ 18	RAID Controller		OK
IRQ 18	RAID Controller		OK
IRQ 18	RAID Controller		OK
IRQ 142	RAID Controller		OK
IRQ 21	Standard Universal PCI to USB Host Controller		OK
IRQ 21	Standard Universal PCI to USB Host Controller		OK
IRQ 21	Standard Enhanced PCI to USB Host Controller		OK
IRQ 20	Standard Universal PCI to USB Host Controller		OK
IRQ 20	Standard Universal PCI to USB Host Controller		OK
IRQ 13	Numeric data processor		OK
IRQ 8	System CMOS/real time clock		OK
IRQ 0	System timer		OK
IRQ 6	Standard floppy disk controller		OK
IRQ 4	Communications Port (COM1)		OK
IRQ 3	Communications Port (COM2)		OK
IRQ 14	Primary IDE Channel		OK

[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
0x00000D00-0x0000FFFF	PCI bus	OK
0x0000DCE0-0x0000DCFF	Standard Universal PCI to USB Host Controller	OK
0x0000DCC0-0x0000DCDF	Standard Universal PCI to USB Host Controller	OK
0x0000DCA0-0x0000DCBF	Standard Universal PCI to USB Host Controller	OK
0x0000DC80-0x0000DC9F	Standard Universal PCI to USB Host Controller	OK
0x0000EC00-0x0000ECFF	Standard VGA Graphics Adapter	OK
0x000003B0-0x000003BB	Standard VGA Graphics Adapter	OK
0x000003C0-0x000003DF	Standard VGA Graphics Adapter	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 board	OK
0x00000070-0x0000007F	System CMOS/real time clock	OK
0x00000040-0x0000005F	System timer	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
0x00000880-0x000008BF	System board	OK
0x000008C0-0x000008DF	System board	OK
0x000008E0-0x000008E3	System board	OK
0x00000C00-0x00000C7F	System board	OK
0x00000CA0-0x00000CA7	System board	OK
0x00000CA9-0x00000CAB	System board	OK
0x00000CAD-0x00000CAF	System board	OK
0x00000060-0x00000060	System board	OK
0x00000064-0x00000064	System board	OK
0x00000CA8-0x00000CA8	System board	OK
0x00000CAC-0x00000CAC	System board	OK
0x0000FC00-0x0000FC0F	Standard Dual Channel PCI IDE Controller	OK
0x000001F0-0x000001F7	Primary IDE Channel	OK

[Memory]

Resource	Device	Status
0xA0000-0xBFFFF	PCI bus	OK
0xA0000-0xBFFFF	Standard VGA Graphics Adapter	OK
0xD0000000-0xFDFFFFFF	PCI bus	OK
0xD2000000-0xD9FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF8300000-0xF83FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF8300000-0xF83FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF8300000-0xF83FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF8300000-0xF83FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD4000000-0xD9FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD6000000-0xD9FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD6000000-0xD9FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD6000000-0xD9FFFFFF	Broadcom BCM5708C NetXtreme II GigE	OK
0xD5E00000-0xD5FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD5E00000-0xD5FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF83F0000-0xF83FFFFFF	RAID Controller	OK
0xD5EE0000-0xD5EFFFFFF	RAID Controller	OK
0xDE900000-0xDEBFFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF8200000-0xF82FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF8200000-0xF82FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xDEA00000-0xDEBFFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF82F0000-0xF82FFFFFF	RAID Controller	OK
0xDEAE0000-0xDEAFFFFFF	RAID Controller	OK
0xDE600000-0xDE8FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF8100000-0xF81FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF8100000-0xF81FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xDE700000-0xDE8FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF81F0000-0xF81FFFFFF	RAID Controller	OK
0xDE7E0000-0xDE7FFFFFF	RAID Controller	OK
0xDEC00000-0xDEEFFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF8400000-0xF84FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF8400000-0xF84FFFFFF	PCI standard PCI-to-PCI bridge	OK

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0xDED00000-0xDEFFFFFF PCI standard PCI-to-PCI bridge OK
0xF84F0000-0xF84FFFFFF RAID Controller OK
0xDEDE0000-0xDEDDFFFF RAID Controller OK
0xDE300000-0xDE5FFFFFF PCI standard PCI-to-PCI bridge OK
0xF8000000-0xF80FFFFFF PCI standard PCI-to-PCI bridge OK
0xF8000000-0xF80FFFFFF PCI standard PCI-to-PCI bridge OK
0xDE400000-0xDE5FFFFFF PCI standard PCI-to-PCI bridge OK
0xF80F0000-0xF80FFFFFF RAID Controller OK
0xDE4E0000-0xDE4FFFFFF RAID Controller OK
0xDA000000-0xDDDDFFFF PCI standard PCI-to-PCI bridge OK
0xDA000000-0xDDDDFFFF PCI standard PCI-to-PCI bridge OK
0xDA000000-0xDDDDFFFF Broadcom BCM5708C NetXtreme II GigE
OK
0xDEF00000-0xDEF003FF Standard Enhanced PCI to USB Host
Controller OK
0xF0000000-0xF7FFFFFF Standard VGA Graphics Adapter OK
0xDE1F0000-0xDE1FFFFFF Standard VGA Graphics Adapter OK
0xE0000000-0xEFFFFFFF Motherboard resources OK
0xFED00000-0xFED003FF High precision event timer OK

```

[Components]

[Multimedia]

[Audio Codecs]

CODEC	Manufacturer	Description	Status	File
Version	Size	Creation Date		
c:\windows\system32\tsoft32.acm	OK	DSP GROUP, INC.		
	C:\WINDOWS\system32\TSSOFT32.ACM	1.01		
	13.50 KB (13,824 bytes)	3/25/2005 6:00 AM		
c:\windows\system32\msadp32.acm	OK	Microsoft Corporation		
	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\msgsm32.acm	OK	Microsoft Corporation		
	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\msg711.acm	OK	Microsoft Corporation		
	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		
c:\windows\system32\imaadp32.acm	OK	Microsoft Corporation		
	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		

[Video Codecs]

CODEC	Manufacturer	Description	Status	File
Version	Size	Creation Date		
c:\windows\system32\msyuv.dll	OK	Microsoft Corporation		
	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		
c:\windows\system32\msvidc32.dll	OK	Microsoft Corporation		
	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\iyuv_32.dll	OK	Microsoft Corporation		
	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\msrle32.dll	OK	Microsoft Corporation		
	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\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

```

[CD-ROM]

Item	Value
Drive	D:
Description	CD-ROM Drive
Media Loaded	No
Media Type	CD-ROM
Name	TSSTcorp CDRWDVD TS-H492C
Manufacturer	(Standard CD-ROM drives)
Status	OK
Transfer Rate	Not Available
SCSI Target ID	0
PNP Device ID	IDE\CDROMTSSTCORP_CDRWDVD_TS-H492C
Driver	c:\windows\system32\drivers\cdrom.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 75.50 KB (77,312 bytes), 3/25/2005 6:00 AM)

[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_01B11028&REV_02\4&2014205D&0&68F0
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	0xF0000000-0xF7FFFFFF
I/O Port	0x0000EC00-0x0000ECFF
Memory Address	0xDE1F0000-0xDE1FFFFFF
I/O Port	0x000003B0-0x000003BB
I/O Port	0x000003C0-0x000003DF
Memory Address	0xA0000-0xBF000
Driver	c:\windows\system32\drivers\vgapnp.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 33.00 KB (33,792 bytes), 11/13/2006 9:47 AM)

[Infrared]

Item	Value
------	-------

[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\6&3080EB9D&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\7&2BEB8CEA&0
&0000
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

[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 11/20/2006 3:16 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_L2TPMINIPOINT\0000
Last Reset 11/20/2006 3:16 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_PPTPMINIPOINT\0000
Last Reset 11/20/2006 3:16 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\raspppt.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_PPPOEMINIPOINT\0000
Last Reset 11/20/2006 3:16 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\raspppoe.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_PTIMINIPOINT\0000
Last Reset 11/20/2006 3:16 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 11/20/2006 3:16 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 Ethernet 802.3

Product Type Broadcom BCM5708C NetXtreme II GigE (NDIS VBD Client)
 Installed Yes
 PNP Device ID B06BDRV\L2ND&PCI_164C14E4&SUBSYS_01B11028&REV_12\6&2F68317E&0&20050500
 Last Reset 11/20/2006 3:16 PM
 Index 7
 Service Name l2nd
 IP Address 192.2.2.29
 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 00:13:72:64:D8:16
 Driver c:\windows\system32\drivers\bxnd52a.sys (2.6.14.0 built by: WinDDK, 78.00 KB (79,872 bytes), 4/3/2006 2:53 PM)

Name [00000008] 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 Not Available
 Last Reset 11/20/2006 3:16 PM
 Index 8
 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

Name [00000009] 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_01B11028&REV_12\8&149AADD6&0&20050900
 Last Reset 11/20/2006 3:16 PM
 Index 9
 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 2:53 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 A:	
Description	3 1/2 Inch Floppy Drive
Drive C:	
Description	Local Fixed Disk
Compressed	No
File System	NTFS
Size	40.00 GB (42,952,376,320 bytes)
Free Space	30.05 GB (32,265,527,296 bytes)
Volume Name	
Volume Serial Number	B4AB6087

Drive D:	
Description	CD-ROM Disc

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

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

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 U:
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 V:
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 259.63 MB (272,236,544 bytes)
Volume Name
Volume Serial Number 78E06704

[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 4
 SCSI Target ID 0
 Sectors/Track 63
 Size 734.25 GB (788,393,088,000 bytes)
 Total Cylinders 95,850
 Total Sectors 1,539,830,250
 Total Tracks 24,441,750
 Tracks/Cylinder 255
 Partition Disk #4, Partition #0
 Partition Size 46.75 GB (50,198,851,584 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #4, Partition #1
 Partition Size 22.51 GB (24,165,872,640 bytes)
 Partition Starting Offset 50,198,883,840 bytes
 Partition Disk #4, Partition #2
 Partition Size 664.99 GB (714,028,331,520 bytes)
 Partition Starting Offset 74,364,756,480 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 1
 Sectors/Track 63
 Size 767.62 GB (824,230,632,960 bytes)
 Total Cylinders 100,207
 Total Sectors 1,609,825,455
 Total Tracks 25,552,785
 Tracks/Cylinder 255
 Partition Disk #5, Partition #0
 Partition Size 48.75 GB (52,345,649,664 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #5, Partition #1
 Partition Size 23.50 GB (25,235,159,040 bytes)
 Partition Starting Offset 52,345,681,920 bytes
 Partition Disk #5, Partition #2
 Partition Size 695.36 GB (746,641,566,720 bytes)
 Partition Starting Offset 77,580,840,960 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 734.25 GB (788,393,088,000 bytes)
 Total Cylinders 95,850
 Total Sectors 1,539,830,250
 Total Tracks 24,441,750
 Tracks/Cylinder 255
 Partition Disk #7, Partition #0
 Partition Size 46.75 GB (50,198,851,584 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #7, Partition #1
 Partition Size 22.51 GB (24,165,872,640 bytes)
 Partition Starting Offset 50,198,883,840 bytes

Partition Disk #7, Partition #2
 Partition Size 664.99 GB (714,028,331,520 bytes)
 Partition Starting Offset 74,364,756,480 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 6
 SCSI Target ID 1
 Sectors/Track 63
 Size 767.62 GB (824,230,632,960 bytes)
 Total Cylinders 100,207
 Total Sectors 1,609,825,455
 Total Tracks 25,552,785
 Tracks/Cylinder 255
 Partition Disk #8, Partition #0
 Partition Size 48.75 GB (52,345,649,664 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #8, Partition #1
 Partition Size 23.50 GB (25,235,159,040 bytes)
 Partition Starting Offset 52,345,681,920 bytes
 Partition Disk #8, Partition #2
 Partition Size 2.01 GB (2,155,023,360 bytes)
 Partition Starting Offset 77,580,840,960 bytes
 Partition Disk #8, Partition #3
 Partition Size 693.36 GB (744,486,543,360 bytes)
 Partition Starting Offset 79,735,864,320 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 734.25 GB (788,393,088,000 bytes)
 Total Cylinders 95,850
 Total Sectors 1,539,830,250
 Total Tracks 24,441,750
 Tracks/Cylinder 255
 Partition Disk #2, Partition #0
 Partition Size 46.75 GB (50,198,851,584 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #2, Partition #1
 Partition Size 22.51 GB (24,165,872,640 bytes)
 Partition Starting Offset 50,198,883,840 bytes
 Partition Disk #2, Partition #2
 Partition Size 664.99 GB (714,028,331,520 bytes)
 Partition Starting Offset 74,364,756,480 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 1
 Sectors/Track 63
 Size 734.25 GB (788,393,088,000 bytes)
 Total Cylinders 95,850
 Total Sectors 1,539,830,250
 Total Tracks 24,441,750
 Tracks/Cylinder 255
 Partition Disk #2, Partition #0
 Partition Size 46.75 GB (50,198,851,584 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #2, Partition #1
 Partition Size 22.51 GB (24,165,872,640 bytes)
 Partition Starting Offset 50,198,883,840 bytes
 Partition Disk #2, Partition #2
 Partition Size 664.99 GB (714,028,331,520 bytes)
 Partition Starting Offset 74,364,756,480 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 1
 Sectors/Track 63

Size 767.62 GB (824,230,632,960 bytes)
 Total Cylinders 100,207
 Total Sectors 1,609,825,455
 Total Tracks 25,552,785
 Tracks/Cylinder 255
 Partition Disk #3, Partition #0
 Partition Size 48.75 GB (52,345,649,664 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #3, Partition #1
 Partition Size 23.50 GB (25,235,159,040 bytes)
 Partition Starting Offset 52,345,681,920 bytes
 Partition Disk #3, Partition #2
 Partition Size 695.36 GB (746,641,566,720 bytes)
 Partition Starting Offset 77,580,840,960 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 2
 SCSI Target ID 0
 Sectors/Track 63
 Size 734.25 GB (788,393,088,000 bytes)
 Total Cylinders 95,850
 Total Sectors 1,539,830,250
 Total Tracks 24,441,750
 Tracks/Cylinder 255
 Partition Disk #0, Partition #0
 Partition Size 46.75 GB (50,198,851,584 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #0, Partition #1
 Partition Size 22.51 GB (24,165,872,640 bytes)
 Partition Starting Offset 50,198,883,840 bytes
 Partition Disk #0, Partition #2
 Partition Size 664.99 GB (714,028,331,520 bytes)
 Partition Starting Offset 74,364,756,480 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 2
 SCSI Target ID 1
 Sectors/Track 63
 Size 767.62 GB (824,230,632,960 bytes)
 Total Cylinders 100,207
 Total Sectors 1,609,825,455
 Total Tracks 25,552,785
 Tracks/Cylinder 255
 Partition Disk #1, Partition #0
 Partition Size 48.75 GB (52,345,649,664 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #1, Partition #1
 Partition Size 23.50 GB (25,235,159,040 bytes)
 Partition Starting Offset 52,345,681,920 bytes
 Partition Disk #1, Partition #2
 Partition Size 695.36 GB (746,641,566,720 bytes)
 Partition Starting Offset 77,580,840,960 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 2
 SCSI Bus 1
 SCSI Logical Unit 0
 SCSI Port 5
 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 #6, Partition #0
 Partition Size 40.00 GB (42,952,379,904 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #6, Partition #1
 Partition Size 60.00 GB (64,428,618,240 bytes)
 Partition Starting Offset 42,952,412,160 bytes

[SCSI]

Item Value
 Name RAID Controller
 Manufacturer Not Available
 Status OK
 PNP Device ID
 PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\7&
 15E7139E&0&7000080010
 Memory Address 0xF83F0000-0xF83FFFFF
 Memory Address 0xD5EE0000-0xD5EFFFFF
 IRQ Channel IRQ 19
 Driver c:\windows\system32\drivers\percsas.sys (1.20.0.64 built by:
 WinDDK, 26.50 KB (27,136 bytes), 11/13/2006 9:30 AM)

Name RAID Controller
 Manufacturer Not Available
 Status OK
 PNP Device ID
 PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&
 40F47DA&0&700018
 Memory Address 0xF82F0000-0xF82FFFFF
 Memory Address 0xDEAE0000-0xDEAFFFFF
 IRQ Channel IRQ 18
 Driver c:\windows\system32\drivers\percsas.sys (1.20.0.64 built by:
 WinDDK, 26.50 KB (27,136 bytes), 11/13/2006 9:30 AM)

Name RAID Controller
 Manufacturer Not Available
 Status OK
 PNP Device ID
 PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&
 2777B40C&0&700020
 Memory Address 0xF81F0000-0xF81FFFFF
 Memory Address 0xDE7E0000-0xDE7EFFFF
 IRQ Channel IRQ 18
 Driver c:\windows\system32\drivers\percsas.sys (1.20.0.64 built by:
 WinDDK, 26.50 KB (27,136 bytes), 11/13/2006 9:30 AM)

Name RAID Controller
 Manufacturer Not Available
 Status OK
 PNP Device ID
 PCI\VEN_1028&DEV_0015&SUBSYS_1F021028&REV_00\5&
 8FB9AF8&0&700028
 Memory Address 0xF84F0000-0xF84FFFFF
 Memory Address 0xDEDE0000-0xDEDEFFFF
 IRQ Channel IRQ 142
 Driver c:\windows\system32\drivers\percsas.sys (1.20.0.64 built by:
 WinDDK, 26.50 KB (27,136 bytes), 11/13/2006 9:30 AM)

Name RAID Controller
 Manufacturer Not Available

Status OK
 PNP Device ID PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&3544DC99&0&700030
 Memory Address 0xF80F0000-0xF80FFFFF
 Memory Address 0xDE4E0000-0xDE4FFFFF
 IRQ Channel IRQ 18
 Driver c:\windows\system32\drivers\percsas.sys (1.20.0.64 built by: WinDDK, 26.50 KB (27,136 bytes), 11/13/2006 9:30 AM)

[IDE]

Item Value
 Name Standard Dual Channel PCI IDE Controller
 Manufacturer (Standard IDE ATA/ATAPI controllers)
 Status OK
 PNP Device ID PCI\VEN_8086&DEV_269E&SUBSYS_01B11028&REV_09\3&61AAA01&0&F9
 I/O Port 0x0000FC00-0x0000FC0F
 Driver c:\windows\system32\drivers\pciide.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 6.00 KB (6,144 bytes), 3/25/2005 6:00 AM)

Name Primary IDE Channel
 Manufacturer (Standard IDE ATA/ATAPI controllers)
 Status OK
 PNP Device ID PCI\IDE\IDECHANNEL\4&1D8A9C03&0&0
 I/O Port 0x000001F0-0x000001F7
 I/O Port 0x000003F6-0x000003F6
 IRQ Channel IRQ 14
 Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 145.00 KB (148,480 bytes), 3/25/2005 6:00 AM)

Name Secondary IDE Channel
 Manufacturer (Standard IDE ATA/ATAPI controllers)
 Status OK
 PNP Device ID PCI\IDE\IDECHANNEL\4&1D8A9C03&0&1
 I/O Port 0x00000170-0x00000177
 I/O Port 0x00000376-0x00000376
 Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 145.00 KB (148,480 bytes), 3/25/2005 6:00 AM)

[Printing]

Name Driver Port Name Server Name

[Problem Devices]

Device PNP Device ID Error Code
 Broadcom BCM5708C NetXtreme II GigE (NDIS VBD Client) #3
 B06BDRV\L2ND&PCI_164C14E4&SUBSYS_01B11028&REV_12\8&149AADD6&0&20050900 This device is disabled.

