



TPC Benchmark™ H
Full Disclosure Report
Lenovo SureServer R630 G7
Using
Microsoft SQL Server 2005 Enterprise x64 Edition SP2
and Windows Server 2003 Enterprise x64 Edition SP2

First Edition

Submitted for Review

February 2008

Lenovo SureServer R630 G7 Server with Microsoft Windows Server 2003 Enterprise x64 Edition SP2 and SQL Server 2005 Enterprise x64 Edition

First Edition – February, 2008

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SureServer R630 G7

TPC-H Rev. 2.6.1

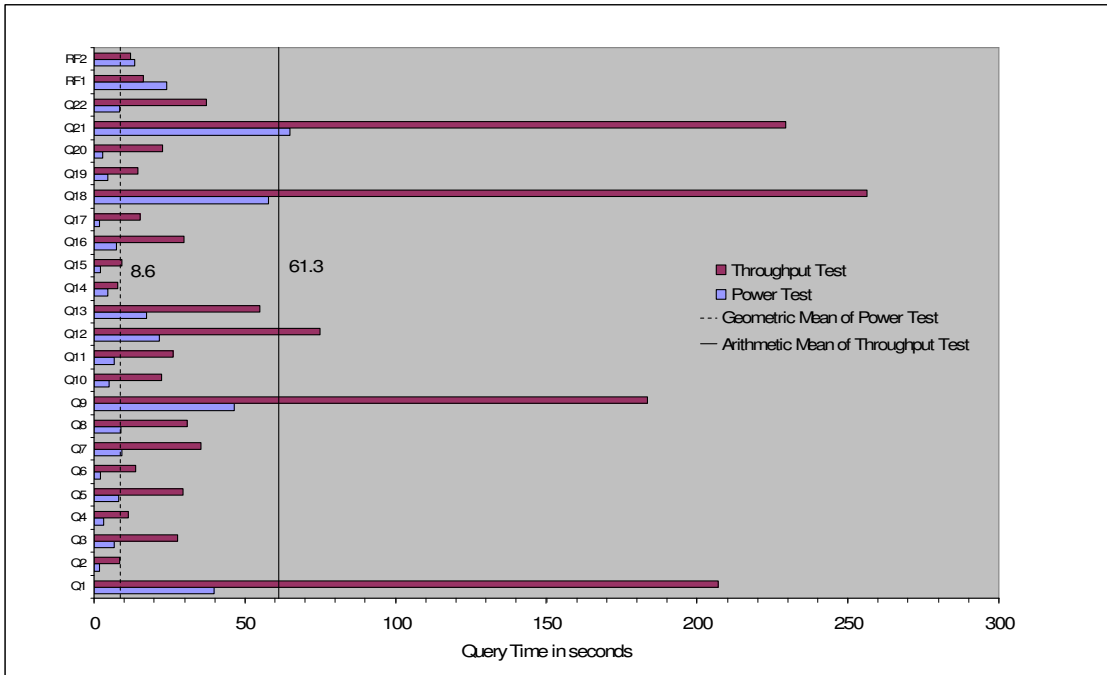
Report Date:
Feb 7, 2008

Total System Cost
1,661,226.00
CNY

Composite Query per Hour Metric
33,184.3
QphH@100GB

Price/Performance
50.07
CNY / QphH@100GB

Database Size	Database Manager	Operating System	Other Software	Availability Date
100GB	Microsoft SQL Server 2005 Enterprise Edition SP2	Windows Server 2003,Enterprise Edition SP2	Visual Studio Standard 2005	Jan 31, 2008



Database Load Time = 0:45:20	Load Included Backup: Y	Total Data Storage / Database Size = 128.48
RAID(Base tables only): N	RAID(Base tables and auxiliary data structures): N	RAID(All): Y

System Configuration:

Processors: 4 x Intel X7350 Quad Core 2.93GHz w/ 8MB Cache
 Cores: 16
 Threads: 16
 Memory: 128GB
 OS Disk Drives: 4 x 73GB Seagate SAS 2.5" 10K rpm drives (internal)
 Network: 2 x on-board GigE
 Disk Controllers: 1 x Intel(R) RAID SAS Riser controller AFCSASRISER (internal)
 7 x MegaRAID SAS 8888ELP RAID Controller (external)
 Disks: 8 x 73GB Seagate SAS 2.5" 10K rpm drives (internal)
 168 x 73GB Seagate SAS 3.5" 15K rpm drives (external)
 Total Disk Storages: 12,848 GB

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



Lenovo SureServer R630 G7

TPC-H Rev 2.6.1

**Report Date:
Feb 7, 2008**

Description	Part Number	Third Party	Unit Price CNY	Qty	Extended Price CNY	3 yr. Maint. Price CNY
Server Hardware						
		Brand	Pricing			
Lenovo SureServer R630 G7, 4P Xeon Quad-Core 2.93GHZ, Intel(R) RAID SAS Riser controller AFCSASRISER (internal), 128G Memory	888-610097	Lenovo	1	384,000.00	1	384,000.00
monitor(17" CRT monitor)	880-00669	Lenovo	1	828.00	1	828.00
APC Smart UPS 1500 rackmount	36-98321	APC	1	2,450.00	1	2,450.00
APC Smart UPS 1500 rackmount (spare)	36-98321	APC	1	2,450.00	2	4,900.00
				Subtotal	392178.00	8000.00
Storage Subsystem						
LSI MegaRAID SAS 8888ELP RAID Controller	11-56398	LSI	1	9,500.00	7	66,500.00
Newisys SA2120 SAS JBOD	AS5064	Newisys	1	20,110.00	14	281,540.00
73GB, 15krpm, 4-Pack, RoHS w/Black Carrier	LFAS5985	Newisys	1	11,592.00	42	486,864.00
5 Meter SAS x4 (SFF-8470) to SAS x4 (SFF-8470) cable	11-0078731	Adaptec	1	700.00	14	9,800.00
73GB Seagate SAS 2.5" 10K rpm drives(internal)	16-003005	Seagate	1	1,200.00	8	9,600.00
10% spare LSI MegaRAID SAS 8888ELP RAID Controller	11-56398	LSI	1	9,500.00	2	19,000.00
10% spare Newisys SA2120 SAS JBOD	AS5064	Newisys	1	11,592.00	2	23,184.00
10% 73GB, 15krpm, 4-Pack, RoHS w/Black Carrier	LFAS5985	Newisys	1	11,592.00	5	57,960.00
10% spare 5 Meter SAS x4 (SFF-8470) to SAS x4 (SFF-8470) cable	11-0078731	Adaptec	1	700.00	2	1,400.00
10% 73GB Seagate SAS 2.5" 10K rpm drives (internal)	16-003005	Seagate	1	1,200.00	2	2,400.00
				Subtotal	958248.00	0.00
Server Software						
Microsoft SQL Server 2005 Enterprise x64 Edition SP2 (per processor)	810-04779	Microsoft	1	63,000.00	4	252,000.00
Microsoft SQL Server 2005 Client License	359-01911	Microsoft	1	1,200.00	25	30,000.00
Windows Server 2003 R2 Enterprise x64 Edition	P72-01684	Microsoft	1	17,000.00	1	17,000.00
Visual Studio Standard 2005	127-00012	Microsoft	1	2,000.00	1	2,000.00
Microsoft Problem Resolution Services		Microsoft	1	1,800.00	1	1,800.00
				Subtotal	301000.00	1800.00
				Total	1651426.00	9800.00

Audited by Lorna Livingtree of Performance Metrics Inc.
Pricing Key: 1.Lenovo. To order this configuration, please call
Lenovo at (86)10-58868888.

Three-Year Cost of Ownership	CNY
	1,661,226.00
QphH@100GB:	33,184.3
CNY/	CNY 50.07
QphH@100GB:	

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. Thank you.



SureServer R630 G7

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Report Date:
Feb 7, 2008

Numerical Quantities

Measurement Results:

Database Scale Factor	= 100
Total Data Storage / Database Size	= 128.48
Start of Database Load	= 2008-01-10 00:34:08
End of Database Load	= 2008-01-10 01:19:28
Database Load Time	= 0:45:20
Query Streams for Throughput Test	= 5
TPC-H Power	= 41,970.6
TPC-H Throughput	= 26,237.3
TPC-H Composite Query-per-Hour Metric(QphH@100GB)	= 33,184.3
Total System Price over 3 Years	= 1,661,226.00 CNY
TPC-H Price/Performance Metric (CNY/QphH@100GB)	= 50.07

Measurement Intervals:

Measurement Interval in Throughput Test(Ts)	= 1,509.3 seconds
---	-------------------

Duration of Stream Execution:

Stream ID	Seed	Start Date	Start Time	Stop Date	Stop Time	Duration
Stream00	110011927	1/10/2008	3:10:59	1/10/2008	3:16:31	0:05:32
Stream01	110011928	1/10/2008	3:16:46	1/10/2008	3:39:26	0:22:40
Stream02	110011929	1/10/2008	3:16:47	1/10/2008	3:39:15	0:22:29
Stream03	110011930	1/10/2008	3:16:47	1/10/2008	3:38:48	0:22:01
Stream04	110011931	1/10/2008	3:16:47	1/10/2008	3:39:19	0:22:32
Stream05	110011932	1/10/2008	3:16:47	1/10/2008	3:39:28	0:22:41
Refresh00		1/10/2008	3:10:35	1/10/2008	3:10:59	0:00:24
		1/10/2008	3:16:31	1/10/2008	3:16:45	0:00:14
Refresh01		1/10/2008	3:39:28	1/10/2008	3:40:02	0:00:34
Refresh02		1/10/2008	3:40:04	1/10/2008	3:40:33	0:00:29
Refresh03		1/10/2008	3:40:34	1/10/2008	3:40:59	0:00:25
Refresh04		1/10/2008	3:41:01	1/10/2008	3:41:28	0:00:27
Refresh05		1/10/2008	3:41:29	1/10/2008	3:41:56	0:00:27



SureServer R630 G7

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Report Date:
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TPC-H Timing Intervals(in seconds):

Query	Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08
Stream 00	39.9	1.7	6.6	3.3	8.3	2.0	9.4	9.0
Stream 01	199.0	6.7	25.5	7.2	35.0	9.9	34.0	26.8
Stream 02	204.4	11.0	29.0	12.3	29.9	12.8	37.1	31.4
Stream 03	212.5	8.1	29.0	13.6	33.1	12.6	41.9	28.8
Stream 04	203.3	7.2	26.1	11.6	19.6	23.6	32.7	33.5
Stream 05	216.5	8.8	29.3	11.5	29.1	10.7	32.5	34.7
Min Qi	199.0	6.7	25.5	7.2	19.6	9.9	32.5	26.8
Max Qi	216.5	11.0	29.3	13.6	35.0	23.6	41.9	34.7
Avg Qi	207.1	8.4	27.8	11.2	29.3	13.9	35.6	31.0
Query	Q09	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Stream 00	46.5	5.0	6.7	21.8	17.5	4.7	2.1	7.6
Stream 01	167.4	18.0	37.4	83.3	54.6	7.9	9.9	32.3
Stream 02	193.7	22.6	19.0	69.6	61.1	8.8	9.4	35.5
Stream 03	181.0	21.2	22.4	76.5	52.8	6.1	9.0	32.4
Stream 04	205.3	21.5	23.2	78.8	54.3	8.3	10.6	24.3
Stream 05	169.9	28.1	28.6	66.7	52.9	7.4	7.3	24.8
Min Qi	167.4	18.0	19.0	66.7	52.8	6.1	7.3	24.3
Max Qi	205.3	28.1	37.4	83.3	61.1	8.8	10.6	35.5
Avg Qi	183.5	22.3	26.1	75.0	55.1	7.7	9.2	29.9
Query	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	1.9	57.9	4.7	3.0	64.9	8.4	24.0	13.4
Stream 01	13.0	260.0	18.9	21.5	257.1	34.2	20.3	13.4
Stream 02	15.2	250.2	14.0	24.5	214.1	43.2	18.0	10.9
Stream 03	12.9	264.6	13.9	20.7	191.1	36.7	14.0	11.2
Stream 04	17.3	240.7	13.3	22.1	241.1	33.9	14.8	12.2
Stream 05	18.7	265.7	12.8	24.5	243.1	37.9	14.8	12.0
Min Qi	12.9	240.7	12.8	20.7	191.1	33.9	14.0	10.9
Max Qi	18.7	265.7	18.9	24.5	257.1	43.2	20.3	13.4
Avg Qi	15.4	256.2	14.6	22.7	229.3	37.2	16.4	11.9

Abstract

Overview

This report documents the methodology and results of the TPC Benchmark™ H test conducted on the Lenovo SureServer R630 G7 using Microsoft SQL Server 2005 Enterprise x64 Edition SP2, in conformance with the requirements of the TPC Benchmark™ H Standard Specification, Revision 2.6.1. The operating system used for the benchmark was Microsoft Windows 2003 Enterprise x64 Edition SP2.

The benchmark results are summarized in the following table.

Hardware	Software	Total System Cost (CNY)	QppH @ 100GB	QptH @ 100GB	QphH @ 100GB	CNY/ pHH @ 100GB
Lenovo SureServer R630 G7	Microsoft SQL Server 2005 Enterprise x64 Edition SP2, Windows Server 2003, Enterprise x64 Edition R2	1,661,226.00	41,970.6	26,237.3	33,184.3	50.07

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

Standard and Executive Summary Statements

Pages ii-iv contains the Executive Summary and Numerical Quantities Summary of the benchmark results for the Lenovo SureServer R630 G7.

Auditor

The benchmark configuration, environment and methodology used to produce and validate the test results, and the pricing model used to calculate the cost per QppH and QthH were audited by Lorna Living tree of Performance Metrics, Inc. to verify compliance with the relevant TPC specifications. The auditor's letter of attestation is attached in Section 9.1 "Auditors' Report."

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1.0 General Items

1.1 Test Sponsor

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

This benchmark was sponsored by Lenovo Group Limited. The benchmark was developed and engineered by Lenovo Group Limited. Testing took place at Lenovo benchmarking laboratories in Beijing, China.

1.2 Parameter Settings

Settings must be provided for all customer-tunable parameters and options which have been changed from the defaults found in actual products, including by 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 parameters*
- *Configuration parameters and options for any other software component incorporated into the pricing structure*
- *Compiler optimization options*

Providing a full list of all parameters and options can satisfy this requirement, as long as all those which 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, “Tunable Parameters”.

1.3 Configuration Items

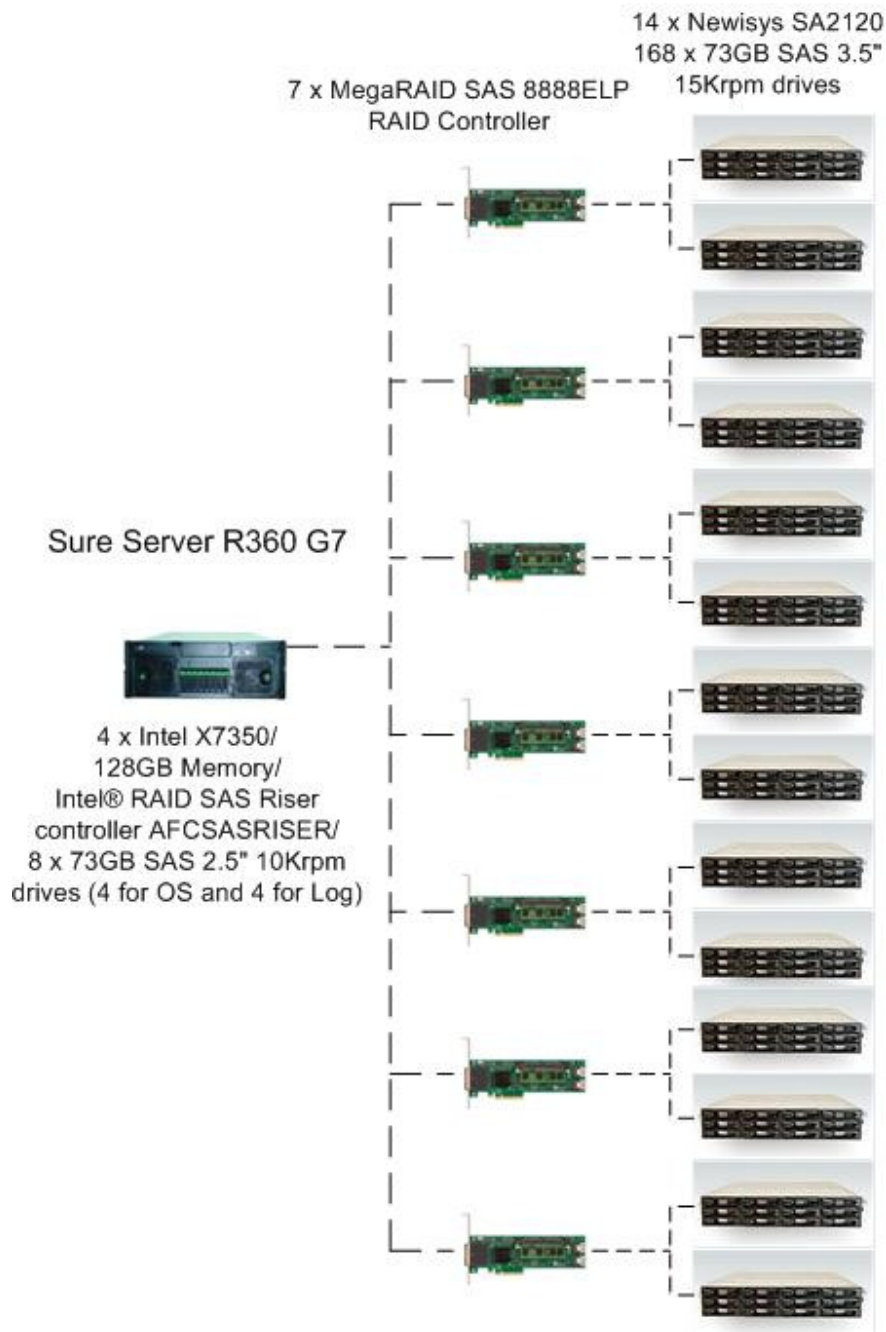
Diagrams of both measured and priced configurations must be provided, accompanied by a description of the differences. This includes, but is not limited to:

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

The server System Under Test (SUT), a Lenovo SureServer R630 G7, depicted in Figure 1.1, consisted of :

- 4x Intel X7350 2.93GHz quad core
- 128 GB of memory
- 7 x MegaRAID SAS 8888ELP RAID Controller
- 1 x Intel(R) RAID SAS Riser controller AFCSASRISER(local)
- 14 x Newisys SA2120 SAS JBOD Enclosure
- 168 x 73GB Segate SAS 3.5” 15k rpm drives external
- 8 x 73GB Segate SAS 2.5” 10K rpm drives internal

Figure 1.1 Benchmarked & Priced configuration



2.0 Clause 1: Logical Database Design

2.1 Table Definitions

Listings must be provided for all table definition statements and all other statements used to set up the test and qualification databases. (8.1.2.1)

Appendix B, “Database Build Scripts,” contains the table definitions and the program used to load the database.

2.2 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.

Refer to the table create statements in Appendix B for further details.

2.3 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

2.4 Replication

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

Replication was not used.

3.0 Clause 2: Queries and Refresh Functions

3.1 Query Language

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

SQL was the query language used.

3.2 Random Number Generation

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

The TPC-supplied DBGEN version 2.6.0 build 1 and QGEN version 2.6.0 build 1 were used to generate all database populations.

3.3 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.

The supplied QGEN version 2.6.0 build 1 was used to generate the substitution parameters.

3.4 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 C contains the query text and query output. The following modifications were used:

- In Q1, Q4, Q5, Q6, Q10, Q12, Q14, Q15 and Q20, the “dateadd” function is used to perform date arithmetic.
- In Q7, Q8 and Q9, the “datepart” function is used to extract part of a date (e.g., “YY”).
- In Q2, Q3, Q10, Q18 and Q21, the “top” function is used to restrict the number of output rows.
- The word GO is used as a command delimiter.

3.5 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 D contains the seed and query substitution parameters used.

3.6 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 1.

3.7 Refresh Functions

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

Appendix E contains the source code for the refresh functions.

4.0 Clause 3: Database System Properties

4.1 Atomicity Requirements

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.

All ACID tests were conducted according to specification. The Atomicity, Isolation, Consistency and Durability tests were performed on the Lenovo SureServer R630 G7.

4.1.1 Atomicity of the Completed Transactions

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

The following steps were performed to verify the Atomicity of completed transactions.

1. The total price from the ORDERS 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 committed.
4. The total price from the ORDERS 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.

4.1.2 Atomicity of Aborted Transactions

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

The following steps were performed to verify the Atomicity of the aborted ACID transaction:

1. The total price from the ORDERS 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 ORDERS table and the extended price from the LINEITEM table were retrieved for the same order key used in steps 1 and 2. It was verified that the appropriate rows had not been changed.

4.2 Consistency Requirements

Consistency is the property of the application that requires any execution of transactions to take the database from one consistent state to another.

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

*$O_TOTALPRICE = SUM(L_EXTENDEDPRICE - L_DISCOUNT) * (1 + L_TAX)$
For each ORDERS and LINEITEM defined by $(O_ORDERKEY = L_ORDERKEY)$*

4.2.1 Consistency Tests

Verify that ORDERS and LINEITEM tables are initially consistent as defined in Clause 3.3.2.1, based upon a random sample of at least 10 distinct values of O_ORDERKEY.

The following steps were performed to verify consistency:

1. The consistency of the ORDERS and LINEITEM tables was verified based on a sample of O_ORDERKEYs.
2. One hundred ACID Transactions were submitted from each of six execution streams.
3. The consistency of the ORDERS and LINEITEM tables was reverified.

4.3 Isolation Requirements

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.

4.3.1 Isolation Test 1 - 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.

The following steps were performed to satisfy the test of isolation for a read-only and a read-write committed transaction:

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 blocked and did not see any uncommitted changes made by the ACID Transaction.
3. The ACID Transaction was resumed and committed.
4. The ACID query completed. It returned the data as committed by the ACID Transaction.

4.3.2 Isolation Test 2 - 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.

The following steps were performed to satisfy the test of isolation for read-only and a rolled back read-write transaction:

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 did not see any uncommitted changes made by the ACID Transaction.
3. The ACID Transaction was ROLLED BACK.
4. The ACID query completed.

4.3.3 Isolation Test 3 - Write-Write Conflict with Commit

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

The following steps were performed to verify isolation of two update transactions:

1. An ACID Transaction T1 was started 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 the same O_KEY and L_KEY and a randomly selected DELTA.
3. T2 waited.
4. The ACID transaction T1 was allowed to Commit and T2 completed.
5. It was verified that:

$$T2.L_EXTENDEDPRICE = T1.L_EXTENDEDPRICE + (DELTA1 * (T1.L_EXTENDEDPRICE / T1.L_QUANTITY))$$

4.3.4 Isolation Test 4 - Write-Write Conflict with Rollback

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

The following steps were performed to verify the isolation of two update transactions after the first one is rolled back:

1. An ACID Transaction T1 was started for a randomly selected O_KEY, L_KEY and DELTA. The ACID Transaction T1 was suspended prior to Rollback.
2. Another ACID Transaction T2 was started using the same O_KEY and L_KEY used in step 1 and a randomly selected DELTA.
3. T2 waited.
4. T1 was allowed to ROLLBACK and T2 completed.
5. It was verified that $T2.L_EXTENDEDPRICE = T1.L_EXTENDEDPRICE$.

4.3.5 Isolation Test 5 – 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 ORDERS, LINEITEM and HISTORY tables were changed.

4.3.6 Isolation Test 6 – 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 ORDERS, LINEITEM and HISTORY tables were changed.

4.4 Durability Requirements

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.

4.4.1 Permanent Unrecoverable Failure of Any Durable Medium and

Loss of System Power

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 log was stored on a RAID10 protected array of 4 physical drives. The tables for the database were stored on 14 RAID0 arrays each containing 12 physical drives. A backup of the database was taken. The backup was spread across 4 RAID0 arrays. All backup files and flatfiles are duplicated across different arrays to kept 2 copies.

The tests were conducted on the qualification database. The steps performed are shown below:

1. The complete database was backed up.
2. Six streams of ACID transactions were started. Each stream executed a minimum of 100 transactions.
3. While the test was running, one of the disks from the database RAID10 log was removed.
4. After it was determined that the test would still run with the loss of a log disk, one physical drive of a RAID0 data volume was removed.
5. A checkpoint was issued to force a failure.
6. The six streams of ACID transactions failed and recorded their number of committed transaction in success files.
7. The database log was dumped to disk.
8. The database and log disks were replaced with new disks and RAID rebuild process started
9. When log RAID rebuild process finished a database restore was done.
10. A command was issued causing the database to run through its roll-forward recovery.
11. The counts in the success files and the HISTORY table count were compared and were found to match.

4.4.2 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. Each stream executed a minimum of 100 transactions.
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 were found to match.

4.4.3 Memory Failure

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

See section 4.4.2

5.0 Clause 4: Scaling and Database Population

5.1 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.

Table 5.1 lists the TPC Benchmark H defined tables and the row count for each table as they existed upon completion of the build.

Table 5. 1: Initial Number of Rows

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

5.2 Distribution of Tables and Logs across Media

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

Microsoft SQL Server was configured on a Lenovo SureServer R630 G7 with the following configuration:

- 7 x MegaRAID SAS 8888ELP RAID Controller
- 1 x Intel(R) RAID SAS Riser controller AFCSASRISER (internal)
- 14 x Newisys SA2120 SAS JBOD Enclosure
- 168 x 73GB Segate SAS 3.5" 15k rpm external drives
- 8 x 73GB Segate SAS 2.5" 10K rpm interna drivesl

All 176 disks were used to hold OS, table data, indexes, database log and the temporary database (TempDB).