[USB]

Device PNP Device ID
 Standard Universal PCI to USB Host Controller
 PCI\VEN_8086&DEV_2688&SUBSYS_01B11028&REV_09\3&61AAA01&0&E8
 Standard Universal PCI to USB Host Controller
 PCI\VEN_8086&DEV_2689&SUBSYS_01B11028&REV_09\3&61AAA01&0&E9
 Standard Universal PCI to USB Host Controller
 PCI\VEN_8086&DEV_268A&SUBSYS_01B11028&REV_09\3&61AAA01&0&EA
 Standard Universal PCI to USB Host Controller
 PCI\VEN_8086&DEV_268B&SUBSYS_01B11028&REV_09\3&61AAA01&0&EB
 Standard Enhanced PCI to USB Host Controller
 PCI\VEN_8086&DEV_268C&SUBSYS_01B11028&REV_09\3&61AAA01&0&EF

[Software Environment]

[System Drivers]

Name	Description	File	Type	Started	Start Mode
	Accept Stop			Accept	Pause
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		
Driver	No	Disabled	Stopped	OK	Normal
	No				No
adpu160m	adpu160m	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No
adpu320	adpu320	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No
afd	AFD	c:\windows\system32\drivers\afd.sys	Kernel Driver		
Driver	Yes	System	Running	OK	Normal
	Yes				No
aic78u2	aic78u2	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No
aic78xx	aic78xx	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No
aliide	AliIde	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No
amdide	AmdIde	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No
arc	arc	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No
asyncmac	RAS Asynchronous Media Driver				
	c:\windows\system32\drivers\asyncmac.sys		Kernel Driver		
	No	Manual	Stopped	OK	Normal
	No				No
atapi	Standard IDE/ESDI Hard Disk Controller				
	c:\windows\system32\drivers\atapi.sys		Kernel Driver		
	Yes	Boot	Running	OK	Normal
	Yes				No
atdisk	Atdisk	Not Available	Kernel Driver	No	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		
	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		
Driver	Yes	System	Running	OK	Normal
	Yes				No
cdac15ba	CdaC15BA	c:\windows\system32\drivers\cdac15ba.sys	Kernel Driver		
	Kernel Driver	Yes	Auto	Running	OK
	Normal	No	Yes		
cdad10ba	CdaD10BA	c:\windows\system32\drivers\cdad10ba.sys	Kernel Driver		
	Kernel Driver	Yes	Auto	Running	OK
	Normal	No	Yes		
cdfs	Cdfs	c:\windows\system32\drivers\cdfs.sys	File System Driver		
	System Driver	Yes	Disabled	Running	OK
	No	Yes			Normal
cdrom	CD-ROM Driver	c:\windows\system32\drivers\cdrom.sys	Kernel Driver		
	Kernel Driver	Yes	System	Running	OK
	Normal	No	Yes		

tcpip	TCP/IP Protocol Driver					Kernel Driver	Microsoft System Management BIOS Driver	Yes	SYSTEM
	c:\windows\system32\drivers\tcpip.sys					Kernel Driver	5.2.3790.1830	10/1/2002 (Standard system devices)	
	Yes	System	Running	OK	Normal	No	machine.inf	Not Available	
	ROOT\SYSTEM\0002								
tdpipe Driver	TDPIPE	c:\windows\system32\drivers\tdpipe.sys			Kernel Driver	Kernel	Microsoft Code Update Device	Yes	SYSTEM 5.2.3790.1830
	No	Manual	Stopped	OK	Ignore	No	10/1/2002 (Standard system devices)	machine.inf	
	Not Available ROOT\SYSTEM\0001								
tdtcp Driver	TDTCP	c:\windows\system32\drivers\tdtcp.sys			Kernel Driver	Kernel	Plug and Play Software Device Enumerator	Yes	SYSTEM
	Yes	Manual	Running	OK	Ignore	No	5.2.3790.1830	10/1/2002 (Standard system devices)	
	machine.inf Not Available ROOT\SYSTEM\0000								
termdd	Terminal Device Driver					Kernel Driver	Terminal Server Mouse Driver	Yes	SYSTEM 5.2.3790.1830
	c:\windows\system32\drivers\termdd.sys					Kernel Driver	10/1/2002 (Standard system devices)	machine.inf	
	Yes	System	Running	OK	Normal	No	Not Available ROOT\RDP_MOU\0000		
toside	TosIde	Not Available			Kernel Driver	No	Terminal Server Keyboard Driver	Yes	SYSTEM
	Disabled	Stopped	OK	Normal	No	No	5.2.3790.1830	10/1/2002 (Standard system devices)	
udfs System Driver	Udfs	c:\windows\system32\drivers\udfs.sys			File	File	machine.inf	Not Available	
	No	No	Disabled	Stopped	OK	Normal	ROOT\RDP_KBD\0000		
ultra	ultra	Not Available			Kernel Driver	No	Terminal Server Device Redirector	Yes	SYSTEM
	Disabled	Stopped	OK	Normal	No	No	5.2.3790.1830	10/1/2002 (Standard system devices)	
update	Microcode Update Driver					Kernel Driver	5.2.3790.1830	10/1/2002 (Standard system devices)	
	c:\windows\system32\drivers\update.sys					Kernel Driver	machine.inf	Not Available	ROOT\RDPDR\0000
	Yes	Manual	Running	OK	Normal	No	Direct Parallel Yes NET 5.2.3790.1830 10/1/2002		
	Yes ROOT\MS_PTMINIIMPORT\0000								
usbccgp	Microsoft USB Generic Parent Driver					Kernel Driver	WAN Miniport (PPTP)	Yes	NET 5.2.3790.1830
	c:\windows\system32\drivers\usbccgp.sys					Kernel Driver	10/1/2002 Microsoft netrasa.inf	Not Available	
	Yes	Manual	Running	OK	Normal	No	ROOT\MS_PPTPMINIIMPORT\0000		
	Yes ROOT\MS_PPTPMINIIMPORT\0000								
usbhci	Microsoft USB 2.0 Enhanced Host Controller Miniport Driver					Kernel Driver	WAN Miniport (PPPOE)	Yes	NET 5.2.3790.1830
	c:\windows\system32\drivers\usbhci.sys					Kernel Driver	10/1/2002 Microsoft netrasa.inf	Not Available	
	Yes	Manual	Running	OK	Normal	No	ROOT\MS_PPPOEMINIIMPORT\0000		
	Yes ROOT\MS_PPPOEMINIIMPORT\0000								
usbhub	Microsoft USB Standard Hub Driver					Kernel Driver	WAN Miniport (IP)	Yes	NET 5.2.3790.1830 10/1/2002
	c:\windows\system32\drivers\usbhub.sys					Kernel Driver	Microsoft netrasa.inf	Not Available	
	Yes	Manual	Running	OK	Normal	No	ROOT\MS_NDISWANIP\0000		
	Yes ROOT\MS_NDISWANIP\0000								
usbstor	USB Mass Storage Driver					Kernel Driver	WAN Miniport (L2TP)	Yes	NET 5.2.3790.1830
	c:\windows\system32\drivers\usbstor.sys					Kernel Driver	10/1/2002 Microsoft netrasa.inf	Not Available	
	No	Manual	Stopped	OK	Normal	No	ROOT\MS_L2TPMINIIMPORT\0000		
	No ROOT\MS_L2TPMINIIMPORT\0000								
usbuhci	Microsoft USB Universal Host Controller Miniport Driver					Kernel Driver	Video Codecs	Yes	MEDIA 5.2.3790.1830 10/1/2002
	c:\windows\system32\drivers\usbuhci.sys					Kernel Driver	(Standard system devices)	wave.inf	Not Available
	Yes	Manual	Running	OK	Normal	No	ROOT\MEDIA\MS_MMVID		
	Yes ROOT\MEDIA\MS_MMVID								
vga Driver	vga	c:\windows\system32\drivers\vgapnp.sys			Kernel Driver	Kernel	Legacy Video Capture Devices	Yes	MEDIA 5.2.3790.1830
	Yes	Manual	Running	OK	Ignore	No	10/1/2002 (Standard system devices)	wave.inf	Not Available
	Yes ROOT\MEDIA\MS_MMDRV								
vgasave	VGA Display Controller.					Kernel Driver	Audio Codecs	Yes	MEDIA 5.2.3790.1830 10/1/2002
	c:\windows\system32\drivers\vga.sys					Kernel Driver	(Standard system devices)	wave.inf	Not Available
	No	System	Stopped	OK	Ignore	No	ROOT\MEDIA\MS_MMCMAC		
	No ROOT\MEDIA\MS_MMCMAC								
viaide	ViaIde	Not Available			Kernel Driver	No	Remote Access IP ARP Driver	Not Available	LEGACYDRIVER
	Disabled	Stopped	OK	Normal	No	No	Not Available	Not Available	Not Available
volsnap	Storage volumes					Kernel Driver	Not Available	Not Available	
	c:\windows\system32\drivers\volsnap.sys					Kernel Driver	ROOT\LEGACY_WANARP\0000		
	Kernel Driver	Yes	Boot	Running	OK	Normal	volsnap	Not Available	LEGACYDRIVER Not Available
	Normal	No	Yes	Not Available ROOT\LEGACY_VOLSNAP\0000					
wanarp	Remote Access IP ARP Driver					Kernel Driver	TDTCP	Not Available	LEGACYDRIVER Not Available
	c:\windows\system32\drivers\wanarp.sys					Kernel Driver	Not Available	Not Available	Not Available
	Yes	Manual	Running	OK	Normal	No	Not Available ROOT\LEGACY_TDTCP\0000		
	Yes ROOT\LEGACY_TDTCP\0000								
wdica	WDICA	Not Available			Kernel Driver	No	TCP/IP Protocol Driver	Not Available	LEGACYDRIVER
	Manual	Stopped	OK	Ignore	No	No	Not Available	Not Available	Not Available
wlbs	Network Load Balancing					Kernel Driver	Not Available	Not Available	
	c:\windows\system32\drivers\wlbs.sys					Kernel Driver	ROOT\LEGACY_TCPIP\0000		
	No	Manual	Stopped	OK	Normal	No	Security Driver	Not Available	LEGACYDRIVER Not Available
	No Not Available Not Available Not Available								
	Not Available ROOT\LEGACY_SECDRV\0000								
[Signed Drivers]							RDPWD	Not Available	LEGACYDRIVER Not Available
							Not Available	Not Available	Not Available
							ROOT\LEGACY_RDPWD\0000		
Device Name	Signed	Device Class			Driver Version				
	Driver Date	Manufacturer			INF Name	Driver			
Name	Device ID								

RDPcdd	Not Available	LEGACYDRIVER	Not Available	Beep	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available		Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_RDPcdd\0000			Not Available	ROOT\LEGACY_BEEP\0000	
Remote Access Auto Connection Driver	Not Available			AFD	Not Available	LEGACYDRIVER	Not Available
	LEGACYDRIVER	Not Available	Not Available		Not Available	Not Available	Not Available
	Not Available	Not Available	Not Available		Not Available	ROOT\LEGACY_AFD\0000	
	ROOT\LEGACY_RASACD\0000			Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
Partition Manager	Not Available	LEGACYDRIVER	Not Available		Microsoft	volume.inf Not Available	
Available	Not Available	Not Available	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATUREFC730320	
	Not Available	ROOT\LEGACY_PARTMGR\0000			OFFSET12102DB000LENGTHADD74E2C00		
Null	Not Available	LEGACYDRIVER	Not Available	Generic volume	Yes	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&SIGNATUREFC730320	
NetBios over Tcpip	Not Available	LEGACYDRIVER	Not Available		OFFSETC300BB800LENGTH5E021F800		
Available	Not Available	Not Available	Not Available	Generic volume	Yes	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&SIGNATUREFC730320	
	Not Available	Not Available	Not Available		OFFSET7E00LENGTH300B3A00		
	Not Available	ROOT\LEGACY_NDPROXY\0000		Generic volume	Yes	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&SIGNATUREFC730321	
	Not Available	Not Available			OFFSET11507C2200LENGTHA63F67B200		
	ROOT\LEGACY_NDISUIO\0000			Generic volume	Yes	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&SIGNATUREFC730321	
	Not Available	Not Available	Not Available		OFFSETBB0162E00LENGTH5A065F400		
	ROOT\LEGACY_NDISTAPI\0000			Generic volume	Yes	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&SIGNATUREFC730321	
	Not Available	ROOT\LEGACY_NDIS\0000			OFFSET7E00LENGTHBB015B000		
mountmgr	Not Available	LEGACYDRIVER	Not Available	Generic volume	Yes	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&SIGNATURED563D56	
mmdd	Not Available	LEGACYDRIVER	Not Available		3OFFSETA0029CC00LENGTHF003EB200		
	Not Available	Not Available	Not Available	Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	ROOT\LEGACY_MNMDD\0000			Microsoft	volume.inf Not Available	
ksecdd	Not Available	LEGACYDRIVER	Not Available		STORAGE\	VOLUME\1&30A96598&0&SIGNATURED563D56	
	Not Available	Not Available	Not Available		3OFFSET7E00LENGTHA00294E00		
	Not Available	ROOT\LEGACY_KSECDD\0000		Generic volume	Yes	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&SIGNATUREFC73032F	
	Not Available	ROOT\LEGACY_IPSEC\0000			OFFSET1290A0BC00LENGTHAD56DB2000		
IP Network Address Translator	Not Available	LEGACYDRIVER		Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available	Not Available		Microsoft	volume.inf Not Available	
	Not Available	Not Available			STORAGE\	VOLUME\1&30A96598&0&SIGNATUREFC73032F	
	ROOT\LEGACY_IPNAT\0000				OFFSET12102DB000LENGTH80730C00		
HTTP	Not Available	LEGACYDRIVER	Not Available	Generic volume	Yes	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&SIGNATUREFC73032F	
Generic Packet Classifier	Not Available	LEGACYDRIVER			OFFSETC300BB800LENGTH5E021F800		
	Not Available	Not Available	Not Available	Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available			Microsoft	volume.inf Not Available	
	ROOT\LEGACY_GPC\0000				STORAGE\	VOLUME\1&30A96598&0&SIGNATUREFC73032F	
Fips	Not Available	LEGACYDRIVER	Not Available		OFFSET7E00LENGTHC300B3A00		
	Not Available	Not Available	Not Available	Generic volume	Yes	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&SIGNATUREFC73032	
	Not Available	Not Available	Not Available		COFFSET11507C2200LENGTHA63F67B200		
	Not Available	ROOT\LEGACY_DMLOAD\0000		Generic volume	Yes	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&SIGNATUREFC73032	
	Not Available	ROOT\LEGACY_DMBOOT\0000			COFFSETBB0162E00LENGTH5A065F400		
CRC Disk Filter Driver	Not Available	LEGACYDRIVER		Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available	Not Available		Microsoft	volume.inf Not Available	
	Not Available	Not Available			STORAGE\	VOLUME\1&30A96598&0&SIGNATUREFC73032	
	ROOT\LEGACY_CRCDISK\0000				COFFSET7E00LENGTHBB015B000		
CdaD10BA	Not Available	LEGACYDRIVER	Not Available	Generic volume	Yes	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&SIGNATUREFC73032	
CdaC15BA	Not Available	LEGACYDRIVER	Not Available		DOFFSET12102DB000LENGTHADD74E2C00		
Available	Not Available	Not Available	Not Available	Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	ROOT\LEGACY_CDAC15BA\0000			Microsoft	volume.inf Not Available	

STORAGE\VOLUME\1&30A96598&0&SIGNATUREFC73032
DOFFSETC300BB800LENGTH5E021F800
Generic volume Yes VOLUME 5.2.3790.1830 10/1/2002
Microsoft volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREFC73032
DOFFSET7E00LENGHTHC300B3A00
Generic volume Yes VOLUME 5.2.3790.1830 10/1/2002
Microsoft volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREFC730322
OFFSET11507C2200LENGTHA63F67B200
Generic volume Yes VOLUME 5.2.3790.1830 10/1/2002
Microsoft volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREFC730322
OFFSETBB0162E00LENGTH5A065F400
Generic volume Yes VOLUME 5.2.3790.1830 10/1/2002
Microsoft volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREFC730322
OFFSET7E00LENGHTHBB015B000
Generic volume Yes VOLUME 5.2.3790.1830 10/1/2002
Microsoft volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREFC730326
OFFSET12102DB000LENGTHADD74E2C00
Generic volume Yes VOLUME 5.2.3790.1830 10/1/2002
Microsoft volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREFC730326
OFFSETC300BB800LENGTH5E021F800
Generic volume Yes VOLUME 5.2.3790.1830 10/1/2002
Microsoft volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREFC730326
OFFSET7E00LENGHTHC300B3A00
Generic volume Yes VOLUME 5.2.3790.1830 10/1/2002
Microsoft volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREFC730327
OFFSET11507C2200LENGTHA63F67B200
Generic volume Yes VOLUME 5.2.3790.1830 10/1/2002
Microsoft volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREFC730327
OFFSETBB0162E00LENGTH5A065F400
Generic volume Yes VOLUME 5.2.3790.1830 10/1/2002
Microsoft volume.inf Not Available
STORAGE\VOLUME\1&30A96598&0&SIGNATUREFC730327
OFFSET7E00LENGHTHBB015B000
Volume Manager Yes SYSTEM 5.2.3790.1830 10/1/2002
(Standard system devices) machine.inf Not
Available ROOT\FTDISK\0000
Logical Disk Manager Yes SYSTEM 5.2.3790.1830 10/1/2002
(Standard system devices) machine.inf Not
Available ROOT\DMIO\0000
ACPI Fixed Feature Button Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available ACPI\FIXEDBUTTON\2&DABA3FF&0
High precision event timer Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available ACPI\PNP0103\0
Motherboard resources Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available ACPI\PNP0C02\0
Secondary IDE Channel Yes HDC 5.2.3790.1830
10/1/2002 (Standard IDE ATA/ATAPI controllers) mshdc.inf
Not Available
PCIIDE\IDECHANNEL\4&1D8A9C03&0&1
CD-ROM Drive Yes CDROM 5.2.3790.1830 10/1/2002
(Standard CD-ROM drives) cdrom.inf Not Available
IDE\CDROMTSSTCORP_CDRWDVD_TS-
H492C_____DE02____\5&41A3CB2&0&0.0.0
Primary IDE Channel Yes HDC 5.2.3790.1830 10/1/2002
(Standard IDE ATA/ATAPI controllers) mshdc.inf Not
Available PCIIDE\IDECHANNEL\4&1D8A9C03&0&0
Standard Dual Channel PCI IDE Controller Yes HDC
5.2.3790.1830 10/1/2002 (Standard IDE ATA/ATAPI
controllers) mshdc.inf Not Available
PCI\VEN_8086&DEV_269E&SUBSYS_01B11028&REV_09\3&
61AAA01&0&F9

System board Yes SYSTEM 5.2.3790.1830 10/1/2002
(Standard system devices) machine.inf Not
Available ACPI\PI0001\5
System board Yes SYSTEM 5.2.3790.1830 10/1/2002
(Standard system devices) machine.inf Not
Available ACPI\PNP0C01\0
Communications Port Yes PORTS 5.2.3790.1830 10/1/2002
(Standard port types) msports.inf Not Available
ACPI\PNP0501\2
Communications Port Yes PORTS 5.2.3790.1830 10/1/2002
(Standard port types) msports.inf Not Available
ACPI\PNP0501\1
Floppy disk drive Yes FLOPPYDISK 5.2.3790.1830
10/1/2002 (Standard floppy disk drives) floppydisk.inf
Not Available
FDC\GENERIC_FLOPPY_DRIVE\5&33C0F973&0&0
Standard floppy disk controller Yes FDC 5.2.3790.1830
10/1/2002 (Standard floppy disk controllers) fdc.inf
Not Available ACPI\PNP0700\4&2AA4AD3D&0
System timer Yes SYSTEM 5.2.3790.1830 10/1/2002
(Standard system devices) machine.inf Not
Available ACPI\PNP0100\4&2AA4AD3D&0
System CMOS/real time clock Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available ACPI\PNP0B00\4&2AA4AD3D&0
System board Yes SYSTEM 5.2.3790.1830 10/1/2002
(Standard system devices) machine.inf Not
Available ACPI\PNP0C01\2
Programmable interrupt controller Yes SYSTEM
5.2.3790.1830 10/1/2002 (Standard system devices)
machine.inf Not Available
ACPI\PNP0000\4&2AA4AD3D&0
Numeric data processor Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available ACPI\PNPC04\4&2AA4AD3D&0
Direct memory access controller Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available ACPI\PNP0200\4&2AA4AD3D&0
PCI standard ISA bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2670&SUBSYS_00000000&REV_09\3&
61AAA01&0&F8
Default Monitor Yes MONITOR 5.2.3790.1830
10/1/2002 (Standard monitor types) monitor.inf
Not Available
DISPLAY\DEFAULT_MONITOR\5&EEED524&0&12345678&
18&0D
Standard VGA Graphics Adapter Yes DISPLAY 5.2.3790.1830
10/1/2002 (Standard display types) display.inf Not
Available
PCI\VEN_1002&DEV_515E&SUBSYS_01B11028&REV_02\4&
2014205D&0&68F0
Intel(R) 82801 PCI Bridge - 244E Yes SYSTEM
5.2.3790.1830 10/1/2002 Intel machine.inf
Not Available
PCI\VEN_8086&DEV_244E&SUBSYS_00000000&REV_D9\3&
61AAA01&0&F0
Generic USB Hub Yes USB 5.2.3790.1830 10/1/2002
(Generic USB Hub) usb.inf Not Available
USB\VID_04B4&PID_6560\5&6F526B7&0&7
USB Root Hub Yes USB 5.2.3790.1830 10/1/2002
(Standard USB Host Controller) usbport.inf Not Available
USB\ROOT_HUB20\4&25F3EE70&0
Standard Enhanced PCI to USB Host Controller Yes USB
5.2.3790.1830 10/1/2002 (Standard USB Host Controller)
usbport.inf Not Available
PCI\VEN_8086&DEV_268C&SUBSYS_01B11028&REV_09\3&
61AAA01&0&EF
USB Root Hub Yes USB 5.2.3790.1830 10/1/2002
(Standard USB Host Controller) usbport.inf Not Available
USB\ROOT_HUB\4&1C386FEF&0

Standard Universal PCI to USB Host Controller	Yes	USB	5.2.3790.1830	10/1/2002 (Standard USB Host Controller)	usbport.inf	Not Available	PCI\VEN_8086&DEV_268B&SUBSYS_01B11028&REV_09\3&61AAA01&0&EB
USB Root Hub	Yes	USB	5.2.3790.1830	10/1/2002 (Standard USB Host Controller)	usbport.inf	Not Available	USB\ROOT_HUB\4&2DD355BC&0
Standard Universal PCI to USB Host Controller	Yes	USB	5.2.3790.1830	10/1/2002 (Standard USB Host Controller)	usbport.inf	Not Available	PCI\VEN_8086&DEV_268A&SUBSYS_01B11028&REV_09\3&61AAA01&0&EA
HID-compliant consumer control device	Yes	HIDCLASS	5.2.3790.1830	10/1/2002 Microsoft	hidserv.inf	Not Available	HID\VID_0518&PID_0001&MI_01&COL03\7&2BEB8CEA&0&0002
HID-compliant device	Yes	HIDCLASS	5.2.3790.1830	10/1/2002 (Standard system devices)	input.inf	Not Available	HID\VID_0518&PID_0001&MI_01&COL02\7&2BEB8CEA&0&0001
HID-compliant mouse	Yes	MOUSE	5.2.3790.1830	10/1/2002 Microsoft	msmouse.inf	Not Available	HID\VID_0518&PID_0001&MI_01&COL01\7&2BEB8CEA&0&0000
USB Human Interface Device	Yes	HIDCLASS	5.2.3790.1830	10/1/2002 (Standard system devices)	input.inf	Not Available	USB\VID_0518&PID_0001&MI_01\6&3080EB9D&0&0001
HID Keyboard Device	Yes	KEYBOARD	5.2.3790.1830	10/1/2002 (Standard keyboards)	keyboard.inf	Not Available	HID\VID_0518&PID_0001&MI_00\7&8144F28&0&0000
USB Human Interface Device	Yes	HIDCLASS	5.2.3790.1830	10/1/2002 (Standard system devices)	input.inf	Not Available	USB\VID_0518&PID_0001&MI_00\6&3080EB9D&0&0000
USB Composite Device	Yes	USB	5.2.3790.1830	10/1/2002 (Standard USB Host Controller)	usb.inf	Not Available	USB\VID_0518&PID_0001\5&3014DA89&0&2
USB Root Hub	Yes	USB	5.2.3790.1830	10/1/2002 (Standard USB Host Controller)	usbport.inf	Not Available	USB\ROOT_HUB\4&2DC298A6&0
Standard Universal PCI to USB Host Controller	Yes	USB	5.2.3790.1830	10/1/2002 (Standard USB Host Controller)	usbport.inf	Not Available	PCI\VEN_8086&DEV_2689&SUBSYS_01B11028&REV_09\3&61AAA01&0&E9
USB Root Hub	Yes	USB	5.2.3790.1830	10/1/2002 (Standard USB Host Controller)	usbport.inf	Not Available	USB\ROOT_HUB\4&1C492D05&0
Standard Universal PCI to USB Host Controller	Yes	USB	5.2.3790.1830	10/1/2002 (Standard USB Host Controller)	usbport.inf	Not Available	PCI\VEN_8086&DEV_2688&SUBSYS_01B11028&REV_09\3&61AAA01&0&E8
Broadcom BCM5708C NetXtreme II GigE (NDIS VBD Client)	Yes	NET	2.6.14.0	4/3/2006 Broadcom Corporation	oem3.inf	Not Available	B06BDRV\L2ND&PCI_164C14E4&SUBSYS_01B11028&REV_12\6&2F68317E&0&20050500
Broadcom BCM5708C NetXtreme II GigE	Yes	SYSTEM	2.6.17.0	4/21/2006 Broadcom Corporation	oem5.inf	Not Available	PCI\VEN_14E4&DEV_164C&SUBSYS_01B11028&REV_12\5&43097C6&0&0000E0
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	10/1/2002 (Standard system devices)	machine.inf	Not Available	PCI\VEN_1166&DEV_0103&SUBSYS_00000000&REV_C3\4&187919FE&0&00E0
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	10/1/2002 (Standard system devices)	machine.inf	Not Available	PCI\VEN_8086&DEV_2690&SUBSYS_00000000&REV_09\3&61AAA01&0&E0
PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830	10/1/2002 (Standard system devices)	machine.inf	Not Available	PCI\VEN_8086&DEV_25F6&SUBSYS_00000000&REV_31\3&61AAA01&0&B0
PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830	10/1/2002 (Standard system devices)	machine.inf	Not Available	PCI\VEN_8086&DEV_25F5&SUBSYS_00000000&REV_31\3&61AAA01&0&A8
PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830	10/1/2002 (Standard system devices)	machine.inf	Not Available	PCI\VEN_8086&DEV_25F3&SUBSYS_00000000&REV_31\3&61AAA01&0&98
PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830	10/1/2002 (Standard system devices)	machine.inf	Not Available	PCI\VEN_8086&DEV_25F1&SUBSYS_00000000&REV_31\3&61AAA01&0&88
PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830	10/1/2002 (Standard system devices)	machine.inf	Not Available	PCI\VEN_8086&DEV_25F0&SUBSYS_00000000&REV_31\3&61AAA01&0&82
PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830	10/1/2002 (Standard system devices)	machine.inf	Not Available	PCI\VEN_8086&DEV_25F0&SUBSYS_00000000&REV_31\3&61AAA01&0&81
PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830	10/1/2002 (Standard system devices)	machine.inf	Not Available	PCI\VEN_8086&DEV_25F0&SUBSYS_00000000&REV_31\3&61AAA01&0&80
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	10/1/2002 (Standard system devices)	machine.inf	Not Available	PCI\VEN_8086&DEV_25E7&SUBSYS_00000000&REV_31\3&61AAA01&0&38
PCI standard PCI-to-PCI bridge	Yes	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&1BB38347&0&0230
RAID Virtual Device	Yes	SYSTEM	5.2.3790.1830	10/1/2002 American Megatrends, Inc.	scsidev.inf	Not Available	SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&REV_0001\6&3A42EBCB&0&1400
Disk drive	Yes	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&3A42EBCB&0&110
Disk drive	Yes	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&3A42EBCB&0&100
RAID Controller	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&3544DC99&0&700030
PCI standard PCI-to-PCI bridge	Yes	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&1BB38347&0&0030

PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830		SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&RE
10/1/2002 (Standard system devices)			machine.inf		V_0001\6&1BA196AF&0&1400
Not Available					Disk drive Yes
PCI\VEN_8086&DEV_25F9&SUBSYS_00000000&REV_31\3&61AAA01&0&30					DISKDRIVE 5.2.3790.1830 10/1/2002
PCI standard PCI-to-PCI bridge	Yes	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&1BA196AF&0&110
PCI\VEN_8086&DEV_0372&SUBSYS_00000000&REV_00\4&2FAA6E78&0&0228					Disk drive Yes
RAID Virtual Device	Yes	SYSTEM	5.2.3790.1830	10/1/2002	DISKDRIVE 5.2.3790.1830 10/1/2002
American Megatrends, Inc.			scsidev.inf	Not Available	(Standard disk drives) disk.inf Not Available
SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&RE					SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV
V_0001\6&27DF413A&0&1400					_1.00\6&1BA196AF&0&100
Disk drive	Yes		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&27DF413A&0&100					RAID Controller
RAID Controller	Not Available		Not Available	Not Available	Not Available
Available	Not Available		Not Available	Not Available	Not Available
Not Available					Not Available
PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&8FB9AF8&0&700028					PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&40F47DA&0&700018
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830		PCI standard PCI-to-PCI bridge
10/1/2002 (Standard system devices)			machine.inf		Yes
Not Available					SYSTEM
PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\4&5F57E72&0&0018					5.2.3790.1830
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830		10/1/2002 (Standard system devices)
10/1/2002 (Standard system devices)			machine.inf		machine.inf
Not Available					Not Available
PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\4&5F57E72&0&0018					PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\4&5F57E72&0&0018
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830		PCI standard PCI-to-PCI bridge
10/1/2002 (Standard system devices)			machine.inf		Yes
Not Available					SYSTEM
PCI\VEN_8086&DEV_25E3&SUBSYS_00000000&REV_31\3&61AAA01&0&18					5.2.3790.1830
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830		10/1/2002 (Standard system devices)
10/1/2002 (Standard system devices)			machine.inf		machine.inf
Not Available					Not Available
PCI\VEN_8086&DEV_350C&SUBSYS_00000000&REV_01\4&EAFE2A7&0&0310					PCI\VEN_8086&DEV_350C&SUBSYS_00000000&REV_01\4&EAFE2A7&0&0310
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830		PCI standard PCI-to-PCI bridge
10/1/2002 (Standard system devices)			machine.inf		Yes
Not Available					SYSTEM
PCI\VEN_8086&DEV_0372&SUBSYS_00000000&REV_00\6&1779266&0&02080010					5.2.3790.1830
RAID Virtual Device	Yes		SYSTEM	5.2.3790.1830	10/1/2002
American Megatrends, Inc.			scsidev.inf	Not Available	
SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&RE					V_0001\8&6C773B2&0&1400
V_0001\8&6C773B2&0&1400					Disk drive
Disk drive	Yes		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\8&6C773B2&0&110					(Standard disk drives) disk.inf Not Available
Disk drive	Yes		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\8&6C773B2&0&100					SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV
RAID Controller	Not Available		Not Available	Not Available	_1.00\8&6C773B2&0&110
Available	Not Available		Not Available	Not Available	Disk drive
Not Available					Yes
PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\7&15E7139E&0&7000080010					DISKDRIVE 5.2.3790.1830 10/1/2002
PCI standard PCI-to-PCI bridge	Yes	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\8&6C773B2&0&110
PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\6&1779266&0&00080010					Disk drive
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830		Yes
10/1/2002 (Standard system devices)			machine.inf		SYSTEM
Not Available					5.2.3790.1830
PCI\VEN_8086&DEV_3514&SUBSYS_00000000&REV_01\5&3BF5BFA&0&080010					10/1/2002 (Standard system devices)
Broadcom BCM5708C NetXtreme II GigE (NDIS VBD Client)	Yes				machine.inf
NET	2.6.14.0	4/3/2006	Broadcom Corporation		Not Available
oem3.inf			Not Available		PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\6&1779266&0&00080010
B06BDRV\L2ND&PCI_164C14E4&SUBSYS_01B11028&REV_12\8&149AADD6&0&20050900					PCI standard PCI-to-PCI bridge
Broadcom BCM5708C NetXtreme II GigE	Yes	SYSTEM	2.6.17.0		Yes
4/21/2006	Broadcom Corporation		oem5.inf	Not Available	SYSTEM
Available					5.2.3790.1830
PCI\VEN_14E4&DEV_164C&SUBSYS_01B11028&REV_12\7&1510B9F1&0&0000000010					10/1/2002 (Standard system devices)
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830		machine.inf
10/1/2002 (Standard system devices)			machine.inf		Not Available
Not Available					PCI\VEN_8086&DEV_3514&SUBSYS_00000000&REV_01\5&3BF5BFA&0&080010
Broadcom BCM5708C NetXtreme II GigE	Yes	SYSTEM	2.6.17.0		Broadcom BCM5708C NetXtreme II GigE
4/21/2006	Broadcom Corporation		oem5.inf	Not Available	Yes
Available					SYSTEM
PCI\VEN_14E4&DEV_164C&SUBSYS_01B11028&REV_12\7&1510B9F1&0&0000000010					2.6.17.0

```

PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_1166&DEV_0103&SUBSYS_00000000&REV_C3\6&
10A3C128&0&00000010
PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_3510&SUBSYS_00000000&REV_01\5&
3BF5BFA&0&000010
PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_3500&SUBSYS_00000000&REV_01\4&
EAFE2A7&0&0010
PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_25E2&SUBSYS_00000000&REV_31\3&
61AAA01&0&10
PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_25C0&SUBSYS_00000000&REV_31\3&
61AAA01&0&00
PCI bus Yes SYSTEM 5.2.3790.1830 10/1/2002 (Standard
system devices) machine.inf Not Available
ACPI\PNP0A03\2&DABA3FF&0
Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_6_MODEL_15_7
Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_6_MODEL_15_6
Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_6_MODEL_15_5
Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_6_MODEL_15_4
Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_6_MODEL_15_3
Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_6_MODEL_15_2
Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_6_MODEL_15_1
Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_6_MODEL_15_0
Microsoft ACPI-Compliant System Yes SYSTEM
5.2.3790.1830 10/1/2002 Microsoft acpi.inf Not
Available ACPI_HAL\PNP0C08\0
ACPI Multiprocessor x64-based PC Yes 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 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\Binn\;C:\Program Files (x86)\Microsoft SQL
Server\90\Tools\Binn\;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 EM64T Family 6 Model 15 Stepping 7,
GenuineIntel <SYSTEM>
PROCESSOR_LEVEL 6 <SYSTEM>
PROCESSOR_REVISION 0f07 <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\LOCAL SERVICE
TMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\LOCAL SERVICE
TEMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\NETWORK SERVICE
TMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\NETWORK SERVICE
TEMP %USERPROFILE%\Local Settings\Temp
PE2900\Administrator
TMP %USERPROFILE%\Local Settings\Temp
PE2900\Administrator

```

[Print Jobs]

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

[Network Connections]

Local Name	Remote Name	Type	Status	User Name
------------	-------------	------	--------	-----------

[Running Tasks]

Name	Path	Process ID	Priority	Min Working Set	Max Working Set
system idle process		Not Available		0	0
Available	Not Available		Not Available	Not Available	Not Available
system	Not Available	4	8	0	1413120
smss.exe	Not Available	380	11	204800	1413120
	11/20/2006 3:16 PM		Not Available		Not Available
csrss.exe	Not Available	528	13	Not Available	Not Available
	11/20/2006 3:16 PM		Not Available		Not Available
winlogon.exe	c:\windows\system32\winlogon.exe			568	
	13	204800	1413120	11/20/2006 3:16 PM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)				901.00 KB
	(922,624 bytes)	3/25/2005 6:00 AM			
services.exe	c:\windows\system32\services.exe			620	
	9	204800	1413120	11/20/2006 3:16 PM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)				216.50 KB
	(221,696 bytes)	3/25/2005 6:00 AM			
lsass.exe	c:\windows\system32\lsass.exe	632	9	204800	
	1413120	11/20/2006 3:16 PM	5.2.3790.1830		