A detailed description of distribution of database filegroups and log can be found in Table 5.2.1

Table 5.2.1: MegaRAID SAS Controller Disk Array to Logical Drive Mapping

Intel RAID SAS Controller(slot1) /MegaRAID SAS 8888ELP Controller(slot2-8)	Logical Drive Array	Number of Physical Drives in LDA	Fault Tolerance	Primary Partition Number	Disk Format	Size (MB)	Contents
Slot 1	A	4	RAID10	1	NTFS	146000	OS
	B	4	RAID10	1	RAW	30000	TpchLog
				2	RAW	20000	TempDBLog
Slot 2	A	12	RAID0	1	RAW	44931	LoadFG
				2	RAW	50077	DataFG
				3	RAW	30004	TempDB
				4	NTFS	698953	Backup & Flatfiles
	B	12	RAID0	1	RAW	44931	LoadFG
				2	RAW	50077	DataFG
				3	RAW	30004	TempDB
				4	NTFS	698953	Backup & Flatfiles
Slot 3	A	12	RAID0	1	RAW	44931	LoadFG
				2	RAW	50077	DataFG
				3	RAW	30004	TempDB
				4	NTFS	698953	Backup & Flatfiles
	B	12	RAID0	1	RAW	44931	LoadFG
				2	RAW	50077	DataFG
				3	RAW	30004	TempDB
				4	NTFS	698953	Backup & Flatfiles
Slot 4	A	12	RAID0	1	RAW	44931	LoadFG
				2	RAW	50077	DataFG
				3	RAW	30004	TempDB
				4	NTFS	698953	Backup & Flatfiles
	B	12	RAID0	1	RAW	44931	LoadFG
				2	RAW	50077	DataFG
				3	RAW	30004	TempDB
				4	NTFS	698953	Backup & Flatfiles
Slot 5	A	12	RAID0	1	RAW	44931	LoadFG
				2	RAW	50077	DataFG
				3	RAW	30004	TempDB
				4	RAW	698953	Backup & Flatfiles
	B	12	RAID0	1	RAW	44931	LoadFG
				2	RAW	50077	DataFG
				3	RAW	30004	TempDB
				4	RAW	698953	Backup & Flatfiles
Slot 6	A	12	RAID0	1	RAW	44931	LoadFG
				2	RAW	50077	DataFG
				3	RAW	30004	TempDB
				4	RAW	698953	Backup & Flatfiles
	B	12	RAID0	1	RAW	44931	LoadFG
				2	RAW	50077	DataFG
				3	RAW	30004	TempDB
				4	RAW	698953	Backup & Flatfiles
Slot 7	A	12	RAID0	1	RAW	44931	LoadFG
				2	RAW	50077	DataFG

				3	RAW	30004	TempDB
				4	RAW	698953	Backup & Flatfiles
	B	12	RAID0	1	RAW	44931	LoadFG
				2	RAW	50077	DataFG
				3	RAW	30004	TempDB
				4	RAW	698953	Backup & Flatfiles
Slot 8	A	12	RAID0	1	RAW	44931	LoadFG
				2	RAW	50077	DataFG
				3	RAW	30004	TempDB
				4	RAW	2000	DataFG_tpchl g
	B	12	RAID0	1	RAW	44931	LoadFG
				2	RAW	50077	DataFG
				3	RAW	30004	TempDB
				4	RAW	2000	DataFG_tpchl g

5.3 Mapping of Database Partitions/Replications

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

Database partitioning/replication was not used..

5.4 Implementation of RAID

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 0 was used for database filegroups, tempdb, and NTFS partitons for flatfiles/Backup files. RAID 10 was used for database recovery logs and the operating system.

5.5 DBGEN 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.

A modified DBGEN version 2.6.0 build 1 was used for database population. The modified version differs only in column order for output flatfiles. The only modified file, Print.C, is included in Appendix F.

5.6 Database Load time

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

The database load time was 42 minutes 20 seconds.

5.7 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 1/100th, rounded up.

Disk Type	Number of Disks	Total Disk Space	Data Storage Ratio
73 GB	176	12,848 GB	128.48

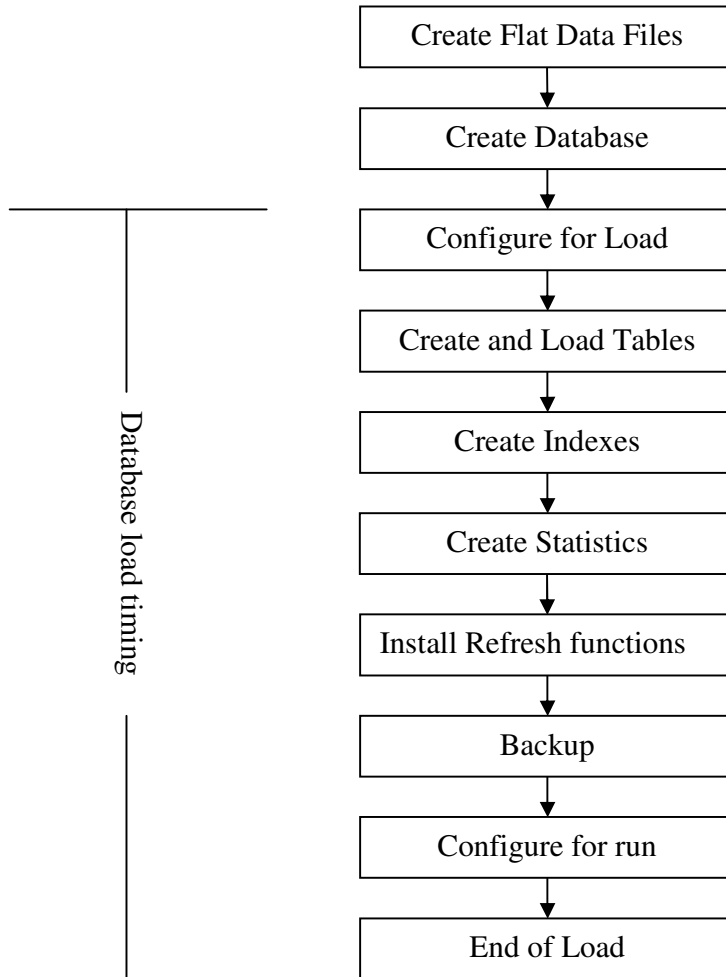
5.8 Database Load Mechanism Details and Illustration

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.

Flat files for each of the tables were created using DBGEN.

The tables were loaded as depicted in Figure 5.8.

Figure 5.8: Block Diagram of Database Load Process



6.0 Clause 5: Performance Metrics and Execution

Rules Related Items

6.1 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. The system was rebooted
2. RF1 Refresh Transaction
3. Stream 00 Execution
4. RF2 Refresh Transaction.

6.2 Timing Intervals for Each Query and Refresh Function

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

The timing intervals for each query and both refresh functions are given in the Numerical Quantities Summary earlier in the executive summary.

6.3 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.

6.4 Start and End Date/Times for Each Query Stream

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

The Numerical Quantities Summary contains the start and stop times for the query execution streams run on the system reported.

6.5 Total Elapsed Time for the Measurement Interval

The total elapsed time of the measurement interval (see Clause 5.3.5) must be reported for the throughput test.

The Numerical Quantities Summary contains the timing intervals for the throughput test run on the system reported.

6.6 Refresh Function Start Date/Time and Finish Date/Time

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

Stream ID	RF	Start Date	Start time	Stop Date	Stop Time
Stream00	RF1	1/10/2008	3:10:35	1/10/2008	3:10:59
Stream00	RF2	1/10/2008	3:16:31	1/10/2008	3:16:45
Stream01	RF1	1/10/2008	3:39:28	1/10/2008	3:39:49
Stream01	RF2	1/10/2008	3:39:49	1/10/2008	3:40:02
Stream02	RF1	1/10/2008	3:40:04	1/10/2008	3:40:22
Stream02	RF2	1/10/2008	3:40:22	1/10/2008	3:40:33
Stream03	RF1	1/10/2008	3:40:34	1/10/2008	3:40:48
Stream03	RF2	1/10/2008	3:40:48	1/10/2008	3:40:59
Stream04	RF1	1/10/2008	3:41:01	1/10/2008	3:41:15
Stream04	RF2	1/10/2008	3:41:15	1/10/2008	3:41:28
Stream05	RF1	1/10/2008	3:41:29	1/10/2008	3:41:44
Stream05	RF2	1/10/2008	3:41:44	1/10/2008	3:41:56

6.7 Timing Intervals for Each Query and Each Refresh Function for Each Stream

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 given in the Numerical Quantities Summary earlier in the executive summary.

6.8 Performance Metrics

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

The Numerical Quantities Summary contains the performance metrics, related numerical quantities, and the price/performance metric for the system reported.

6.9 The Performance Metric and Numerical Quantities from Both Runs

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 difference for the metric points:

Run	QppH @ 100GB	QthH @ 100GB	QphH @ 100GB
Run1	41902.9	26586.1	33377.2
Run2	41970.6	26237.3	33184.3

6.10 System Activity Between Tests

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

SUT was rebooted and SQL Server was restarted between runs.

7.0 Clause 6: SUT and Driver Implementation

Related Items

7.1 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 set of scripts are used to perform all Power and Throughput stream executions. QGEN is used to produce query text. Two scripts were used. These scripts are in Appendix F.

7.2 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.

The following steps are performed, to accomplish the Power and Throughput Runs:

1. Power Run

- Execute 32 concurrent RF1 processes, each of which will apply a segment of an update set generated by dbgen.
- Each process submits multiple transactions, where a transaction spans a set of orders and their associated line items.
- Execute the Stream0 queries, in the prescribed order.
- Execute 32 concurrent RF2 processes, each of which will apply a segment of an update set generated by dbgen. Each thread submits multiple transactions, where a transaction spans a set of orders and their associated line items.

2. Throughput Run

- Execute five concurrent query streams. Each stream executes queries in the prescribed order for the appropriate Stream Id (1-5). Upon completion of each stream, a semaphore is set to indicate completion.
- Execute five consecutive RF1/RF2 transactions, against ascending Update sets produced by dbgen. The first RF1 waits on a semaphore prior to beginning its insert operations.

Each step is timed by the script. The timing information is stored in the database for later analysis. The inputs and outputs of steps are stored in text files for later analysis.

7.3 Profile-Directed Optimization

If profile-directed optimization as described in Clause 5.2.9 is used, such used must be disclosed.

Profile-directed optimization was not used.

8.0 Clause 7: Pricing Related Items

8.1 Hardware and Software Used

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 all hardware and software, including the 3-year price, is provided in the Executive Summary at the front of this report. No 3-party quotation is included in the price list.

8.2 Total 3 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 list of all hardware and software, including the 3-year price, is provided in the Executive Summary at the front of this report. The price quotations are included in Appendix G, at the end of this document.

8.3 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.

The Lenovo SureServer R630 G7 and all other hardware is generally available at the time of publication.

The system software, Microsoft Windows Server 2003, Enterprise x64 Edition SP2 and the database software, Microsoft SQL Server 2005 Enterprise x64 Edition SP2 are generally available at the time of publication.

8.4 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 that date arrives*
- The method for verifying the price*

All components are orderable on the publication date.

8.5 Country-Specific Pricing

Additional Clause 7 related items may be included in the Full Disclosure Report for each country-specific priced configuration. Country-specific pricing is subject to Clause 7.1.7.

The configuration is priced for People's Republic of China.

9.0 Clause 9: Related Items

9.1 Auditors' 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.

This implementation of the TPC Benchmark H was audited by Lorna Livingtree of Performance Metrics. Further information regarding the audit process may be obtained from:

Performance Metrics, Inc.
PO Box 984
Klamath, CA 95548
Telephone: (707) 482-0523
Fax: (707) 482-0575

For a copy of this disclosure, go to www.tpc.org.



February 4, 2008

Mr. Lei Feitao
Director, Technical Support & Service
Server Business, Lenovo
No.6 Shang Di Chuang Ye Road,
Hai Dian District,
Beijing, China

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

Platform: Lenovo SureServer R630 G7
Database Manager: Microsoft SQL Server 2005 Enterprise Edition SP2
Operating System: Microsoft Windows Server 2003 Enterprise Edition SP2

CPU's	Memory	Total Disks	Qpph@ 100GB	QthH@100GB	QphH@100GB
4 Intel@2.93 GHz quad-core	128 GB	2 @ 73GB (OS) 174 @ 73GB	41,970.6	26,237.3	33,184.3

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 2.6.0. The references data was verified.
- The qualification database layout was identical to the tested database except for the number and size of the files.
- The query text was verified to use only compliant variants and minor modifications.
- The executable query text was generated by QGEN and submitted through Oracle's standard interactive interface. The version of QGEN was 2.6.0.
- 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

- Note: These are the settings used during the power test. The settings altered for the load are documented in Appendix B.

A.1 Microsoft SQL Server 2005

Version

The following text was output was generated by executing the select @@version command:

```
Microsoft SQL Server 2005 - 9.00.3042.00 (X64)
    Feb 10 2007 00:59:02
    Copyright (c) 1988-2005 Microsoft Corporation
    Enterprise Edition (64-bit) on Windows NT 5.2 (Build 3790:
    Service Pack 2)
```

A.2 SQL Server 2005

Installation

The installation followed the default options. For the sort order Latin1_General_binary was chosen. Client tools and development tools were not installed on the server. Mixed mode authentication was used.

A.3 SQL Server 2005 Startup

Parameters

```
SQLSERVER -c -x -E -T834 -T836
-x Disable the Keeping of CPU time and cache-hit ratio statistics.
-c Start SQL Server independently of Windows NT Service
Control Manager
-E Increase the number of consecutive extents allocated per file to
4
-T834 Enable large page support
-T836 Make use of all physical memory
```

A.4 Microsoft SQL Server 2005

Configuration Parameters

name	minimum	maximum	config_value	run_value
Ad Hoc Distributed Queries	0	1	0	0
affinity I/O mask	-2147483648	2147483647	0	0
affinity mask	-2147483648	2147483647	65535	65535
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
c2 audit mode	0	1	0	0
clr enabled	0	1	0	0

```
common criteria compliance enabled 0 1 0 0
cost threshold for parallelism 0 32767 0 0
cross db ownership chaining 0 1 0 0
cursor threshold -1 2147483647 -1 -1
Database Mail XPs 0 1 0 0
default full-text language 0 2147483647 1033 1033
default language 0 9999 0 0
default trace enabled 0 1 0 0
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 127000 127000
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 0 16
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 0 0
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 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 proc 0 1 0 0
server trigger recursion 0 1 1 1
set working set size 0 1 1 1
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
```

A.5 Microsoft SQL Server 2005

Node Configuration

Windows Registry Editor Version 5.00

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL Server\90\NodeConfiguration]
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL Server\90\NodeConfiguration\Node0]
"CPUMask"=dword:00000003
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL Server\90\NodeConfiguration\Node1]
"CPUMask"=dword:00000003
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL Server\90\NodeConfiguration\Node2]
"CPUMask"=dword:00000003
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL Server\90\NodeConfiguration\Node3]
"CPUMask"=dword:00000003
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL Server\90\NodeConfiguration\Node4]
"CPUMask"=dword:00000003
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL Server\90\NodeConfiguration\Node5]
"CPUMask"=dword:00000003
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL Server\90\NodeConfiguration\Node6]
"CPUMask"=dword:00003000
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL Server\90\NodeConfiguration\Node7]
```

System Type x64-based PC

```
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
Processor EM64T Family 6 Model 15 Stepping 11 GenuineIntel ~2926 Mhz
```

```
BIOS Version/Date Intel Corporation
SFC4UR.86B.01.00.0019.092720071709, 9/27/2007
SMBIOS Version 2.5
Windows Directory C:\WINDOWS
System Directory C:\WINDOWS\system32
Boot Device \Device\HarddiskVolume9
Locale United States
Hardware Abstraction Layer Version = "5.2.3790.3959 (srv03_sp2_rtm.070216-1710)"
User Name Not Available
Time Zone China Standard Time
Total Physical Memory 131,064.95 MB
Available Physical Memory 124.75 GB
Total Virtual Memory 127.11 GB
Available Virtual Memory 126.66 GB
Page File Space 2.00 GB
Page File C:\pagefile.sys
```

```
[Hardware Resources]
```

```
[Conflicts/Sharing]
```

```
Resource Device
I/O Port 0x0000A000-0x0000AFF7 Intel(R) 7300 Chipset PCI Express Port 1 - 3604
I/O Port 0x0000A000-0x0000AFF7 LSI Logic MegaRAID SAS 8888ELP RAID Controller