(srv03_sp1_rtm.050324-1447)	14.00 KB (14,336 bytes)	3/25/2005	logon.scr	Not Available	704	4	Not Available
6:00 AM				Not Available			11/20/2006 3:26 PM
svchost.exe	c:\windows\system32\svchost.exe	812		Not Available			Not Available
8	204800 1413120	11/20/2006 3:16 PM	wuaucht.exe	c:\windows\system32\wuaucht.exe	2576		
(25,088 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB	8	204800 1413120	11/21/2006 4:37 AM		
svchost.exe	Not Available	892	8	Not Available			156.00 KB
Available	Not Available	11/20/2006 3:16 PM	Not Available				(159,744 bytes)
Not Available	Not Available						cmd.exe
svchost.exe	Not Available	976	8	Not Available			c:\windows\system32\cmd.exe
Available	Not Available	11/20/2006 3:16 PM	Not Available		2456	8	204800
Not Available	Not Available				1413120	11/21/2006 5:45 AM	5.2.3790.1830
svchost.exe	Not Available	1032	8	Not Available			(srv03_sp1_rtm.050324-1447)
Available	Not Available	11/20/2006 3:16 PM	Not Available		538.50 KB (551,424 bytes)		3/25/2005
Not Available	Not Available				6:00 AM		
svchost.exe	Not Available	1052					stepmaster.exe
Available	Not Available	11/20/2006 3:16 PM	Not Available		c:\program files (x86)\stepmaster\stepmaster.exe		
Not Available	Not Available				2812	8	204800
svchost.exe	c:\windows\system32\svchost.exe	1052			2.05.0005	1.92 MB (2,015,285 bytes)	11/14/2006 11:52 AM
8	204800 1413120	11/20/2006 3:16 PM	helpctr.exe	c:\windows\pchealth\helpctr\binaries\helpctr.exe	3560		
(25,088 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB	8	204800 1413120	11/21/2006 6:16 AM		
spoolsv.exe	c:\windows\system32\spoolsv.exe	1312			5.2.3790.1830 (srv03_sp1_rtm.050324-1447)		1.30 MB
8	204800 1413120	11/20/2006 3:16 PM	(1,363,456 bytes)				
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)		107.00 KB	wmiprvse.exe	Not Available	3832	8	Not Available
(109,568 bytes)	3/25/2005 6:00 AM		Available	Not Available	11/21/2006 6:16 AM		Not Available
msdtc.exe	Not Available	1340	8	Not Available			
Not Available	Not Available	11/20/2006 3:16 PM	Not Available				
Not Available	Not Available						
svchost.exe	c:\windows\system32\svchost.exe	1504					helpsvc.exe
8	204800 1413120	11/20/2006 3:16 PM	Available	Not Available	11/21/2006 6:16 AM		Not Available
(25,088 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB	Not Available	Not Available			
inetinfo.exe	c:\windows\system32\inetrv\inetinfo.exe	1612					
8	204800 1413120	11/20/2006 3:16 PM	8	204800 1413120	11/21/2006 6:16 AM		
(17,920 bytes)	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	17.50 KB	Available	Not Available	11/13/2006 4:00 PM		
svchost.exe	Not Available	1652	8	Not Available			
Available	Not Available	11/20/2006 3:16 PM	Not Available				
Not Available	Not Available						
svchost.exe	c:\windows\system32\svchost.exe	200					
8	204800 1413120	11/20/2006 3:16 PM	Name	Version	Size	File Date	Manufacturer
(25,088 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB	winlogon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	901.00 KB		Path
svchost.exe	c:\windows\system32\svchost.exe	300	(922,624 bytes)	3/25/2005 6:00 AM	Microsoft Corporation		
8	204800 1413120	11/20/2006 3:16 PM	c:\windows\system32\winlogon.exe				
(25,088 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB	ntdll	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.20 MB		
csrss.exe	Not Available	1388	(1,257,472 bytes)	3/25/2005 6:00 AM	Microsoft Corporation		
Not Available	Not Available	11/20/2006 3:17 PM	c:\windows\system32\ntdll.dll				
Not Available	Not Available		kernel32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.43 MB		
winlogon.exe	c:\windows\system32\winlogon.exe	1524	(1,500,160 bytes)	3/25/2005 6:00 AM	Microsoft Corporation		
13	204800 1413120	11/20/2006 3:17 PM	c:\windows\system32\kernel32.dll				
(922,624 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	901.00 KB	advapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.00 MB		
rdpclip.exe	c:\windows\system32\rdpclip.exe	516	(1,051,136 bytes)	3/25/2005 6:00 AM	Microsoft Corporation		
1413120	11/20/2006 3:17 PM	5.2.3790.1830	c:\windows\system32\advapi32.dll				
(srv03_sp1_rtm.050324-1447)	99.00 KB (101,376 bytes)		rpcrt4	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.63 MB		
11/13/2006 3:59 PM			(1,714,176 bytes)	3/25/2005 6:00 AM	Microsoft Corporation		
explorer.exe	c:\windows\explorer.exe	2064	c:\windows\system32\rpcrt4.dll				
204800	1413120	11/20/2006 3:17 PM	crypt32	5.131.3790.1830 (srv03_sp1_rtm.050324-1447)	1.36 MB		
(srv03_sp1_rtm.050324-1447)	1.30 MB (1,364,480 bytes)	3/25/2005	(1,428,992 bytes)	3/25/2005 6:00 AM	Microsoft Corporation		
6:00 AM			c:\windows\system32\crypt32.dll				
cmd.exe	c:\windows\system32\cmd.exe	2588	msasn1	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	152.50 KB		
1413120	11/20/2006 3:17 PM	5.2.3790.1830	(156,160 bytes)	3/25/2005 6:00 AM	Microsoft Corporation		
(srv03_sp1_rtm.050324-1447)	538.50 KB (551,424 bytes)	3/25/2005	c:\windows\system32\msasn1.dll				
6:00 AM			msvcrt	7.0.3790.1830 (srv03_sp1_rtm.050324-1447)	508.00 KB		
sqlservr.exe	c:\program files\microsoft sql		(520,192 bytes)	3/25/2005 6:00 AM	Microsoft Corporation		
server\mssql.1\mssql\binn\sqlservr.exe	2600	13	c:\windows\system32\msvcrt.dll				
1413120	11/20/2006 3:17 PM	2005.090.2047.00	user32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.04 MB		
(39,263,520 bytes)	4/14/2006 12:59 PM		(1,085,952 bytes)	3/25/2005 6:00 AM	Microsoft Corporation		
wmiprvse.exe	Not Available	436	c:\windows\system32\user32.dll				
Available	Not Available	11/20/2006 3:18 PM	gdi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	592.00 KB		
Not Available	Not Available		(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	cscdll	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	151.50 KB
(29,696 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(155,136 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\psapi.dll			c:\windows\system32\cscdll.dll	
regapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	108.50 KB	dimsntfy	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	28.00 KB
(111,104 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(28,672 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\regapi.dll			c:\windows\system32\dimsntfy.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 (1,116,160 bytes)	3/25/2005
(28,672 bytes)	3/25/2005 6:00 AM Microsoft Corporation		6:00 AM	Microsoft Corporation	
	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	
ws2_32	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
(180,736 bytes)	3/25/2005 6:00 AM Microsoft Corporation		bytes)	11/13/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\ws2_32.dll			c:\windows\winsxs\amd64_microsoft.windows.common-	
ws2help	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.50 KB	controls_6595b64144ccf1df_5.82.3790.1830_x-ww_4d792d2a\comctl32.dll		
(31,232 bytes)	3/25/2005 6:00 AM Microsoft Corporation		uxtheme	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	494.50 KB
	c:\windows\system32\ws2help.dll		(506,368 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
				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)	11/13/2006 3:59 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)	11/13/2006 3:59 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)	11/13/2006 3:59 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)	11/13/2006 3:58 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	ntdsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	127.50 KB
bytes)	11/13/2006 9:36 AM Microsoft Corporation		(130,560 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\winsxs\amd64_microsoft.windows.common-			c:\windows\system32\ntdsapi.dll	
	controls_6595b64144ccf1df_6.0.3790.1830_x-ww_aced72af\comctl32.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	
wldap32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	390.00 KB	umpnpmgr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	205.00 KB
(399,360 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(209,920 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wldap32.dll			c:\windows\system32\umpnpmgr.dll	
rsaenh	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	241.96 KB	eventlog	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	127.00 KB
(247,768 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(130,048 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\rsaenh.dll			c:\windows\system32\eventlog.dll	

cryptnet	5.131.3790.1830 (srv03_sp1_rtm.050324-1447)	108.50 KB	ws03res	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	794.00 KB
(111,104 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(813,056 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\cryptnet.dll			c:\windows\system32\ws03res.dll	
sensapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	10.50 KB	ipsecsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	358.50 KB
(10,752 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(367,104 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\sensapi.dll			c:\windows\system32\ipsecsvc.dll	
cabinet	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	138.50 KB	oakley	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	372.50 KB
(141,824 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(381,440 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\cabinet.dll			c:\windows\system32\oakley.dll	
imm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	208.00 KB	winipsec	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	52.50 KB
(212,992 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(53,760 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\imm32.dll			c:\windows\system32\winipsec.dll	
lsass	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	14.00 KB	pstorsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.00 KB
(14,336 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(36,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\lsass.exe			c:\windows\system32\pstorsvc.dll	
lsasrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.50 MB	psbase	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	124.00 KB
(1,568,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(126,976 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\lsasrv.dll			c:\windows\system32\psbase.dll	
samlib	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	69.00 KB	hnetcfg	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	561.00 KB
(70,656 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(574,464 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\samlib.dll			c:\windows\system32\hnetcfg.dll	
samsrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.01 MB	wshtcpip	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	29.00 KB
(1,059,328 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(29,696 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\samsrv.dll			c:\windows\system32\wshtcpip.dll	
cryptdll	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	47.00 KB	dssenh	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	226.96 KB
(48,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(232,408 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\cryptdll.dll			c:\windows\system32\dssenh.dll	
msprivs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	47.50 KB	wlbcstrl	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	137.50 KB
(48,640 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(140,800 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msprivs.dll			c:\windows\system32\wlbcstrl.dll	
kerberos	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	698.00 KB	w3ssl	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	21.00 KB
(714,752 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(21,504 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\kerberos.dll			c:\windows\system32\w3ssl.dll	
msv1_0	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	253.00 KB	strmfilt	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	131.50 KB
(259,072 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(134,656 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msv1_0.dll			c:\windows\system32\strmfilt.dll	
iphlpapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	177.00 KB	httpapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.50 KB
(181,248 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(37,376 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\iphlpapi.dll			c:\windows\system32\httpapi.dll	
netlogon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	666.00 KB	svchost	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB
(681,984 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(25,088 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\netlogon.dll			c:\windows\system32\svchost.exe	
w32time	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	400.50 KB	rpss	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	672.00 KB
(410,112 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(688,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\w32time.dll			c:\windows\system32\rpss.dll	
schannel	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	248.00 KB	ntmarta	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	222.50 KB
(253,952 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(227,840 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\schannel.dll			c:\windows\system32\ntmarta.dll	
wdigest	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	130.50 KB	wzcsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	492.00 KB
(133,632 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(503,808 bytes)	3/24/2005 11:35 AM Microsoft Corporation	
	c:\windows\system32\wdigest.dll			c:\windows\system32\wzcsvc.dll	
rassfm	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.00 KB	rtutils	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	66.00 KB
(36,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(67,584 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\rassfm.dll			c:\windows\system32\rtutils.dll	
kdcsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	409.00 KB	wmi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	5.50 KB
(418,816 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(5,632 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\kdcsvc.dll			c:\windows\system32\wmi.dll	
ntdsa	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.81 MB	dhcpcsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	219.00 KB
(2,948,096 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(224,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ntdsa.dll			c:\windows\system32\dhcpcsvc.dll	
esent	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.26 MB	atl	3.05.2284 96.50 KB (98,816 bytes)	3/25/2005 6:00 AM
(2,366,976 bytes)	3/25/2005 6:00 AM Microsoft Corporation			Microsoft Corporation	
	c:\windows\system32\esent.dll			c:\windows\system32\atl.dll	
ntdsatq	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	51.00 KB	rastls	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	236.50 KB
(52,224 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(242,176 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ntdsatq.dll			c:\windows\system32\rastls.dll	
msocket	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	478.00 KB	cryptui	5.131.3790.1830 (srv03_sp1_rtm.050324-1447)	705.50 KB
(489,472 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(722,432 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msocket.dll			c:\windows\system32\cryptui.dll	
scecli	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	308.00 KB	mprapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	154.50 KB
(315,392 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(158,208 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\scecli.dll			c:\windows\system32\mprapi.dll	

activeds	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	348.50 KB	trkwks	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	177.50 KB
(356,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(181,760 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\activeds.dll			c:\windows\system32\trkwks.dll	
adslsdp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	240.50 KB	wmisvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	227.00 KB
(246,272 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(232,448 bytes)	11/13/2006 3:59 PM Microsoft Corporation	
	c:\windows\system32\adslsdp.dll			c:\windows\system32\wbem\wmisvc.dll	
credui	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	202.00 KB	wuauerv	5.7.3790.1830 (srv03_sp1_rtm.050324-1447)	12.00 KB
(206,848 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(12,288 bytes)	11/13/2006 4:01 PM Microsoft Corporation	
	c:\windows\system32\credui.dll			c:\windows\system32\wuauerv.dll	
rasapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	410.00 KB	wuaueng	5.7.3790.1830 (srv03_sp1_rtm.050324-1447)	2.17 MB
(419,840 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(2,270,720 bytes)	11/13/2006 4:01 PM Microsoft Corporation	
	c:\windows\system32\rasapi32.dll			c:\windows\system32\wuaueng.dll	
rasman	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	95.50 KB	advpack	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	146.00 KB
(97,792 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(149,504 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\rasman.dll			c:\windows\system32\advpack.dll	
tapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	332.50 KB	mspatcha	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	48.00 KB
(340,480 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(49,152 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\tapi32.dll			c:\windows\system32\mspach.dll	
raschap	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	141.00 KB	shfolder	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	34.00 KB
(144,384 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(34,816 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\raschap.dll			c:\windows\system32\shfolder.dll	
schedsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	308.50 KB	winhttp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	508.50 KB
(315,904 bytes)	11/13/2006 4:00 PM Microsoft Corporation		(520,704 bytes)	11/13/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\schedsvc.dll			c:\windows\winsxs\amd64_microsoft.windows.winhttp_6595b641	
msidle	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	9.00 KB	44ccf1df_5.1.3790.1830_x-ww_a61ef4db\winhttp.dll		
(9,216 bytes)	3/25/2005 6:00 AM Microsoft Corporation			comsvcs	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\msidle.dll			(2,156,544 bytes)	11/13/2006 3:59 PM Microsoft Corporation
wkssvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	221.00 KB		c:\windows\system32\comsvcs.dll	
(226,304 bytes)	3/25/2005 6:00 AM Microsoft Corporation			browser	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\wkssvc.dll			(128,512 bytes)	3/25/2005 6:00 AM Microsoft Corporation
wiarpc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	57.00 KB		c:\windows\system32\browser.dll	
(58,368 bytes)	3/25/2005 6:00 AM Microsoft Corporation			netrap	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\wiarpc.dll			(26,624 bytes)	3/25/2005 6:00 AM Microsoft Corporation
aelupsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.50 KB		c:\windows\system32\netrap.dll	
(32,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation			netman	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\aelupsvc.dll			(467,968 bytes)	3/25/2005 6:00 AM Microsoft Corporation
apphelp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	241.00 KB		c:\windows\system32\netman.dll	
(246,784 bytes)	3/25/2005 6:00 AM Microsoft Corporation			netshell	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\apphelp.dll			(2,437,120 bytes)	3/25/2005 6:00 AM Microsoft Corporation
cryptsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	114.00 KB		c:\windows\system32\netshell.dll	
(116,736 bytes)	3/25/2005 6:00 AM Microsoft Corporation			clusapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\cryptsvc.dll			(130,048 bytes)	3/25/2005 6:00 AM Microsoft Corporation
certcli	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	372.00 KB		c:\windows\system32\clusapi.dll	
(380,928 bytes)	3/25/2005 6:00 AM Microsoft Corporation			wininet	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\certcli.dll			(1,186,304 bytes)	3/25/2005 6:00 AM Microsoft Corporation
vssapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.26 MB		c:\windows\system32\wininet.dll	
(1,320,960 bytes)	3/25/2005 6:00 AM Microsoft Corporation			wzcsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\vssapi.dll			(50,176 bytes)	3/24/2005 11:35 AM Microsoft Corporation
dmserver	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.50 KB		c:\windows\system32\wzcsapi.dll	
(37,376 bytes)	3/25/2005 6:00 AM Microsoft Corporation			wbemcore	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\dmserver.dll			(1,299,968 bytes)	11/13/2006 3:59 PM Microsoft Corporation
es	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	357.00 KB		c:\windows\system32\wbem\wbemcore.dll	
(365,568 bytes)	3/25/2005 6:00 AM Microsoft Corporation			esscli	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\es.dll			(641,536 bytes)	11/13/2006 3:58 PM Microsoft Corporation
pchsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	76.00 KB		c:\windows\system32\wbem\esscli.dll	
(77,824 bytes)	11/13/2006 4:00 PM Microsoft Corporation			wmiutils	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\pchealth\helpctr\binaries\pchsvc.dll			(175,104 bytes)	11/13/2006 3:59 PM Microsoft Corporation
hidserv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB		c:\windows\system32\wbem\wmiutils.dll	
(24,576 bytes)	11/13/2006 9:55 AM Microsoft Corporation			repdrvfs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\hidserv.dll			(361,984 bytes)	11/13/2006 3:59 PM Microsoft Corporation
hid	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	33.00 KB		c:\windows\system32\wbem\repdrvfs.dll	
(33,792 bytes)	3/24/2005 11:18 AM Microsoft Corporation			wmiprvsd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\hid.dll			(760,832 bytes)	11/13/2006 3:59 PM Microsoft Corporation
srvsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	156.50 KB		c:\windows\system32\wbem\wmiprvsd.dll	
(160,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation			wbemess	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\srvsvc.dll			(545,280 bytes)	11/13/2006 3:59 PM Microsoft Corporation
seclogon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	27.50 KB		c:\windows\system32\wbem\wbemess.dll	
(28,160 bytes)	3/25/2005 6:00 AM Microsoft Corporation			rasdlg	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\seclogon.dll			(880,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation
sens	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	63.50 KB		c:\windows\system32\rasdlg.dll	
(65,024 bytes)	3/25/2005 6:00 AM Microsoft Corporation			rasadhlp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
	c:\windows\system32\sens.dll			(12,288 bytes)	3/25/2005 6:00 AM Microsoft Corporation
				c:\windows\system32\rasadhlp.dll	

ncprov	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	73.00 KB	iisrtl	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	225.00 KB
(74,752 bytes)	11/13/2006 3:58 PM Microsoft Corporation		(230,400 bytes)	11/14/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\wbem\ncprov.dll			c:\windows\system32\iisrtl.dll	
wups	5.7.3790.1830 (srv03_sp1_rtm.050324-1447)	37.50 KB	iisadmin	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	30.00 KB
(38,400 bytes)	11/13/2006 4:01 PM Microsoft Corporation		(30,720 bytes)	11/14/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\wups.dll			c:\windows\system32\inetrv\iisadmin.dll	
ntlsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	11.00 KB	coadmin	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	100.50 KB
(11,264 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(102,912 bytes)	11/14/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\ntlsapi.dll			c:\windows\system32\inetrv\coadmin.dll	
spoolsv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	107.00 KB	admwprox	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	66.00 KB
(109,568 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(67,584 bytes)	11/14/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\spoolsv.exe			c:\windows\system32\admwprox.dll	
spoolss	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	163.00 KB	iisfcg	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	1.24 MB
(166,912 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(1,298,432 bytes)	11/14/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\spoolss.dll			c:\windows\system32\inetrv\iisfcg.dll	
localspl	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	730.50 KB	metadata	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	342.00 KB
(748,032 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(350,208 bytes)	11/14/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\localspl.dll			c:\windows\system32\inetrv\metadata.dll	
cnbjmon	5.2.3790.1224 (dnsvr(skatar).040514-1058)	63.00 KB (64,512 bytes)	msxml3	8.70.1104.0	2.04 MB (2,141,184 bytes)
	3/24/2005 11:15 AM Microsoft Corporation		6:00 AM	Microsoft Corporation	3/25/2005
	c:\windows\system32\cnbjmon.dll			c:\windows\system32\msxml3.dll	
pjlmon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	25.50 KB	svcxext	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	60.50 KB
(26,112 bytes)	3/24/2005 11:22 AM Microsoft Corporation		(61,952 bytes)	11/14/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\pjlmon.dll			c:\windows\system32\inetrv\svcxext.dll	
tcpmon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	91.00 KB	security	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.00 KB
(93,184 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(6,144 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\tcpmon.dll			c:\windows\system32\security.dll	
wsnmp32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	67.50 KB	iismap	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	97.00 KB
(69,120 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(99,328 bytes)	11/14/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\wsnmp32.dll			c:\windows\system32\iismap.dll	
tcpmib	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	25.00 KB	wamreg	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	78.50 KB
(25,600 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(80,384 bytes)	11/14/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\tcpmib.dll			c:\windows\system32\inetrv\wamreg.dll	
wsock32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB	iisw3adm	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	305.00 KB
(25,088 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(312,320 bytes)	11/14/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\wsock32.dll			c:\windows\system32\inetrv\iisw3adm.dll	
mgmtapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	22.50 KB	w3cache	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	27.50 KB
(23,040 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(28,160 bytes)	11/14/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\mgmtapi.dll			c:\windows\system32\inetrv\w3cache.dll	
snmpapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.50 KB	w3tp	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	16.00 KB
(32,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(16,384 bytes)	11/14/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\snmpapi.dll			c:\windows\system32\inetrv\w3tp.dll	
usbmon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	28.50 KB	lonsint	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	17.50 KB
(29,184 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(17,920 bytes)	11/14/2006 9:36 AM Microsoft Corporation	
	c:\windows\system32\usbmon.dll			c:\windows\system32\inetrv\lonsint.dll	
winrr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.00 KB	termsrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	354.50 KB
(30,720 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(363,008 bytes)	11/13/2006 3:59 PM Microsoft Corporation	
	c:\windows\system32\winrr.dll			c:\windows\system32\termsrv.dll	
wshqos	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	33.50 KB	icaapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	27.50 KB
(34,304 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(28,160 bytes)	11/13/2006 3:59 PM Microsoft Corporation	
	c:\windows\system32\wshqos.dll			c:\windows\system32\icaapi.dll	
win32spl	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	167.00 KB	mstlsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	187.00 KB
(171,008 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(191,488 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\win32spl.dll			c:\windows\system32\mstlsapi.dll	
inetpp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	148.50 KB	rdpwsx	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	170.13 KB
(152,064 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(174,216 bytes)	11/13/2006 3:59 PM Microsoft Corporation	
	c:\windows\system32\inetpp.dll			c:\windows\system32\rdpwsx.dll	
icmp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	3.50 KB	rdpsnd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	25.00 KB
(3,584 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(25,600 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\icmp.dll			c:\windows\system32\rdpsnd.dll	
ersvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.00 KB	scredir	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	38.50 KB
(31,744 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(39,424 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ersvc.dll			c:\windows\system32\scredir.dll	
inetinfo	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	17.50 KB	csui	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	441.00 KB
(17,920 bytes)	11/14/2006 9:36 AM Microsoft Corporation		(451,584 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\inetrv\inetinfo.exe			c:\windows\system32\csui.dll	
iisutil	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	316.50 KB	msacm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.00 KB
(324,096 bytes)	11/14/2006 9:36 AM Microsoft Corporation		(31,744 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\inetrv\iisutil.dll			c:\windows\system32\msacm32.drv	
rpref	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	4.50 KB	msacm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	112.00 KB
(4,608 bytes)	11/14/2006 9:36 AM Microsoft Corporation		(114,688 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\inetrv\rpref.dll			c:\windows\system32\msacm32.dll	

imaadp32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB (24,576 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\imaadp32.acm
msadp32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	23.50 KB (24,064 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\msadp32.acm
msg711	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	13.50 KB (13,824 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\msg711.acm
msgsm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	34.50 KB (35,328 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\msgsm32.acm
tssoft32	1.01	13.50 KB (13,824 bytes)	3/25/2005 6:00 AM	DSP GROUP, INC.	c:\windows\system32\tssoft32.acm
tsd32	1.03	24.50 KB (25,088 bytes)	3/25/2005 6:00 AM	DSP GROUP, INC.	c:\windows\system32\tsd32.dll
printui	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	928.50 KB (950,784 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\printui.dll
cfgmgr32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	18.00 KB (18,432 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\cfgmgr32.dll
rdpclip	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	99.00 KB (101,376 bytes)	11/13/2006 3:59 PM	Microsoft Corporation	c:\windows\system32\rdpclip.exe
urlmon	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	1.02 MB (1,074,176 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\urlmon.dll
explorer	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	1.30 MB (1,364,480 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\explorer.exe
browseui	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	1.53 MB (1,601,536 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\browseui.dll
shdocvw	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	2.30 MB (2,416,128 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\shdocvw.dll
themeui	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	530.50 KB (543,232 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\themeui.dll
msimg32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.50 KB (6,656 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\msimg32.dll
linkinfo	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.00 KB (30,720 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\linkinfo.dll
ntshrui	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	184.00 KB (188,416 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\ntshrui.dll
webcheck	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	439.00 KB (449,536 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\webcheck.dll
stobject	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	142.50 KB (145,920 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\stobject.dll
batmeter	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	41.50 KB (42,496 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\batmeter.dll
powrprof	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	32.50 KB (33,280 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\powrprof.dll
drprov	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB (24,576 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\drprov.dll
ntlanman	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	71.50 KB (73,216 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\ntlanman.dll
netui0	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	130.00 KB (133,120 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\netui0.dll
netui1	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	338.50 KB (346,624 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\netui1.dll
davclnt	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	38.00 KB (38,912 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\davclnt.dll
browsecl	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	63.00 KB (64,512 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\browsecl.dll
shdoclc	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	589.50 KB (603,648 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\shdoclc.dll
mydocs	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	101.00 KB (103,424 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\mydocs.dll
jscrip	5.6.0.8827 974.50 KB (997,888 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\jscrip.dll	
dfshim	2.0.50727.42 (RTM.050727-4200)	95.00 KB (97,280 bytes)	9/23/2005 12:52 AM	Microsoft Corporation	c:\windows\system32\dfshim.dll
mscoree	2.0.50727.42 (RTM.050727-4200)	441.00 KB (451,584 bytes)	9/23/2005 12:37 AM	Microsoft Corporation	c:\windows\system32\mscoree.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
query	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.56 MB (2,683,904 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\query.dll
shfusion	2.0.50727.42 (RTM.050727-4200)	105.50 KB (108,032 bytes)	9/23/2005 12:36 AM	Microsoft Corporation	c:\windows\microsoft.net\framework64\v2.0.50727\shfusion.dll
msvcr80	8.00.50727.42	803.50 KB (822,784 bytes)	9/23/2005 12:26 AM	Microsoft Corporation	c:\windows\winsxs\amd64_microsoft.vc80.crt_1fc8b3b9a1e18e3b_8.0.50727.42_x-ww_3fea50ad\msvcr80.dll
fusion	2.0.50727.42 (RTM.050727-4200)	11.00 KB (11,264 bytes)	9/23/2005 12:37 AM	Microsoft Corporation	c:\windows\microsoft.net\framework64\v2.0.50727\fusion.dll
culture	2.0.50727.42 (RTM.050727-4200)	22.00 KB (22,528 bytes)	9/23/2005 12:41 AM	Microsoft Corporation	c:\windows\microsoft.net\framework64\v2.0.50727\culture.dll
shfusres	2.0.50727.42 (RTM.050727-4200)	85.00 KB (87,040 bytes)	9/23/2005 12:36 AM	Microsoft Corporation	c:\windows\microsoft.net\framework64\v2.0.50727\shfusres.dll
zipfldr	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	449.50 KB (460,288 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\zipfldr.dll
actxprxy	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	220.50 KB (225,792 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\actxprxy.dll
sendmail	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	64.00 KB (65,536 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\sendmail.dll
cmd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	538.50 KB (551,424 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\cmd.exe
sqlservr	2005.090.2047.00	37.44 MB (39,263,520 bytes)	4/14/2006 12:59 PM	Microsoft Corporation	c:\program files\microsoft sql server\mssql.1\mssql\bin\sqlservr.exe
msvcp80	8.00.50727.42	1.05 MB (1,097,728 bytes)	9/23/2005 12:28 AM	Microsoft Corporation	c:\windows\winsxs\amd64_microsoft.vc80.crt_1fc8b3b9a1e18e3b_8.0.50727.42_x-ww_3fea50ad\msvcp80.dll
opends60	2005.090.1399.00	22.21 KB (22,744 bytes)	10/14/2005 3:31 PM	Microsoft Corporation	c:\program files\microsoft sql server\mssql.1\mssql\bin\opends60.dll
instapi	2005.090.1399.00	40.71 KB (41,688 bytes)	10/14/2005 3:23 PM	Microsoft Corporation	c:\program files\microsoft sql server\90\shared\instapi.dll
sqllevn70	2005.090.2047.00	1.58 MB (1,652,512 bytes)	4/14/2006 12:53 PM	Microsoft Corporation	c:\program files\microsoft sql server\mssql.1\mssql\bin\resources\1033\sqllevn70.rll
sqlqs	2005.090.1399.00	15.71 KB (16,088 bytes)	10/14/2005 3:35 PM	Microsoft Corporation	c:\program files\microsoft sql server\mssql.1\mssql\bin\sqlqs.dll

xolehlp 2001.12.4720.1830 (srv03_sp1_rtm.050324-1447) 10.50 KB
(10,752 bytes) 11/13/2006 3:59 PM Microsoft Corporation
c:\windows\system32\xolehlp.dll

msdtcprx 2001.12.4720.1830 (srv03_sp1_rtm.050324-1447) 805.50 KB
(824,832 bytes) 11/13/2006 3:59 PM Microsoft Corporation
c:\windows\system32\msdtcprx.dll

mtxclu 2001.12.4720.1830 (srv03_sp1_rtm.050324-1447) 141.50 KB
(144,896 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\mtxclu.dll

resutils 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 98.50 KB
(100,864 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\resutils.dll

sqlncli 2005.090.2047.00 2.72 MB (2,854,744 bytes) 4/14/2006
12:59 PM Microsoft Corporation c:\windows\system32\sqlncli.dll

comdlg32 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) 446.50 KB
(457,216 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\comdlg32.dll

sqlnclir 2005.090.1399.00 201.21 KB (206,040 bytes)
10/14/2005 3:31 PM Microsoft Corporation
c:\windows\system32\sqlnclir.rll

wuauclt 5.7.3790.1830 (srv03_sp1_rtm.050324-1447) 156.00 KB
(159,744 bytes) 11/13/2006 4:01 PM Microsoft Corporation
c:\windows\system32\wuauclt.exe

wuauclt 5.7.3790.1830 (srv03_sp1_rtm.050324-1447) 177.50 KB
(181,760 bytes) 11/13/2006 4:01 PM Microsoft Corporation
c:\windows\system32\wuauclt.cpl

StepMaster 2.05.0005 1.92 MB (2,015,285 bytes)
11/14/2006 11:52 AM Microsoft Corporation c:\program
files (x86)\stepmaster\stepmaster.exe

wow64 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 245.00 KB
(250,880 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\wow64.dll

wow64win5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 280.00 KB
(286,720 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\wow64win.dll

wow64cpu 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 18.50 KB
(18,944 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\wow64cpu.dll

helpctr 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 1.30 MB
(1,363,456 bytes) 11/13/2006 4:00 PM Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\helpctr.exe

hcappres 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 7.50 KB
(7,680 bytes) 11/13/2006 4:00 PM Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\hcappres.dll

itss 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\itss.dll

pchshell 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 155.00 KB
(158,720 bytes) 11/13/2006 4:00 PM Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\pchshell.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

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) 11/13/2006 4:00 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) 11/13/2006 4:00 PM Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\helpsvc.exe

[Services]

Display Name	Name	State	Start Mode	Service Type
Application Experience Lookup Service	AeLookupSvc	Running	Normal	Share Process
Alerter	Alerter	Stopped	Disabled	Share Process
Application Layer Gateway Service	ALG	Stopped	Manual	Normal
Application Management Process	AppMgmt	Stopped	Manual	Share
ASP.NET State Service	aspnet_state	Stopped	Manual	Own Process
Windows Audio	AudioSrv	Stopped	Disabled	Share Process
Background Intelligent Transfer Service	BITS	Stopped	Manual	Share Process
Computer Browser	Browser	Running	Auto	Share Process
Indexing Service	CiSvc	Stopped	Disabled	Share Process
ClipBook	ClipSrv	Stopped	Disabled	Own Process
.NET Runtime Optimization Service v2.0.50727_X86	clr_optimization_v2.0.50727_32	Stopped	Manual	Own
.NET Runtime Optimization Service v2.0.50727_x64	clr_optimization_v2.0.50727_64	Stopped	Manual	Own
COM+ System Application	COMSysApp	Stopped	Manual	Own Process
Cryptographic Services	CryptSvc	Running	Auto	Share
DCOM Server Process Launcher	DcomLaunch	Running	Auto	Share Process
Distributed File System	Dfs	Stopped	Manual	Own
DHCP Client	Dhcp	Running	Auto	Share Process
Logical Disk Manager Administrative Service	dmadmin	Stopped	Manual	Share Process

	c:\windows\system32\dmadmin.exe /com	Normal							Network DDE	NetDDE	Stopped	Disabled	Share Process
Logical Disk Manager	dmserver	Running	Auto	Share Process					c:\windows\system32\netdde.exe	Normal		LocalSystem	0
	c:\windows\system32\svchost.exe -k netsvcs	Normal						Network DDE DSDM	NetDDEdsdm	Stopped	Disabled	Share	
	LocalSystem	0						Process	c:\windows\system32\netdde.exe	Normal		LocalSystem	0
DNS Client	Dnscache	Running	Auto	Share Process					Net Logon	Netlogon	Stopped	Manual	Share Process
	c:\windows\system32\svchost.exe -k networkservice	Normal							c:\windows\system32\lsass.exe	Normal		LocalSystem	0
	NT AUTHORITY\NetworkService	0											
Error Reporting Service	ERSvc	Running	Auto	Share					Network Connections	Netman	Running	Manual	Share Process
Process	c:\windows\system32\svchost.exe -k winerr	Ignore							c:\windows\system32\svchost.exe -k netsvcs	Normal			
	LocalSystem	0											
Event Log	Eventlog	Running	Auto	Share Process					Network Location Awareness (NLA)	Nla	Running	Manual	
	c:\windows\system32\services.exe	Normal							Share Process	c:\windows\system32\svchost.exe -k netsvcs	0		
	LocalSystem	0							Normal	LocalSystem	0		
COM+ Event System	EventSystem	Running	Auto	Share					File Replication	NtFrs	Stopped	Manual	Own Process
Process	c:\windows\system32\svchost.exe -k netsvcs	Normal							c:\windows\system32\ntfrs.exe	Ignore		LocalSystem	0
	LocalSystem	0											
Help and Support	helpsvc	Running	Auto	Share Process					NT LM Security Support Provider		NtLmSsp	Stopped	Manual
	c:\windows\system32\svchost.exe -k netsvcs	Normal							Share Process	c:\windows\system32\lsass.exe	Normal		
	LocalSystem	0											
HID Input Service	HidServ	Running	Auto	Share Process					Removable Storage	NtmsSvc	Stopped	Manual	Share Process
	c:\windows\system32\svchost.exe -k netsvcs	Normal							c:\windows\system32\svchost.exe -k netsvcs	Normal			
	LocalSystem	0							LocalSystem	0			
HTTP SSL HTTP Filter		Running	Manual	Share Process					Office Source Engine	ose	Stopped	Manual	Own Process
	c:\windows\system32\lsass.exe	Normal							"c:\program files (x86)\common files\microsoft shared\source				
	LocalSystem	0							engine\ose.exe"	Normal	LocalSystem	0	
IAS Jet Database Access	IASJet	Stopped	Manual	Share					Plug and Play	PlugPlay	Running	Auto	Share Process
Process	c:\windows\systwow64\svchost.exe -k iasjet	Normal							c:\windows\system32\services.exe	Normal			
	LocalSystem	0							LocalSystem	0			
IIS Admin Service	IISADMIN	Running	Auto	Share					IPSEC Services	PolicyAgent	Running	Auto	Share
Process	c:\windows\system32\inetrv\inetinfo.exe	Normal							Process	c:\windows\system32\lsass.exe	Normal		LocalSystem
	LocalSystem	0							0				
IMAPI CD-Burning COM Service	ImapiService	Stopped							Protected Storage	ProtectedStorage	Running	Auto	Share
	Disabled	Own Process							Process	c:\windows\system32\lsass.exe	Normal		LocalSystem
	Normal	LocalSystem	0						0				
Intersite Messaging	IsmServ	Stopped	Disabled	Own Process					Remote Access Auto Connection Manager	RasAuto	Stopped	Manual	
	c:\windows\system32\ismserv.exe	Normal							Share Process	c:\windows\system32\svchost.exe -k netsvcs	0		
	LocalSystem	0							Normal	LocalSystem	0		
Kerberos Key Distribution Center	kdc	Stopped	Disabled						Remote Access Connection Manager	RasMan	Stopped	Manual	
	Share Process	c:\windows\system32\lsass.exe	Normal						Share Process	c:\windows\system32\svchost.exe -k netsvcs	0		
	LocalSystem	0							Normal	LocalSystem	0		
Server	lanmanserver	Running	Auto	Share Process					Remote Desktop Help Session Manager	RDSessMgr		Stopped	
	c:\windows\system32\svchost.exe -k netsvcs	Normal							Manual	Own Process			
	LocalSystem	0							c:\windows\system32\sessmgr.exe	Normal			
Workstation	lanmanworkstation	Running	Auto	Share					Routing and Remote Access	RemoteAccess	Stopped	Disabled	
Process	c:\windows\system32\svchost.exe -k netsvcs	Normal							Share Process	c:\windows\system32\svchost.exe -k netsvcs	0		
	LocalSystem	0							Normal	LocalSystem	0		
License Logging	LicenseService	Stopped	Disabled	Own					Remote Registry	RemoteRegistry	Running	Auto	Share
Process	c:\windows\system32\llsrv.exe	Normal		NT					Process	c:\windows\system32\svchost.exe -k regsvc	Normal		NT
	AUTHORITY\NetworkService	0							AUTHORITY\LocalService	0			
TCP/IP NetBIOS Helper	LmHosts	Running	Auto	Share					Remote Procedure Call (RPC) Locator	RpcLocator	Stopped		
Process	c:\windows\system32\svchost.exe -k localservice	Normal							Manual	Own Process	c:\windows\system32\locator.exe	0	
	NT AUTHORITY\LocalService	0							Normal	NT AUTHORITY\NetworkService	0		
Messenger	Messenger	Stopped	Disabled	Share Process					Remote Procedure Call (RPC)	RpcSs	Running	Auto	Share
	c:\windows\system32\svchost.exe -k netsvcs	Normal							Process	c:\windows\system32\svchost.exe -k rpcss	Normal		NT
	LocalSystem	0							AUTHORITY\NetworkService	0			
NetMeeting	Remote Desktop Sharing	mmmsrv	Stopped	Disabled					Resultant Set of Policy Provider	RSOPProv	Stopped	Manual	Share
	Own Process	c:\windows\system32\mmmsrv.exe							Process	c:\windows\system32\rsopprov.exe		Normal	
	Normal	LocalSystem	0						LocalSystem	0			
Distributed Transaction Coordinator	MSDTC	Running	Auto						Special Administration Console Helper	sacsrv	Stopped	Manual	
	Own Process	c:\windows\system32\msdtc.exe	Normal						Share Process	c:\windows\system32\svchost.exe -k netsvcs	0		
	NT AUTHORITY\NetworkService	0							Normal	LocalSystem	0		
Windows Installer	MSIServer	Stopped	Manual	Share Process					Security Accounts Manager	SamSs	Running	Auto	Share
	c:\windows\system32\msiexec.exe /v	Normal							Process	c:\windows\system32\lsass.exe	Normal		LocalSystem
	LocalSystem	0							0				
SQL Server (MSSQLSERVER)	MSSQLSERVER	Stopped	Manual						Smart Card	SCardSvr	Stopped	Manual	Share Process
	Own Process	"c:\program files\microsoft sql							c:\windows\system32\scardsvr.exe				Ignore
server\mssql.1\mssql\bin\sqlservr.exe" -smssqlserver	Normal								AUTHORITY\LocalService	0			NT
	LocalSystem	0											
SQL Server Active Directory Helper	MSSQLServerADHelper	Stopped	Disabled	Own Process					Task Scheduler	Schedule	Running	Auto	Share Process
	Stopped	Disabled	Own Process	"c:\program					c:\windows\system32\svchost.exe -k netsvcs	Normal			
files\microsoft sql server\90\shared\sqladhlp90.exe"	Normal			NT					LocalSystem	0			
	AUTHORITY\NetworkService	0											