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

Memory Address 0xA1000000-0xA8FFFFFF Intel(R) 7300 Chipset PCI Express Port 4 - 3607
Memory Address 0xA1000000-0xA8FFFFFF PCI standard PCI-to-PCI bridge
```

A.6 Windows 2003 Configuration

The default installation of Windows 2003 Enterprise Edition was used. All default options were selected during the install except:

- A TCP/IP address was configured on the system.

Updated installation to optimize performance for applications. (System Properties > Advanced > Performance Options > Programs)

A.7 System Hardware Information

System Information report written at: 01/11/08 11:03:53
System Name: TPCH
[System Summary]

Item	Value
OS Name	Microsoft(R) Windows(R) Server 2003 Enterprise x64 Edition
Version	5.2.3790 Service Pack 2 Build 3790
Other OS Description	R2
OS Manufacturer	Microsoft Corporation
System Name	TPCH
System Manufacturer	Intel
System Model	Lenovo WQ r630g7

Memory Address 0xA1000000-0xA8FFFFFF PCI standard PCI-to-PCI bridge

Memory Address 0xA1000000-0xA8FFFFFF LSI Logic MegaRAID SAS 8888ELP RAID Controller

I/O Port 0x00002000-0x00002FFF Intel(R) 631xESB/6321ESB/3100 Chipset PCI Express Root Port 1 - 2690

I/O Port 0x00002000-0x00002FFF LSI Logic MegaRAID SAS 8888ELP RAID Controller

IRQ 22 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host Controller - 2688

IRQ 22 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host Controller - 2689

IRQ 22 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host Controller - 268A

IRQ 22 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host Controller - 268B

I/O Port 0x00009000-0x00009FFF Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E1 - 3510

I/O Port 0x00009000-0x00009FFF Integrated Intel(R) RAID Controller SROMBSASFC

I/O Port 0x00006000-0x00006FFF PCI standard PCI-to-PCI bridge
I/O Port 0x00006000-0x00006FFF LSI Logic MegaRAID SAS 8888ELP RAID Controller

IRQ 25 Intel(R) 7300 Chipset PCI Express Port 6 - 3609

IRQ 25 LSI Logic MegaRAID SAS 8888ELP RAID Controller

I/O Port 0x00003000-0x00004FFF Intel(R) 7300 Chipset PCI Express Port 6 - 3609

I/O Port 0x00003000-0x00004FFF PCI standard PCI-to-PCI bridge

I/O Port 0x00003000-0x00004FFF PCI standard PCI-to-PCI bridge

I/O Port 0x00003000-0x00004FFF LSI Logic MegaRAID SAS 8888ELP RAID Controller

Memory Address 0x98000000-0x98BFFFFFF Intel(R) 7300 Chipset PCI Express Port 2 - 3605

Memory Address 0x98000000-0x98BFFFFFF Intel(R) 6311ESB/6321ESB PCI Express Upstream Port - 3500

Memory Address 0x98000000-0x98BFFFFFF Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E3 - 3518

Memory Address 0x98000000-0x98BFFFFFF Intel(R) PRO/1000 EB Network Connection with I/O Acceleration #2

IRQ 26 Intel(R) 7300 Chipset PCI Express Port 4 - 3607

IRQ 26 LSI Logic MegaRAID SAS 8888ELP RAID Controller

Memory Address 0x98C00000-0xA0BFFFFFF Intel(R) 7300 Chipset PCI Express Port 4 - 3607

Memory Address 0x98C00000-0xA0BFFFFFF PCI standard PCI-to-PCI bridge

Memory Address 0x98C00000-0xA0BFFFFFF PCI standard PCI-to-PCI bridge

Memory Address 0x90000000-0xFDFFFFFFF PCI bus

Memory Address 0x90000000-0xFDFFFFFFF Standard VGA Graphics Adapter

Memory Address 0x98900000-0x989FFFFFF Intel(R)

6311ESB/6321ESB PCI Express Downstream Port E2 - 3514

Memory Address 0x98900000-0x989FFFFFF LSI Logic MegaRAID SAS 8888ELP RAID Controller

Memory Address 0xA9000000-0xA90FFFFFF Intel(R) 7300 Chipset PCI Express Port 1 - 3604

Memory Address 0xA9000000-0xA90FFFFFF LSI Logic MegaRAID SAS 8888ELP RAID Controller

IRQ 16 Intel(R) 7300 Chipset Memory Controller Hub - 3600

IRQ 16 Intel(R) PRO/1000 EB Network Connection with I/O Acceleration #2

IRQ 16 Intel(R) 7300 Chipset QuickData Technology Device - 360B

IRQ 16 LSI Logic MegaRAID SAS 8888ELP RAID Controller

Memory Address 0xA0D00000-0xA0DFFFFFF Intel(R) 631xESB/6321ESB/3100 Chipset PCI Express Root Port 1 - 2690

Memory Address 0xA0D00000-0xA0DFFFFFF LSI Logic MegaRAID SAS 8888ELP RAID Controller

Memory Address 0xA5000000-0xA8FFFFFF PCI standard PCI-to-PCI bridge

Memory Address 0xA5000000-0xA8FFFFFF LSI Logic MegaRAID SAS 8888ELP RAID Controller

I/O Port 0x00005000-0x00006FFF Intel(R) 7300 Chipset PCI Express Port 4 - 3607

I/O Port 0x00005000-0x00006FFF PCI standard PCI-to-PCI bridge

I/O Port 0x00005000-0x00006FFF PCI standard PCI-to-PCI bridge

I/O Port 0x00005000-0x00006FFF LSI Logic MegaRAID SAS 8888ELP RAID Controller

IRQ 17 Intel(R) 7300 Chipset PCI Express Port 2 - 3605

IRQ 17 Intel(R) 6311ESB/6321ESB PCI Express Upstream Port - 3500

IRQ 17 Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E1 - 3510

IRQ 17 Integrated Intel(R) RAID Controller SROMBSASFC

IRQ 28 Intel(R) 7300 Chipset PCI Express Port 1 - 3604

IRQ 28 LSI Logic MegaRAID SAS 8888ELP RAID Controller

IRQ 18 Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E2 - 3514

IRQ 18 LSI Logic MegaRAID SAS 8888ELP RAID Controller

IRQ 19 Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E3 - 3518

IRQ 19 Intel(R) PRO/1000 EB Network Connection with I/O Acceleration

Memory Address 0xA0000-0xBFFFF PCI bus

Memory Address 0xA0000-0xBFFFF Standard VGA Graphics Adapter

Memory Address 0xA0F00000-0xA0FFFFFF PCI standard PCI-to-PCI bridge

Memory Address 0xA0F00000-0xA0FFFFFF LSI Logic MegaRAID SAS 8888ELP RAID Controller

Memory Address 0x98A00000-0x98AFFFFFF Intel(R)

6311ESB/6321ESB PCI Express Downstream Port E1 - 3510

Memory Address 0x98A00000-0x98AFFFFFF Integrated Intel(R) RAID Controller SROMBSASFC

I/O Port 0x00007000-0x00009FFF Intel(R) 7300 Chipset PCI Express Port 2 - 3605

I/O Port 0x00007000-0x00009FFF Intel(R) 6311ESB/6321ESB PCI Express Upstream Port - 3500

I/O Port 0x00007000-0x00009FFF Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E3 - 3518

I/O Port 0x00007000-0x00009FFF Intel(R) PRO/1000 EB Network Connection with I/O Acceleration #2

I/O Port 0x00004000-0x00004FFF PCI standard PCI-to-PCI bridge

I/O Port 0x00004000-0x00004FFF LSI Logic MegaRAID SAS 8888ELP RAID Controller

Memory Address 0xA0E00000-0xA0FFFFFF	Intel(R) 7300	0x00003000-0x00004FFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller	OK
Chipset PCI Express Port 6 - 3609		0x00004000-0x00004FFF	PCI standard PCI-to-PCI bridge	OK
Memory Address 0xA0E00000-0xA0FFFFFF	PCI standard	0x00004000-0x00004FFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller	OK
PCI-to-PCI bridge		0x00002000-0x00002FFF	Intel(R) 631xESB/6321ESB/3100	
Memory Address 0xA0E00000-0xA0FFFFFF	PCI standard	0x00002000-0x00002FFF	Chipset PCI Express Root Port 1 - 2690	OK
PCI-to-PCI bridge		0x00002000-0x00002FFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller	OK
Memory Address 0xA0E00000-0xA0FFFFFF	LSI Logic	0x0000B080-0x0000B09F	Intel(R) 631xESB/6321ESB/3100	
MegaRAID SAS 8888ELP RAID Controller		0x0000B060-0x0000B07F	Chipset USB Universal Host Controller - 2688	OK
I/O Port 0x00008000-0x00008FFF	Intel(R) 6311ESB/6321ESB PCI	0x0000B060-0x0000B07F	Intel(R) 631xESB/6321ESB/3100	
Express Downstream Port E2 - 3514		0x0000B060-0x0000B07F	Chipset USB Universal Host Controller - 2689	OK
I/O Port 0x00008000-0x00008FFF	LSI Logic MegaRAID SAS	0x0000B040-0x0000B05F	Intel(R) 631xESB/6321ESB/3100	
8888ELP RAID Controller		0x0000B040-0x0000B05F	Chipset USB Universal Host Controller - 268A	OK
Memory Address 0xFED40000-0xFED44FFF	PCI bus	0x0000B020-0x0000B03F	Intel(R) 631xESB/6321ESB/3100	
Memory Address 0xFED40000-0xFED44FFF	STMicroelectronics	0x0000B020-0x0000B03F	Chipset USB Universal Host Controller - 268B	OK
Trusted Platform Module		0x00001000-0x000010FF	Standard VGA Graphics Adapter	OK
[DMA]		0x000003B0-0x000003BB	Standard VGA Graphics Adapter	OK
Resource Device Status		0x000003C0-0x000003DF	Standard VGA Graphics Adapter	OK
Channel 4	Direct memory access controller	0x00000081-0x00000083	Direct memory access controller	OK
[Forced Hardware]		0x00000087-0x00000087	Direct memory access controller	OK
Device PNP Device ID		0x00000089-0x0000008B	Direct memory access controller	OK
[I/O]		0x0000008F-0x0000008F	Direct memory access controller	OK
Resource Device Status		0x000000C0-0x000000DF	Direct memory access controller	OK
0x00000000-0x00000CF7	PCI bus	0x00000070-0x00000071	System CMOS/real time clock	OK
0x00000000-0x00000CF7	Direct memory access controller	0x00000074-0x00000077	System CMOS/real time clock	OK
0x00000D00-0x0000FFFF	PCI bus	0x00000020-0x0000003D	Programmable interrupt controller	OK
0x0000A000-0x0000AFFF	Intel(R) 7300 Chipset PCI Express Port 1 - 3604	0x000000A0-0x000000BD	Programmable interrupt controller	OK
0x0000A000-0x0000AFFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller	0x0000004D0-0x000004D1	Programmable interrupt controller	OK
0x00007000-0x00009FFF	Intel(R) 7300 Chipset PCI Express Port 2 - 3605	0x000000F0-0x000000FF	Numeric data processor	OK
0x00007000-0x00009FFF	Intel(R) 6311ESB/6321ESB PCI Express Upstream Port - 3500	0x00000040-0x00000043	System timer	OK
0x00007000-0x00009FFF	Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E3 - 3518	0x00000050-0x00000053	System timer	OK
0x00007000-0x00009FFF	Intel(R) PRO/1000 EB Network Connection with I/O Acceleration #2	0x00000061-0x00000061	System speaker	OK
0x00009000-0x00009FFF	Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E1 - 3510	0x00000500-0x0000053F	Motherboard resources	OK
0x00009000-0x00009FFF	Integrated Intel(R) RAID Controller	0x00000400-0x0000047F	Motherboard resources	OK
SR0MBSASFC	OK	0x00000092-0x00000092	Motherboard resources	OK
0x00008000-0x00008FFF	Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E2 - 3514	0x00000800-0x0000087F	Motherboard resources	OK
0x00008000-0x00008FFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller	0x0000010-0x0000001F	Motherboard resources	OK
0x00007020-0x0000703F	Intel(R) PRO/1000 EB Network Connection with I/O Acceleration	0x00000072-0x00000073	Motherboard resources	OK
0x00005000-0x00006FFF	Intel(R) 7300 Chipset PCI Express Port 4 - 3607	0x00000080-0x00000080	Motherboard resources	OK
0x00005000-0x00006FFF	PCI standard PCI-to-PCI bridge	0x00000084-0x00000086	Motherboard resources	OK
0x00005000-0x00006FFF	PCI standard PCI-to-PCI bridge	0x00000088-0x00000088	Motherboard resources	OK
0x00005000-0x00006FFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller	0x0000008C-0x0000008E	Motherboard resources	OK
0x00006000-0x00006FFF	PCI standard PCI-to-PCI bridge	0x00000090-0x0000009F	Motherboard resources	OK
0x00006000-0x00006FFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller	0x00000060-0x00000060	Motherboard resources	OK
0x00003000-0x00004FFF	Intel(R) 7300 Chipset PCI Express Port 6 - 3609	0x00000064-0x00000064	Motherboard resources	OK
0x00003000-0x00004FFF	PCI standard PCI-to-PCI bridge	0x00000CA2-0x00000CA7	Motherboard resources	OK
0x00003000-0x00004FFF	PCI standard PCI-to-PCI bridge	0x00000CA8-0x00000CAF	Motherboard resources	OK
		0x00000161-0x00000161	Motherboard resources	OK
		0x00000162-0x00000162	Motherboard resources	OK
		0x000003F8-0x000003FF	Communications Port (COM1)	OK
		0x000002F8-0x000002FF	Communications Port (COM2)	OK
		0x0000B0A0-0x0000B0AF	Intel(R) 631xESB/6321ESB/3100	
		0x00000000-0x00000000	Chipset Serial ATA Storage Controller - 2680	OK
		0x000001F0-0x000001F7	Primary IDE Channel	OK
		0x000003F6-0x000003F6	Primary IDE Channel	OK
		0x00000170-0x00000177	Secondary IDE Channel	OK
		0x00000376-0x00000376	Secondary IDE Channel	OK
		0x0000B000-0x0000B01F	Intel(R) 631xESB/6321ESB/3100	
		0x00000000-0x00000000	Chipset SMBus Controller - 269B	OK
		[IRQs]		
	Resource Device Status			

IRQ 9 Microsoft ACPI-Compliant System	OK	Module	OK
IRQ 16 Intel(R) 7300 Chipset Memory Controller Hub - 3600	OK	0xA9000000-0xA90FFFFF	Intel(R) 7300 Chipset PCI Express Port 1 - 3604
IRQ 16 Intel(R) PRO/1000 EB Network Connection with I/O Acceleration #2	OK	0xA9000000-0xA90FFFFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller
IRQ 16 Intel(R) 7300 Chipset QuickData Technology Device - 360B	OK	0xA9040000-0xA907FFFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller
IRQ 16 LSI Logic MegaRAID SAS 8888ELP RAID Controller	OK	0x98000000-0x98BFFFFF	Intel(R) 7300 Chipset PCI Express Port 2 - 3605
IRQ 28 Intel(R) 7300 Chipset PCI Express Port 1 - 3604	OK	0x98000000-0x98BFFFFF	Intel(R) 6311ESB/6321ESB PCI Express Upstream Port - 3500
IRQ 28 LSI Logic MegaRAID SAS 8888ELP RAID Controller	OK	0x98000000-0x98BFFFFF	Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E3 - 3518
IRQ 17 Intel(R) 7300 Chipset PCI Express Port 2 - 3605	OK	0x98000000-0x98BFFFFF	Intel(R) PRO/1000 EB Network Connection with I/O Acceleration #2
IRQ 17 Intel(R) 6311ESB/6321ESB PCI Express Upstream Port - 3500	OK	0x98A00000-0x98AFFFFF	Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E1 - 3510
IRQ 17 Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E1 - 3510	OK	0x98A00000-0x98AFFFFF	Integrated Intel(R) RAID Controller SROMBSASFC
IRQ 17 Integrated Intel(R) RAID Controller SROMBSASFC	OK	0x98A40000-0x98A7FFFF	Integrated Intel(R) RAID Controller SROMBSASFC
IRQ 18 Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E2 - 3514	OK	0x98900000-0x989FFFFF	Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E2 - 3514
IRQ 18 LSI Logic MegaRAID SAS 8888ELP RAID Controller	OK	0x98900000-0x989FFFFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller
IRQ 19 Intel(R) 6311ESB/6321ESB PCI Express Downstream Port E3 - 3518	OK	0x98940000-0x9897FFFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller
IRQ 19 Intel(R) PRO/1000 EB Network Connection with I/O Acceleration	OK	0x98820000-0x9883FFFF	Intel(R) PRO/1000 EB Network Connection with I/O Acceleration
IRQ 29 Intel(R) 7300 Chipset PCI Express Port 3 - 3606	OK	0x98400000-0x987FFFFF	Intel(R) PRO/1000 EB Network Connection with I/O Acceleration
IRQ 26 Intel(R) 7300 Chipset PCI Express Port 4 - 3607	OK	0x98800000-0x9881FFFF	Intel(R) PRO/1000 EB Network Connection with I/O Acceleration #2
IRQ 26 LSI Logic MegaRAID SAS 8888ELP RAID Controller	OK	0xA1000000-0xA8FFFFFF	Intel(R) 7300 Chipset PCI Express Port 4 - 3607
IRQ 24 LSI Logic MegaRAID SAS 8888ELP RAID Controller	OK	0xA1000000-0xA8FFFFFF	PCI standard PCI-to-PCI bridge
IRQ 25 Intel(R) 7300 Chipset PCI Express Port 6 - 3609	OK	0xA1000000-0xA8FFFFFF	PCI standard PCI-to-PCI bridge
IRQ 25 LSI Logic MegaRAID SAS 8888ELP RAID Controller	OK	0xA1000000-0xA8FFFFFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller
IRQ 27 LSI Logic MegaRAID SAS 8888ELP RAID Controller	OK	0x98C00000-0xA0BFFFFF	Intel(R) 7300 Chipset PCI Express Port 4 - 3607
IRQ 22 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host Controller - 2688	OK	0x98C00000-0xA0BFFFFF	PCI standard PCI-to-PCI bridge
IRQ 22 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host Controller - 2689	OK	0x98C00000-0xA0BFFFFF	PCI standard PCI-to-PCI bridge
IRQ 22 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host Controller - 268A	OK	0xA5000000-0xA8FFFFFF	PCI standard PCI-to-PCI bridge
IRQ 22 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host Controller - 268B	OK	0xA5000000-0xA8FFFFFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller
IRQ 23 Intel(R) 631xESB/6321ESB/3100 Chipset USB2 Enhanced Host Controller - 268C	OK	0x9CC00000-0xA0BFFFFF	PCI standard PCI-to-PCI bridge
IRQ 8 System CMOS/real time clock	OK	0xA5040000-0xA507FFFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller
IRQ 13 Numeric data processor	OK	0xA1040000-0xA107FFFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller
IRQ 0 System timer	OK	0xA0E00000-0xA0FFFFFF	Intel(R) 7300 Chipset PCI Express Port 6 - 3609
IRQ 4 Communications Port (COM1)	OK	0xA0E00000-0xA0FFFFFF	PCI standard PCI-to-PCI bridge
IRQ 3 Communications Port (COM2)	OK	0xA0E00000-0xA0FFFFFF	PCI standard PCI-to-PCI bridge
IRQ 14 Primary IDE Channel	OK	0xA0E00000-0xA0FFFFFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller
IRQ 15 Secondary IDE Channel	OK	0xA0F00000-0xA0FFFFFF	PCI standard PCI-to-PCI bridge
IRQ 11 Intel(R) 631xESB/6321ESB/3100 Chipset SMBus Controller - 269B	OK	0xA0F00000-0xA0FFFFFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller
[Memory]		0xA0F40000-0xA0F7FFFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller
Resource Device Status		0xA0E40000-0xA0E7FFFF	LSI Logic MegaRAID SAS 8888ELP RAID Controller
0xA0000-0xBFFFF	PCI bus	OK	
0xA0000-0xBFFFF	Standard VGA Graphics Adapter	OK	
0xC0000-0xFFFF	PCI bus	OK	
0x90000000-0xFDFFFFFF	PCI bus	OK	
0x90000000-0xFDFFFFFF	Standard VGA Graphics Adapter	OK	
0xFE700000-0xFE7003FF	PCI bus	OK	
0xFED40000-0xFED44FFF	PCI bus	OK	
0xFED40000-0xFED44FFF	STMicroelectronics Trusted Platform	OK	

0xA0D40000-0xA0D7FFFF LSI Logic MegaRAID SAS 8888ELP
RAID Controller OK
0xA9100800-0xA9100BFF Intel(R) 631xESB/6321ESB/3100
Chipset USB2 Enhanced Host Controller - 268C OK
0xA0C00000-0xA0C0FFFF Standard VGA Graphics Adapter
OK
0xFED00000-0xFED003FF High precision event timer OK
0xA9100400-0xA91007FF Intel(R) 631xESB/6321ESB/3100
Chipset Serial ATA Storage Controller - 2680 OK
0x80000000-0x8FFFFFFF Motherboard resources OK
0xFED1C000-0xFED1FFFF Motherboard resources OK
0xFFC00000-0xFFFFFFFF Motherboard resources OK
0xFEC00000-0xFECFFFFFFF Motherboard resources OK
0xFEE00000-0xFEEFFFFFFF Motherboard resources OK
0xFE600000-0xFE6FFFFFFF Motherboard resources OK
0xFE000000-0xFE01FFFF Motherboard resources OK

[Components]

[Multimedia]

[Audio Codecs]

CODEC	Manufacturer	Description	Status	File	Version
	Size	Creation Date			
c:\windows\system32\msadp32.acm	Microsoft Corporation	OK	C:\WINDOWS\system32\MSADP32.ACM	5.2.3790.1830	(srv03_sp1_rtm.050324-1447) 23.50 KB (24,064 bytes) 2/18/2007 8:00 PM
c:\windows\system32\imaadp32.acm	Microsoft Corporation	OK	C:\WINDOWS\system32\IMAADP32.ACM	5.2.3790.1830	(srv03_sp1_rtm.050324-1447) 24.00 KB (24,576 bytes) 2/18/2007 8:00 PM
c:\windows\system32\tsoft32.acm	DSP GROUP, INC.	OK	C:\WINDOWS\system32\TSSOFT32.ACM	1.01 13.50	KB (13,824 bytes) 2/18/2007 8:00 PM
c:\windows\system32\msgsm32.acm	Microsoft Corporation	OK	C:\WINDOWS\system32\MSGSM32.ACM	5.2.3790.1830	(srv03_sp1_rtm.050324-1447) 34.50 KB (35,328 bytes) 2/18/2007 8:00 PM
c:\windows\system32\msg711.acm	Microsoft Corporation	OK	C:\WINDOWS\system32\MSG711.ACM	5.2.3790.1830	(srv03_sp1_rtm.050324-1447) 13.50 KB (13,824 bytes) 2/18/2007 8:00 PM

[Video Codecs]

CODEC	Manufacturer	Description	Status	File	Version
	Size	Creation Date			
c:\windows\system32\iyuv_32.dll	Microsoft Corporation	OK	C:\WINDOWS\system32\IYUV_32.DLL	5.2.3790.1830	(srv03_sp1_rtm.050324-1447) 52.50 KB (53,760 bytes) 3/25/2005 1:19 AM
c:\windows\system32\msrle32.dll	Microsoft Corporation	OK	C:\WINDOWS\system32\MSRLE32.DLL	5.2.3790.1830	(srv03_sp1_rtm.050324-1447) 15.50 KB (15,872 bytes) 2/18/2007 8:00 PM
c:\windows\system32\msvidc32.dll	Microsoft Corporation	OK	C:\WINDOWS\system32\MSVIDC32.DLL	5.2.3790.1830	(srv03_sp1_rtm.050324-1447) 43.00 KB (44,032 bytes) 2/18/2007 8:00 PM
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) 3/25/2005 1:34 AM
c:\windows\system32\msyuv.dll	Microsoft Corporation	OK			

C:\WINDOWS\system32\MSYUV.DLL 5.2.3790.1830
(srv03_sp1_rtm.050324-1447) 21.00 KB (21,504 bytes) 3/25/2005 1:21 AM

[CD-ROM]

Item	Value
Drive Z:	
Description	CD-ROM Drive
Media Loaded	No
Media Type	CD-ROM
Name	Optiarc DVD-ROM DDU810A
Manufacturer	(Standard CD-ROM drives)
Status	OK
Transfer Rate	Not Available
SCSI Target ID	0
PNP Device ID	IDE\CDROMOPTIARC_DVD-ROM_DDU810A_____
	____RX02____\5&A09E987&0&0.0.0
Driver	c:\windows\system32\drivers\cdrom.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 75.50 KB (77,312 bytes), 2/18/2007 8:00 PM)

[Sound Device]

Item Value

[Display]

Item	Value
Name	Standard VGA Graphics Adapter
PNP Device ID	PCI\VEN_1002&DEV_515E&SUBSYS_34CC8086&REV_02\4&213AFEB0&0&60F0
Adapter Type	Not Available
Adapter Description	(Standard display types)
Adapter RAM	Not Available
Installed Drivers	Not Available
Driver Version	Not Available
INF File	5.2.3790.1830 (display.inf section)
Color Planes	vga
Color Table Entries	Not Available
Resolution	Not Available
Bits/Pixel	Not Available
Memory Address	0x90000000-0xFDFFFFFFFF
I/O Port	0x00001000-0x000010FF
Memory Address	0xA0C00000-0xA0C0FFFF
I/O Port	0x000003B0-0x000003BB
I/O Port	0x000003C0-0x000003DF
Memory Address	0xA0000-0xBFFFF
Driver	c:\windows\system32\drivers\vgaPNP.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 33.00 KB (33,792 bytes), 11/2/2007 8:21 PM)

[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_05AF&PID_0802&MI_00\6&819D0CF&0&0000

Number of Function Keys 12
Driver:\windows\system32\drivers\hidusb.sys (5.2.3790.1830
(srv03_sp1_rtm.050324-1447), 18.50 KB (18,944 bytes), 2/18/2007 8:00
PM)

[Pointing Device]

Item Value
Hardware Type Logitech USB First/Pilot Mouse+
Number of Buttons 3
Status OK
PNP Device ID USB\VID_046D&PID_C001\5&1F462798&0&2
Power Management Supported No
Double Click Threshold 6
Handedness Right Handed Operation
Driver:\windows\system32\drivers\hidusb.sys (5.2.3790.1830
(srv03_sp1_rtm.050324-1447), 18.50 KB (18,944 bytes), 2/18/2007 8:00
PM)

[Modem]

Item Value

[Network]

[Adapter]

Item Value
Name [00000001] RAS Async Adapter
Adapter Type Wide Area Network (WAN)
Product Type RAS Async Adapter
Installed Yes
PNP Device ID
SW\{EEAB7790-C514-11D1-B42B-00805FC1270E}\ASYNCM
AC
Last Reset 1/10/2008 2:55 AM
Index 1
Service Name AsyneMac
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 20:41:53:59:4E:FF
Driver:\windows\system32\drivers\asynccmac.sys (5.2.3790.1830
(srv03_sp1_rtm.050324-1447), 24.50 KB (25,088 bytes), 2/18/2007 8:00
PM)

Name [00000002] WAN Miniport (L2TP)
Adapter Type Not Available
Product Type WAN Miniport (L2TP)
Installed Yes
PNP Device ID ROOTMS_L2TPMINIPOINT\0000
Last Reset 1/10/2008 2:55 AM
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:\windows\system32\drivers\rasl2tp.sys (5.2.3790.3959
(srv03_sp2_rtm.070216-1710), 132.00 KB (135,168 bytes), 2/18/2007

8:00 PM)

Name [00000003] WAN Miniport (PPTP)
Adapter Type Wide Area Network (WAN)
Product Type WAN Miniport (PPTP)
Installed Yes
PNP Device ID ROOTMS_PPTPMINIPOINT\0000
Last Reset 1/10/2008 2:55 AM
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:\windows\system32\drivers\raspptp.sys (5.2.3790.3959
(srv03_sp2_rtm.070216-1710), 117.50 KB (120,320 bytes), 2/18/2007
8:00 PM)

Name [00000004] WAN Miniport (PPPOE)
Adapter Type Wide Area Network (WAN)
Product Type WAN Miniport (PPPOE)
Installed Yes
PNP Device ID ROOTMS_PPPOEMINIPOINT\0000
Last Reset 1/10/2008 2:55 AM
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:\windows\system32\drivers\rasppoe.sys (5.2.3790.3959
(srv03_sp2_rtm.070216-1710), 67.50 KB (69,120 bytes), 2/18/2007 8:00
PM)

Name [00000005] Direct Parallel
Adapter Type Not Available
Product Type Direct Parallel
Installed Yes
PNP Device ID ROOTMS_PTMINIPOINT\0000
Last Reset 1/10/2008 2:55 AM
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:\windows\system32\drivers\raspti.sys (5.2.3790.1830
(srv03_sp1_rtm.050324-1447), 30.50 KB (31,232 bytes), 2/18/2007 8:00
PM)

Name [00000006] WAN Miniport (IP)
Adapter Type Not Available
Product Type WAN Miniport (IP)
Installed Yes
PNP Device ID ROOTMS_NDISWANIP\0000
Last Reset 1/10/2008 2:55 AM
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:\windows\system32\drivers\ndiswan.sys (5.2.3790.3959
 (srv03_sp2_rtm.070216-1710), 157.50 KB (161,280 bytes), 2/18/2007
 8:00 PM)

 Name [00000007] Intel(R) PRO/1000 EB Network Connection with I/O
 Acceleration
 Adapter Type Ethernet 802.3
 Product Type Intel(R) PRO/1000 EB Network Connection with I/O
 Acceleration
 Installed Yes
 PNP Device ID
 PCI\VEN_8086&DEV_1096&SUBSYS_34CC8086&REV_01\6&
 14078006&0&00100010
 Last Reset 1/10/2008 2:55 AM
 Index 7
 Service Name e!express
 IP Address 219.142.163.2
 IP Subnet 255.255.252.0
 Default IP Gateway 219.142.163.1
 DHCP Enabled No
 DHCP Server Not Available
 DHCP Lease Expires Not Available
 DHCP Lease Obtained Not Available
 MAC Address 00:15:17:3E:69:F6
 Memory Address 0x98820000-0x9883FFFF
 Memory Address 0x98400000-0x987FFFFF
 I/O Port 0x00007020-0x0000703F
 IRQ Channel IRQ 19
 Driver:\windows\system32\drivers\le1e5132e.sys (9.9.13.0 built by:
 WinDDK, 340.40 KB (348,568 bytes), 6/20/2007 3:47 AM)

Name [00000008] Intel(R) PRO/1000 EB Network Connection with I/O
 Acceleration
 Adapter Type Ethernet 802.3
 Product Type Intel(R) PRO/1000 EB Network Connection with I/O
 Acceleration
 Installed Yes
 PNP Device ID
 PCI\VEN_8086&DEV_1096&SUBSYS_34CC8086&REV_01\6&
 14078006&0&01100010
 Last Reset 1/10/2008 2:55 AM
 Index 8
 Service Name e!express
 IP Address 192.168.10.91
 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 00:15:17:3E:69:F7
 Memory Address 0x98800000-0x9881FFFF
 Memory Address 0x98000000-0x98BFFFFF
 I/O Port 0x00007000-0x00009FFF
 IRQ Channel IRQ 16
 Driver:\windows\system32\drivers\le1e5132e.sys (9.9.13.0 built by:
 WinDDK, 340.40 KB (348,568 bytes), 6/20/2007 3:47 AM)

[Protocol]

Item Value
 Name MSAFD Tcpi [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 Tcpi [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
Driverc:\windows\system32\drivers\serial.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 118.50 KB (121,344 bytes), 2/18/2007 8:00 PM)

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
Driverc:\windows\system32\drivers\serial.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 118.50 KB (121,344 bytes), 2/18/2007 8:00 PM)

[Parallel]

Item Value

[Storage]

[Drives]

Item Value
Drive C:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 78.13 GB (83,889,594,368 bytes)
Free Space 67.02 GB (71,959,592,960 bytes)
Volume Name
Volume Serial Number 20791213
Drive D:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 55.97 GB (60,102,119,424 bytes)
Free Space 55.20 GB (59,265,421,312 bytes)
Volume Name New Volume
Volume Serial Number 686EB606
Drive F:
Description Local Fixed Disk
Compressed No
File System NTFS

Size 682.57 GB (732,905,345,024 bytes)
Free Space 623.59 GB (669,574,823,936 bytes)
Volume Name
Volume Serial Number 5C825083

Drive G:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 682.57 GB (732,905,345,024 bytes)
Free Space 627.37 GB (673,632,522,240 bytes)
Volume Name
Volume Serial Number 808757E6

Drive H:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 682.57 GB (732,905,345,024 bytes)
Free Space 627.34 GB (673,600,462,848 bytes)
Volume Name
Volume Serial Number C88C17E1

Drive I:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 682.57 GB (732,905,345,024 bytes)