Secondary Logon	seclogon	Running	Auto	Share Process	
	c:\windows\system32\svchost.exe -k netsvcs	Ignore			
	LocalSystem	0			
System Event Notification Process	c:\windows\system32\svchost.exe -k netsvcs	SENS	Running	Auto	Share
	LocalSystem	0			
Windows Firewall/Internet Connection Sharing (ICS)		Stopped	Disabled	Share Process	
	c:\windows\system32\svchost.exe -k netsvcs	Normal			
	LocalSystem	0			
Shell Hardware Detection	ShellHWDetection	Running	Auto	Share Process	
	c:\windows\system32\svchost.exe -k netsvcs	Ignore			
	LocalSystem	0			
Print Spooler	Spooler	Running	Auto	Own Process	
	c:\windows\system32\spoolsv.exe			Normal	
	LocalSystem	0			
SQL Server Browser	SQLBrowser	Stopped	Disabled	Own Process	
	"c:\program files (x86)\microsoft sql server\90\shared\sqlbrowser.exe"	Normal		LocalSystem	0
SQL Server Agent (MSSQLSERVER)	SQLSERVERAGENT	Stopped	Manual	Own Process	
	"c:\program files\microsoft sql server\mssql.1\mssql\bin\sqlagent90.exe" -i mssqlserver	Normal		LocalSystem	0
SQL Server VSS Writer	SQLWriter	Stopped	Manual	Own Process	
	"c:\program files\microsoft sql server\90\shared\sqlwriter.exe"	Normal		LocalSystem	0
Windows Image Acquisition (WIA)	stisvc	Stopped	Disabled	Share Process	
	c:\windows\system32\svchost.exe -k imgsvc	Normal		NT AUTHORITY\LocalService	0
Microsoft Software Shadow Copy Provider	swprv	Stopped	Manual	Own Process	
	c:\windows\system32\svchost.exe -k swprv	Normal		LocalSystem	0
Performance Logs and Alerts	SysmonLog	Stopped	Auto	Own Process	
	c:\windows\system32\smlogsvc.exe	Normal		NT Authority\NetworkService	0
Telephony TapiSrv	Stopped	Manual	Share Process		
	c:\windows\system32\svchost.exe -k tapisrv	LocalSystem		0	
Terminal Services	TermService	Running	Manual	Share Process	
	c:\windows\system32\svchost.exe -k termsvcs	LocalSystem		0	Normal
Themes	Themes	Stopped	Disabled	Share Process	
	c:\windows\system32\svchost.exe -k netsvcs	LocalSystem		0	Normal
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	LocalSystem		0	Normal
Distributed Link Tracking Client	TrkWks	Running	Auto	Share Process	
	c:\windows\system32\svchost.exe -k netsvcs	LocalSystem		0	Normal
Terminal Services Session Directory	Tssdis	Stopped	Disabled	Own Process	
	c:\windows\system32\tssdis.exe	LocalSystem		0	Normal
Windows User Mode Driver Framework	UMWdf	Stopped	Manual	Own Process	
	c:\windows\system32\wdfmgr.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	Running	Auto	Share Process	
	c:\windows\system32\svchost.exe -k localservice	NT AUTHORITY\LocalService		0	Normal
World Wide Web Publishing Service	W3SVC	Running	Auto	Share Process	
	c:\windows\system32\svchost.exe -k iissvcs	Normal		LocalSystem	0
WebClient	WebClient	Stopped	Disabled	Share Process	
	c:\windows\system32\svchost.exe -k localservice	NT AUTHORITY\LocalService		0	Normal
WinHTTP Web Proxy Auto-Discovery Service	WinHttpAutoProxySvc	Stopped	Manual	Share Process	
	c:\windows\system32\svchost.exe -k localservice	NT AUTHORITY\LocalService		0	Normal
Windows Management Instrumentation	wimgmt	Running	Auto	Share Process	
	c:\windows\system32\svchost.exe -k netsvcs	Ignore		LocalSystem	0
Portable Media Serial Number Service	WmdmPmSN	Stopped	Manual	Share Process	
	c:\windows\system32\svchost.exe -k netsvcs	LocalSystem		0	Normal
Windows Management Instrumentation Driver Extensions		Stopped	Manual	Share Process	
	c:\windows\system32\svchost.exe -k netsvcs	LocalSystem		0	Normal
WMI Performance Adapter	WmiApSrv	Stopped	Manual	Own Process	
	c:\windows\system32\wbem\wmiaprv.exe	Normal		LocalSystem	0
Automatic Updates	wuauerv	Running	Auto	Share Process	
	c:\windows\system32\svchost.exe -k netsvcs	LocalSystem		0	Normal
Wireless Configuration	WZCSVC	Running	Auto	Share Process	
	c:\windows\system32\svchost.exe -k netsvcs	LocalSystem		0	Normal
Network Provisioning Service	xmlprov	Stopped	Manual	Share Process	
	c:\windows\system32\svchost.exe -k netsvcs	LocalSystem		0	Normal

[Program Groups]

Group Name	Name	User Name
Accessories	Default User:Accessories	Default User
Accessories\Accessibility	Default User:Accessories\Accessibility	Default User
Accessories\Entertainment	Default User:Accessories\Entertainment	Default User
Startup	Default User:Startup	Default User
Accessories	All Users:Accessories	All Users
Accessories\Accessibility	All Users:Accessories\Accessibility	All Users
Accessories\Communications	All Users:Accessories\Communications	All Users
Accessories\Entertainment	All Users:Accessories\Entertainment	All Users
Accessories\System Tools	All Users:Accessories\System Tools	All Users
Administrative Tools	All Users:Administrative Tools	All Users
Microsoft SQL Server 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\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 PE2900\Administrator:Accessories
 PE2900\Administrator
 Accessories\Accessibility PE2900\Administrator:Accessories\Accessibility
 PE2900\Administrator
 Accessories\Entertainment PE2900\Administrator:Accessories\Entertainment
 PE2900\Administrator
 Administrative Tools PE2900\Administrator:Administrative Tools
 PE2900\Administrator
 Startup PE2900\Administrator:Startup PE2900\Administrator

[Startup Programs]

Program	Command	User Name	Location
desktop	desktop.ini	NT AUTHORITY\SYSTEM	Startup
desktop	desktop.ini	PE2900\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
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[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 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
actxprxy.dll	6.0.3790.1830	221 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
advpack.dll	6.0.3790.1830	146 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
advpack.dll	6.0.3790.1830	146 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
asctrls.ocx	6.0.3790.1830	147 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
asctrls.ocx	6.0.3790.1830	147 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation

browsecl.dll	6.0.3790.1830	63 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
browsecl.dll	6.0.3790.1830	63 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
browseui.dll	6.0.3790.1830	1,564 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
browseui.dll	6.0.3790.1830	1,564 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
cdfview.dll	6.0.3790.1830	216 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
cdfview.dll	6.0.3790.1830	216 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
comctl32.dll	5.82.3790.1830	935 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
comctl32.dll	5.82.3790.1830	935 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
dxtrans.dll	6.3.3790.1830	320 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
dxtrans.dll	6.3.3790.1830	320 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
dxtmsft.dll	6.3.3790.1830	549 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
dxtmsft.dll	6.3.3790.1830	549 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iecont.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 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iedkcs32.dll	16.0.3790.1830	417 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iepeers.dll	6.0.3790.1830	361 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iepeers.dll	6.0.3790.1830	361 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iesetup.dll	6.0.3790.1830	71 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iesetup.dll	6.0.3790.1830	71 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
ieunit.inf	Not Available	24 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Not Available
ieunit.inf	Not Available	24 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Not Available
ieexplore.exe	6.0.3790.1830	94 KB	3/25/2005 6:00:00 AM	C:\Program Files\Internet Explorer	Microsoft Corporation
imgutil.dll	6.0.3790.1830	61 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
imgutil.dll	6.0.3790.1830	61 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inetctl.cpl	6.0.3790.1830	428 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inetctl.cpl	6.0.3790.1830	428 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inetctl.dll	6.0.3790.1830	110 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inetctl.dll	6.0.3790.1830	110 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inseng.dll	6.0.3790.1830	147 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inseng.dll	6.0.3790.1830	147 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mlang.dll	6.0.3790.1830	686 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mlang.dll	6.0.3790.1830	686 KB	3/25/2005 6:00:00 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 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshta.exe	6.0.3790.1830	38 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation


```

mshtml.dll 6.0.3790.1830 5,790 KB 3/25/2005 6:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
mshtml.dll 6.0.3790.1830 5,790 KB 3/25/2005 6:00:00 AM
. Microsoft Corporation
mshtml.tlb 6.0.3790.1830 1,320 KB 3/25/2005 6:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
mshtml.tlb 6.0.3790.1830 1,320 KB 3/25/2005 6:00:00 AM
. Microsoft Corporation
mshtml.dll 6.0.3790.1830 906 KB 3/25/2005 6:00:00
AM C:\WINDOWS\system32 Microsoft Corporation
mshtml.dll 6.0.3790.1830 906 KB 3/25/2005 6:00:00
AM . Microsoft Corporation
mshtml.dll 6.0.3790.1830 56 KB 3/25/2005 6:00:00
AM C:\WINDOWS\system32 Microsoft Corporation
mshtml.dll 6.0.3790.1830 56 KB 3/25/2005 6:00:00
AM . Microsoft Corporation
msident.dll 6.0.3790.1830 69 KB 3/25/2005 6:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
msident.dll 6.0.3790.1830 69 KB 3/25/2005 6:00:00 AM
. Microsoft Corporation
msidntld.dll 6.0.3790.1830 16 KB 3/25/2005 6:00:00
AM C:\WINDOWS\system32 Microsoft Corporation
msidntld.dll 6.0.3790.1830 16 KB 3/25/2005 6:00:00
AM . Microsoft Corporation
msieftp.dll 6.0.3790.1830 369 KB 3/25/2005 6:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
msieftp.dll 6.0.3790.1830 369 KB 3/25/2005 6:00:00 AM
. Microsoft Corporation
msrating.dll 6.0.3790.1830 240 KB 3/25/2005 6:00:00
AM C:\WINDOWS\system32 Microsoft Corporation
msrating.dll 6.0.3790.1830 240 KB 3/25/2005 6:00:00
AM . Microsoft Corporation
mstime.dll 6.0.3790.1830 878 KB 3/25/2005 6:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
mstime.dll 6.0.3790.1830 878 KB 3/25/2005 6:00:00 AM
. Microsoft Corporation
occache.dll 6.0.3790.1830 126 KB 3/25/2005 6:00:00
AM C:\WINDOWS\system32 Microsoft Corporation
occache.dll 6.0.3790.1830 126 KB 3/25/2005 6:00:00
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 6:00:00
AM C:\WINDOWS\system32 Microsoft Corporation
sendmail.dll 6.0.3790.1830 64 KB 3/25/2005 6:00:00
AM . Microsoft Corporation
shdoclc.dll 6.0.3790.1830 590 KB 3/25/2005 6:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
shdoclc.dll 6.0.3790.1830 590 KB 3/25/2005 6:00:00 AM
. Microsoft Corporation
shdocvw.dll 6.0.3790.1830 2,360 KB 3/25/2005 6:00:00
AM C:\WINDOWS\system32 Microsoft Corporation
shdocvw.dll 6.0.3790.1830 2,360 KB 3/25/2005 6:00:00
AM . Microsoft Corporation
shfolder.dll 6.0.3790.1830 34 KB 3/25/2005 6:00:00
AM C:\WINDOWS\system32 Microsoft Corporation
shfolder.dll 6.0.3790.1830 34 KB 3/25/2005 6:00:00
AM . Microsoft Corporation
shlwapi.dll 6.0.3790.1830 607 KB 3/25/2005 6:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
shlwapi.dll 6.0.3790.1830 607 KB 3/25/2005 6:00:00 AM
. Microsoft Corporation
tdc.ocx 1.3.0.3130 91 KB 3/25/2005 6:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
tdc.ocx 1.3.0.3130 91 KB 3/25/2005 6:00:00 AM
. Microsoft Corporation
url.dll 6.0.3790.1830 40 KB 3/25/2005 6:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
url.dll 6.0.3790.1830 40 KB 3/25/2005 6:00:00 AM
. Microsoft Corporation
urlmon.dll 6.0.3790.1830 1,049 KB 3/25/2005 6:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

```

```

urlmon.dll 6.0.3790.1830 1,049 KB 3/25/2005 6:00:00 AM
. Microsoft Corporation
webcheck.dll 6.0.3790.1830 439 KB 3/25/2005 6:00:00
AM C:\WINDOWS\system32 Microsoft Corporation
webcheck.dll 6.0.3790.1830 439 KB 3/25/2005 6:00:00
AM . Microsoft Corporation
wininet.dll 6.0.3790.1830 1,159 KB 3/25/2005 6:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation
wininet.dll 6.0.3790.1830 1,159 KB 3/25/2005 6:00:00 AM
. Microsoft Corporation

```

[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
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

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          = 47652MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_li_2,
    FILENAME      = "G:",
    SIZE          = 49818MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_li_3,
    FILENAME      = "H:",
    SIZE          = 47652MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_li_4,
    FILENAME      = "I:",
    SIZE          = 49818MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_li_5,
    FILENAME      = "J:",
    SIZE          = 47652MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_li_6,
    FILENAME      = "K:",
    SIZE          = 49818MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_li_7,
    FILENAME      = "L:",
    SIZE          = 47652MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_li_8,
    FILENAME      = "M:",
    SIZE          = 49818MB,
    FILEGROWTH    = 0),
FILEGROUP GENERAL_FG
(
    NAME          = %DBNAME%_gen_1,
    FILENAME      = "O:",
    SIZE          = 22924MB,
```

```
FILEGROWTH = 0),
(
    NAME          = %DBNAME%_gen_2,
    FILENAME      = "P:",
    SIZE          = 23966MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_gen_3,
    FILENAME      = "Q:",
    SIZE          = 22924MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_gen_4,
    FILENAME      = "R:",
    SIZE          = 23966MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_gen_5,
    FILENAME      = "S:",
    SIZE          = 22924MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_gen_6,
    FILENAME      = "T:",
    SIZE          = 23966MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_gen_7,
    FILENAME      = "U:",
    SIZE          = 22924MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_gen_8,
    FILENAME      = "V:",
    SIZE          = 23966MB,
    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,
```

Appendix B

```

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
  (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_SHIPPRIORITY 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: CREATECLUSTEREDINDEXES.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

```

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```
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
```

```
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
```

Appendix B

```
go -- GO
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load14
go
ALTER DATABASE %DBNAME% REMOVE FILE -- File: BACKUPDATABASE.SQL
%DBNAME%_load15 -- Microsoft TPC-H Benchmark Kit Version
go 2.00
ALTER DATABASE %DBNAME% REMOVE FILE -- Copyright Microsoft, 1999
%DBNAME%_load16 --
go
ALTER DATABASE %DBNAME% REMOVE backup database %DBNAME% to BackupDev1,
FILEGROUP LOAD_FG BackupDev2, BackupDev3, BackupDev4, BackupDev5 with
Go init, stats=10

-- File: CREATEBACKUPDEVICES.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- 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_dumpdevice 'disk', 'BackupDev1',
'C:\B\S\TPCHbackup1'
GO
sp_dumpdevice 'disk', 'BackupDev2',
'C:\B\T\TPCHbackup2'
GO
sp_dumpdevice 'disk', 'BackupDev3',
'C:\B\U\TPCHbackup3'
GO
sp_dumpdevice 'disk', 'BackupDev4',
'C:\B\V\TPCHbackup4'
GO
-- sp_dumpdevice 'disk', 'BackupDev5',
'C:\B\W\TPCHbackup5'
```

```
-- File: RESTOREDATABASE.SQL
-- Microsoft TPC-H Benchmark Kit Version
-- 2.00
-- Copyright Microsoft, 1999
--
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\P\tempdev_4',size=15000mb),
(name=tempdev5,
filename='C:\B\P\tempdev_5',size=15000mb),
(name=tempdev6,
filename='C:\B\R\tempdev_6',size=15000mb),
```


Appendix B

```
(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  
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,
            @o_key,
            @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
PARTSUPP
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,
@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
@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,
@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

-- 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 +
@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())

--      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_EXTENDEDPRI
(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 " "
--      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_EXTENDEDPRI 'L_EXTENDEDPRI',
        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_EXTENDEDPRI,
        @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_EXTENDEDPRI =
@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:"

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

end

go

-- 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_EXTENDEDPRIE 'L_EXTENDEDPRIE',
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_EXTENDEDPRIE,
@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 +

update LINEITEM
set L_EXTENDEDPRIE =
@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 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_EXTENDEDPRIE 'L_EXTENDEDPRIE',
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,
```

```
@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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```

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

```

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```
-- 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,vZGiwu2FWEJdLDx04      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_EXTENDEDPRI)
                AS SUM_BASE_PRICE,
                SUM(L_EXTENDEDPRI*(1-L_DISCOUNT))
                AS SUM_DISC_PRICE,
                SUM(L_EXTENDEDPRI*(1-
L_DISCOUNT)*(1+L_TAX)) AS SUM_CHARGE,
                AVG(L_QUANTITY)
                AS AVG_QTY,
                AVG(L_EXTENDEDPRI)
                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
56586554400.730347      53758257134.870140
55909065222.827301      25.522006      38273.129735
0.049985      1478493
N      F      991417.000000      1487504710.380003
1413082168.054097      1469649223.194376      25.516472
38284.467761      0.050093      38854
N      O      74476040.000000
111701729697.739730      106118230307.605070
110367043872.497440      25.502227      38249.117989
0.049997      2920374
R      F      37719753.000000
56568041380.899826      53741292684.604103
55889619119.832237      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			even dolphins above the furiously ironic foxes sleep slyly
across the closely final instructi			around the caref
9923.770000	Supplier#000002324	GERMANY	9681.330000
29821	Manufacturer#4	y3OD9UywSTOk	78405
17-779-299-1839			32-139-873-8571
quickly express packages breach quiet pinto			furiously even deposits affix thinly special
beans. requ			theodolites. furiou
9871.220000	Supplier#000006373	GERMANY	9643.550000
43868	Manufacturer#5	J8fcXWSTqM	107617
17-813-485-8637			29-252-617-4850
never silent deposits integrate furiously blit			doggedly even ideas boost furiously against
9870.780000	Supplier#000001286	GERMANY	the furiously express
81285	Manufacturer#2		9624.820000
YKA,E2fjiVd7eUrzp2Ef8j1QxGo2DFnosaTEH		17-516-924-4574	34306
final theodolites cajole slyly special,			Manufacturer#3
9870.780000	Supplier#000001286	GERMANY	e7vab91vLJPWxxZnewmnDBpDmxYHrb
181285	Manufacturer#4		16-392-237-6726
YKA,E2fjiVd7eUrzp2Ef8j1QxGo2DFnosaTEH		17-516-924-4574	blithely regular accounts cajole furiously. regular
final theodolites cajole slyly special,			9624.780000
9852.520000	Supplier#000008973	RUSSIA	189657
18972	Manufacturer#2		Manufacturer#1
t5L67YdBYH6o,Vz24jpDyQ9		32-188-594-7038	oE9uBgEfSS4opIcepXyAYM,x
quickly regular instructions wake-- carefully unusual braids			29-748-876-2014
into the expres			regular deposits haggle. furiously express asympto
9847.830000	Supplier#000008097	RUSSIA	9612.940000
130557	Manufacturer#2	xMe97bpE69NzdwLoX	120715
32-375-640-3593			Manufacturer#2
slyly regular dependencies sleep slyly			KDdpNKN3cWu7ZSrbdq7AfSLxx,qWB
furiously express dep			29-325-784-8187
9847.570000	Supplier#000006345	FRANCE	carefully pending accounts serve. furiously close
86344	Manufacturer#1		deposits boost slyly. q
VSt3rzk3qG698u6ld8HhOByvrTcSTSvQIDQDag		16-886-766-7945	9612.940000
silent pinto beans should have to snooze carefully			Supplier#000003228
along the final reques			198189
9847.570000	Supplier#000006345	FRANCE	Manufacturer#4
173827	Manufacturer#2		KDdpNKN3cWu7ZSrbdq7AfSLxx,qWB
VSt3rzk3qG698u6ld8HhOByvrTcSTSvQIDQDag		16-886-766-7945	29-325-784-8187
silent pinto beans should have to snooze carefully			carefully pending accounts serve. furiously close
along the final reques			deposits boost slyly. q
9836.930000	Supplier#000007342	RUSSIA	9571.830000
4841	Manufacturer#4	JOIK7C1,7xrEZSSow	Supplier#000004305
32-399-414-5385			179270
final accounts haggle. bold accounts are			Manufacturer#2
furiously dugouts. furiously silent asymptotes are slyly			qNHZ7WmCzygwMPRDO9Ps
9817.100000	Supplier#000002352	RUSSIA	29-973-481-1831
124815	Manufacturer#2	4LfoHUZjgEbAKw	furiously final deposits
TgdKcgOc4D4uCYw		32-551-831-1437	9558.100000
blithely pending			Supplier#000003532
packages across the ironic accounts grow slyly after the			88515
furiously			Manufacturer#4
9817.100000	Supplier#000002352	RUSSIA	EOeuiOn21OVpTIGguufFDFsbN1p0lhpXHp
152351	Manufacturer#3	4LfoHUZjgEbAKw	33-152-301-2164
TgdKcgOc4D4uCYw		32-551-831-1437	daring, sly accounts breach about th
blithely pending			9492.790000
			Supplier#000005975
			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