Free Space 627.34 GB (673,603,350,528 bytes)
Volume Name
Volume Serial Number E490BB44

Drive J:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 682.57 GB (732,905,345,024 bytes)
Free Space 669.02 GB (718,350,979,072 bytes)
Volume Name
Volume Serial Number 24954925

Drive K:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 682.57 GB (732,905,345,024 bytes)
Free Space 669.02 GB (718,349,619,200 bytes)
Volume Name
Volume Serial Number C099F843

Drive L:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 682.57 GB (732,905,345,024 bytes)
Free Space 669.01 GB (718,348,845,056 bytes)
Volume Name
Volume Serial Number F09E9E2F

Drive M:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 682.57 GB (732,905,345,024 bytes)
Free Space 669.01 GB (718,348,414,976 bytes)
Volume Name
Volume Serial Number 48A34614

Drive N:
Description Local Fixed Disk

Compressed No
File System NTFS
Size 682.57 GB (732,905,345,024 bytes)
Free Space 682.49 GB (732,815,364,096 bytes)
Volume Name New Volume
Volume Serial Number 4811749A

Drive O:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 682.57 GB (732,905,345,024 bytes)
Free Space 682.49 GB (732,815,364,096 bytes)
Volume Name New Volume
Volume Serial Number F8162671

Drive P:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 682.57 GB (732,905,345,024 bytes)
Free Space 682.49 GB (732,815,364,096 bytes)
Volume Name New Volume
Volume Serial Number 701BFBF0

Drive Q:
Description Local Fixed Disk
Compressed No
File System NTFS
Size 682.57 GB (732,905,345,024 bytes)
Free Space 682.49 GB (732,815,364,096 bytes)
Volume Name New Volume
Volume Serial Number D8277EAD

Drive Z:
Description CD-ROM Disc

[Disks]

Item	Value
Description	Disk drive
Manufacturer	(Standard disk drives)
Model	INTEL SROMBSASFC 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	4
SCSI Target ID	0
Sectors/Track	63
Size	134.10 GB (143,991,751,680 bytes)
Total Cylinders	17,506
Total Sectors	281,233,890
Total Tracks	4,464,030
Tracks/Cylinder	255
Partition	Disk #4, Partition #0
Partition Size	78.13 GB (83,889,598,464 bytes)
Partition Starting Offset	32,256 bytes
Partition	Disk #4, Partition #1
Partition Size	55.97 GB (60,102,120,960 bytes)
Partition Starting Offset	83,889,630,720 bytes

Description	Disk drive
Manufacturer	(Standard disk drives)
Model	INTEL SROMBSASFC 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 134.10 GB (143,991,751,680 bytes)
 Total Cylinders 17,506
 Total Sectors 281,233,890
 Total Tracks 4,464,030
 Tracks/Cylinder 255
 Partition Disk #5, Partition #0
 Partition Size 29.30 GB (31,461,663,744 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #5, Partition #1
 Partition Size 19.53 GB (20,974,464,000 bytes)
 Partition Starting Offset 31,461,696,000 bytes
 Partition Disk #5, Partition #2
 Partition Size 85.27 GB (91,555,591,680 bytes)
 Partition Starting Offset 52,436,160,000 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 ModelLSI MegaRAID 8888ELP 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 3
 SCSI Target ID 0
 Sectors/Track 63
 Size 804.65 GB (863,991,636,480 bytes)
 Total Cylinders 105,041
 Total Sectors 1,687,483,665
 Total Tracks 26,785,455
 Tracks/Cylinder 255
 Partition Disk #2, Partition #0
 Partition Size 43.88 GB (47,114,371,584 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #2, Partition #1
 Partition Size 48.90 GB (52,510,187,520 bytes)
 Partition Starting Offset 47,114,403,840 bytes
 Partition Disk #2, Partition #2
 Partition Size 29.30 GB (31,461,696,000 bytes)
 Partition Starting Offset 99,624,591,360 bytes
 Partition Disk #2, Partition #3
 Partition Size 682.57 GB (732,905,349,120 bytes)
 Partition Starting Offset 131,086,287,360 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 ModelLSI MegaRAID 8888ELP 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 3
 SCSI Target ID 1
 Sectors/Track 63
 Size 804.65 GB (863,991,636,480 bytes)
 Total Cylinders 105,041
 Total Sectors 1,687,483,665
 Total Tracks 26,785,455
 Tracks/Cylinder 255
 Partition Disk #3, Partition #0
 Partition Size 43.88 GB (47,114,371,584 bytes)

Partition Starting Offset 32,256 bytes
 Partition Disk #3, Partition #1
 Partition Size 48.90 GB (52,510,187,520 bytes)
 Partition Starting Offset 47,114,403,840 bytes
 Partition Disk #3, Partition #2
 Partition Size 29.30 GB (31,461,696,000 bytes)
 Partition Starting Offset 99,624,591,360 bytes
 Partition Disk #3, Partition #3
 Partition Size 682.57 GB (732,905,349,120 bytes)
 Partition Starting Offset 131,086,287,360 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 ModelLSI MegaRAID 8888ELP 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 2
 SCSI Target ID 0
 Sectors/Track 63
 Size 804.65 GB (863,991,636,480 bytes)
 Total Cylinders 105,041
 Total Sectors 1,687,483,665
 Total Tracks 26,785,455
 Tracks/Cylinder 255
 Partition Disk #0, Partition #0
 Partition Size 43.88 GB (47,114,371,584 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #0, Partition #1
 Partition Size 48.90 GB (52,510,187,520 bytes)
 Partition Starting Offset 47,114,403,840 bytes
 Partition Disk #0, Partition #2
 Partition Size 29.30 GB (31,461,696,000 bytes)
 Partition Starting Offset 99,624,591,360 bytes
 Partition Disk #0, Partition #3
 Partition Size 682.57 GB (732,905,349,120 bytes)
 Partition Starting Offset 131,086,287,360 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 ModelLSI MegaRAID 8888ELP 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 2
 SCSI Target ID 1
 Sectors/Track 63
 Size 804.65 GB (863,991,636,480 bytes)
 Total Cylinders 105,041
 Total Sectors 1,687,483,665
 Total Tracks 26,785,455
 Tracks/Cylinder 255
 Partition Disk #1, Partition #0
 Partition Size 43.88 GB (47,114,371,584 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #1, Partition #1
 Partition Size 48.90 GB (52,510,187,520 bytes)
 Partition Starting Offset 47,114,403,840 bytes
 Partition Disk #1, Partition #2
 Partition Size 29.30 GB (31,461,696,000 bytes)
 Partition Starting Offset 99,624,591,360 bytes
 Partition Disk #1, Partition #3
 Partition Size 682.57 GB (732,905,349,120 bytes)
 Partition Starting Offset 131,086,287,360 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 ModelLSI MegaRAID 8888ELP 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 7
 SCSI Target ID 0
 Sectors/Track 63
 Size 804.65 GB (863,991,636,480 bytes)
 Total Cylinders 105,041
 Total Sectors 1,687,483,665
 Total Tracks 26,785,455
 Tracks/Cylinder 255
 Partition Disk #10, Partition #0
 Partition Size 43.88 GB (47,114,371,584 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #10, Partition #1
 Partition Size 48.90 GB (52,510,187,520 bytes)
 Partition Starting Offset 47,114,403,840 bytes
 Partition Disk #10, Partition #2
 Partition Size 29.30 GB (31,461,696,000 bytes)
 Partition Starting Offset 99,624,591,360 bytes
 Partition Disk #10, Partition #3
 Partition Size 682.57 GB (732,905,349,120 bytes)
 Partition Starting Offset 131,086,287,360 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 ModelLSI MegaRAID 8888ELP 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 7
 SCSI Target ID 1
 Sectors/Track 63
 Size 804.65 GB (863,991,636,480 bytes)
 Total Cylinders 105,041
 Total Sectors 1,687,483,665
 Total Tracks 26,785,455
 Tracks/Cylinder 255
 Partition Disk #11, Partition #0
 Partition Size 43.88 GB (47,114,371,584 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #11, Partition #1
 Partition Size 48.90 GB (52,510,187,520 bytes)
 Partition Starting Offset 47,114,403,840 bytes
 Partition Disk #11, Partition #2
 Partition Size 29.30 GB (31,461,696,000 bytes)
 Partition Starting Offset 99,624,591,360 bytes
 Partition Disk #11, Partition #3
 Partition Size 682.57 GB (732,905,349,120 bytes)
 Partition Starting Offset 131,086,287,360 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 ModelLSI MegaRAID 8888ELP 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 8
 SCSI Target ID 0
 Sectors/Track 63
 Size 804.65 GB (863,991,636,480 bytes)
 Total Cylinders 105,041
 Total Sectors 1,687,483,665
 Total Tracks 26,785,455
 Tracks/Cylinder 255
 Partition Disk #12, Partition #0
 Partition Size 43.88 GB (47,114,371,584 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #12, Partition #1
 Partition Size 48.90 GB (52,510,187,520 bytes)
 Partition Starting Offset 47,114,403,840 bytes
 Partition Disk #12, Partition #2
 Partition Size 29.30 GB (31,461,696,000 bytes)
 Partition Starting Offset 99,624,591,360 bytes
 Partition Disk #12, Partition #3
 Partition Size 682.57 GB (732,905,349,120 bytes)
 Partition Starting Offset 131,086,287,360 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 ModelLSI MegaRAID 8888ELP 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 8
 SCSI Target ID 1
 Sectors/Track 63
 Size 804.65 GB (863,991,636,480 bytes)
 Total Cylinders 105,041
 Total Sectors 1,687,483,665
 Total Tracks 26,785,455
 Tracks/Cylinder 255
 Partition Disk #13, Partition #0
 Partition Size 43.88 GB (47,114,371,584 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #13, Partition #1
 Partition Size 48.90 GB (52,510,187,520 bytes)
 Partition Starting Offset 47,114,403,840 bytes
 Partition Disk #13, Partition #2
 Partition Size 29.30 GB (31,461,696,000 bytes)
 Partition Starting Offset 99,624,591,360 bytes
 Partition Disk #13, Partition #3
 Partition Size 682.57 GB (732,905,349,120 bytes)
 Partition Starting Offset 131,086,287,360 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 ModelLSI MegaRAID 8888ELP 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 9
 SCSI Target ID 0
 Sectors/Track 63
 Size 804.65 GB (863,991,636,480 bytes)
 Total Cylinders 105,041
 Total Sectors 1,687,483,665
 Total Tracks 26,785,455
 Tracks/Cylinder 255
 Partition Disk #14, Partition #0
 Partition Size 43.88 GB (47,114,371,584 bytes)

Partition Starting Offset 32,256 bytes
Partition Disk #14, Partition #1
Partition Size 48.90 GB (52,510,187,520 bytes)
Partition Starting Offset 47,114,403,840 bytes
Partition Disk #14, Partition #2
Partition Size 29.30 GB (31,461,696,000 bytes)
Partition Starting Offset 99,624,591,360 bytes
Partition Disk #14, Partition #3
Partition Size 1.95 GB (2,097,446,400 bytes)
Partition Starting Offset 131,086,287,360 bytes

Description Disk drive
Manufacturer (Standard disk drives)
ModelLSI MegaRAID 8888ELP 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 9
SCSI Target ID 1
Sectors/Track 63
Size 804.65 GB (863,991,636,480 bytes)
Total Cylinders 105,041
Total Sectors 1,687,483,665
Total Tracks 26,785,455
Tracks/Cylinder 255
Partition Disk #15, Partition #0
Partition Size 43.88 GB (47,114,371,584 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #15, Partition #1
Partition Size 48.90 GB (52,510,187,520 bytes)
Partition Starting Offset 47,114,403,840 bytes
Partition Disk #15, Partition #2
Partition Size 29.30 GB (31,461,696,000 bytes)
Partition Starting Offset 99,624,591,360 bytes
Partition Disk #15, Partition #3
Partition Size 1.95 GB (2,097,446,400 bytes)
Partition Starting Offset 131,086,287,360 bytes

Description Disk drive
Manufacturer (Standard disk drives)
ModelLSI MegaRAID 8888ELP 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 5
SCSI Target ID 0
Sectors/Track 63
Size 804.65 GB (863,991,636,480 bytes)
Total Cylinders 105,041
Total Sectors 1,687,483,665
Total Tracks 26,785,455
Tracks/Cylinder 255
Partition Disk #6, Partition #0
Partition Size 43.88 GB (47,114,371,584 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #6, Partition #1
Partition Size 48.90 GB (52,510,187,520 bytes)
Partition Starting Offset 47,114,403,840 bytes
Partition Disk #6, Partition #2
Partition Size 29.30 GB (31,461,696,000 bytes)
Partition Starting Offset 99,624,591,360 bytes
Partition Disk #6, Partition #3
Partition Size 682.57 GB (732,905,349,120 bytes)
Partition Starting Offset 131,086,287,360 bytes

Description Disk drive
Manufacturer (Standard disk drives)
ModelLSI MegaRAID 8888ELP 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 5
SCSI Target ID 1
Sectors/Track 63
Size 804.65 GB (863,991,636,480 bytes)
Total Cylinders 105,041
Total Sectors 1,687,483,665
Total Tracks 26,785,455
Tracks/Cylinder 255
Partition Disk #7, Partition #0
Partition Size 43.88 GB (47,114,371,584 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #7, Partition #1
Partition Size 48.90 GB (52,510,187,520 bytes)
Partition Starting Offset 47,114,403,840 bytes
Partition Disk #7, Partition #2
Partition Size 29.30 GB (31,461,696,000 bytes)
Partition Starting Offset 99,624,591,360 bytes
Partition Disk #7, Partition #3
Partition Size 682.57 GB (732,905,349,120 bytes)
Partition Starting Offset 131,086,287,360 bytes

Description Disk drive
Manufacturer (Standard disk drives)
ModelLSI MegaRAID 8888ELP 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 0
Sectors/Track 63
Size 804.65 GB (863,991,636,480 bytes)
Total Cylinders 105,041
Total Sectors 1,687,483,665
Total Tracks 26,785,455
Tracks/Cylinder 255
Partition Disk #8, Partition #0
Partition Size 43.88 GB (47,114,371,584 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #8, Partition #1
Partition Size 48.90 GB (52,510,187,520 bytes)
Partition Starting Offset 47,114,403,840 bytes
Partition Disk #8, Partition #2
Partition Size 29.30 GB (31,461,696,000 bytes)
Partition Starting Offset 99,624,591,360 bytes
Partition Disk #8, Partition #3
Partition Size 682.57 GB (732,905,349,120 bytes)
Partition Starting Offset 131,086,287,360 bytes

Description Disk drive
Manufacturer (Standard disk drives)
ModelLSI MegaRAID 8888ELP 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 804.65 GB (863,991,636,480 bytes)
Total Cylinders 105,041
Total Sectors 1,687,483,665
Total Tracks 26,785,455
Tracks/Cylinder 255
Partition Disk #9, Partition #0
Partition Size 43.88 GB (47,114,371,584 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #9, Partition #1
Partition Size 48.90 GB (52,510,187,520 bytes)
Partition Starting Offset 47,114,403,840 bytes
Partition Disk #9, Partition #2
Partition Size 29.30 GB (31,461,696,000 bytes)
Partition Starting Offset 99,624,591,360 bytes
Partition Disk #9, Partition #3
Partition Size 682.57 GB (732,905,349,120 bytes)
Partition Starting Offset 131,086,287,360 bytes

[SCSI]

Item Value
Name LSI Logic MegaRAID SAS 8888ELP RAID Controller
Manufacturer LSI Logic Corp.,
Status OK
PNP Device ID
PCI\VEN_1000&DEV_0060&SUBSYS_10061000&REV_03\4&9BADCA&0&0008
Memory Address 0xA9000000-0xA90FFFFF
I/O Port 0x0000A000-0x0000AFFF
Memory Address 0xA9040000-0xA907FFFF
IRQ Channel IRQ 28
Driver:\windows\system32\drivers\msas2k3.sys (2.7.0.64 built by: WinDDK, 31.00 KB (31,744 bytes), 11/2/2007 8:11 PM)

Name Integrated Intel(R) RAID Controller SROMBSASFC
Manufacturer Intel(R) Corporation
Status OK
PNP Device ID
PCI\VEN_1000&DEV_0060&SUBSYS_34CC8086&REV_03\6&2A4BBC22&0&00000010
Memory Address 0x98A00000-0x98AFFFFF
I/O Port 0x00009000-0x00009FFF
Memory Address 0x98A40000-0x98A7FFFF
IRQ Channel IRQ 17
Driver:\windows\system32\drivers\msas2k3.sys (2.7.0.64 built by: WinDDK, 31.00 KB (31,744 bytes), 11/2/2007 8:11 PM)

Name LSI Logic MegaRAID SAS 8888ELP RAID Controller
Manufacturer LSI Logic Corp.,
Status OK
PNP Device ID
PCI\VEN_1000&DEV_0060&SUBSYS_10061000&REV_03\6&31EE89F2&0&00080010
Memory Address 0x98900000-0x989FFFFF
I/O Port 0x00008000-0x00008FFF
Memory Address 0x98940000-0x9897FFFF
IRQ Channel IRQ 18
Driver:\windows\system32\drivers\msas2k3.sys (2.7.0.64 built by: WinDDK, 31.00 KB (31,744 bytes), 11/2/2007 8:11 PM)

Name LSI Logic MegaRAID SAS 8888ELP RAID Controller
Manufacturer LSI Logic Corp.,
Status OK
PNP Device ID
PCI\VEN_1000&DEV_0060&SUBSYS_10061000&REV_03\6&83841D0&0&00100020
Memory Address 0xA5000000-0xA8FFFFFF

I/O Port 0x00006000-0x00006FFF
Memory Address 0xA5040000-0xA507FFFF
IRQ Channel IRQ 24
Driver:\windows\system32\drivers\msas2k3.sys (2.7.0.64 built by: WinDDK, 31.00 KB (31,744 bytes), 11/2/2007 8:11 PM)

Name LSI Logic MegaRAID SAS 8888ELP RAID Controller
Manufacturer LSI Logic Corp.,
Status OK
PNP Device ID
PCI\VEN_1000&DEV_0060&SUBSYS_10061000&REV_03\6&5131A95&0&00200020
Memory Address 0xA1000000-0xA8FFFFFFF
I/O Port 0x00005000-0x00006FFF
Memory Address 0xA1040000-0xA107FFFF
IRQ Channel IRQ 26
Driver:\windows\system32\drivers\msas2k3.sys (2.7.0.64 built by: WinDDK, 31.00 KB (31,744 bytes), 11/2/2007 8:11 PM)

Name LSI Logic MegaRAID SAS 8888ELP RAID Controller
Manufacturer LSI Logic Corp.,
Status OK
PNP Device ID
PCI\VEN_1000&DEV_0060&SUBSYS_10061000&REV_03\6&13D3EB1A&0&00100030
Memory Address 0xA0F00000-0xA0FFFFFFF
I/O Port 0x00004000-0x00004FFF
Memory Address 0xA0F40000-0xA0F7FFFF
IRQ Channel IRQ 27
Driver:\windows\system32\drivers\msas2k3.sys (2.7.0.64 built by: WinDDK, 31.00 KB (31,744 bytes), 11/2/2007 8:11 PM)

Name LSI Logic MegaRAID SAS 8888ELP RAID Controller
Manufacturer LSI Logic Corp.,
Status OK
PNP Device ID
PCI\VEN_1000&DEV_0060&SUBSYS_10061000&REV_03\6&2AEC0628&0&00200030
Memory Address 0xA0E00000-0xA0FFFFFFF
I/O Port 0x00003000-0x00004FFF
Memory Address 0xA0E40000-0xA0E7FFFF
IRQ Channel IRQ 25
Driver:\windows\system32\drivers\msas2k3.sys (2.7.0.64 built by: WinDDK, 31.00 KB (31,744 bytes), 11/2/2007 8:11 PM)

Name LSI Logic MegaRAID SAS 8888ELP RAID Controller
Manufacturer LSI Logic Corp.,
Status OK
PNP Device ID
PCI\VEN_1000&DEV_0060&SUBSYS_10061000&REV_03\4&199FF851&0&00E0
Memory Address 0xA0D00000-0xA0DFFFFFFF
I/O Port 0x00002000-0x00002FFF
Memory Address 0xA0D40000-0xA0D7FFFF
IRQ Channel IRQ 16
Driver:\windows\system32\drivers\msas2k3.sys (2.7.0.64 built by: WinDDK, 31.00 KB (31,744 bytes), 11/2/2007 8:11 PM)

[IDE]

Item Value
Name Intel(R) 631xESB/6321ESB/3100 Chipset Serial ATA Storage Controller - 2680
Manufacturer Intel
Status OK
PNP Device ID
PCI\VEN_8086&DEV_2680&SUBSYS_34CC8086&REV_09\3&B1BFB68&0&FA
I/O Port 0x0000B0A0-0x0000B0AF
Memory Address 0xA9100400-0xA91007FF

Driver:c:\windows\system32\drivers\pciide.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 6.00 KB (6,144 bytes), 2/18/2007 8:00 PM)

Name Primary IDE Channel
 Manufacturer (Standard IDE ATA/ATAPI controllers)
 Status OK
 PNP Device ID PCI\VEN\IDECHANNEL\4&152EB20B&0&0
 I/O Port 0x000001F0-0x000001F7
 I/O Port 0x000003F6-0x000003F6
 IRQ Channel IRQ 14
 Driver:c:\windows\system32\drivers\atap.sys (5.2.3790.3959 (srv03_sp2_rtm.070216-1710), 146.50 KB (150,016 bytes), 2/18/2007 8:00 PM)

Name Secondary IDE Channel
 Manufacturer (Standard IDE ATA/ATAPI controllers)
 Status OK
 PNP Device ID PCI\VEN\IDECHANNEL\4&152EB20B&0&0
 I/O Port 0x00000170-0x00000177
 I/O Port 0x00000376-0x00000376
 IRQ Channel IRQ 15
 Driver:c:\windows\system32\drivers\atap.sys (5.2.3790.3959 (srv03_sp2_rtm.070216-1710), 146.50 KB (150,016 bytes), 2/18/2007 8:00 PM)

[Printing]

Name DriverPort Name Server Name

[Problem Devices]

Device PNP Device ID Error Code

[USB]

Device PNP Device ID
 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host Controller - 2688
 PCI\VEN_8086&DEV_2688&SUBSYS_34CC8086&REV_09\3&B1BFB68&0&E8
 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host Controller - 2689
 PCI\VEN_8086&DEV_2689&SUBSYS_34CC8086&REV_09\3&B1BFB68&0&E9
 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host Controller - 268A
 PCI\VEN_8086&DEV_268A&SUBSYS_34CC8086&REV_09\3&B1BFB68&0&EA
 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host Controller - 268B
 PCI\VEN_8086&DEV_268B&SUBSYS_34CC8086&REV_09\3&B1BFB68&0&EB
 Intel(R) 631xESB/6321ESB/3100 Chipset USB2 Enhanced Host Controller - 268C
 PCI\VEN_8086&DEV_268C&SUBSYS_34CC8086&REV_09\3&B1BFB68&0&EF

[Software Environment]

[System Drivers]

Name	Description	File	Type	Started	Start Mode	State	Status
abiosdsk	Abiosdsk		Kernel Driver	Not Available	Kernel Driver	No	No
acpi	Microsoft ACPI Driver	c:\windows\system32\drivers\acpi.sys	Kernel Driver	Yes	Boot Running	OK Normal	Yes

Name	Description	File	Type	Started	Start Mode	State	Status
acpiec	ACPIEC	c:\windows\system32\drivers\acpiec.sys	Kernel Driver	No	Disabled Stopped	OK Normal	No
adpu160m	adpu160m		Kernel Driver	Not Available	Kernel Driver	No	No
adpu320	adpu320		Kernel Driver	Not Available	Kernel Driver	No	No
afd	AFD	c:\windows\system32\drivers\afd.sys	Kernel Driver	Yes	System Running	OK Normal	Yes
aic78u2	aic78u2		Kernel Driver	Not Available	Kernel Driver	No	No
aic78xx	aic78xx		Kernel Driver	Not Available	Kernel Driver	No	No
aliide	AliIde		Kernel Driver	Not Available	Kernel Driver	No	Disabled
amdide	AmdIde		Kernel Driver	Not Available	Kernel Driver	No	No
arc	arc		Kernel Driver	Not Available	Kernel Driver	No	Disabled
asynmac	RAS Asynchronous Media Driver	c:\windows\system32\drivers\asynmac.sys	Kernel Driver	Yes	Manual Running	OK Normal	Yes
atapi	Standard IDE/ESDI Hard Disk Controller	c:\windows\system32\drivers\atap.sys	Kernel Driver	Yes	Boot Running	OK Normal	Yes
atdisk	Atdisk		Kernel Driver	Not Available	Kernel Driver	No	No
atmarpc	ATM ARP Client Protocol	c:\windows\system32\drivers\atmarpc.sys	Kernel Driver	No	Manual Stopped	OK Normal	No
audstub	Audio Stub Driver	c:\windows\system32\drivers\audstub.sys	Kernel Driver	Yes	Manual Running	OK Normal	Yes
beep	Beep	c:\windows\system32\drivers\beep.sys	Kernel Driver	Yes	System Running	OK Normal	Yes
cdac15ba	CdaC15BA	c:\windows\system32\drivers\cdac15ba.sys	Kernel Driver	Yes	Auto Running	OK Normal	Yes
cdad10ba	CdaD10BA	c:\windows\system32\drivers\cdad10ba.sys	Kernel Driver	Yes	Auto Running	OK Normal	Yes
cdfs	Cdfs	c:\windows\system32\drivers\cdfs.sys	File System Driver	Yes	Disabled Running	OK Normal	Yes
cdrom	CD-ROM Driver	c:\windows\system32\drivers\cdrom.sys	Kernel Driver	Yes	System Running	OK Normal	Yes
changer	Changer		Kernel Driver	Not Available	Kernel Driver	No	No
clusdisk	Cluster Disk Driver	c:\windows\system32\drivers\clusdisk.sys	Kernel Driver	No	Disabled Stopped	OK Normal	No
cmdide	CmdIde		Kernel Driver	Not Available	Kernel Driver	No	No
cpqccism	cpqccism		Kernel Driver	Not Available	Kernel Driver	No	No
credisk	CRC Disk Filter Driver	c:\windows\system32\drivers\credisk.sys	Kernel Driver	Yes	Boot Running	OK Normal	Yes
dfsdriver	DfsDriver	c:\windows\system32\drivers\dfs.sys	File System Driver	Yes	Boot Running	OK Normal	No
disk	Disk Driver	c:\windows\system32\drivers\disk.sys	Kernel Driver	Yes	Boot Running	OK Normal	Yes
dmboot	dmboot	c:\windows\system32\drivers\dmboot.sys	Kernel Driver	No	Disabled Stopped	OK Normal	No
dmio	Logical Disk Manager Driver	c:\windows\system32\drivers\dmio.sys	Kernel Driver	Yes	Boot Running	OK Normal	Yes
dmload	dmload	c:\windows\system32\drivers\dmload.sys	Kernel Driver	Yes	Boot Running	OK Normal	Yes

Kernel Driver	Yes	Boot	Running	OK	Normal	
No	Yes					
dpti2odpti2o	Not Available	Kernel Driver	No	Disabled		
Stopped	OK	Normal	No	No		
e1express	Intel(R) PRO/1000 PCI Express Network Connection Driver					
c:\windows\system32\drivers\le1e5132e.sys	Kernel Driver					
Yes	Manual	Running	OK	Normal	No	Yes
elxstor	elxstor	Not Available	Kernel Driver	No		
Disabled	Stopped	OK	Normal	No	No	
fastfat	Fastfat	c:\windows\system32\drivers\fastfat.sys	File			
System Driver	No	Disabled	Stopped	OK	Normal	
No	No					
fdc	Fdc	c:\windows\system32\drivers\fdc.sys	Kernel Driver			
No	System	Stopped	OK	Ignore	No	No
fips	Fips	c:\windows\system32\drivers\fips.sys	Kernel Driver			
Yes	System	Running	OK	Normal	No	Yes
flpydisk	Flpydisk	c:\windows\system32\drivers\flpydisk.sys				
Kernel Driver	No	System	Stopped	OK	Ignore	
No	No					
fltmgr	FltMgr	c:\windows\system32\drivers\fltmgr.sys	File			
System Driver	Yes	Boot	Running	OK	Normal	No
Yes						
ftdisk	Volume Manager Driver	c:\windows\system32\drivers\ftdisk.sys				
Kernel Driver	Yes	Boot	Running	OK	Normal	
No	Yes					
gpc	Generic Packet Classifier	c:\windows\system32\drivers\msgpc.sys				
Kernel Driver	Yes	Manual	Running	OK	Normal	
No	Yes					
hidusb	Microsoft HID Class Driver					
c:\windows\system32\drivers\hidusb.sys	Kernel Driver					
Yes	Manual	Running	OK	Ignore	No	Yes
hpciss	hpciss	Not Available	Kernel Driver	No		
Disabled	Stopped	OK	Normal	No	No	
http	HTTP	c:\windows\system32\drivers\http.sys	Kernel Driver			
Yes	Manual	Running	OK	Normal	No	Yes
i2omgmt	i2omgmt	Not Available	Kernel Driver	No		
System	Stopped	OK	Normal	No	No	
i8042prt	i8042prt	c:\windows\system32\drivers\i8042prt.sys				
Kernel Driver	No	System	Stopped	OK	Ignore	
No	No					
iirsp	iirsp	Not Available	Kernel Driver	No	Disabled	
Stopped	OK	Normal	No	No		
imapi	CD-Burning Filter Driver	c:\windows\system32\drivers\imapi.sys				
Kernel Driver	No	System	Stopped	OK	Normal	
No	No					
intelde	IntellIde	Not Available	Kernel Driver	No		
Disabled	Stopped	OK	Normal	No	No	
intelppm	Intel Processor Driver					
c:\windows\system32\drivers\intelppm.sys	Kernel Driver					
Yes	Manual	Running	OK	Normal	No	Yes
ioatdma	Intel(R) QuickData Technology Device					
c:\windows\system32\drivers\ioatdma.sys	Kernel Driver					
Yes	Boot	Running	OK	Normal	No	Yes
ip6fw	IPv6 Windows Firewall Driver					
c:\windows\system32\drivers\ip6fw.sys	Kernel Driver					
No	Manual	Stopped	OK	Normal	No	No
ipfilterdriver	IP Traffic Filter Driver					
c:\windows\system32\drivers\ipfltdrv.sys	Kernel Driver					
No	Manual	Stopped	OK	Normal	No	No
ipinip	IP in IP Tunnel Driver	c:\windows\system32\drivers\ipinip.sys				
Kernel Driver	No	Manual	Stopped	OK	Normal	
No	No					
ipnat	IP Network Address Translator					
c:\windows\system32\drivers\ipnat.sys	Kernel Driver					
Manual	Stopped	OK	Normal	No	No	
ipsec	IPSEC driver	c:\windows\system32\drivers\ipsec.sys	Kernel			
Driver	Yes	System	Running	OK	Normal	No
Yes	System	Running	OK	Normal	No	Yes
isapnp	PnP ISA/EISA Bus Driver					
c:\windows\system32\drivers\isapnp.sys	Kernel Driver					
Yes	Boot	Running	OK	Critical	No	Yes

kbdclass	Keyboard Class Driver					
c:\windows\system32\drivers\kbdclass.sys	Kernel Driver					
Yes	System	Running	OK	Normal	No	Yes
kbdhid	Keyboard HID Driver					
c:\windows\system32\drivers\kbdhid.sys	Kernel Driver					
Yes	System	Running	OK	Ignore	No	Yes
ksecdd	KSecDD	c:\windows\system32\drivers\ksecdd.sys				
Kernel Driver	Yes	Boot	Running	OK	Normal	
No	Yes					
ksthunk	Kernel Streaming WOW64 Thunk Service					
c:\windows\system32\drivers\ksthunk.sys	Kernel Driver					
Yes	Manual	Running	OK	Normal	No	Yes
lp6nds35	lp6nds35	Not Available	Kernel Driver	No		
Disabled	Stopped	OK	Normal	No	No	
mmdd	mmdd	c:\windows\system32\drivers\mmdd.sys				
Kernel Driver	Yes	System	Running	OK	Ignore	
No	Yes					
modem	Modem	c:\windows\system32\drivers\modem.sys				
Kernel Driver	No	Manual	Stopped	OK	Ignore	
No	No					
mouclass	Mouse Class Driver					
c:\windows\system32\drivers\mouclass.sys	Kernel Driver					
Yes	System	Running	OK	Normal	No	Yes
mouhid	Mouse HID Driver					
c:\windows\system32\drivers\mouhid.sys	Kernel Driver					
Yes	Manual	Running	OK	Ignore	No	Yes
mountmgr	Mount Point Manager					
c:\windows\system32\drivers\mountmgr.sys	Kernel Driver					
Yes	Boot	Running	OK	Normal	No	Yes
mraid35x	mraid35x	Not Available	Kernel Driver	No		
Disabled	Stopped	OK	Normal	No	No	
mrxdav	WebDav Client Redirector					
c:\windows\system32\drivers\mrxdav.sys	File System Driver					
No	Manual	Stopped	OK	Normal	No	No
mrxsmb	MRXSMB	c:\windows\system32\drivers\mrxsmb.sys				
File System Driver	Yes	System	Running	OK	Normal	
No	Yes					
msas2k3	msas2k3	c:\windows\system32\drivers\msas2k3.sys				
Kernel Driver	Yes	Boot	Running	OK	Normal	
No	Yes					
msfs	Msfs	c:\windows\system32\drivers\msfs.sys	File System Driver			
Yes	System	Running	OK	Normal	No	Yes
mssmbios	Microsoft System Management BIOS Driver					
c:\windows\system32\drivers\mssmbios.sys	Kernel Driver					
Yes	Manual	Running	OK	Normal	No	Yes
mup	Mup	c:\windows\system32\drivers\mup.sys	File System Driver			
Yes	Boot	Running	OK	Normal	No	Yes
ndis	NDIS System Driver	c:\windows\system32\drivers\ndis.sys				
Kernel Driver	Yes	Boot	Running	OK	Normal	
No	Yes					
ndistapi	Remote Access NDIS TAPI Driver					
c:\windows\system32\drivers\ndistapi.sys	Kernel Driver					
Yes	Manual	Running	OK	Normal	No	Yes
ndisuio	NDIS Usermode I/O Protocol					
c:\windows\system32\drivers\ndisuio.sys	Kernel Driver					
No	Manual	Stopped	OK	Normal	No	No
ndiswan	Remote Access NDIS WAN Driver					
c:\windows\system32\drivers\ndiswan.sys	Kernel Driver					
Yes	Manual	Running	OK	Normal	No	Yes
ndproxy	NDIS Proxy	c:\windows\system32\drivers\ndproxy.sys				
Kernel Driver	Yes	Manual	Running	OK	Normal	
No	Yes					
netbios	NetBIOS Interface	c:\windows\system32\drivers\netbios.sys				
File System Driver	Yes	System	Running	OK	Normal	
No	Yes					
netbt	NetBios over Tcpip	c:\windows\system32\drivers\netbt.sys				
Kernel Driver	Yes	System	Running	OK	Normal	
No	Yes					
nfrd960	nfrd960	Not Available	Kernel Driver	No		
Disabled	Stopped	OK	Normal	No	No	

wlbs Network Load Balancing c:\windows\system32\drivers\wlbs.sys
 Kernel Driver No Manual Stopped OK Normal
 No No

[Signed Drivers]

Device Name	Signed	Device Class	Driver Version	Driver
Date Manufacturer	INF Name	Driver Name	Device ID	
Microsoft System Management	5.2.3790.3959	BIOS Driver	Yes SYSTEM	
machine.inf	10/1/2002	(Standard system devices)	ROOT\SYSTEM\0002	
Microcode Update Device	Yes	SYSTEM	5.2.3790.3959	
10/1/2002	(Standard system devices)	machine.inf	Not Available	
ROOT\SYSTEM\0001				
RAS Async Adapter	Yes	NET	5.2.3790.1830	10/1/2002
Microsoft netrasa.inf	Not Available			
SW\{EEAB7790-C514-11D1-B42B-00805FC1270E}\ASYNCM				
AC				
Plug and Play Software Device Enumerator	Yes	SYSTEM		
5.2.3790.3959	10/1/2002	(Standard system devices)	ROOT\SYSTEM\0000	
machine.inf	Not Available			
Terminal Server Mouse Driver	Yes	SYSTEM	5.2.3790.3959	
10/1/2002	(Standard system devices)	machine.inf	Not Available	
ROOT\RDPMOU\0000				
Terminal Server Keyboard Driver	Yes	SYSTEM	5.2.3790.3959	
10/1/2002	(Standard system devices)	machine.inf	Not Available	
ROOT\RDPKBD\0000				
Terminal Server Device Redirector	Yes	SYSTEM	5.2.3790.3959	
10/1/2002	(Standard system devices)	machine.inf	Not Available	
ROOT\RDPRD\0000				
Direct Parallel	Yes	NET	5.2.3790.1830	10/1/2002
Microsoft netrasa.inf	Not Available			
ROOT\MS_PT\MINIPORT\0000				
WAN Miniport (PPTP)	Yes	NET	5.2.3790.1830	10/1/2002
Microsoft netrasa.inf	Not Available			
ROOT\MS_PPTP\MINIPORT\0000				
WAN Miniport (PPPOE)	Yes	NET	5.2.3790.1830	10/1/2002
Microsoft netrasa.inf	Not Available			
ROOT\MS_PPPOE\MINIPORT\0000				
WAN Miniport (IP)	Yes	NET	5.2.3790.1830	10/1/2002
Microsoft netrasa.inf	Not Available			
ROOT\MS_NDIS\WANIP\0000				
WAN Miniport (L2TP)	Yes	NET	5.2.3790.1830	10/1/2002
Microsoft netrasa.inf	Not Available			
ROOT\MS_L2TP\MINIPORT\0000				
Video Codecs	Yes	MEDIA	5.2.3790.1830	10/1/2002
(Standard system devices)	wave.inf	Not Available		
ROOT\MEDIA\MS_MMVID				
Legacy Video Capture Devices	Yes	MEDIA	5.2.3790.1830	
10/1/2002	(Standard system devices)	wave.inf	Not Available	
ROOT\MEDIA\MS_MMVCD				
Media Control Devices	Yes	MEDIA	5.2.3790.1830	
10/1/2002	(Standard system devices)	wave.inf	Not Available	
ROOT\MEDIA\MS_MMMCI				
Legacy Audio Drivers	Yes	MEDIA	5.2.3790.1830	
10/1/2002	(Standard system devices)	wave.inf	Not Available	
ROOT\MEDIA\MS_MMDRV				
Audio Codecs	Yes	MEDIA	5.2.3790.1830	10/1/2002
(Standard system devices)	wave.inf	Not Available		
ROOT\MEDIA\MS_MMACM				
Remote Access IP ARP Driver	Not Available	LEGACYDRIVER		
Not Available	Not Available	Not Available	Not Available	Not Available
Available	Not Available	ROOT\LEGACY_WANARP\0000		
Storage volumes	Not Available	LEGACYDRIVER	Not Available	
Not Available	Not Available	Not Available	Not Available	Not Available
Available	ROOT\LEGACY_VOLS\SNAP\0000			
TDTCP	Not Available	LEGACYDRIVER	Not Available	
Not Available	Not Available	Not Available	Not Available	Not Available
Available	ROOT\LEGACY_TDTCP\0000			
TCP/IP Protocol Driver	Not Available	LEGACYDRIVER	Not Available	

Available	Not Available	Not Available	Not Available	
Not Available	ROOT\LEGACY_TCPIP\0000			
Security Driver	Not Available	LEGACYDRIVER	Not Available	
Not Available	Not Available	Not Available	Not Available	Not Available
Available	ROOT\LEGACY_SEC\DRV\0000			
RDPWD	Not Available	LEGACYDRIVER	Not Available	
Not Available	Not Available	Not Available	Not Available	Not Available
Available	ROOT\LEGACY_RDPWD\0000			
RDPCCD	Not Available	LEGACYDRIVER	Not Available	
Not Available	Not Available	Not Available	Not Available	Not Available
Available	ROOT\LEGACY_RDPCCD\0000			
Remote Access Auto Connection Driver		Not Available		
LEGACYDRIVER	Not Available	Not Available	Not Available	Not Available
Available	Not Available	Not Available		
ROOT\LEGACY_RAS\ACD\0000				
pmxdrv	Not Available	LEGACYDRIVER	Not Available	
Not Available	Not Available	Not Available	Not Available	Not Available
Available	ROOT\LEGACY_PMX\DRV\0000			
Partition Manager	Not Available	LEGACYDRIVER	Not Available	
Not Available	Not Available	Not Available	Not Available	Not Available
Available	ROOT\LEGACY_PART\MGR\0000			
Null	Not Available	LEGACYDRIVER	Not Available	Not Available
Available	Not Available	Not Available	Not Available	Not Available
ROOT\LEGACY_NULL\0000				
NetBios over Tcpip	Not Available	LEGACYDRIVER	Not Available	
Available	Not Available	Not Available	Not Available	Not Available
Not Available	ROOT\LEGACY_NET\BT\0000			
NDProxy	Not Available	LEGACYDRIVER	Not Available	
Not Available	Not Available	Not Available	Not Available	Not Available
Available	ROOT\LEGACY_NDP\PROXY\0000			
NDIS Usermode I/O Protocol	Not Available	LEGACYDRIVER		
Not Available	Not Available	Not Available	Not Available	Not Available
Available	Not Available	ROOT\LEGACY_NDIS\UIO\0000		
Remote Access NDIS TAPI Driver	Not Available			
LEGACYDRIVER	Not Available	Not Available	Not Available	Not Available
Available	Not Available	Not Available		
ROOT\LEGACY_NDIS\TAPI\0000				
NDIS System Driver	Not Available	LEGACYDRIVER	Not Available	
Available	Not Available	Not Available	Not Available	Not Available
Not Available	ROOT\LEGACY_NDIS\0000			
mountmgr	Not Available	LEGACYDRIVER	Not Available	
Not Available	Not Available	Not Available	Not Available	Not Available
Available	ROOT\LEGACY_MOUNT\MGR\0000			
mmdd	Not Available	LEGACYDRIVER	Not Available	
Not Available	Not Available	Not Available	Not Available	Not Available
Available	ROOT\LEGACY_MN\MDD\0000			
ksecdd	Not Available	LEGACYDRIVER	Not Available	
Not Available	Not Available	Not Available	Not Available	Not Available
Available	ROOT\LEGACY_KSEC\DD\0000			
IPSEC driver	Not Available	LEGACYDRIVER	Not Available	
Not Available	Not Available	Not Available	Not Available	Not Available
Available	ROOT\LEGACY_IPSEC\0000			
IP Network Address Translator	Not Available	LEGACYDRIVER		
Not Available	Not Available	Not Available	Not Available	Not Available
Available	Not Available	ROOT\LEGACY_IP\NAT\0000		
HTTP	Not Available	LEGACYDRIVER	Not Available	Not Available
Available	Not Available	Not Available	Not Available	Not Available
ROOT\LEGACY_HTTP\0000				
Generic Packet Classifier	Not Available	LEGACYDRIVER	Not Available	
Available	Not Available	Not Available	Not Available	Not Available
Not Available	ROOT\LEGACY_GPC\0000			
Fips	Not Available	LEGACYDRIVER	Not Available	Not Available
Available	Not Available	Not Available	Not Available	Not Available
ROOT\LEGACY_FIPS\0000				
dmload	Not Available	LEGACYDRIVER	Not Available	
Not Available	Not Available	Not Available	Not Available	Not Available
Available	ROOT\LEGACY_DM\LOAD\0000			
dmboot	Not Available	LEGACYDRIVER	Not Available	
Not Available	Not Available	Not Available	Not Available	Not Available
Available	ROOT\LEGACY_DM\BOOT\0000			

Microsoft volume.inf Not Available	4OFFSETC35704E00LENGTH1551237600		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925F3	Generic volume Yes VOLUME 5.2.3790.1830	10/1/2002	
OFFSET7E00LENGTHAF83C4200	Microsoft volume.inf Not Available		
Generic volume Yes VOLUME 5.2.3790.1830	STORAGE\VOLUME1&30A96598&0&SIGNATURE2E88BF0		
Microsoft volume.inf Not Available	4OFFSET753436200LENGTH4E22CEC00		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925FD	Generic volume Yes VOLUME 5.2.3790.1830	10/1/2002	
OFFSET1E855A0200LENGTHAAA4902000	Microsoft volume.inf Not Available		
Generic volume Yes VOLUME 5.2.3790.1830	STORAGE\VOLUME1&30A96598&0&SIGNATURE2E88BF0		
Microsoft volume.inf Not Available	4OFFSET7E00LENGTH75342E400		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925FD	Generic volume Yes VOLUME 5.2.3790.1830	10/1/2002	
OFFSET173216A000LENGTH753436200	Microsoft volume.inf Not Available		
Generic volume Yes VOLUME 5.2.3790.1830	STORAGE\VOLUME1&30A96598&0&SIGNATURED3FF02D		
Microsoft volume.inf Not Available	EOFFSET1388362E00LENGTHDFE5D9600		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925FD	Generic volume Yes VOLUME 5.2.3790.1830	10/1/2002	
OFFSETAF83CC000LENGTHC39D9E000	Microsoft volume.inf Not Available		
Generic volume Yes VOLUME 5.2.3790.1830	STORAGE\VOLUME1&30A96598&0&SIGNATURED3FF02D		
Microsoft volume.inf Not Available	EOFFSET7E00LENGTHI38835B000		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925FD	Generic volume Yes VOLUME 5.2.3790.1830	10/1/2002	
OFFSET7E00LENGTHAF83C4200	Microsoft volume.inf Not Available		
Generic volume Yes VOLUME 5.2.3790.1830	STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C9		
Microsoft volume.inf Not Available	OFFSET1E855A0200LENGTHAAA4902000		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925FF	Generic volume Yes VOLUME 5.2.3790.1830	10/1/2002	
OFFSET1E855A0200LENGTHAAA4902000	Microsoft volume.inf Not Available		
Generic volume Yes VOLUME 5.2.3790.1830	STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C9		
Microsoft volume.inf Not Available	OFFSET173216A000LENGTH753436200		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925FF	Generic volume Yes VOLUME 5.2.3790.1830	10/1/2002	
OFFSET173216A000LENGTH753436200	Microsoft volume.inf Not Available		
Generic volume Yes VOLUME 5.2.3790.1830	STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C9		
Microsoft volume.inf Not Available	OFFSETAF83CC000LENGTHC39D9E000		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925FF	Generic volume Yes VOLUME 5.2.3790.1830	10/1/2002	
OFFSETAF83CC000LENGTHC39D9E000	Microsoft volume.inf Not Available		
Generic volume Yes VOLUME 5.2.3790.1830	STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C9		
Microsoft volume.inf Not Available	OFFSET7E00LENGTHAF83C4200		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925FF	Generic volume Yes VOLUME 5.2.3790.1830	10/1/2002	
OFFSET7E00LENGTHAF83C4200	Microsoft volume.inf Not Available		
Generic volume Yes VOLUME 5.2.3790.1830	STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C		
Microsoft volume.inf Not Available	BOFFSET1E855A0200LENGTHAAA4902000		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C1	Generic volume Yes VOLUME 5.2.3790.1830	10/1/2002	
OFFSET1E855A0200LENGTHAAA4902000	Microsoft volume.inf Not Available		
Generic volume Yes VOLUME 5.2.3790.1830	STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C		
Microsoft volume.inf Not Available	BOFFSET173216A000LENGTH753436200		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C1	Generic volume Yes VOLUME 5.2.3790.1830	10/1/2002	
OFFSET173216A000LENGTH753436200	Microsoft volume.inf Not Available		
Generic volume Yes VOLUME 5.2.3790.1830	STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C		
Microsoft volume.inf Not Available	BOFFSETAF83CC000LENGTHC39D9E000		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C1	Generic volume Yes VOLUME 5.2.3790.1830	10/1/2002	
OFFSETAF83CC000LENGTHC39D9E000	Microsoft volume.inf Not Available		
Generic volume Yes VOLUME 5.2.3790.1830	STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C		
Microsoft volume.inf Not Available	BOFFSET7E00LENGTHAF83C4200		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C1	Volume Manager Yes SYSTEM 5.2.3790.3959	10/1/2002	
OFFSET7E00LENGTHAF83C4200	(Standard system devices)machine.inf Not Available		
Generic volume Yes VOLUME 5.2.3790.1830	ROOT\FTDISK\0000		
Microsoft volume.inf Not Available	Logical Disk Manager Yes SYSTEM 5.2.3790.3959		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C3	10/1/2002 (Standard system devices)machine.inf Not Available		
OFFSET1E855A0200LENGTHAAA4902000	ROOT\DMIO\0000		
Generic volume Yes VOLUME 5.2.3790.1830	ACPI Fixed Feature Button Yes SYSTEM 5.2.3790.3959		
Microsoft volume.inf Not Available	10/1/2002 (Standard system devices)machine.inf Not Available		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C3	ACPI\FIXEDBUTTON\2&DABA3FF&0		
OFFSET173216A000LENGTH753436200	Motherboard resources Yes SYSTEM 5.2.3790.3959		
Generic volume Yes VOLUME 5.2.3790.1830	10/1/2002 (Standard system devices)machine.inf Not Available		
Microsoft volume.inf Not Available	ACPI\PNP0C02\3&B1BFB68&0		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C3	Intel(R) 631xESB/6321ESB/3100 Chipset SMBus Controller - 269B		
OFFSETAF83CC000LENGTHC39D9E000	Yes SYSTEM 8.3.0.1011 2/6/2007 Intel oem4.inf		
Generic volume Yes VOLUME 5.2.3790.1830	Not Available		
Microsoft volume.inf Not Available	PCI\VEN_8086&DEV_269B&SUBSYS_34CC8086&REV_09\3		
STORAGE\VOLUME1&30A96598&0&SIGNATURE237925C3	&B1BFB68&0&FB		
OFFSET7E00LENGTHAF83C4200	Secondary IDE Channel Yes HDC 5.2.3790.1830	10/1/2002	
Generic volume Yes VOLUME 5.2.3790.1830	(Standard IDE ATA/ATAPI controllers) mshdc.inf Not		
Microsoft volume.inf Not Available	Available PCI\IDE\CHANNEL4&152EB20B&0&1		
STORAGE\VOLUME1&30A96598&0&SIGNATURE2E88BF0	CD-ROM Drive Yes CDROM 5.2.3790.1830	10/1/2002	

(Standard CD-ROM drives) cdrom.inf Not Available
 IDE\CDROMOPTIARC_DVD-ROM_DDU810A
 RX02\5&A09E987&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\IDECHANNEL4&152EB20B&0&0
 Intel(R) 631xESB/6321ESB/3100 Chipset Serial ATA Storage Controller
 - 2680 Yes HDC 8.2.0.1011 11/15/2006 Intel oem6.inf Not
 Available
 PCIVEN_8086&DEV_2680&SUBSYS_34CC8086&REV_09\3&
 B1BFB68&0&FA
 High precision event timer Yes SYSTEM 5.2.3790.3959
 10/1/2002 (Standard system devices) machine.inf Not Available
 ACPI\PNP0103\4&2BCB8B90&0
 STMicroelectronics Trusted Platform Module Yes SYSTEM 1.0.4.14
 5/18/2005 STMicroelectronics oem16.inf Not Available
 ACPI\PNP0C31\4&2BCB8B90&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
 Motherboard resources Yes SYSTEM 5.2.3790.3959
 10/1/2002 (Standard system devices) machine.inf Not Available
 ACPI\PNP0C02\4&2BCB8B90&0
 System speaker Yes SYSTEM 5.2.3790.3959 10/1/2002
 (Standard system devices) machine.inf Not Available
 ACPI\PNP0800\4&2BCB8B90&0
 System timer Yes SYSTEM 5.2.3790.3959 10/1/2002
 (Standard system devices) machine.inf Not Available
 ACPI\PNP0100\4&2BCB8B90&0
 Numeric data processor Yes SYSTEM 5.2.3790.3959
 10/1/2002 (Standard system devices) machine.inf Not Available
 ACPI\PNP0C04\4&2BCB8B90&0
 Programmable interrupt controller Yes SYSTEM 5.2.3790.3959
 10/1/2002 (Standard system devices) machine.inf Not Available
 ACPI\PNP0000\4&2BCB8B90&0
 System CMOS/real time clock Yes SYSTEM 5.2.3790.3959
 10/1/2002 (Standard system devices) machine.inf Not Available
 ACPI\PNP0B00\4&2BCB8B90&0
 Direct memory access controller Yes SYSTEM 5.2.3790.3959
 10/1/2002 (Standard system devices) machine.inf Not Available
 ACPI\PNP0200\4&2BCB8B90&0
 Intel(R) 631xESB/6321ESB/3100 Chipset LPC Interface Controller -
 2670 Yes SYSTEM 8.3.0.1011 2/6/2007 Intel oem4.inf
 Not Available
 PCIVEN_8086&DEV_2670&SUBSYS_00000000&REV_09\3&
 B1BFB68&0&F8
 Plug and Play Monitor Yes MONITOR 5.2.3790.1830
 10/1/2002 (Standard monitor types) monitor.inf Not Available
 DISPLAY\LEN0901\5&2EA8B33&0&12345678&18&0C
 Standard VGA Graphics Adapter Yes DISPLAY 5.2.3790.1830
 10/1/2002 (Standard display types) display.inf Not Available
 PCIVEN_1002&DEV_515E&SUBSYS_34CC8086&REV_02\4
 &213AFEB0&0&60F0
 Intel(R) 82801 PCI Bridge - 244E Yes SYSTEM 5.2.3790.3959
 10/1/2002 Intel machine.inf Not Available
 PCIVEN_8086&DEV_244E&SUBSYS_00000000&REV_D9\3&
 B1BFB68&0&F0
 Generic USB Hub Yes USB 5.2.3790.1830 10/1/2002
 (Generic USB Hub) usb.inf Not Available
 USB\VID_0424&PID_2504\5&388CD002&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&1B2FC74C&0
 Intel(R) 631xESB/6321ESB/3100 Chipset USB2 Enhanced Host
 Controller - 268C Yes USB 7.4.0.1005 5/15/2006 Intel
 oem7.inf Not Available
 PCIVEN_8086&DEV_268C&SUBSYS_34CC8086&REV_09\3

&B1BFB68&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&21C15BA4&0
 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host
 Controller - 268B Yes USB 7.4.0.1005 5/15/2006 Intel
 oem7.inf Not Available
 PCIVEN_8086&DEV_268B&SUBSYS_34CC8086&REV_09\3
 &B1BFB68&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&284A6A07&0
 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host
 Controller - 268A Yes USB 7.4.0.1005 5/15/2006 Intel
 oem7.inf Not Available
 PCIVEN_8086&DEV_268A&SUBSYS_34CC8086&REV_09\3
 &B1BFB68&0&EA
 Logitech USB First/Pilot Mouse+ Yes MOUSE 5.2.3790.1830
 10/1/2002 Logitech msmouse.inf Not Available
 HID\VID_046D&PID_C001\6&3B2F4551&0&0000
 Logitech USB First/Pilot Mouse+ Yes HIDCLASS 5.2.3790.1830
 10/1/2002 Logitech input.inf Not Available
 USB\VID_046D&PID_C001\5&1F462798&0&2
 HID-compliant consumer control device Yes HIDCLASS
 5.2.3790.1830 10/1/2002 Microsoft hidserv.inf Not
 Available
 HID\VID_05AF&PID_0802&MI_01&COL02\7&CD1C0E8&0&
 0001
 HID-compliant device Yes HIDCLASS 5.2.3790.1830
 10/1/2002 (Standard system devices) input.inf Not Available
 HID\VID_05AF&PID_0802&MI_01&COL01\7&CD1C0E8&0&
 0000
 USB Human Interface Device Yes HIDCLASS 5.2.3790.1830
 10/1/2002 (Standard system devices) input.inf Not Available
 USB\VID_05AF&PID_0802&MI_01\6&819D0CF&0&0001
 HID Keyboard Device Yes KEYBOARD 5.2.3790.1830
 10/1/2002 (Standard keyboards) keyboard.inf Not Available
 HID\VID_05AF&PID_0802&MI_00\7&2001DD26&0&0000
 USB Human Interface Device Yes HIDCLASS 5.2.3790.1830
 10/1/2002 (Standard system devices) input.inf Not Available
 USB\VID_05AF&PID_0802&MI_00\6&819D0CF&0&0000
 USB Composite Device Yes USB 5.2.3790.1830 10/1/2002
 (Standard USB Host Controller) usb.inf Not Available
 USB\VID_05AF&PID_0802\5&1F462798&0&1
 USB Root Hub Yes USB 5.2.3790.1830 10/1/2002
 (Standard USB Host Controller) usbport.inf Not Available
 USB\ROOT_HUB\4&19E41D90&0
 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host
 Controller - 2689 Yes USB 7.4.0.1005 5/15/2006 Intel
 oem7.inf Not Available
 PCIVEN_8086&DEV_2689&SUBSYS_34CC8086&REV_09\3&
 B1BFB68&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&24DA88B7&0
 Intel(R) 631xESB/6321ESB/3100 Chipset USB Universal Host
 Controller - 2688 Yes USB 7.4.0.1005 5/15/2006 Intel
 oem7.inf Not Available
 PCIVEN_8086&DEV_2688&SUBSYS_34CC8086&REV_09\3&
 B1BFB68&0&E8
 Intel(R) RAID Virtual Device Yes SYSTEM 2.15.0.64
 6/25/2007 INTEL(R) Corporation oem0.inf Not Available
 SCSI\OTHER&VEN__RAID&PROD_DUMMYDEVICE&RE
 V_0001\5&39B7104B&0&014000
 Disk drive Yes DISKDRIVE 5.2.3790.1830 10/1/2002
 (Standard disk drives) disk.inf Not Available
 SCSI\DISK&VEN_LSI&PROD_MEGARAID_8888ELP&REV_1
 .12\5&39B7104B&0&010100
 Disk drive Yes DISKDRIVE 5.2.3790.1830 10/1/2002
 (Standard disk drives) disk.inf Not Available

SCSNDISK&VEN_LSI&PROD_MEGARAID_8888ELP&REV_1
.12V5&39B7104B&0&010000
Newisys S50 SAS Backplane Device No SYSTEM 5.2.0.15317
9/15/2007 ADAPTEC, INC. oem20.inf Not Available
SCSNCLOSURE&VEN_NEWISYS&PROD_SANBLOC_S50
&REV_T024V5&39B7104B&0&002D00
Newisys S50 SAS Backplane Device No SYSTEM 5.2.0.15317
9/15/2007 ADAPTEC, INC. oem20.inf Not Available
SCSNCLOSURE&VEN_NEWISYS&PROD_SANBLOC_S50
&REV_T024V5&39B7104B&0&002000
LSI Logic MegaRAID SAS 8888ELP RAID Controller Yes
SCSIADAPTER 2.7.0.64 11/3/2006 LSI Logic Corp.,
oem18.inf Not Available
PCIVEN_1000&DEV_0060&SUBSYS_10061000&REV_03V4&
199FF851&0&00E0
Intel(R) 631xESB/6321ESB/3100 Chipset PCI Express Root Port 1 -
2690 Yes SYSTEM 8.3.0.1011 2/6/2007 Intel oem4.inf
Not Available
PCIVEN_8086&DEV_2690&SUBSYS_00000000&REV_09V3&
B1BFB68&0&E0
Intel(R) 7300 Chipset FBD Branch 1 Registers - 3610 Yes
SYSTEM 8.4.0.1011 4/16/2007 Intel oem5.inf Not
Available
PCIVEN_8086&DEV_3610&SUBSYS_00000000&REV_01V3&
B1BFB68&0&B0
Intel(R) 7300 Chipset FBD Branch 0 Registers - 360F Yes
SYSTEM 8.4.0.1011 4/16/2007 Intel oem5.inf Not
Available
PCIVEN_8086&DEV_360F&SUBSYS_00000000&REV_01V3&
B1BFB68&0&A8
Intel(R) 7300 Chipset Debug and Miscellaneous Registers - 360E
Yes SYSTEM 8.4.0.1011 4/16/2007 Intel oem5.inf
Not Available
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B1BFB68&0&98
Intel(R) 7300 Chipset Snoop Filter Registers - 360D Yes SYSTEM
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Intel(R) 7300 Chipset FSB Registers - 360C Yes SYSTEM
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Intel(R) 7300 Chipset FSB Registers - 360C Yes SYSTEM
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Intel(R) 7300 Chipset QuickData Technology Device - 360B Yes
SYSTEM 1.2.74.4 5/31/2007 Intel oem13.inf Not
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Intel(R) RAID Virtual Device Yes SYSTEM 2.15.0.64
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PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.3959
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LSI Logic MegaRAID SAS 8888ELP RAID Controller Yes
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PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.3959
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PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.3959
10/1/2002 (Standard system devices)machine.inf Not Available
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Intel(R) 7300 Chipset PCI Express Port 6 - 3609 Yes SYSTEM
8.4.0.1011 4/16/2007 Intel oem5.inf Not Available
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LSI Logic MegaRAID SAS 8888ELP RAID Controller Yes
SCSIADAPTER 2.7.0.64 11/3/2006 LSI Logic Corp.,
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PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.3959
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Disk drive Yes DISKDRIVE 5.2.3790.1830 10/1/2002
(Standard disk drives) disk.inf Not Available
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LSI Logic MegaRAID SAS 8888ELP RAID Controller Yes
SCSIADAPTER 2.7.0.64 11/3/2006 LSI Logic Corp.,
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Yes SYSTEM 8.3.0.1011 2/6/2007 Intel oem4.inf
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Intel(R) PRO/1000 EB Network Connection with I/O Acceleration
Yes NET 9.9.13.0 6/19/2007 Intel oem9.inf Not
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Yes SYSTEM 8.3.0.1011 2/6/2007 Intel oem4.inf
Not Available
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Newisys S50 SAS Backplane Device No SYSTEM 5.2.0.15317
9/15/2007 ADAPTEC, INC. oem20.inf Not Available
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Newisys S50 SAS Backplane Device No SYSTEM 5.2.0.15317
9/15/2007 ADAPTEC, INC. oem20.inf Not Available
SCSNENCLOSURE&VEN_NEWISYS&PROD_SANBLOC_S50
&REV_T024V7&26DAEB6A&0&001C00
LSI Logic MegaRAID SAS 8888ELP RAID Controller Yes
SCSIADAPTER 2.7.0.64 11/3/2006 LSI Logic Corp.,
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Yes SYSTEM 8.3.0.1011 2/6/2007 Intel oem4.inf
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 LSI Logic MegaRAID SAS 8888ELP RAID Controller Yes
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 5.2.3790.3959 10/1/2002 (Standard computers) hal.inf
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 SQL Server\90\DTSDTS\Binn\;C:\Program Files\Microsoft SQL
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GenuineIntel<SYSTEM>
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[Print Jobs]

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

[Network Connections]

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

Name	Path	Process ID	Priority	Min Working Set	Max Working Set
Set	Start Time	Version	Size	File Date	
system	idle	process	Not Available	0	0
	Not Available	Not Available	Not Available	Not Available	Not Available
system	Not Available	Not Available	4	8	0
	Not Available	Not Available	Not Available	Not Available	Not Available
smss.exe	Not Available	360	11	200	1380
	2:56 AM	Not Available	Not Available	Not Available	1/10/2008
csrss.exe	Not Available	408	13	Not Available	Not Available
	Available	1/10/2008 2:56 AM	Not Available	Not Available	Not Available
winlogon.exe	c:\windows\system32\winlogon.exe	432	13	200	1380
	200	1380	1/10/2008 2:56 AM	5.2.3790.3959	
	(srv03_sp2_rtm.070216-1710)	922.00 KB (944,128 bytes)			
	2/18/2007 8:00 PM				
services.exe	c:\windows\system32\services.exe	480	9	200	200
	1380	1/10/2008 2:56 AM	5.2.3790.3959		
	(srv03_sp2_rtm.070216-1710)	219.00 KB (224,256 bytes)			
	2/18/2007 8:00 PM				
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	1/10/2008 2:56 AM	5.2.3790.1830			
	(srv03_sp1_rtm.050324-1447)	14.00 KB (14,336 bytes)			
	8:00 PM				
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	1380	1/10/2008 2:56 AM	5.2.3790.3959		
	(srv03_sp2_rtm.070216-1710)	25.00 KB (25,600 bytes)			
	2/18/2007				