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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, h9Vixj9ARHFvKgMDf	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	slyly ironic requests	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-	722-866-1658	quickly ironic sauternes use b		
9249.350000	Supplier#000003973	FRANCE	furiously. blithely ironic foxes wake boldly across the		
33972	Manufacturer#1		furiously s		
d18GiDsL6Wm2IsGXM, RZfljCsgZAOjNYVThTRP4	16-	722-866-1658	quickly ironic sauternes use b		
9208.700000	Supplier#000007769	ROMANIA	8920.590000	Supplier#000003967	ROMANIA
40256	Manufacturer#5	rsimdze 5o9P Ht7xS	26460	Manufacturer#1	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	8920.590000	Supplier#000003967	ROMANIA
KINGDOM	67183	Manufacturer#5	173966	Manufacturer#2	eHoAXe62SY9
BnUTlmi5zdeEl7R7		33-121-267-9529	29-194-731-3944		quickly even requests should have to affix
unusual accounts integrate slyly. platelets			blithely-- fur		
9192.100000	Supplier#000000115	UNITED	8913.960000	Supplier#000004603	UNITED
KINGDOM	85098	Manufacturer#3	KINGDOM	137063	Manufacturer#2
2t0f7Ve, wL1, 6WzGBJLNUCKIsV		33-597-248-1220	OUzlvMUr7n, utLxmPNeYKsf3T24OXskxB5	33-789-	
slyly bold pinto beans boost across the furiously regular			255-7342		slyly ironic packages detect furious accounts. ironic
packages. carefully regu			de		
9189.980000	Supplier#000001226	GERMANY	8877.820000	Supplier#000007967	FRANCE
21225	Manufacturer#4	qsLCqSvLyZfuXIpjz	167966	Manufacturer#5	
17-725-903-1381		final, express instruction	A3pi1BARM4nx6R, qrwFoRPU	16-442-147-9345	
9128.970000	Supplier#000004311	RUSSIA	final deposits after the silent deposits ha		
146768	Manufacturer#5		8862.240000	Supplier#000003323	ROMANIA
I8IjnXd7NSJR594RxsRR0		32-155-440-7120	73322	Manufacturer#3	W9 IYcsC9FwBqk3ItL
regular pinto beans sleep ca			29-736-951-3710		unusual, pending theodolites integrate
			furiously slyly even pinto beans. unusual sheaves sleep befor		
			8841.590000	Supplier#000005750	ROMANIA
			100729	Manufacturer#5	
			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
HJFStOu9R5NGPOegKhgbzBdyvrG2yh8w 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
 Dh8lkg39onrbOL4DyTfGw8a9oKUX3d9Y 32-836-132-
 8872 carefully regular instructions integrate blithely silent
 foxes. furiously express instructions hagggl
 8042.090000 Supplier#000003245 RUSSIA
 150729 Manufacturer#1
 Dh8lkg39onrbOL4DyTfGw8a9oKUX3d9Y 32-836-132-
 8872 carefully regular instructions integrate blithely silent
 foxes. furiously express instructions hagggl
 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
WHEREO_ORDERDATE >= '1993-07-01' AND
      O_ORDERDATE < dateadd (mm, 3, '1993-
07-01') AND
      EXISTS      (
        SELECT      *
        FROM LINEITEM
        WHEREL_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
WHEREC_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
WHEREL_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
vXCxocSuo0Bad5JQI ,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

```

```

N_NAME
31134  7938318.300000
45636  7937240.850000
56694  7936015.950000
8114   7933921.880000
71518  7932261.690000
72922  7930400.640000
146699 7929167.400000
92387  7928972.670000
186289 7928786.190000
95952  7927972.780000
196514 7927180.700000
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)

..... Additional Rows Deleted

```

85096  7943691.060000
51657  7943593.770000
196680 7943578.890000
13141  7942730.340000
193327 7941036.250000
152612 7940663.710000
139680 7939242.360000

```

-- 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'

```

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```

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

(2 row(s) affected)

-- using default substitutions

/* TPC_H Query 13 - Customer Distribution */

SELECT C_COUNT,
       COUNT(*) AS CUSTDIST
FROM ( SELECT C_CUSTKEY,
            COUNT(O_ORDERKEY)
      FROM CUSTOMER left outer join
ORDERS on
            C_CUSTKEY = O_CUSTKEY
      AND
            O_COMMENT not like
'%special%requests%'
      )
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
-----
0 50004
9 6641
10 6566
11 6058

```

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```

-----
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)
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

```

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Brand#12	STANDARD ANODIZED TIN	49	20	-- using default substitutions
Brand#12	STANDARD PLATED BRASS	19	20	
Brand#13	ECONOMY BRUSHED BRASS	9	20	/* TPC_H Query 17 - Small-Quantity-Order Revenue */
Brand#13	ECONOMY BURNISHED STEEL	14	20	
Brand#13	LARGE BURNISHED NICKEL	19	20	SELECT SUM(L_EXTENDEDPRICE)/7.0 AS
Brand#13	MEDIUM BURNISHED COPPER	36	20	AVG_YEARLY
Brand#13	SMALL BRUSHED TIN	45	20	FROM LINEITEM,
Brand#13	STANDARD ANODIZED COPPER	3	20	PART
Brand#13	STANDARD PLATED NICKEL	23	20	WHEREP_PARTKEY = L_PARTKEY AND
Brand#14	ECONOMY ANODIZED COPPER	14	20	P_BRAND = 'Brand#23'
Brand#14	ECONOMY PLATED TIN	36	20	AND
				P_CONTAINER = 'MED BOX' AND
.....	Additional Rows Deleted		L_QUANTITY < (SELECT
				0.2 * AVG(L_QUANTITY)
				FROM
Brand#55	STANDARD PLATED COPPER	45	4	LINEITEM
Brand#55	STANDARD PLATED NICKEL	3	4	WHERE
Brand#55	STANDARD PLATED NICKEL	19	4	L_PARTKEY = P_PARTKEY
Brand#55	STANDARD PLATED NICKEL	45	4)
Brand#55	STANDARD PLATED STEEL	14	4	AVG_YEARLY
Brand#55	STANDARD PLATED STEEL	23	4	-----
Brand#55	STANDARD PLATED STEEL	49	4	348406.054286
Brand#55	STANDARD PLATED TIN	9	4	
Brand#55	STANDARD PLATED TIN	14	4	(1 row(s) affected)
Brand#55	STANDARD PLATED TIN	36	4	
Brand#55	STANDARD POLISHED BRASS	3	4	-- using default substitutions
Brand#55	STANDARD POLISHED BRASS	9	4	
Brand#55	STANDARD POLISHED BRASS	23	4	/* TPC_H Query 18 - Large Volume Customer */
Brand#55	STANDARD POLISHED COPPER	3	4	
Brand#55	STANDARD POLISHED COPPER	23	4	SELECT TOP 100
Brand#55	STANDARD POLISHED COPPER	45	4	C_NAME,
Brand#55	STANDARD POLISHED NICKEL	3	4	C_CUSTKEY,
Brand#55	STANDARD POLISHED NICKEL	23	4	O_ORDERKEY,
Brand#55	STANDARD POLISHED NICKEL	36	4	O_ORDERDATE,
Brand#55	STANDARD POLISHED NICKEL	45	4	O_TOTALPRICE,
Brand#55	STANDARD POLISHED NICKEL	49	4	SUM(L_QUANTITY)
Brand#55	STANDARD POLISHED STEEL	14	4	FROM CUSTOMER,
Brand#55	STANDARD POLISHED STEEL	23	4	ORDERS,
Brand#55	STANDARD POLISHED TIN	9	4	LINEITEM
Brand#55	STANDARD POLISHED TIN	19	4	WHEREO_ORDERKEY IN (SELECT
Brand#55	STANDARD POLISHED TIN	36	4	L_ORDERKEY
Brand#11	SMALL BRUSHED TIN	19	3	FROM
Brand#15	LARGE PLATED NICKEL	45	3	LINEITEM
Brand#15	LARGE POLISHED NICKEL	9	3	GROUP BY
Brand#21	PROMO BURNISHED STEEL	45	3	L_ORDERKEY HAVING SUM(L_QUANTITY) >
Brand#22	STANDARD PLATED STEEL	23	3	300
Brand#25	LARGE PLATED STEEL	19	3) AND
Brand#32	STANDARD ANODIZED COPPER	23	3	C_CUSTKEY = O_CUSTKEY AND
Brand#33	SMALL ANODIZED BRASS	9	3	O_ORDERKEY = L_ORDERKEY
Brand#35	MEDIUM ANODIZED TIN	19	3	GROUP BY C_NAME,
Brand#51	SMALL PLATED BRASS	23	3	C_CUSTKEY,
Brand#52	MEDIUM BRUSHED BRASS	45	3	O_ORDERKEY,
Brand#53	MEDIUM BRUSHED TIN	45	3	O_ORDERDATE,
Brand#54	ECONOMY POLISHED BRASS	9	3	O_TOTALPRICE
Brand#55	PROMO PLATED BRASS	19	3	ORDER BY O_TOTALPRICE DESC,
Brand#55	STANDARD PLATED TIN	49	3	O_ORDERDATE
				C_NAME C_CUSTKEY O_ORDERKEY
				O_ORDERDATE O_TOTALPRICE

(18314 row(s) affected)

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Customer#000128120	128120	4722021	1994-	Customer#000117076	117076	4290656	1997-
04-07 00:00:00.000	544089.090000	323.000000		02-05 00:00:00.000	449545.850000	301.000000	
Customer#000144617	144617	3043270	1997-	Customer#000129379	129379	4720454	1997-
02-12 00:00:00.000	530604.440000	317.000000		06-07 00:00:00.000	448665.790000	303.000000	
Customer#000013940	13940	2232932	1997-	Customer#000126865	126865	4702759	1994-
04-13 00:00:00.000	522720.610000	304.000000		11-07 00:00:00.000	447606.650000	320.000000	
Customer#000066790	66790	2199712	1996-	Customer#000088876	88876	983201	1993-
09-30 00:00:00.000	515531.820000	327.000000		12-30 00:00:00.000	446717.460000	304.000000	
Customer#000046435	46435	4745607	1997-	Customer#000036619	36619	4806726	1995-
07-03 00:00:00.000	508047.990000	309.000000		01-17 00:00:00.000	446704.090000	328.000000	
Customer#000015272	15272	3883783	1993-	Customer#000141823	141823	2806245	1996-
07-28 00:00:00.000	500241.330000	302.000000		12-29 00:00:00.000	446269.120000	310.000000	
Customer#000146608	146608	3342468	1994-	Customer#000053029	53029	2662214	1993-
06-12 00:00:00.000	499794.580000	303.000000		08-13 00:00:00.000	446144.490000	302.000000	
Customer#000096103	96103	5984582	1992-	Customer#000018188	18188	3037414	1995-
03-16 00:00:00.000	494398.790000	312.000000		01-25 00:00:00.000	443807.220000	308.000000	
Customer#000024341	24341	1474818	1992-	Customer#000066533	66533	29158	1995-
11-15 00:00:00.000	491348.260000	302.000000		10-21 00:00:00.000	443576.500000	305.000000	
Customer#000137446	137446	5489475	1997-	Customer#000037729	37729	4134341	1995-
05-23 00:00:00.000	487763.250000	311.000000		06-29 00:00:00.000	441082.970000	309.000000	
Customer#000107590	107590	4267751	1994-	Customer#000003566	3566	2329187	1998-
11-04 00:00:00.000	485141.380000	301.000000		01-04 00:00:00.000	439803.360000	304.000000	
Customer#000050008	50008	2366755	1996-	Customer#000045538	45538	4527553	1994-
12-09 00:00:00.000	483891.260000	302.000000		05-22 00:00:00.000	436275.310000	305.000000	
Customer#000015619	15619	3767271	1996-	Customer#000081581	81581	4739650	1995-
08-07 00:00:00.000	480083.960000	318.000000		11-04 00:00:00.000	435405.900000	305.000000	
Customer#000077260	77260	1436544	1992-	Customer#000119989	119989	1544643	1997-
09-12 00:00:00.000	479499.430000	307.000000		09-20 00:00:00.000	434568.250000	320.000000	
Customer#000109379	109379	5746311	1996-	Customer#000003680	3680	3861123	1998-
10-10 00:00:00.000	478064.110000	302.000000		07-03 00:00:00.000	433525.970000	301.000000	
Customer#000054602	54602	5832321	1997-	Customer#000113131	113131	967334	1995-
02-09 00:00:00.000	471220.080000	307.000000		12-15 00:00:00.000	432957.750000	301.000000	
Customer#000105995	105995	2096705	1994-	Customer#000141098	141098	565574	1995-
07-03 00:00:00.000	469692.580000	307.000000		09-24 00:00:00.000	430986.690000	301.000000	
Customer#000148885	148885	2942469	1992-	Customer#000093392	93392	5200102	1997-
05-31 00:00:00.000	469630.440000	313.000000		01-22 00:00:00.000	425487.510000	304.000000	
Customer#000114586	114586	551136	1993-	Customer#000015631	15631	1845057	1994-
05-19 00:00:00.000	469605.590000	308.000000		05-12 00:00:00.000	419879.590000	302.000000	
Customer#000105260	105260	5296167	1996-	Customer#000112987	112987	4439686	1996-
09-06 00:00:00.000	469360.570000	303.000000		09-17 00:00:00.000	418161.490000	305.000000	
Customer#000147197	147197	1263015	1997-	Customer#000012599	12599	4259524	1998-
02-02 00:00:00.000	467149.670000	320.000000		02-12 00:00:00.000	415200.610000	304.000000	
Customer#000064483	64483	2745894	1996-	Customer#000105410	105410	4478371	1996-
07-04 00:00:00.000	466991.350000	304.000000		03-05 00:00:00.000	412754.510000	302.000000	
Customer#000136573	136573	2761378	1996-	Customer#000149842	149842	5156581	1994-
05-31 00:00:00.000	461282.730000	301.000000		05-30 00:00:00.000	411329.350000	302.000000	
Customer#000016384	16384	502886	1994-	Customer#000010129	10129	5849444	1994-
04-12 00:00:00.000	458378.920000	312.000000		03-21 00:00:00.000	409129.850000	309.000000	
Customer#000117919	117919	2869152	1996-	Customer#000069904	69904	1742403	1996-
06-20 00:00:00.000	456815.920000	317.000000		10-19 00:00:00.000	408513.000000	305.000000	
Customer#000012251	12251	735366	1993-	Customer#000017746	17746	6882	1997-
11-24 00:00:00.000	455107.260000	309.000000		04-09 00:00:00.000	408446.930000	303.000000	
Customer#000120098	120098	1971680	1995-	Customer#000013072	13072	1481925	1998-
06-14 00:00:00.000	453451.230000	308.000000		03-15 00:00:00.000	399195.470000	301.000000	
Customer#000066098	66098	5007490	1992-	Customer#000082441	82441	857959	1994-
08-07 00:00:00.000	453436.160000	304.000000		02-07 00:00:00.000	382579.740000	305.000000	
				Customer#000088703	88703	2995076	1994-
				01-30 00:00:00.000	363812.120000	302.000000	

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(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
           P_BRAND      = 'Brand#12'
           AND
           P_CONTAINER IN ( 'SM CASE', 'SM
BOX', 'SM PACK', 'SM PKG')
           AND
           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')
           AND
           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')
           AND
           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 S_SUPPKEY IN (
SELECT
PS_SUPPKEY
FROM
PARTSUPP
WHERE
PS_PARTKEY in (
SELECT
P_PARTKEY
FROM PART
WHERE P_NAME like 'forest%'
)
AND
sum(L_QUANTITY)
> (
SELECT
PS_AVAILQTY
0.5 *
FROM LINEITEM
WHERE L_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

```


Appendix D

Supplier#000000091	Supplier#000002419	qydBQd14I515mVXa4fYY
YV45D7TkfdQanOOZ7q9QxkyGUapU1oOWU6q3	Supplier#000002481	nLKHUOn2MI9TOA06Znq9GEMcIIMO2
Supplier#000000197	Supplier#000002571	JZUugz04c iJFLrLGSz9O N,W
YC2Acon6kjY3zj3Fbxs2k4Vdf7X0cd2F	1rVHNIReyq	
Supplier#000000226	Supplier#000002585	CsPoKpw2QuTY4AV1NkWuttneIa4SN
Supplier#000000285	Supplier#000002630	ZIQAvjNUY9KH5ive zm7k
Supplier#000000378	VIPiD17CCo21	
Supplier#000000402	Supplier#000002719	4nnzQI2CbqREQUuIsXTBVUkaP4mNS3
i9Sw4DoyMhzhKXCH9By,AYSgmD	Supplier#000002721	HVdFAN2JHMQSpKm
Supplier#000000530	Supplier#000002730	lIFxR4fzm31C6,muzJw184z
OcmLyfRXlagA8ukENJv,	Supplier#000002775	yDclaDaBD4ihH
Supplier#000000688	Supplier#000002853	rTNAOIItXka
D	Supplier#000002875	6JgMi
fw5ocppmZpYBBIP1718hCihLDZ5KhKX	Supplier#000002934	9Qt6VmwL3Ltt1SRIKww0keLQ,RAZA
Supplier#000000710	Supplier#000002941	m,trBENywsARwg3DhB
f19YPvOyb	Supplier#000002960	Naddba 8YTEKekZyP0
QoYwjKC,oPycpGfieBAcwKJo	Supplier#000002980	KCPCEsRGGo6vx8TygHh60nAYf9rStQT2T
Supplier#000000736	Supplier#000002980	B9k9yVsyaXvWktOSHezqHiAEp9id0SKzkw
l6i2nMwVuovfKnuVgaSGK2rDy65D1AFLegiL7	Supplier#000003062	LSQNqgY1xnOzz9zBCapy7HwOZQ
Supplier#000000761	Supplier#000003087	ANwe8QsZ4rgj1HSqVz991eWQ
zISLeIQUj2XrvTTFnv7WAcYZGvvMTx882d4	Supplier#000003089	s5b VCIZqMSZVa r
Supplier#000000884	Supplier#000003095	HxON3jJhUi3zjt,r mTD
bmhEShejaS	Supplier#000003201	E87yws6I,t0qNs4QW7UzExKiJnJZwue
Supplier#000000887	Supplier#000003213	pxrRP4irQ1VoyfQ,dTf3
urEaTejH5POADP2ARrf	Supplier#000003241	j06SU,LS9O3mwjAMOVIAneIhb
Supplier#000000935	Supplier#000003275	9xO4nyJ2QJcX6vGf
ij98czM	Supplier#000003288	EDdfNt7E5Uc,xLTupoIgL4yY7ujh,
2KzWe7dDToxB8sq0UfCdvrx	Supplier#000003313	El2I7we,049SPrvomUm4hZwJoOhZkvLxLJXgVH
Supplier#000000975	Supplier#000003314	Supplier#000003380
,AC e,tBpNwKb5xMUzeohx1Rn,	Supplier#000003380	jPv0V,pszouuFT3YsAqIP,kxT3u,gTFIEbRt,x
hdZJo73gFQF8y	Supplier#000003403	e3X2o ,KCG9tsHji8A
Supplier#000001263	Supplier#000003421	XXCxiF2hZWBw
rQWr6nf8ZhB2TAiIDivo5Io	Supplier#000003421	Sh3dt9W5oefFWovnFhrg,
Supplier#000001399	Supplier#000003441	zvFJLz,sOUuShHjpcX
LmrocNIMSyYOWuANx7	Supplier#000003590	sy79CMLxqb,Cbo
Supplier#000001446	Supplier#000003607	lNqFHQYjwSAkf
lch9HMNU1R7a0LIybsUodVknk6	Supplier#000003625	qY588W0Yk5iaUy1RXTgNrEKrMAjBYHcKs
Supplier#000001454	Supplier#000003656	Supplier#000003656
TOpimgu2TVXIjhiL93h,	JdfG32XtDgJV,db56	Supplier#000003782
Supplier#000001500	Supplier#000003782	iVsPZg7bk06TqNMwi0LKbLUrC1zmrq
wDmF5xLxtQch9ctVu,	Supplier#000003918	meRvRCsJoAbfqd0Re4
Supplier#000001602	Supplier#000003941	Pmb05mQFBMS618O7WKqZJ
uKNWleafaM644	9vyv	Supplier#000003994
Supplier#000001626	Supplier#000003994	W00LZp3NjK0
UhxNRzUu1dtFmp0		
Supplier#000001682		
pXtKGxrTQVyH1Rr		
Supplier#000001699		
Q9C4rfJ26oijVPqqcqVXeRI		
Supplier#000001700		
7hMICof1Y5zLFg		
Supplier#000001726		
TeRY7TtTH24sEword7yAaSkjx8		
Supplier#000001730		
Re8e,1Pybn r6zo0VJIEiD0UD vhk		
Supplier#000001746		
qWsendlOekQG1aW4uq06uQaCm51se8lirv7 hBRd		
Supplier#000001752		
Fra7outx41THYJaRThdOGiBk		
Supplier#000001856		
jXcRgzYF0ah05iR8p6w5SbJLcUGyYiURPvFwUWM		
Supplier#000001931		
FpJbMU2h6ZR2eBv8I9NIxF		
Supplier#000001939		
Nrk,JA4bfReUs		
Supplier#000001990		
DSDJkCgBJzuPg1yuM,CUdLnsRliOxkkHezTCA		
Supplier#000002020		
jb6r1d7MxP6co		
Supplier#000002022		
dwebGX7Id2pc25YvY33		
Supplier#000002036		
20ytTtVObjKUUI2WCB0A		
Supplier#000002204		
uYmlr46C06udCqanj0KiRsoTQakZsEyssL		
Supplier#000002243		
nSOEV3JeOU79		
Supplier#000002245		
hz2qWXWVjOyKhqPYMoEwz6zFkrTaDM		
Supplier#000002282		
ES21K9dxoW1I1TzWCj7ekdlNwSWnv1Z 6mQ,BKn		
Supplier#000002303		
nCoWfpB6YOymbgOht7lftklpkHl		
Supplier#000002373		
RzHSxOTQmElCjxiBiVA5Zz		
JB58rJhPRyIR		