```

8:00 PM
svchost.exe Not Available 732 8 Not Available Not
Available 1/10/2008 2:56 AM Not Available Not Available
Not Available
svchost.exe Not Available 800 8 Not Available Not
Available 1/10/2008 2:56 AM Not Available Not Available
Not Available
svchost.exe Not Available 836 8 Not Available Not
Available 1/10/2008 2:56 AM Not Available Not Available
Not Available
svchost.exe c:\windows\system32\svchost.exe 864 8 200
1380 1/10/2008 2:56 AM 5.2.3790.3959
(srv03_sp2_rtm.070216-1710) 25.00 KB (25,600 bytes) 2/18/2007
8:00 PM
msdtc.exe Not Available 976 8 Not Available Not
Available 1/10/2008 2:56 AM Not Available Not Available
Not Available
svchost.exe c:\windows\system32\svchost.exe 1096 8 200
1380 1/10/2008 2:56 AM 5.2.3790.3959
(srv03_sp2_rtm.070216-1710) 25.00 KB (25,600 bytes) 2/18/2007
8:00 PM
inetinfo.exe c:\windows\system32\inetrv\inetinfo.exe 1268 8
200 1380 1/10/2008 2:56 AM 6.0.3790.3959
(srv03_sp2_rtm.070216-1710) 17.50 KB (17,920 bytes) 11/2/2007
3:19 PM
svchost.exe Not Available 1352 8 Not Available Not
Available 1/10/2008 2:56 AM Not Available Not Available
Not Available
vivaldiframework.exe c:\program files (x86)\megaraid storage
manager\framework\vivaldiframework.exe 1596 8 200 1380
1/10/2008 2:56 AM Not Available 52.00 KB (53,248
bytes) 11/29/2006 7:05 PM
svchost.exe c:\windows\system32\svchost.exe 1772 8 200
1380 1/10/2008 2:56 AM 5.2.3790.3959
(srv03_sp2_rtm.070216-1710) 25.00 KB (25,600 bytes) 2/18/2007
8:00 PM
mrmonitor.exe c:\program files (x86)\megaraid storage
manager\megamonitor\mrmonitor.exe 396 8 200 1380
1/10/2008 2:56 AM Not Available 424.00 KB (434,176
bytes) 7/18/2007 11:24 PM
cmd.exe c:\windows\system32\cmd.exe 388 8 200 1380
1/10/2008 2:56 AM 5.2.3790.3959
(srv03_sp2_rtm.070216-1710) 538.00 KB (550,912 bytes)
2/18/2007 8:00 PM
javaw.exe c:\program files (x86)\megaraid storage
manager\jre\bin\javaw.exe 196 8 200 1380 1/10/2008
2:56 AM 6.0.0.105 132.00 KB (135,168 bytes) 9/11/2007
1:27 PM
svchost.exe c:\windows\system32\svchost.exe 248 8 200
1380 1/10/2008 2:56 AM 5.2.3790.3959
(srv03_sp2_rtm.070216-1710) 25.00 KB (25,600 bytes) 2/18/2007
8:00 PM
wmiprvse.exe Not Available 2220 8 Not Available
Not Available 1/10/2008 2:56 AM Not Available
Not Available Not Available
csrss.exe Not Available 2448 13 Not Available Not
Available 1/10/2008 2:57 AM Not Available Not Available
Not Available
winlogon.exe c:\windows\system32\winlogon.exe 2476 13
200 1380 1/10/2008 2:57 AM 5.2.3790.3959
(srv03_sp2_rtm.070216-1710) 922.00 KB (944,128 bytes)
2/18/2007 8:00 PM
rdpclip.exe c:\windows\system32\rdpclip.exe 2632 8 200
1380 1/10/2008 2:58 AM 5.2.3790.3959
(srv03_sp2_rtm.070216-1710) 99.00 KB (101,376 bytes) 11/3/2007
4:27 AM
explorer.exe c:\windows\explorer.exe 2712 8 200 1380
1/10/2008 2:58 AM 6.00.3790.3959
(srv03_sp2_rtm.070216-1710) 1.30 MB (1,364,480 bytes)
2/18/2007 8:00 PM

```

popup.exe c:\program files (x86)\megaraid storage manager\megapopup\popup.exe 2868 8 200 1380 1/10/2008 2:58 AM 1.00-24 76.10 KB (77,922 bytes) 8/8/2007 3:44 PM

csrss.exe Not Available 1900 13 Not Available Not Available 1/10/2008 3:01 AM Not Available Not Available Not Available

winlogon.exe c:\windows\system32\winlogon.exe 1924 13 200 1380 1/10/2008 3:01 AM 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 922.00 KB (944,128 bytes) 2/18/2007 8:00 PM

rdpclip.exe c:\windows\system32\rdpclip.exe 1380 8 200 1380 1/10/2008 3:01 AM 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 99.00 KB (101,376 bytes) 11/3/2007 4:27 AM

explorer.exe c:\windows\explorer.exe 2336 8 200 1380 1/10/2008 3:01 AM 6.00.3790.3959 (srv03_sp2_rtm.070216-1710) 1.30 MB (1,364,480 bytes) 2/18/2007 8:00 PM

popup.exe c:\program files (x86)\megaraid storage manager\megapopup\popup.exe 2560 8 200 1380 1/10/2008 3:01 AM 1.00-24 76.10 KB (77,922 bytes) 8/8/2007 3:44 PM

logon.scr Not Available 3720 4 Not Available Not Available 1/10/2008 3:11 AM Not Available Not Available Not Available

cmd.exe c:\windows\system32\cmd.exe 4500 8 200 1380 1/11/2008 12:49 AM 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 538.00 KB (550,912 bytes) 2/18/2007 8:00 PM

w3wp.exe c:\windows\system32\inetrv\w3wp.exe 6620 8 200 1380 1/11/2008 10:05 AM 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 8.50 KB (8,704 bytes) 11/2/2007 3:20 PM

wmiprvse.exe Not Available 7900 8 Not Available Not Available 1/11/2008 10:53 AM Not Available Not Available Not Available

helpctr.exe c:\windows\pchealth\helpctr\binaries\helpctr.exe 8228 8 200 1380 1/11/2008 11:02 AM 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 1.30 MB (1,363,456 bytes) 11/3/2007 4:28 AM

helpsvc.exe c:\windows\pchealth\helpctr\binaries\helpsvc.exe 8324 8 200 1380 1/11/2008 11:02 AM 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 1.52 MB (1,591,296 bytes) 11/3/2007 4:28 AM

[Loaded Modules]

Name	Version	Size	File Date	Manufacturer	Path
winlogon	5.2.3790.3959	(944,128 bytes)	(srv03_sp2_rtm.070216-1710) 2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\winlogon.exe
ntdll	5.2.3790.3959	1.20 MB (1,254,400 bytes)	(srv03_sp2_rtm.070216-1710) 2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\ntdll.dll
kernel32	5.2.3790.3959	1.43 MB (1,503,232 bytes)	(srv03_sp2_rtm.070216-1710) 2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\kernel32.dll
advapi32	5.2.3790.3959	1.00 MB (1,051,648 bytes)	(srv03_sp2_rtm.070216-1710) 2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\advapi32.dll
rpcrt4	5.2.3790.3959	1.58 MB (1,653,248 bytes)	(srv03_sp2_rtm.070216-1710) 2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\rpcrt4.dll
secur32	5.2.3790.3959	120.00 KB (122,880 bytes)	(srv03_sp2_rtm.070216-1710) 2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\secur32.dll
crypt32	5.131.3790.3959	1.36 MB (1,429,504 bytes)	(srv03_sp2_rtm.070216-1710) 2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\crypt32.dll
msvcrt	7.0.3790.3959	508.00 KB (520,192 bytes)	(srv03_sp2_rtm.070216-1710) 2/18/2007 8:00 PM	Microsoft Corporation	

c:\windows\system32\msvcrt.dll	user32	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 1.04 MB (1,086,976 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\user32.dll	gdi32	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 603.50 KB (617,984 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\gdi32.dll	msasn1	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 152.50 KB (156,160 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\msasn1.dll	nddeapi	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 25.00 KB (25,600 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\nddeapi.dll	profmap	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 36.00 KB (36,864 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\profmap.dll	netapi32	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 589.00 KB (603,136 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\netapi32.dll	userenv	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 1.02 MB (1,071,104 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\userenv.dll	psapi	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 29.00 KB (29,696 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\psapi.dll	regapi	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 108.50 KB (111,104 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\regapi.dll	setupapi	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 1.45 MB (1,524,224 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\setupapi.dll	version	5.2.3790.1830	(srv03_sp1_rtm.050324-1447) 28.00 KB (28,672 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\version.dll	winsta	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 89.00 KB (91,136 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\winsta.dll	ws2_32	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 174.50 KB (178,688 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\ws2_32.dll	ws2help	5.2.3790.1830	(srv03_sp1_rtm.050324-1447) 30.50 KB (31,232 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\ws2help.dll	msgina	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 1.14 MB (1,193,472 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\msgina.dll	shsvcs	6.00.3790.3959	(srv03_sp2_rtm.070216-1710) 194.00 KB (198,656 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\shsvcs.dll	shlwapi	6.00.3790.3959	(srv03_sp2_rtm.070216-1710) 607.00 KB (621,568 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\shlwapi.dll	sfc	5.2.3790.1830	(srv03_sp1_rtm.050324-1447) 6.00 KB (6,144 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\sfc.dll	sfc_os	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 183.50 KB (187,904 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\sfc_os.dll	wintrust	5.131.3790.3959	(srv03_sp2_rtm.070216-1710) 297.50 KB (304,640 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\wintrust.dll	imagehlp	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 57.50 KB (58,880 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\imagehlp.dll	ole32	5.2.3790.3959	(srv03_sp2_rtm.070216-1710) 2.50 MB (2,622,976 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
c:\windows\system32\ole32.dll	comctl32	6.0	(srv03_sp2_rtm.070216-1710) 1.51 MB (1,584,640 bytes)	11/2/2007 8:15 PM	Microsoft Corporation
c:\windows\system32\comctl32.dll					

6595b64144ccf1df_6.0.3790.3959_x-ww_0a7b2435\comctl32.dll	clbcatq	2001.12.4720.3959 (srv03_sp2_rtm.070216-1710)	862.50 KB (883,200 bytes)	11/3/2007 4:27 AM	Microsoft Corporation
winscard 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)229.50 KB (235,008 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\clbcatq.dll				
c:\windows\system32\winscard.dll	comres	2001.12.4720.3959 (srv03_sp2_rtm.070216-1710)	779.50 KB (798,208 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
wtsapi32 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)29.00 KB (29,696 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\comres.dll				
c:\windows\system32\wtsapi32.dll	csoui	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	441.00 KB (451,584 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
sxs 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)1.89 MB (1,977,856 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\csoui.dll				
c:\windows\system32\sxs.dll	rdpsnd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	25.00 KB (25,600 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
winmm 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)303.50 KB (310,784 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\rdpsnd.dll				
c:\windows\system32\winmm.dll	msacm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.00 KB (31,744 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
shell32 6.00.3790.3959 (srv03_sp2_rtm.070216-1710) 10.02 MB (10,505,728 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\msacm32.drv				
c:\windows\system32\shell32.dll	msacm32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	112.00 KB (114,688 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
wldap32 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)390.50 KB (399,872 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\msacm32.dll				
c:\windows\system32\wldap32.dll	imaadp32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB (24,576 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
rsaenh5.2.3790.3959 (srv03_sp2_rtm.070216-1710)298.84 KB (306,008 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\imaadp32.acm				
c:\windows\system32\rsaenh.dll	msadp32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	23.50 KB (24,064 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
csddl 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)151.50 KB (155,136 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\msadp32.acm				
c:\windows\system32\csddl.dll	msg711	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	13.50 KB (13,824 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
dimsntfy 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)28.00 KB (28,672 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\msg711.acm				
c:\windows\system32\dimsntfy.dll	msgsm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	34.50 KB (35,328 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
wlnotify 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)148.50 KB (152,064 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\msgsm32.acm				
c:\windows\system32\wlnotify.dll	tssoft32	1.01 13.50 KB (13,824 bytes)	2/18/2007 8:00 PM	DSP GROUP, INC.	
winspool 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)247.00 KB (252,928 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\tssoft32.acm				
c:\windows\system32\winspool.drv	tsd32	1.03 24.50 KB (25,088 bytes)	2/18/2007 8:00 PM	DSP GROUP, INC.	
mpr 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)115.00 KB (117,760 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\tsd32.dll				
c:\windows\system32\mpr.dll	ntmarta	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	222.50 KB (227,840 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
oleaut32 5.2.3790.3959 1.07 MB (1,121,792 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\ntmarta.dll				
c:\windows\system32\oleaut32.dll	xpsp2res	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	2.77 MB (2,899,456 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
comctl32 5.82 (srv03_sp2_rtm.070216-1710) 935.00 KB (957,440 bytes) 11/2/2007 8:15 PMMicrosoft Corporation	c:\windows\system32\xpsp2res.dll				
c:\windows\winsxs\amd64_microsoft.windows.common-controls_6595b64144ccf1df_5.82.3790.3959_x-ww_ab06deb0\comctl32.dll	wbemprox	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	38.00 KB (38,912 bytes)	11/3/2007 4:28 AM	Microsoft Corporation
uxtheme 6.00.3790.3959 (srv03_sp2_rtm.070216-1710) 494.50 KB (506,368 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\wbem\wbemprox.dll				
c:\windows\system32\uxtheme.dll	wbemcomn	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	518.00 KB (530,432 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
mprapi 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)154.50 KB (158,208 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\wbem\wbemcomn.dll				
c:\windows\system32\mprapi.dll	wbemsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	58.00 KB (59,392 bytes)	11/3/2007 4:28 AM	Microsoft Corporation
activeds 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)348.50 KB (356,864 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\wbem\wbemsvc.dll				
c:\windows\system32\activeds.dll	fastprox	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	866.50 KB (887,296 bytes)	11/3/2007 4:27 AM	Microsoft Corporation
adslrpc 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)240.50 KB (246,272 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\wbem\fastprox.dll				
c:\windows\system32\adslrpc.dll	msvcp60	7.0.3790.1830 (srv03_sp1_rtm.050324-1447)	919.50 KB (941,568 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
credui 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)202.00 KB (206,848 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\msvcp60.dll				
c:\windows\system32\credui.dll	ntdsapi	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	127.50 KB (130,560 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
atl 3.05.2284 96.50 KB (98,816 bytes) 2/18/2007 8:00 PM Microsoft Corporation	c:\windows\system32\ntdsapi.dll				
c:\windows\system32\atl.dll	dnsapi5	2.3790.3959 (srv03_sp2_rtm.070216-1710)	298.50 KB (305,664 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
rtutils 5.2.3790.1830 (srv03_sp1_rtm.050324-1447)66.00 KB (67,584 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\dnsapi.dll				
c:\windows\system32\rtutils.dll	services	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	219.00 KB (224,256 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
samlib 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)69.50 KB (71,168 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\services.exe				
c:\windows\system32\samlib.dll	scesrv	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	595.00 KB (609,280 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
scredir 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)38.50 KB (39,424 bytes) 2/18/2007 8:00 PMMicrosoft Corporation	c:\windows\system32\scesrv.dll				
c:\windows\system32\scredir.dll	authz	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	171.00 KB (175,104 bytes)	2/18/2007 8:00 PM	Microsoft Corporation
	c:\windows\system32\authz.dll				

umpnpgmr 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)205.00 KB (209,920 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\umpnpgmr.dll	(581,632 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\hnetcfg.dll
ncobjapi 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)77.50 KB (79,360 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\ncobjapi.dll	wshtcpip 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)29.00 KB (29,696 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\wshtcpip.dll
eventlog 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)127.50 KB (130,560 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\eventlog.dll	ipsecsvc 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)361.50 KB (370,176 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\ipsecsvc.dll
lsass 5.2.3790.1830 (srv03_sp1_rtm.050324-1447)14.00 KB (14,336 bytes)2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\lsass.exe	oakley 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)385.00 KB (394,240 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\oakley.dll
lsasrv 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)1.49 MB (1,566,720 bytes)2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\lsasrv.dll	winipsec 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)52.50 KB (53,760 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\winipsec.dll
samsrv 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)1.01 MB (1,059,328 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\samsrv.dll	pstorsvc 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)36.00 KB (36,864 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\pstorsvc.dll
cryptdll 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)47.00 KB (48,128 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\cryptdll.dll	psbase 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)124.00 KB (126,976 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\psbase.dll
msprivs 5.2.3790.1830 (srv03_sp1_rtm.050324-1447)47.50 KB (48,640 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\msprivs.dll	dssenh 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)231.34 KB (236,888 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\dssenh.dll
kerberos 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)706.00 KB (722,944 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\kerberos.dll	wlbcctl 5.2.3790.1830 (srv03_sp1_rtm.050324-1447)137.50 KB (140,800 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\wlbcctl.dll
msv1_0 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)253.00 KB (259,072 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\msv1_0.dll	w3ssl 6.0.3790.1830 (srv03_sp1_rtm.050324-1447)21.00 KB (21,504 bytes)2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\w3ssl.dll
iphlpapi 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)178.50 KB (182,784 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\iphlpapi.dll	strmfilt 6.0.3790.1830 (srv03_sp1_rtm.050324-1447)131.50 KB (134,656 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\strmfilt.dll
netlogon 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)665.50 KB (681,472 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\netlogon.dll	httpapi 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)36.50 KB (37,376 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\httpapi.dll
w32time 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)398.00 KB (407,552 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\w32time.dll	svchost 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)25.00 KB (25,600 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\svchost.exe
schannel 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)248.00 KB (253,952 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\schannel.dll	rpss 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)819.00 KB (838,656 bytes)2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\rpss.dll
wdigest 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)131.00 KB (134,144 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\wdigest.dll	schedsvc 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)308.00 KB (315,392 bytes) 11/3/2007 4:28 AM Microsoft Corporation c:\windows\system32\schedsvc.dll
rassfm 5.2.3790.1830 (srv03_sp1_rtm.050324-1447)36.00 KB (36,864 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\rassfm.dll	msidle 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) 9.00 KB (9,216 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\msidle.dll
kdcsvc 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)410.00 KB (419,840 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\kdcsvc.dll	wkssvc 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)221.00 KB (226,304 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\wkssvc.dll
ntlsa 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)2.83 MB (2,967,040 bytes)2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\ntlsa.dll	wiarpc 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)57.00 KB (58,368 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\wiarpc.dll
ntdsatq 5.2.3790.1830 (srv03_sp1_rtm.050324-1447)51.00 KB (52,224 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\ntdsatq.dll	aelupsvc 5.2.3790.1830 (srv03_sp1_rtm.050324-1447)31.50 KB (32,256 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\aelupsvc.dll
mswsock 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)480.50 KB (492,032 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\mswsock.dll	apphelp 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)241.00 KB (246,784 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\apphelp.dll
esent 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)2.26 MB (2,367,488 bytes)2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\esent.dll	cryptsvc 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)114.00 KB (116,736 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\cryptsvc.dll
scecli 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)308.00 KB (315,392 bytes)2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\scecli.dll	certcli 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)371.50 KB (380,416 bytes)2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\certcli.dll
ws03res 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)794.00 KB (813,056 bytes) 2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\ws03res.dll	vssapi 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)1.26 MB (1,320,960 bytes)2/18/2007 8:00 PMMicrosoft Corporation c:\windows\system32\vssapi.dll
hnetcfg 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)568.00 KB	dmserver 5.2.3790.3959 (srv03_sp2_rtm.070216-1710)36.50 KB (37,376 bytes) 2/18/2007 8:00 PMMicrosoft Corporation

c:\windows\system32\dmserver.dll
 es 2001.12.4720.3959 (srv03_sp2_rtm.070216-1710) 357.00 KB
 (365,568 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\es.dll
 pchsvc 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 75.50 KB
 (77,312 bytes) 11/3/2007 4:29 AM Microsoft Corporation
 c:\windows\pchealth\helpctr\binaries\pchsvc.dll
 hidserv 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 24.00 KB
 (24,576 bytes) 11/2/2007 8:21 PM Microsoft Corporation
 c:\windows\system32\hidserv.dll
 hid 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 33.00 KB (33,792
 bytes) 2/17/2007 8:28 AM Microsoft Corporation
 c:\windows\system32\hid.dll
 srvcsv 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 156.50 KB (160,256
 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\srvcsv.dll
 seclogon 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 27.50 KB
 (28,160 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\seclogon.dll
 sens 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 63.50 KB (65,024
 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\sens.dll
 trkwks 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 177.50 KB
 (181,760 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\trkwks.dll
 wmisvc 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 227.50 KB
 (232,960 bytes) 11/3/2007 4:27 AM Microsoft Corporation
 c:\windows\system32\wbem\wmisvc.dll
 wuauerv 5.7.3790.1830 (srv03_sp1_rtm.050324-1447) 12.00 KB
 (12,288 bytes) 11/3/2007 4:29 AM Microsoft Corporation
 c:\windows\system32\wuauerv.dll
 wuaueng 7.0.6000.381 (winmain(wmbla).070730-1749) 2.06
 MB (2,164,568 bytes) 11/3/2007 4:29 AM Microsoft
 Corporation c:\windows\system32\wuaueng.dll
 winhttp 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 511.50 KB
 (523,776 bytes) 11/2/2007 8:15 PM Microsoft Corporation
 c:\windows\winsxs\amd64_microsoft.windows.winhttp_6595b641
 44ccf1df_5.1.3790.3959_x-ww_03aca661\winhttp.dll
 cabinet 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 138.50 KB
 (141,824 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\cabinet.dll
 mspatcha 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 48.00 KB
 (49,152 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\mspatcha.dll
 comsvcs 2001.12.4720.3959 (srv03_sp2_rtm.070216-1710) 2.13
 MB (2,234,880 bytes) 11/3/2007 4:27 AM Microsoft
 Corporation c:\windows\system32\comsvcs.dll
 browser 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 125.50 KB
 (128,512 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\browser.dll
 netrap 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 26.00 KB (26,624
 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\netrap.dll
 wbemcore 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 1.22 MB
 (1,282,560 bytes) 11/3/2007 4:27 AM Microsoft Corporation
 c:\windows\system32\wbem\wbemcore.dll
 esscli 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 626.50 KB (641,536
 bytes) 11/3/2007 4:27 AM Microsoft Corporation
 c:\windows\system32\wbem\esscli.dll
 wmiutils 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 171.00 KB
 (175,104 bytes) 11/3/2007 4:27 AM Microsoft Corporation
 c:\windows\system32\wbem\wmiutils.dll
 repdrvfs 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 353.50 KB
 (361,984 bytes) 11/3/2007 4:27 AM Microsoft Corporation
 c:\windows\system32\wbem\repdrvfs.dll
 wmiprvsd 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 743.00 KB
 (760,832 bytes) 11/3/2007 4:27 AM Microsoft Corporation
 c:\windows\system32\wbem\wmiprvsd.dll
 wbemess 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 532.50 KB
 (545,280 bytes) 11/3/2007 4:27 AM Microsoft Corporation

c:\windows\system32\wbem\wbemess.dll
 ncprov 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 73.00 KB
 (74,752 bytes) 11/3/2007 4:28 AM Microsoft Corporation
 c:\windows\system32\wbem\ncprov.dll
 netman 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 454.50 KB
 (465,408 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\netman.dll
 netshell 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 2.33 MB
 (2,438,656 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\netshell.dll
 clusapi 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 127.00 KB
 (130,048 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\clusapi.dll
 rasapi32 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 410.00 KB
 (419,840 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\rasapi32.dll
 rasman 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 95.50 KB
 (97,792 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\rasman.dll
 tapi32 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 332.50 KB (340,480
 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\tapi32.dll
 wzcsvc 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 644.50 KB
 (659,968 bytes) 2/17/2007 9:05 AM Microsoft Corporation
 c:\windows\system32\wzcsvc.dll
 wmi 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 5.50 KB (5,632 bytes)
 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\wmi.dll
 dhcpcsvc 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 220.50 KB
 (225,792 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\dhcpcsvc.dll
 wininet 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 1.14
 MB (1,190,912 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\wininet.dll
 wzcsapi 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 50.50 KB
 (51,712 bytes) 2/17/2007 9:05 AM Microsoft Corporation
 c:\windows\system32\wzcsapi.dll
 rasdlg 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 859.50 KB (880,128
 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\rasdlg.dll
 rasadhlp 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 12.00 KB
 (12,288 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\rasadhlp.dll
 xactsrv 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 134.50 KB
 (137,728 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\xactsrv.dll
 ersvc 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 31.00 KB (31,744
 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\ersvc.dll
 inetinfo 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 17.50 KB
 (17,920 bytes) 11/2/2007 3:19 PM Microsoft Corporation
 c:\windows\system32\inetrv\inetinfo.exe
 iisutil 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 329.00 KB (336,896
 bytes) 11/2/2007 3:19 PM Microsoft Corporation
 c:\windows\system32\inetrv\iisutil.dll
 rpref 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) 4.50 KB (4,608 bytes)
 11/2/2007 3:20 PM Microsoft Corporation
 c:\windows\system32\inetrv\pref.dll
 iisrtl 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) 225.00 KB (230,400
 bytes) 11/2/2007 3:20 PM Microsoft Corporation
 c:\windows\system32\iisrtl.dll
 iisadmin 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 29.50 KB
 (30,208 bytes) 11/2/2007 3:19 PM Microsoft Corporation
 c:\windows\system32\inetrv\iisadmin.dll
 coadmin 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 100.50 KB
 (102,912 bytes) 11/2/2007 3:19 PM Microsoft Corporation
 c:\windows\system32\inetrv\coadmin.dll
 admwprox 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 66.00 KB
 (67,584 bytes) 11/2/2007 3:19 PM Microsoft Corporation
 c:\windows\system32\admwprox.dll

iisfcg	6.0.3790.3959 (srv03_sp2_rtm.070216-1710)	1.24 MB (1,298,432 bytes)	11/2/2007 3:19 PM	Microsoft Corporation	c:\windows\system32\inet\iisfcg.dll
metadata	6.0.3790.3959 (srv03_sp2_rtm.070216-1710)	342.00 KB (350,208 bytes)	11/2/2007 3:19 PM	Microsoft Corporation	c:\windows\system32\inet\metadata.dll
msxml3	8.80.1185.0	2.04 MB (2,144,256 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\msxml3.dll
svcxext	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	60.50 KB (61,952 bytes)	11/2/2007 3:20 PM	Microsoft Corporation	c:\windows\system32\inet\svcxext.dll
security	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.00 KB (6,144 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\security.dll
iismap	6.0.3790.3959 (srv03_sp2_rtm.070216-1710)	97.00 KB (99,328 bytes)	11/2/2007 3:19 PM	Microsoft Corporation	c:\windows\system32\iis\map.dll
wamreg	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	78.50 KB (80,384 bytes)	11/2/2007 3:20 PM	Microsoft Corporation	c:\windows\system32\inet\wamreg.dll
odbc32	3.526.3959.0 (srv03_sp2_rtm.070216-1710)	408.00 KB (417,792 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\odbc32.dll
comdlg32	6.0.3790.3959 (srv03_sp2_rtm.070216-1710)	447.00 KB (457,728 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\comdlg32.dll
odbcint	3.526.1830.0 (srv03_sp1_rtm.050324-1447)	96.00 KB (98,304 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\odbcint.dll
winnr	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	30.00 KB (30,720 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\winnr.dll
iislog	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	109.50 KB (112,128 bytes)	11/2/2007 3:20 PM	Microsoft Corporation	c:\windows\system32\inet\iislog.dll
VivaldiFramework	Not Available	52.00 KB (53,248 bytes)	11/29/2006 7:05 PM	Not Available	c:\program files (x86)\megaraid storage manager\framework\vivaldiframework.exe
wow64	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	244.50 KB (250,368 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\wow64.dll
wow64win	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	280.00 KB (286,720 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\wow64win.dll
wow64cpu	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	18.50 KB (18,944 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\wow64cpu.dll
iisw3adm	6.0.3790.3959 (srv03_sp2_rtm.070216-1710)	305.50 KB (312,832 bytes)	11/2/2007 3:20 PM	Microsoft Corporation	c:\windows\system32\inet\iisw3adm.dll
w3cache	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	27.50 KB (28,160 bytes)	11/2/2007 3:20 PM	Microsoft Corporation	c:\windows\system32\inet\w3cache.dll
w3tp	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	16.00 KB (16,384 bytes)	11/2/2007 3:20 PM	Microsoft Corporation	c:\windows\system32\inet\w3tp.dll
lonsint	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	17.50 KB (17,920 bytes)	11/2/2007 3:20 PM	Microsoft Corporation	c:\windows\system32\inet\lonsint.dll
mrmonitor	Not Available	424.00 KB (434,176 bytes)	7/18/2007 11:24 PM	Not Available	c:\program files (x86)\megaraid storage manager\megamonitor\mrmonitor.exe
cmd	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	538.00 KB (550,912 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\cmd.exe
javaw	6.0.0.105	132.00 KB (135,168 bytes)	9/11/2007 1:27 PM	Sun Microsystems, Inc.	c:\program files (x86)\megaraid storage manager\jre\bin\javaw.exe
termsrv	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	355.50 KB (364,032 bytes)	11/3/2007 4:27 AM	Microsoft Corporation	c:\windows\system32\termsrv.dll
icaapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	27.50 KB (28,160 bytes)	11/3/2007 4:28 AM	Microsoft Corporation	c:\windows\system32\icaapi.dll
mstlsapi	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	188.00 KB (192,512 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\mstlsapi.dll
rdpwsx	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	170.13 KB (174,216 bytes)	11/3/2007 4:27 AM	Microsoft Corporation	c:\windows\system32\rdpwsx.dll
rdpclip	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	99.00 KB (101,376 bytes)	11/3/2007 4:27 AM	Microsoft Corporation	c:\windows\system32\rdpclip.exe
wsock32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB (25,088 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\wsock32.dll
urlmon	6.0.3790.3959 (srv03_sp2_rtm.070216-1710)	1.04 MB (1,088,000 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\urlmon.dll
explorer	6.0.3790.3959 (srv03_sp2_rtm.070216-1710)	1.30 MB (1,364,480 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\explorer.exe
browseui	6.0.3790.3959 (srv03_sp2_rtm.070216-1710)	1.53 MB (1,605,120 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\browseui.dll
shdocvw	6.0.3790.3959 (srv03_sp2_rtm.070216-1710)	2.33 MB (2,438,144 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\shdocvw.dll
cryptui	5.131.3790.3959 (srv03_sp2_rtm.070216-1710)	705.50 KB (722,432 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\cryptui.dll
themeui	6.0.3790.3959 (srv03_sp2_rtm.070216-1710)	531.50 KB (544,256 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\themeui.dll
msimg32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.50 KB (6,656 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\msimg32.dll
linkinfo	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	31.00 KB (31,744 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\linkinfo.dll
ntshrui	6.0.3790.3959 (srv03_sp2_rtm.070216-1710)	184.00 KB (188,416 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\ntshrui.dll
webcheck	6.0.3790.3959 (srv03_sp2_rtm.070216-1710)	438.50 KB (449,024 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\webcheck.dll
stobject	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	142.50 KB (145,920 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\stobject.dll
batmeter	6.0.3790.3959 (srv03_sp2_rtm.070216-1710)	41.50 KB (42,496 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\batmeter.dll
powrprof	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	32.50 KB (33,280 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\powrprof.dll
drprov	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB (24,576 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\drprov.dll
ntlanman	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	72.00 KB (73,728 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\ntlanman.dll
netui0	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	130.00 KB (133,120 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\netui0.dll
netui1	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	338.50 KB (346,624 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	c:\windows\system32\netui1.dll
davclnt	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	39.50 KB (40,448 bytes)	2/18/2007 8:00 PM	Microsoft Corporation	

c:\windows\system32\davelnt.dll
 browselc 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) 63.00 KB (64,512 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\browselc.dll
 duser 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 445.00 KB (455,680 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\duser.dll
 shdoclc 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) 589.50 KB (603,648 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\shdoclc.dll
 gdiplus 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 2.75 MB (2,878,976 bytes) 11/2/2007 8:15 PM Microsoft Corporation
 c:\windows\winsxs\amd64_microsoft.windows.gdiplus_6595b64144ccf1df_1.0.3790.3959_x-ww_b45ba3be\gdiplus.dll
 popup 1.00-24 76.10 KB (77,922 bytes) 8/8/2007 3:44 PM
 c:\program files (x86)\megaraid storage manager\megapopup\popup.exe
 actxprxy 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 220.50 KB (225,792 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\actxprxy.dll
 mlang 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 686.00 KB (702,464 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\mlang.dll
 mydocs 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 101.00 KB (103,424 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\mydocs.dll
 zipfldr 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 449.50 KB (460,288 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\zipfldr.dll
 sendmail 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 64.00 KB (65,536 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\sendmail.dll
 shimgvw 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 619.00 KB (633,856 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\shimgvw.dll
 w3wp 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 8.50 KB (8,704 bytes) 11/2/2007 3:20 PM Microsoft Corporation
 c:\windows\system32\inetrv\w3wp.exe
 w3core 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 530.50 KB (543,232 bytes) 11/2/2007 3:20 PM Microsoft Corporation
 c:\windows\system32\inetrv\w3core.dll
 w3dt 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) 56.50 KB (57,856 bytes) 11/2/2007 3:20 PM Microsoft Corporation
 c:\windows\system32\inetrv\w3dt.dll
 w3comlog 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 13.50 KB (13,824 bytes) 11/2/2007 3:20 PM Microsoft Corporation
 c:\windows\system32\inetrv\w3comlog.dll
 iisres 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) 120.50 KB (123,392 bytes) 11/2/2007 3:20 PM Microsoft Corporation
 c:\windows\system32\inetrv\iisres.dll
 aspnet_filter 2.0.50727.42 (RTM.050727-4200) 13.00 KB (13,312 bytes) 9/22/2005 11:52 PM Microsoft Corporation
 c:\windows\microsoft.net\framework64\v2.0.50727\aspnet_filter.dll
 msvcr80 8.0.50727.42 803.50 KB (822,784 bytes) 9/22/2005 11:26 PM Microsoft Corporation
 c:\windows\winsxs\amd64_microsoft.vc80.crt_1fc8b3b9a1e18e3b_8.0.50727.42_x-ww_3fea50ad\msvcr80.dll
 w3isapi 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) 81.50 KB (83,456 bytes) 11/2/2007 3:20 PM Microsoft Corporation
 c:\windows\system32\inetrv\w3isapi.dll
 gzip 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) 35.00 KB (35,840 bytes) 11/2/2007 3:20 PM Microsoft Corporation
 c:\windows\system32\inetrv\gzip.dll
 helpctr 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 1.30 MB (1,363,456 bytes) 11/3/2007 4:28 AM 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) 11/3/2007 4:29 AM Microsoft Corporation
 c:\windows\pchealth\helpctr\binaries\hcappres.dll

itss 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 208.50 KB (213,504 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\itss.dll
 pchshell 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 155.00 KB (158,720 bytes) 11/3/2007 4:29 AM Microsoft Corporation
 c:\windows\pchealth\helpctr\binaries\pchshell.dll
 mshtml 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 5.72 MB (5,999,616 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\mshtml.dll
 msls31 3.10.349.0 357.00 KB (365,568 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\msls31.dll
 msimtf 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 380.50 KB (389,632 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\msimtf.dll
 msctf 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 617.50 KB (632,320 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\msctf.dll
 jscript 5.6.0.8832 976.00 KB (999,424 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\jscript.dll
 imm32 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 208.00 KB (212,992 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\imm32.dll
 mshtmlmed 6.0.3790.3959 (srv03_sp2_rtm.070216-1710) 905.50 KB (927,232 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\mshtmlmed.dll
 vbscript 5.6.0.8832 647.00 KB (662,528 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\vbscript.dll
 msinfo 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 635.50 KB (650,752 bytes) 11/3/2007 4:29 AM Microsoft Corporation
 c:\windows\pchealth\helpctr\binaries\msinfo.dll
 mfc42u 6.50.9146.0 1.39 MB (1,460,992 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\mfc42u.dll
 riched32 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 7.00 KB (7,168 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\riched32.dll
 riched20 5.31.23.1225 1.11 MB (1,160,192 bytes) 2/18/2007 8:00 PM Microsoft Corporation
 c:\windows\system32\riched20.dll
 helpsvc 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 1.52 MB (1,591,296 bytes) 11/3/2007 4:28 AM Microsoft Corporation
 c:\windows\pchealth\helpctr\binaries\helpsvc.exe

[Services]

Display Name	Name	State	Start Mode	Service Type	Path
Error Control	Start Name	Tag ID			
Application Experience	Lookup Service	AeLookupSvc	Running	Auto Share Process	c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem0
Alerter	Alerter	Stopped	Disabled	Share Process	c:\windows\system32\svchost.exe -k localservice Normal NT AUTHORITY\LocalService0
Application Layer Gateway Service	ALG	Stopped	Manual	Own Process	c:\windows\system32\alg.exe Normal NT AUTHORITY\LocalService0
Application Management	AppMgmt	Stopped	Manual	Share Process	c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem0
ASP.NET State Service	aspnet_state	Stopped	Manual	Own Process	c:\windows\microsoft.net\framework64\v2.0.50727\aspnet_state.exe Normal NT AUTHORITY\NetworkService 0
Windows Audio	AudioSrv	Stopped	Disabled	Share Process	c:\windows\system32\svchost.exe -k netsvcs Normal LocalSystem0
Background Intelligent Transfer Service	BITS	Stopped	Manual	Share Process	c:\windows\system32\svchost.exe -k netsvcs

Normal LocalSystem0
Computer Browser Browser Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem0
Indexing Service Cifsvc Stopped Disabled Share Process
c:\windows\system32\cisvc.exe Normal LocalSystem0
ClipBook ClipSrv Stopped Disabled Own Process
c:\windows\system32\clipsrv.exe Normal LocalSystem0

.NET Runtime Optimization Service v2.0.50727_X86
clr_optimization_v2.0.50727_32 Stopped Manual Own
Process
c:\windows\microsoft.net\framework\v2.0.50727\mscorsvw.exe
IgnoreLocalSystem0
.NET Runtime Optimization Service v2.0.50727_x64
clr_optimization_v2.0.50727_64 Stopped Manual Own
Process
c:\windows\microsoft.net\framework64\v2.0.50727\mscorsvw.exe
IgnoreLocalSystem0
COM+ System Application COMSysApp Stopped Manual
Own Process:c:\windows\system32\dlhhost.exe
/processid:{02d4b3f1-fd88-11d1-960d-00805fc79235} Normal
LocalSystem0
Cryptographic Services CryptSvc Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem0
DCOM Server Process Launcher DcomLaunch Running
Auto Share Process c:\windows\system32\svchost.exe -k
dcomlaunch Normal LocalSystem0
Distributed File System Dfs Stopped Manual Own Process
c:\windows\system32\dfssvc.exe Normal LocalSystem0

DHCP Client Dhcp Running Auto Share Process
c:\windows\system32\svchost.exe -k networkservice Normal
NT AUTHORITY\NetworkService 0
Logical Disk Manager Administrative Service dmadmin Stopped
Manual Share Process
c:\windows\system32\dmadmin.exe /com Normal
LocalSystem0
Logical Disk Manager dmsrvr Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem0
DNS Client Dnscache Running Auto Share Process
c:\windows\system32\svchost.exe -k networkservice Normal
NT AUTHORITY\NetworkService 0
Error Reporting Service ERSvc Running Auto Share Process
c:\windows\system32\svchost.exe -k winerr IgnoreLocalSystem0

Event Log Eventlog Running Auto Share Process
c:\windows\system32\services.exe Normal LocalSystem0

COM+ Event System EventSystem Running Auto Share
Process c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem0
Help and Support helpsvc Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem0
HID Input Service HidSrv Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem0
HTTP SSL HTTPFilter Running Manual Share Process
c:\windows\system32\lsass.exe Normal LocalSystem0
IAS Jet Database Access IASJet Stopped Manual Share
Process c:\windows\syswow64\svchost.exe -k iasjet Normal
LocalSystem0
InstallDriver Table Manager IDriverT Stopped Manual
Own Process"c:\program files (x86)\common
files\installshield\driver\1050\intel 32\idrivert.exe" IgnoreLocalSystem0

IIS Admin Service IISADMIN Running Auto Share Process

c:\windows\system32\inetresrv\inetinfo.exe Normal
LocalSystem0
IMAPI CD-Burning COM Service ImapiService Stopped
Disabled Own Process:c:\windows\system32\imapi.exe Normal
LocalSystem0
Intersite MessagingIsmServ Stopped Disabled Own Process
c:\windows\system32\ismsserv.exe Normal LocalSystem0

Kerberos Key Distribution Center kdc Stopped Disabled
Share Process c:\windows\system32\lsass.exe Normal
LocalSystem0
Serverlanmanserver Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem0
Workstation lanmanworkstation Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem0
License Logging LicenseService Stopped Disabled Own
Process c:\windows\system32\llssrv.exe Normal NT
AUTHORITY\NetworkService 0
TCP/IP NetBIOS Helper LmHosts Running Auto Share Process
c:\windows\system32\svchost.exe -k localservice Normal
NT AUTHORITY\LocalService 0
MRMonitor MegaMonitorSrv Running Auto Own Process
"c:\program files (x86)\megaraid storage
manager\megamonitor\mrmmonitor.exe" LocalSystem0
Messenger Messenger Stopped Disabled Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem0
NetMeeting Remote Desktop Sharing mnmsrvc Stopped
Disabled Own Process:c:\windows\system32\mnmsrvc.exe
Normal LocalSystem0
Distributed Transaction Coordinator MSDTC Running Auto
Own Process:c:\windows\system32\msdtc.exe Normal NT
AUTHORITY\NetworkService 0
SQL Server Integration Services MsDtsServer Stopped Manual
Own Process"c:\program files\microsoft sql
server\90\dts\bin\msdtssrvr.exe" Normal NT
AUTHORITY\NetworkService 0
SQL Server FullText Search (MSSQLSERVER) msftesql Stopped
Manual Own Process"c:\program files\microsoft sql
server\mssql.1\mssql\bin\msftesql.exe" -s:mssql.1 -f:mssqlserver
Normal LocalSystem0
FTP Publishing Service MSFtpsvc Stopped Manual Share
Process c:\windows\system32\inetresrv\inetinfo.exe Normal
LocalSystem0
Windows Installer MSIServer Stopped Manual Share Process
c:\windows\system32\msiexec.exe /v Normal LocalSystem0

MSMFramework MSMFramework Running Auto Own Process
"c:\program files (x86)\megaraid storage
manager\framework\livaldidframework.exe" Normal LocalSystem0

SQL Server (MSSQLSERVER) MSSQLSERVER Stopped Manual
Own Process"c:\program files\microsoft sql
server\mssql.1\mssql\bin\sqlservr.exe" -smssqlserver Normal
LocalSystem0
SQL Server Active Directory Helper MSSQLServerADHelper Stopped
Disabled Own Process"c:\program files\microsoft sql
server\90\shared\sqladhlp90.exe" Normal NT
AUTHORITY\NetworkService 0
SQL Server Analysis Services (MSSQLSERVER)
MSSQLServerOLAPService Stopped Manual Own
Process "c:\program files\microsoft sql
server\mssql.2\olap\bin\msmdsrvr.exe" -s "c:\program files\microsoft sql
server\mssql.2\olap\config" Normal LocalSystem0
Network DDE NetDDE Stopped Disabled Share Process
c:\windows\system32\netdde.exe Normal LocalSystem0

Network DDE DSDM NetDDEdsdm Stopped Disabled

Share Process LocalSystem0	c:\windows\system32\netdde.exe	Normal			c:\windows\system32\svchost.exe -k netsvcs	IgnoreLocalSystem0
Net Logon	Netlogon	Stopped	Manual	Share Process		
	c:\windows\system32\lsass.exe	Normal		LocalSystem0		
Network Connections	Netman	Running	Manual	Share		
Process	c:\windows\system32\svchost.exe -k netsvcs	Normal		LocalSystem0		
Network Location Awareness (NLA)	Nla	Running	Manual			
Share Process	c:\windows\system32\svchost.exe -k netsvcs			LocalSystem0		
File Replication	NtFrs	Stopped	Manual	Own Process		
	c:\windows\system32\ntfrs.exe	Ignore		LocalSystem0		
NT LM Security Support Provider	NtLmSsp	Stopped	Manual			
Share Process	c:\windows\system32\lsass.exe	Normal		LocalSystem0		
Removable StorageNtmsSvc		Stopped	Manual	Share Process		
	c:\windows\system32\svchost.exe -k netsvcs	Normal		LocalSystem0		
Office Source Engine	ose	Stopped	Manual	Own Process		
	"c:\program files (x86)\common files\microsoft shared\source engine\ose.exe"	Normal		LocalSystem0		
Plug and Play	PlugPlay	Running	Auto	Share Process		
	c:\windows\system32\services.exe	Normal		LocalSystem0		
IPSEC Services	PolicyAgent	Running	Auto	Share Process		
	c:\windows\system32\lsass.exe	Normal		LocalSystem0		
Protected Storage	ProtectedStorage	Running	Auto	Share Process		
	c:\windows\system32\lsass.exe	Normal		LocalSystem0		
Remote Access Auto Connection Manager	RasAuto	Stopped				
Manual	Share Process			c:\windows\system32\svchost.exe		
-k netsvcs	Normal			LocalSystem0		
Remote Access Connection Manager	RasMan	Stopped	Manual			
Share Process	c:\windows\system32\svchost.exe -k netsvcs			Normal		
Remote Desktop Help Session Manager	RDSessMgr	Stopped				
Manual	Own Process:c:\windows\system32\sessmgr.exe			Normal		
Routing and Remote Access	RemoteAccess	Stopped				
Disabled	Share Process			c:\windows\system32\svchost.exe		
-k netsvcs	Normal			LocalSystem0		
Remote Registry	RemoteRegistry	Running	Auto	Share Process		
	c:\windows\system32\svchost.exe -k regsvc	Normal		NT		
AUTHORITY\LocalService	0					
SQL Server Reporting Services (MSSQLSERVER)	ReportServer	Stopped	Manual	Own Process"	c:\program files\microsoft sql server\mssql.3\reporting services\reportserver\bin\reportingservices\service.exe"	Normal
LocalSystem0						
Remote Procedure Call (RPC) Locator	RpcLocator	Stopped	Manual			
Own Process:c:\windows\system32\locator.exe		Normal		NT		
AUTHORITY\NetworkService	0					
Remote Procedure Call (RPC)	RpcSs	Running	Auto	Share Process		
	c:\windows\system32\svchost.exe -k rpsvc	Normal		NT		
AUTHORITY\NetworkService	0					
Resultant Set of Policy Provider	RSOPProv	Stopped	Manual			
Share Process	c:\windows\system32\rsopprov.exe	Normal		LocalSystem0		
Special Administration Console	Helpersacsvr	Stopped	Manual			
Share Process	c:\windows\system32\svchost.exe -k netsvcs			Normal		
Security Accounts Manager	SamSs	Running	Auto	Share		
Process	c:\windows\system32\lsass.exe	Normal		LocalSystem0		
Smart Card	SCardSvr	Stopped	Manual	Share Process		
	c:\windows\system32\scardsvr.exe	Ignore		NT		
AUTHORITY\LocalService	0					
Task Scheduler	Schedule	Running	Auto	Share Process		
	c:\windows\system32\svchost.exe -k netsvcs	Normal		LocalSystem0		
Secondary Logon	seclogon	Running	Auto	Share Process		
System Event Notification	SENS	Running	Auto	Share Process		
	c:\windows\system32\svchost.exe -k netsvcs	Normal		LocalSystem0		
Windows Firewall/Internet Connection Sharing (ICS)		Stopped	Disabled	Share Process		SharedAccess
	c:\windows\system32\svchost.exe -k netsvcs	Normal		LocalSystem0		
Shell Hardware Detection	ShellHWDetection	Running	Auto	Share		
Process	c:\windows\system32\svchost.exe -k netsvcs	Ignore		LocalSystem0		
Print Spooler	Spooler	Stopped	Disabled	Own Process		
	c:\windows\system32\spoolsv.exe	Normal		LocalSystem0		
SQL Server Browser	SQLBrowser	Stopped	Disabled			
Own Process"	c:\program files (x86)\microsoft sql server\90\shared\sqlbrowser.exe"	Normal		LocalSystem0		
SQL Server Agent (MSSQLSERVER)	SQLSERVERAGENT	Stopped				
Manual	Own Process"	c:\program files\microsoft sql server\mssql.1\mssql\bin\sqlagent90.exe" -i mssqlserver	Normal	LocalSystem0		
SQL Server VSS Writer	SQLWriter	Stopped	Manual	Own		
Process	"c:\program files\microsoft sql server\90\shared\sqlwriter.exe"	Normal		LocalSystem0		
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		LocalSystem0		
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	Normal		LocalSystem0		
Terminal Services	TermService	Running	Manual	Share Process		
	c:\windows\system32\svchost.exe -k termsvcs	Normal		LocalSystem0		
Themes	Themes	Stopped	Disabled	Share Process		
	c:\windows\system32\svchost.exe -k netsvcs	Normal		LocalSystem0		
TelnetTlntSvr		Stopped	Disabled	Own Process		
	c:\windows\system32\tlntsvr.exe	Normal		NT		
AUTHORITY\LocalService	0					
Distributed Link Tracking Server	TrkSvr	Stopped				
Disabled	Share Process			c:\windows\system32\svchost.exe		
-k netsvcs	Normal			LocalSystem0		
Distributed Link Tracking Client	TrkWks	Running	Auto			
Share Process	c:\windows\system32\svchost.exe -k netsvcs	Normal		LocalSystem0		
Terminal Services Session Directory	Tssdis	Stopped	Disabled			
Own Process:c:\windows\system32\tssdis.exe		Normal		LocalSystem0		
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		LocalSystem0		
Volume Shadow Copy	VSS	Stopped	Manual	Own Process		
	c:\windows\system32\vssvc.exe	Normal		LocalSystem0		
Windows Time	W32Time	Running	Auto	Share Process		
	c:\windows\system32\svchost.exe -k localservice	Normal		NT		
AUTHORITY\LocalService	0					
World Wide Web Publishing Service	W3SVC	Running	Auto			
Share Process	c:\windows\system32\svchost.exe -k iissvcs					

Normal LocalSystem0
WebClient WebClient Stopped Disabled Share Process
c:\windows\system32\svchost.exe -k localservice Normal
NT AUTHORITY\LocalService0
WinHTTP Web Proxy Auto-Discovery Service
WinHttpAutoProxySvc Stopped Manual Share Process
c:\windows\system32\svchost.exe -k localservice Normal
NT AUTHORITY\LocalService0
Windows Management Instrumentation winmgmt Running
Auto Share Process c:\windows\system32\svchost.exe -k
netsvcs IgnoreLocalSystem0
Portable Media Serial Number Service WmdmPmSN Stopped
Manual Share Process c:\windows\system32\svchost.exe
-k netsvcs Normal LocalSystem0
Windows Management Instrumentation Driver Extensions Wmi Stopped
Manual Share Process c:\windows\system32\svchost.exe
-k netsvcs Normal LocalSystem0
WMI Performance Adapter WmiApSrv Stopped Manual
Own Process:c:\windows\system32\wbem\wmiapsrv.exe Normal
LocalSystem0
Automatic Updates wuauerv Running Auto Share Process
c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem0
Wireless Configuration WZCSVC Stopped Disabled Share
Process c:\windows\system32\svchost.exe -k netsvcs Normal
LocalSystem0
Network Provisioning Service xmlprov Stopped Manual
Share Process c:\windows\system32\svchost.exe -k netsvcs
Normal LocalSystem0

[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
MegaRAID Storage Manager	All Users:MegaRAID Storage Manager	All Users
Microsoft SQL Server 2005	All Users:Microsoft SQL Server 2005	All Users
Microsoft SQL Server 2005\Analysis Services	All Users:Microsoft SQL Server 2005\Analysis Services	All Users
Microsoft SQL Server 2005\Configuration Tools	All Users:Microsoft SQL Server 2005\Configuration Tools	All Users
Microsoft SQL Server 2005\Documentation and Tutorials	All Users:Microsoft SQL Server 2005\Documentation and Tutorials	All Users
Microsoft SQL Server 2005\Documentation and Tutorials\Tutorials	All Users:Microsoft SQL Server 2005\Documentation and Tutorials\Tutorials	All Users
Microsoft SQL Server 2005\Performance Tools	All Users:Microsoft SQL Server 2005\Performance Tools	All Users
Microsoft Visual Studio 2005	All Users:Microsoft Visual Studio 2005	All Users
Microsoft Visual Studio 2005\Visual Studio Tools	All Users:Microsoft Visual Studio 2005\Visual Studio 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 TPCH\Administrator:Accessories TPCH\Administrator
Accessories\Accessibility TPCH\Administrator:Accessories\Accessibility
TPCH\Administrator
Accessories\Entertainment
TPCH\Administrator:Accessories\Entertainment
TPCH\Administrator
Administrative Tools TPCH\Administrator:Administrative Tools
TPCH\Administrator
Startup TPCH\Administrator:Startup TPCH\Administrator
[Startup Programs]
Program Command User Name Location
desktop desktop.ini NT AUTHORITY\SYSTEM Startup
desktop desktop.ini TPCH\Administrator Startup
desktop desktop.ini .DEFAULT Startup
desktop desktop.ini All Users Common Startup
UserFaultCheck %systemroot%\system32\dumprep 0 -u All
Users HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Run

[OLE Registration]

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

[Windows Error Reporting]

Time	Type	Details
1/11/2008 1:20 AM	Application Error	Faulting application KILL.EXE, version 4.0.1371.1, faulting module unknown, version 0.0.0.0, fault address 0x34883482.

[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 InstallNo	

[File Versions]

File	Version	Size	Date	Path	Company
actxprxy.dll	6.0.3790.3959	221 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
advpack.dll	6.0.3790.3959	146 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
asctrls.ocx	6.0.3790.1830	147 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
browsecl.dll	6.0.3790.1830	63 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
browseui.dll	6.0.3790.3959	1,568 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
cdfview.dll	6.0.3790.3959	216 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
comctl32.dll	5.82.3790.3959	935 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
dxtrans.dll	6.3.3790.3959	325 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
dxtmsft.dll	6.3.3790.3959	549 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
iecont.dll	<File Missing>	Not Available	Not Available		
iecontlc.dll	<File Missing>	Not Available	Not Available		
iedkcs32.dll	16.0.3790.3959	417 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
iepeers.dll	6.0.3790.3959	362 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
iesetup.dll	6.0.3790.1830	71 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
ieuinit.inf	Not Available	24 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Not Available
ieexplore.exe	6.0.3790.1830	94 KB	2/18/2007 8:00:00 PM	C:\Program Files\Internet Explorer	Microsoft Corporation
imgutil.dll	6.0.3790.3959	61 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
inetcp.cpl	6.0.3790.3959	431 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
inetcpl.dll	6.0.3790.1830	110 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
inseng.dll	6.0.3790.3959	147 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
mlang.dll	6.0.3790.3959	686 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
msencode.dll	<File Missing>	Not Available	Not Available		
mshta.exe	6.0.3790.1830	38 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
mshtml.dll	6.0.3790.3959	5,859 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
mshtml.tlb	6.0.3790.1830	1,320 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
mshtml.dll	6.0.3790.3959	906 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
mshtmlr.dll	6.0.3790.1830	56 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
msident.dll	6.0.3790.1830	69 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
msidntld.dll	6.0.3790.1830	16 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
msieftp.dll	6.0.3790.3959	369 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
msrating.dll	6.0.3790.3959	240 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
mstime.dll	6.0.3790.3959	880 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
occache.dll	6.0.3790.3959	126 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation

proctexe.ocx	<File Missing>	Not Available	Not Available		
sendmail.dll	6.0.3790.3959	64 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
shdoclc.dll	6.0.3790.1830	590 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
shdocvw.dll	6.0.3790.3959	2,381 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
shfolder.dll	6.0.3790.1830	34 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
shlwapi.dll	6.0.3790.3959	607 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
tdc.ocx	1.3.0.3130	91 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
url.dll	6.0.3790.1830	40 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
urlmon.dll	6.0.3790.3959	1,063 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
webcheck.dll	6.0.3790.3959	439 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	Microsoft Corporation
wininet.dll	6.0.3790.3959	1,163 KB	2/18/2007 8:00:00 PM	C:\WINDOWS\system32	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 FileStatus 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	Custom
Restricted sites	Custom

Appendix B: Database Build Scripts

B.1 CreateDatabase.sql