Appendix D

Supplier#000004005	V723F1wCy2eA4OgIu8TjBtOVUHP	Supplier#000005875	IK,sYiGzB94hSyHy9xvSZFbVQNCZe2LXZuGbs	
Supplier#000004033	ncsAhv9Je,kFXTNjfb2	Supplier#000005974	REhR5jE,iLusQXvf54SwYySgsSSVFhu	
Supplier#000004140	0hL7DJyYjcHL	Supplier#000005989	rjFY,5kgLpBu7c	
Supplier#000004165	wTJ2dZNA8P2oi99N6DT47ndHy,XKD2	Supplier#000006059	4m0cv8MwJ9yX2vIwI Z	
Supplier#000004207	tF64pwiOM4IkWjN3mS,e06WuAjLx	Supplier#000006065	UiI2Cy3W4Tu5sLk	
Supplier#000004236	dl,HPTJmGipxYsSq9wmqkuWjst,mCeJ8O6T	LuvXLRy6KihlGv	Supplier#000006070	TalC5m0pDrO6DZbngfmGmqe
Supplier#000004246	Xha aXQF7u4qU3LsHD	Supplier#000006109	rY5gbfh3dKHnycQUTPGCwnbe	
Supplier#000004278	bBddbBxIVp Di9	Supplier#000006121	S92ycWwEzYYw4GspCBJN1WMuHhoZ	
Supplier#000004343	GK3sbopqrQEkwLMvVBFCG	Supplier#000006215	j2iEbTsl,5PWdqWZ7k1yiISb7qtiiZljDIPEo	
Supplier#000004346	S3076LEOwo	Supplier#000006217	RVN23SYT9jenUeaWGxUd	
Supplier#000004388	VfZ 11J,mwp4aS	Supplier#000006274	S3yTZWqxTKUq g QQgcW9	
Supplier#000004406	Ah0ZaLu6VwufPWUz,7kbXgYZhauEaHqGig	AqhCkNZsW51hHuWU	Supplier#000006435	xIge69XszYbnO4Eon7cHHO8y
Supplier#000004430	yvSsKNSTL5HLXBET4luOsPNLxKzAMk	Supplier#000006463	7 wkdj2EO49iotley2kmlM	
Supplier#000004522	xXtCKwsZDArxIBGDfzX2PgobGZsBg	ADpLSszGV3RNWj	Supplier#000006493	ojV
Supplier#000004527	p	f,sNaB6Hm7r,fknDVTl63raJgAjZK	Supplier#000006521	b9 2zjHzxR
Supplier#000004542	pVXCnxgcklWF6A1o3OHY3qW6	Supplier#000006607	3F 2e2gqD5u5B	
Supplier#000004574	NJSbLJDroYG2y1r3rDiKg	Supplier#000006706	Ak4ga,ePu1QZ6C3qkrjosaX0gxvqS9vkbe	
Supplier#000004574	1HvGwnVueZ5CIndc	Supplier#000006761	n4jhxGMqB5prD1HhpLvvrWStOLlla	
Supplier#000004655	67NqBc4 t3PG3F8aO	Supplier#000006808	HGD2Xo	
Supplier#000004701	6jX4u47URzIMHf	9nEcHJhZvXjXxWKIpApT	Supplier#000006858	fnlINT885vBBhsWwTGiZ0o22thwGY16h GHJj21
Supplier#000004711	bEzjp1QdQu ls2ERMxv0km	Supplier#000006872	XIDPiA7PLXCWK6SeEclD	
Supplier#000004987	UFx1upJ8MvOvgFjA8	Supplier#000006949	mLxYUJhsGcLtKe	
Supplier#000005000	DeX804 w0H8FrCuVahgy	,GFirNu183AvT	Supplier#000006985	PrUUiboQpy,OtgJ01Z4BxJQUyrw9c3I
Supplier#000005100	OfvYpS3Io,wEvvLHNaLuCX	Supplier#000007072	2tRyX9M1a	
Supplier#000005192	JDp4rhXiDw0kf6RH	4Rcm57s779F1ANG9jlpK	Supplier#000007098	G3j8g0Kc4OcbAu2OV0PhrXQWMCUdjQ8wgCHOExu
Supplier#000005195	Woi3b2ZaicPh ZSfu1EfXhE	Supplier#000007135	ls DoKV7V5ulfQy9V	
Supplier#000005283	5fxYXxwXy,TQX,MqDC2hxzyQ	Supplier#000007160	TqDGBULB3cTqIT6FKDvm9BS4e4v,zwYiQPb	
Supplier#000005300	gXG28YqpxU	Supplier#000007169	tEc95D2moN9S84nd55O,dlnW	
Supplier#000005386	Ub6AAfHpWLWP	Supplier#000007322	wr7dgte5q	
Supplier#000005426	9Dz2OVT1q	MAjiY0uwmi3MyDkSMX1	Supplier#000007365	51xhROLvQMj05DndtZWt
Supplier#000005484	sb4BK71ljQ1XjPBYRPvO	Supplier#000007398	V8eE6oZ00OFNU,	
Supplier#000005505	saFdOR	Supplier#000007402	4UVv58ery1rjmqSR5	
Supplier#000005506	qW7AFY,3asPqiiAa11Mo22pCoN0BtPrKo	Supplier#000007448	yhhpWiJi7EJ6Q5VcaQ	
Supplier#000005516	d2sbjG43KwMPX	Supplier#000007477	9m9j0wfhWzCvVHxkU,PpAxwSH0h	
Supplier#000005536	On f5ypzoWgB	Supplier#000007509	q8,V6LJR0hHjHcOuSG7aLTMg	
Supplier#000005605	XsN99Ks9wEvcohU6jRD2MeebQFf76mD8vovuY	Supplier#000007561	rMcFg2530VC	
Supplier#000005631	Nzo9tGkpgbHT,EZ4D,77MYK14ah1C	Supplier#000007789	rQ7cUcPrtudOyO3svNSkimqH6qrfWT2Sz	
Supplier#000005730	7Vj6Eil0mThqkM	Supplier#000007801	69fi,U1r6enUb	
Supplier#000005736	14TVrjlzo2SJEBYCDgpMwTlvwSqC	Supplier#000007818	yhhc2CQec Jrvc8zqBi83	
Supplier#000005737	5rkb0PSews			
Supplier#000005797	HvxkL8JaD41UpnSF2cg8H1			
Supplier#000005836	2dq XTYhtYWSfp			
	dmEWcS32C3kx,d,B95 OmYn48			
	,o,OebwRbSDmV19gN9fpWPCiqB			
	UogvISR			
	tx3SjPD2ZuWGFBRH,			

Appendix D

Supplier#000007885
u3sicchh5ZpyTUpN1cJKNcAoabIWgY
Supplier#000007918 r,v9mBQ6LoEYyj1
Supplier#000007926 ErzCF80K9Uy
Supplier#000007957 ELwnio14ssoU1 dRyZIL OK3Vtzb
Supplier#000007965 F7Un5lJ7p5hhj
Supplier#000007968
DsF9UIZ2Fo6HXN9aErvyg1ikHoD582HSGZpP
Supplier#000007998
LnASFBfYRFOo9d6d,asBvVq9Lo2P
Supplier#000008168 aOa82a8ZbKcNfDLX
Supplier#000008231 IK7eGw Yj90sTdpsP,vcqWxLB
Supplier#000008243 2AyePMkDqzmzVzjGTizXthFLo8h
EiudCMxOmIIG
Supplier#000008275 BlbNDfWg,gpXKQILN
Supplier#000008323 75I18sZmASwm
POeheRMdj9tmpyeQ,BfCXN5BIAB
Supplier#000008366
h778cEj14BuW9OEKlvPTWq4iwASR6EBBXN7zeS8
Supplier#000008423
RQhKnkAhR0DAR3Ix4Q1weMMn00hNe Kq
Supplier#000008480 4sSDA4ACReklNjEm5T6b
Supplier#000008532
Uc29q4,5xVdDOF87UZrxhr4xWS0ihEUXuh
Supplier#000008595 MH0iB73GQ3z UW3O DbCbqmc
Supplier#000008610
SgVgP90vP452sUNTgzL9zKwXHXAzV6tV
Supplier#000008705 aE,trRNdPx,4yinTD9O3DebDIp
Supplier#000008742 HmPIQEzKCPEcTUL14,kKq
Supplier#000008841 I 85Lu1sekbq2xrSIzm0
Supplier#000008895
2cH4okfaLSZTTg8sKRbbJQxkmeFu2Esj
Supplier#000008967 2kwEHYMG
7FwozNImAUE6mH0hYtqYculJM
Supplier#000008972 w2vF6 D5YZO3visPXsqVfLADTK
Supplier#000009032 qK,trB6Sdy4Dz1BRUFNy
Supplier#000009147 rOAuryHxpZ9eOvx
Supplier#000009252 F7cZaPUHwh1
ZKyj3xmAVWC1XdP ue1p5m,i
Supplier#000009278 RqYTzgxj93CLX 0mcYfCENOfD
Supplier#000009327 uoqMdf7e7Gj9dbQ53
Supplier#000009430 igRqmneFt
Supplier#000009567 r4Wfx4c3xsEAjcGj71HHZByornl
D9vrztXlv4
Supplier#000009601 51m637bO,Rw5DnHWFUvLacRx9
Supplier#000009709
rRnCbHYgDgl9PZYnyWKVYSUW0vKg
Supplier#000009753 wLhVEcRmd7PkJF4FBnGK7Z
Supplier#000009796 z,y4Idmr15DOvPUqYG
Supplier#000009799 4wNjXGa4OKW1
Supplier#000009811 E3iuyq7UnZxU7oPZle2Gu6
Supplier#000009812
APFRMy3lCbGfGa53n5t9DxzFPQPgnjrGt32
Supplier#000009862 rJzweWeN58
Supplier#000009868 ROjGgx5gvtkmnUUoeyy7v
Supplier#000009869
ucLqxrpbBTRMewGSM29t0rNTM30g1Tu3Xgg3mKag
Supplier#000009899 7XdpAHzr1t,UQFZE

Supplier#000009974
7wJ,J5DKcxSU4Kp1cQLpbcAvB5AsvKT
(204 row(s) affected)
-- using default substitutions
/* 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

Appendix D

Supplier#00002095 16
 Supplier#00005799 16
 Supplier#00005842 16
 Supplier#00006450 16
 Supplier#00006939 16
 Supplier#00009200 16
 Supplier#00009727 16
 Supplier#00000486 15
 Supplier#00000565 15
 Supplier#00001046 15
 Supplier#00001047 15
 Supplier#00001161 15
 Supplier#00001336 15
 Supplier#00001435 15
 Supplier#00003075 15
 Supplier#00003335 15
 Supplier#00005649 15
 Supplier#00006027 15
 Supplier#00006795 15
 Supplier#00006800 15
 Supplier#00006824 15
 Supplier#00007131 15
 Supplier#00007382 15
 Supplier#00008913 15
 Supplier#00009787 15
 Supplier#00000633 14
 Supplier#00001960 14
 Supplier#00002323 14
 Supplier#00002490 14
 Supplier#00002993 14
 Supplier#00003101 14
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 Supplier#00005435 14
 Supplier#00005583 14
 Supplier#00005774 14
 Supplier#00007579 14
 Supplier#00008180 14
 Supplier#00008695 14
 Supplier#00009224 14
 Supplier#00000357 13
 Supplier#00000436 13
 Supplier#00000610 13
 Supplier#00000788 13
 Supplier#00000889 13
 Supplier#00001062 13
 Supplier#00001498 13
 Supplier#00002056 13
 Supplier#00002312 13
 Supplier#00002344 13
 Supplier#00002596 13
 Supplier#00002615 13
 Supplier#00002978 13
 Supplier#00003048 13
 Supplier#00003234 13
 Supplier#00003727 13
 Supplier#00003806 13
 Supplier#00004472 13
 Supplier#00005236 13
 Supplier#00005906 13

Supplier#00006241 13
 Supplier#00006326 13
 Supplier#00006384 13
 Supplier#00006394 13
 Supplier#00006624 13
 Supplier#00006629 13
 Supplier#00006682 13
 Supplier#00006737 13
 Supplier#00006825 13
 Supplier#00007021 13
 Supplier#00007417 13
 Supplier#00007497 13
 Supplier#00007602 13
 Supplier#00008134 13
 Supplier#00008234 13
 Supplier#00009435 13
 Supplier#00009436 13
 Supplier#00009564 13
 Supplier#00009896 13
 Supplier#00000379 12
 Supplier#00000673 12
 Supplier#00000762 12
 Supplier#00000811 12
 Supplier#00000821 12
 Supplier#00001337 12
 Supplier#00001916 12
 Supplier#00001925 12
 Supplier#00002039 12
 Supplier#00002357 12
 Supplier#00002483 12

(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
            WHERESUBSTRING(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

```

Appendix D

```
SELECT      NOT EXISTS (
*
ORDERS
O_CUSTKEY  = C_CUSTKEY
)
) AS CUSTSALE
GROUP BY   CENTRYCODE
ORDER BY   CENTRYCODE
CENTRYCODE NUMCUST  TOTACCTBAL
```

```
-----
13   888   6737713.990000
17   861   6460573.720000
18   964   7236687.400000
23   892   6701457.950000
29   948   7158866.630000
30   909   6808436.130000
31   922   6806670.180000
```

(7 row(s) affected)

Appendix E: Seed and Input Parameters

Appendix E

Seed

1120131139

Stream0

1 87
 2 10 NICKEL ASIA
 3 HOUSEHOLD 1995-03-15
 4 1995-04-01
 5 EUROPE 1995-01-01
 6 1995-01-01 0.06 25
 7 JORDAN ROMANIA
 8 ROMANIA EUROPE STANDARD
 BRUSHED NICKEL
 9 chartreuse
 10 1994-10-01
 11 IRAQ 0.0000010000
 12 MAIL TRUCK 1993-01-01
 13 unusual packages
 14 1993-11-01
 15 1997-05-01
 16 Brand#11 LARGE PLATED 48
 5 14 1 31 43 4
 30
 17 Brand#13 JUMBO BOX
 18 314
 19 Brand#41 Brand#35 Brand#45
 9 19 20
 20 blanchéd 1995-01-01 SAUDI ARABIA
 21 JORDAN
 22 30 15 31 10 23 34
 20

Stream1

21 ETHIOPIA
 3 AUTOMOBILE 1995-03-31
 18 315
 5 MIDDLE EAST 1995-01-01
 11 UNITED STATES 0.0000010000
 7 ETHIOPIA IRAQ
 6 1995-01-01 0.03 24
 20 linen 1994-01-01 INDONESIA
 17 Brand#15 JUMBO PACK
 12 TRUCK MAIL 1994-01-01
 16 Brand#41 PROMO BRUSHED 36
 26 11 20 45 35 17
 47
 15 1995-02-01
 13 unusual packages
 10 1993-08-01
 2 48 COPPER MIDDLE EAST

8 IRAQ MIDDLE EAST STANDARD PLATED
 BRASS
 14 1994-02-01
 19 Brand#43 Brand#22 Brand#34
 4 20 27
 9 blanchéd
 22 19 23 10 18 33 29
 21
 1 95
 4 1997-11-01

Stream2

6 1996-01-01 0.09 24
 17 Brand#12 JUMBO DRUM
 14 1994-05-01
 16 Brand#21 MEDIUM ANODIZED 26
 33 46 49 21 32 44
 39
 19 Brand#45 Brand#55 Brand#33
 9 10 23
 10 1994-05-01
 9 antique
 2 35 STEEL ASIA
 15 1997-09-01
 8 CANADA AMERICA STANDARD
 ANODIZED BRASS
 5 AMERICA 1996-01-01
 22 33 21 17 31 28 18
 30
 12 AIR MAIL 1994-01-01
 7 RUSSIAN CANADA
 13 unusual requests
 18 313
 1 103
 4 1995-08-01
 20 tan 1997-01-01 UNITED STATES
 3 FURNITURE 1995-03-17
 11 JAPAN 0.0000010000
 21 RUSSIA

Stream3

8 SAUDI ARABIA MIDDLE EAST PROMO
 POLISHED BRASS
 5 ASIA 1996-01-01
 4 1993-05-01
 6 1996-01-01 0.06 25
 17 Brand#14 WRAP BOX
 7 KENYA SAUDI ARABIA
 1 111
 18 314
 22 15 18 30 12 32 24
 26
 14 1994-08-01

Appendix E

9	turquoise				19	Brand#51	Brand#54	Brand#21
10	1993-02-01				5	13	23	
15	1995-05-01				18	314		
11	ALGERIA	0.0000010000			14	1995-03-01		
20	ghost	1995-01-01	KENYA		22	13	16	12 24 14 33
2	23	BRASS AFRICA				31		
21	KENYA				11	ARGENTINA	0.0000010000	
19	Brand#52	Brand#33	Brand#22		13	unusual requests		
	4	11	20		3	MACHINERY	1995-03-04	
13	unusual requests				1	66		
16	Brand#11	ECONOMY PLATED	9		2	49	TIN AFRICA	
	17	7	18 20 2 6		5	MIDDLE EAST	1996-01-01	
	35				8	EGYPT MIDDLE EAST	ECONOMY BRUSHED	
12	REG AIR	MAIL	1994-01-01			BRASS		
3	AUTOMOBILE	1995-03-02			20	chocolate	1997-01-01	CHINA
					12	FOB RAIL	1995-01-01	
					17	Brand#13	WRAP DRUM	
					10	1994-08-01		
					9	sandy		

Stream4

5	EUROPE	1996-01-01			
21	FRANCE				
14	1994-12-01				
19	Brand#54	Brand#21	Brand#22		
	10	12	27		
15	1993-02-01				
17	Brand#11	WRAP PACK			
12	SHIP MAIL	1994-01-01			
6	1996-01-01	0.03	25		
4	1995-12-01				
9	snow				
8	JAPAN ASIA	PROMO BURNISHED BRASS			
16	Brand#41	STANDARD POLISHED 8			
	5	14	48 17 40 1		
	29				
11	JORDAN	0.0000010000			
2	11	NICKEL	ASIA		
10	1993-11-01				
18	312				
1	119				
13	unusual requests				
7	FRANCE	JAPAN			
22	17	16	15 33 12 25		
	18				
3	FURNITURE	1995-03-19			
20	red	1994-01-01	EGYPT		

Stream5

21	UNITED STATES				
15	1995-09-01				
4	1993-09-01				
6	1996-01-01	0.09	24		
7	UNITED KINGDOM	EGYPT			
16	Brand#21	LARGE ANODIZED	49		
	18	30	31 6 13 16		
	5				

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 Function

```

```

        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

June 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.