```
--
-- File:      CREATEDATABASE.SQL
--            Microsoft TPC-H Benchmark Kit Ver. 2.06
--            Copyright Microsoft, 2007
--
-- Drop the existing database
--
use master
GO

if exists (select name from sysdatabases where name = '%DBNAME%')
    drop database %DBNAME%

CREATE DATABASE tpch100g
ON PRIMARY
( NAME = %DBNAME%_root,
  FILENAME = 'D:\tpch_root.mdf',
  SIZE = 10MB,
  FILEGROWTH = 10MB),
FILEGROUP DATA_FG
( NAME = %DBNAME%_data1,
  FILENAME = 'C:\tpch\d1V',
  SIZE = 24000MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_data2,
  FILENAME = 'C:\tpch\d2V',
  SIZE = 24000MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_data3,
  FILENAME = 'C:\tpch\d3V',
  SIZE = 24000MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_data4,
  FILENAME = 'C:\tpch\d4V',
  SIZE = 24000MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_data5,
  FILENAME = 'C:\tpch\d5V',
  SIZE = 24000MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_data6,
  FILENAME = 'C:\tpch\d6V',
  SIZE = 24000MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_data7,
  FILENAME = 'C:\tpch\d7V',
  SIZE = 24000MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_data8,
  FILENAME = 'C:\tpch\d8V',
  SIZE = 24000MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_data9,
  FILENAME = 'C:\tpch\d9V',
  SIZE = 24000MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_data10,
  FILENAME = 'C:\tpch\d10V',
  SIZE = 24000MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_data11,
  FILENAME = 'C:\tpch\d11V',
  SIZE = 24000MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_data12,
  FILENAME = 'C:\tpch\d12V',
  SIZE = 24000MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_data13,
  FILENAME = 'C:\tpch\d13V',
  SIZE = 24000MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_data14,
  FILENAME = 'C:\tpch\d14V',
  SIZE = 24000MB,
  FILEGROWTH = 0),
FILEGROUP LOAD_FG
( NAME = %DBNAME%_load1,
  FILENAME = 'C:\tpch\l1V',
  SIZE = 21500MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_load2,
  FILENAME = 'C:\tpch\l2V',
  SIZE = 21500MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_load3,
  FILENAME = 'C:\tpch\l3V',
  SIZE = 21500MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_load4,
  FILENAME = 'C:\tpch\l4V',
  SIZE = 21500MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_load5,
  FILENAME = 'C:\tpch\l5V',
  SIZE = 21500MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_load6,
  FILENAME = 'C:\tpch\l6V',
  SIZE = 21500MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_load7,
  FILENAME = 'C:\tpch\l7V',
  SIZE = 21500MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_load8,
  FILENAME = 'C:\tpch\l8V',
  SIZE = 21500MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_load9,
  FILENAME = 'C:\tpch\l9V',
  SIZE = 21500MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_load10,
  FILENAME = 'C:\tpch\l10V',
  SIZE = 21500MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_load11,
  FILENAME = 'C:\tpch\l11V',
  SIZE = 21500MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_load12,
  FILENAME = 'C:\tpch\l12V',
  SIZE = 21500MB,
  FILEGROWTH = 0),
```

```

FILEGROWTH = 0),
( NAME = %DBNAME%_load13,
  FILENAME = 'C:\tpch\l13\',
  SIZE = 21500MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_load14,
  FILENAME = 'C:\tpch\l14\',
  SIZE = 21500MB,
  FILEGROWTH = 0)
LOG ON
( NAME = %DBNAME%_log,
  FILENAME = 'c:\tpch\tpch100glog\',
  SIZE = 20000MB,
  FILEGROWTH = 0)

```

B.2 CreateTables.sql

```

--
-- File:      CREATETABLES.SQL
--            Microsoft TPC-H Benchmark Kit Ver. 2.06
--            Copyright Microsoft, 2007
--

```

```

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

```

```

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

```

```

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

```

```

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

```

```

create table ORDERS
(O_ORDERKEY bigint not null,
 O_CUSTKEY int not null,

```

```

O_ORDERSTATUS char(1) not null,
O_TOTALPRICE float not null,
O_ORDERDATE datetime not null,
O_ORDERPRIORITY char(15) not null,
O_CLERK char(15) not null,
O_SHIPPRIORITY int not null,
O_COMMENT varchar(79) not null)
on LOAD_FG

```

```

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

```

```

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

```

B.3 CreateIndexes_1.sql

```

--
-- File:      CREATECLUSTEREDINDEXES.SQL
--            Microsoft TPC-H Benchmark Kit Ver. 2.06
--            Copyright Microsoft, 2007
--

```

```

ALTER TABLE NATION ADD CONSTRAINT PK_N_NATIONKEY
PRIMARY KEY (N_NATIONKEY)
ON DATA_FG

```

```

ALTER TABLE REGION ADD CONSTRAINT PK_R_REGIONKEY
PRIMARY KEY (R_REGIONKEY)
ON DATA_FG

```

```

CREATE INDEX N_REGIONKEY_IDX ON
NATION(N_REGIONKEY)
WITH ( FILLFACTOR=100, SORT_IN_TEMPDB=ON,
MAXDOP=%NUMBER_OF_PROCS% )
ON DATA_FG

```

```

ALTER TABLE PART ADD CONSTRAINT PK_P_PARTKEY
PRIMARY KEY (P_PARTKEY)
ON DATA_FG

```

```

ALTER TABLE SUPPLIER ADD CONSTRAINT PK_S_SUPPKEY

```

```
PRIMARY KEY (S_SUPPKEY)
ON DATA_FG
```

```
CREATE INDEX S_NATIONKEY_IDX ON
SUPPLIER(S_NATIONKEY)
WITH ( FILLFACTOR=100, SORT_IN_TEMPDB=ON,
MAXDOP=%NUMBER_OF_PROCS% )
ON DATA_FG
```

```
ALTER TABLE CUSTOMER ADD CONSTRAINT PK_C_CUSTKEY
PRIMARY KEY (C_CUSTKEY)
ON DATA_FG
```

```
ALTER TABLE PARTSUPP ADD CONSTRAINT
PK_PS_PARTKEY_PS_SUPPKEY PRIMARY KEY (PS_PARTKEY,
PS_SUPPKEY)
ON DATA_FG
```

```
CREATE CLUSTERED INDEX O_ORDERDATE_CLUIDX ON
ORDERS(O_ORDERDATE)
WITH ( FILLFACTOR=95, SORT_IN_TEMPDB=ON,
MAXDOP=%NUMBER_OF_PROCS% )
ON DATA_FG
```

```
ALTER TABLE ORDERS ADD CONSTRAINT PK_O_ORDERKEY
PRIMARY KEY (O_ORDERKEY)
WITH (FILLFACTOR = 95)
ON DATA_FG
```

B.4 CreateIndexes_2.sql

```
--
-- File:      CREATEINDEXESSTREAM2.SQL
--            Microsoft TPC-H Benchmark Kit Ver. 2.06
--            Copyright Microsoft, 2007
--
```

```
CREATE INDEX PS_SUPPKEY_IDX ON PARTSUPP(PS_SUPPKEY)
WITH ( FILLFACTOR=100, SORT_IN_TEMPDB=ON,
MAXDOP=%NUMBER_OF_PROCS% )
ON DATA_FG
```

```
CREATE CLUSTERED INDEX L_SHIPDATE_CLUIDX ON
LINEITEM(L_SHIPDATE)
WITH ( FILLFACTOR=95, SORT_IN_TEMPDB=ON,
MAXDOP=%NUMBER_OF_PROCS% )
ON DATA_FG
```

```
CREATE INDEX L_ORDERKEY_IDX ON
LINEITEM(L_ORDERKEY)
WITH ( FILLFACTOR=95, SORT_IN_TEMPDB=ON,
MAXDOP=%NUMBER_OF_PROCS% )
ON DATA_FG
```

```
CREATE INDEX L_PARTKEY_IDX ON LINEITEM(L_PARTKEY)
WITH ( FILLFACTOR=95, SORT_IN_TEMPDB=ON,
MAXDOP=%NUMBER_OF_PROCS% )
ON DATA_FG
```

B.5 CreateFK.sql

```
--
-- File:      CREATERFK.SQL
--            Microsoft TPC-H Benchmark Kit Ver. 2.06
--            Copyright Microsoft, 2007
--
```

```
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)
```

B.6 CreateBackupDevices.sql

```
-- 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
```

```
sp_addumpdevice 'disk', 'BackupDev1',
'f:\backup\TPCH_14disk_backup1.dmp'
GO
sp_addumpdevice 'disk', 'BackupDev2',
'g:\backup\TPCH_14disk_backup2.dmp'
GO
```

```

sp_addumpdevice 'disk', 'BackupDev3',
'h:\backup\TPCH_14disk_backup3.dmp'
GO
sp_addumpdevice 'disk', 'BackupDev4',
'i:\backup\TPCH_14disk_backup4.dmp'
GO

```

B.7 BackupDatabase.sql

```

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

```

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

B.8 RestoreDatabase.sql

```

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

```

restore database %DBNAME% from BackupDev1, BackupDev2, BackupDev3, BackupDev4 with stats=10

B.9 Move_Resize_TempDB.sql

```

-- File: MOVE_RESIZE_TEMPDB.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.06
-- Copyright Microsoft, 2006, 2007

```

```

ALTER DATABASE tempdb
  MODIFY FILE (NAME='tempdev', FILENAME='C:\tpch\1\',
SIZE=27000MB, FILEGROWTH=0)
GO

```

```

ALTER DATABASE tempdb
  MODIFY FILE (NAME='templog', FILENAME='c:\tpch\templog\',
SIZE=7500mb, FILEGROWTH=0)
GO

```

```

ALTER DATABASE tempdb
  ADD FILE (NAME='tempdev2', FILENAME='C:\tpch\2\',
SIZE=27000MB, FILEGROWTH=0)
GO

```

```

ALTER DATABASE tempdb
  ADD FILE (NAME='tempdev3', FILENAME='C:\tpch\3\',
SIZE=27000MB, FILEGROWTH=0)
GO

```

```

ALTER DATABASE tempdb
  ADD FILE (NAME='tempdev4', FILENAME='C:\tpch\4\',
SIZE=27000MB, FILEGROWTH=0)
GO

```

```

ALTER DATABASE tempdb
  ADD FILE (NAME='tempdev5', FILENAME='C:\tpch\5\',
SIZE=27000MB, FILEGROWTH=0)
GO

```

```

ALTER DATABASE tempdb
  ADD FILE (NAME='tempdev6', FILENAME='C:\tpch\6\',

```

```

SIZE=27000MB, FILEGROWTH=0)
GO

```

```

ALTER DATABASE tempdb
  ADD FILE (NAME='tempdev7', FILENAME='C:\tpch\7\',
SIZE=27000MB, FILEGROWTH=0)
GO

```

```

ALTER DATABASE tempdb
  ADD FILE (NAME='tempdev8', FILENAME='C:\tpch\8\',
SIZE=27000MB, FILEGROWTH=0)
GO

```

```

ALTER DATABASE tempdb
  ADD FILE (NAME='tempdev9', FILENAME='C:\tpch\9\',
SIZE=27000MB, FILEGROWTH=0)
GO

```

```

ALTER DATABASE tempdb
  ADD FILE (NAME='tempdev10', FILENAME='C:\tpch\10\',
SIZE=27000MB, FILEGROWTH=0)
GO

```

```

ALTER DATABASE tempdb
  ADD FILE (NAME='tempdev11', FILENAME='C:\tpch\11\',
SIZE=27000MB, FILEGROWTH=0)
GO

```

```

ALTER DATABASE tempdb
  ADD FILE (NAME='tempdev12', FILENAME='C:\tpch\12\',
SIZE=27000MB, FILEGROWTH=0)
GO

```

```

ALTER DATABASE tempdb
  ADD FILE (NAME='tempdev13', FILENAME='C:\tpch\13\',
SIZE=27000MB, FILEGROWTH=0)
GO

```

```

ALTER DATABASE tempdb
  ADD FILE (NAME='tempdev14', FILENAME='C:\tpch\14\',
SIZE=27000MB, FILEGROWTH=0)
GO

```

B.10 DropLoadFG.sql

```

-- File: DROPLLOADFG.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 2.06
-- Copyright Microsoft, 2007
--

```

```

USE %DBNAME%
GO
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 FILEGROUP
LOAD_FG
GO
```

Appendix C: Query Text and Output

C.1 Qualification Queries and Output

Qualification Query 1

-- using default substitutions

/* TPC_H Query 1 - Pricing Summary Report */

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

```
L_RETURNFLAG L_LINESTATUS SUM_QTY
SUM_BASE_PRICE SUM_DISC_PRICE
SUM_CHARGE AVG_QTY
AVG_PRICE AVG_DISC
COUNT_ORDER
```

```
-----
A          F          37734107.000000
56586554400.730186  53758257134.870224
55909065222.827751  25.522006
38273.129735        0.049985          1478493
N          F          991417.000000
1487504710.380000   1413082168.054097
1469649223.194377  25.516472
38284.467761        0.050093          38854
N          O          74476040.000000
111701729697.740100 106118230307.605800
110367043872.497330 25.502227
38249.117989        0.049997          2920374
R          F          37719753.000000
56568041380.900047  53741292684.604042
55889619119.831856  25.505794
38250.854626        0.050009          1478870
-----
```

(4 row(s) affected)

Qualification Query 2

-- 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 P_PARTKEY P_MFGR
N_NAME P_PARTKEY S_PHONE
S_ADDRESS
S_COMMENT
-----
9938.530000 Supplier#000005359 UNITED
KINGDOM 185358 Manufacturer#4
QKuHYh,vZGiwu2FWEJoLDx04 33-429-790-6131
uriously regular requests hag
9937.840000 Supplier#000005969 ROMANIA
108438 Manufacturer#1
-----
```

ANDENSOSmk,miq23Xfb5RWt6dvUcvt6Qa 29-520-692-3537
 efully express instructions. regular requests against the slyly fin
 9936.220000 Supplier#000005250 UNITED
 KINGDOM 249 Manufacturer#4
 B3rqp0xbSEim4Mpy2RH J 33-320-228-2957
 etect about the furiously final accounts. slyly ironic pinto beans sleep
 inside the furiously
 9923.770000 Supplier#000002324
 GERMANY 29821 Manufacturer#4
 y3OD9UywSTok 17-779-299-1839
 ackages boost blithely. blithely regular deposits c
 9871.220000 Supplier#000006373
 GERMANY 43868 Manufacturer#5
 J8fcXWsTqM 17-813-485-8637
 etect blithely bold asymptotes. fluffily ironic platelets wake furiously; blit
 9870.780000 Supplier#000001286
 GERMANY 81285 Manufacturer#2
 YKA,E2fjiVd7eUrzp2Ef8j1QxGo2DFnosaTEH 17-516-924-4574
 regular accounts. furiously unusual courts above the fi
 9870.780000 Supplier#000001286
 GERMANY 181285 Manufacturer#4
 YKA,E2fjiVd7eUrzp2Ef8j1QxGo2DFnosaTEH 17-516-924-4574
 regular accounts. furiously unusual courts above the fi

(additional rows deleted here...)

7894.560000 Supplier#000007981
 GERMANY 85472 Manufacturer#4
 NSJ96vMROAbeXP 17-963-404-3760
 ic platelets affix after the furiously
 7887.080000 Supplier#000009792
 GERMANY 164759 Manufacturer#3
 Y28ITVeYriT3kiGdV2K8fSZ V2UqT5H1Otz 17-988-938-4296
 ckly around the carefully fluffly theodolites. slyly ironic pack
 7871.500000 Supplier#000007206 RUSSIA
 104695 Manufacturer#1 3w
 fNCnrVmvJjE95sgWZzvW 32-432-452-7731
 ionic requests. furiously final theodolites cajole. final, express packages
 sleep. quickly reg
 7852.450000 Supplier#000005864 RUSSIA
 8363 Manufacturer#4 WCNfBPZeSXh3h,c
 32-454-883-3821 usly unusual pinto beans. brave ideas sleep carefully
 quickly ironi
 7850.660000 Supplier#000001518 UNITED
 KINGDOM 86501 Manufacturer#1
 ONda3YJiHKJOC 33-730-383-3892
 ifts haggle fluffily pending pai
 7843.520000 Supplier#000006683 FRANCE
 11680 Manufacturer#4
 2Z0JGkiv01Y00oCFwUGfviIbhzcDdy 16-464-517-8943
 express, final pinto beans x-ray slyly asymptotes. unusual, unusual

(100 row(s) affected)

Qualification Query 3

-- 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_SHIPRIORITY
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_SHIPRIORITY
ORDER BY REVENUE DESC,
  O_ORDERDATE
```

L_ORDERKEY	REVENUE	O_ORDERDATE	O_SHIPRIORITY
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			
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)

Qualification Query 4

-- using default substitutions

/* TPC_H Query 4 - Order Priority Checking */

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

```
GROUP BY O_ORDERPRIORITY
ORDER BY O_ORDERPRIORITY
O_ORDERPRIORITY ORDER_COUNT
```

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

(5 row(s) affected)

Qualification Query 5

-- using default substitutions

/* TPC_H Query 5 - Local Supplier Volume */

```

SELECT  N_NAME,
        SUM(L_EXTENDEDPRI*(1-L_DISCOUNT)) AS
REVENUE
FROM    CUSTOMER,
        ORDERS,
        LINEITEM,
        SUPPLIER,
        NATION,
        REGION
WHERE   C_CUSTKEY   = O_CUSTKEY AND
        L_ORDERKEY  = O_ORDERKEY AND
        L_SUPPKEY   = S_SUPPKEY AND
        C_NATIONKEY = S_NATIONKEY AND
        S_NATIONKEY = N_NATIONKEY AND
        N_REGIONKEY = R_REGIONKEY AND
        R_NAME      = 'ASIA' AND
        O_ORDERDATE >= '1994-01-01' AND
        O_ORDERDATE < DATEADD(YY, 1, '1994-01-01')
GROUP  BY N_NAME
ORDER  BY REVENUE DESC
N_NAME          REVENUE
-----
INDONESIA        55502041.169700
VIETNAM         55295086.996700
CHINA           53724494.256600
INDIA           52035512.000200
JAPAN           45410175.695400

```

(5 row(s) affected)

Qualification Query 6

-- using default substitutions

/* TPC_H Query 6 - Forecasting Revenue Change */

```

SELECT  SUM(L_EXTENDEDPRI*L_DISCOUNT) AS
REVENUE
FROM    LINEITEM
WHERE   L_SHIPDATE   >= '1994-01-01' AND
        L_SHIPDATE   < dateadd (yy, 1, '1994-01-01') AND
        L_DISCOUNT  BETWEEN .06 - 0.01 AND .06 + 0.01 AND
        L_QUANTITY    < 24
REVENUE
-----
123141078.228300

```

(1 row(s) affected)

Qualification Query 7

-- 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,
        REGION
WHERE   P_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

```

```

CUSTOMER,
NATION N1,
NATION N2
WHERE   S_SUPPKEY   = L_SUPPKEY AND
        O_ORDERKEY  = L_ORDERKEY AND
        C_CUSTKEY   = O_CUSTKEY 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)

Qualification Query 8

-- 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_EXTENDEDPRI * (1-L_DISCOUNT) AS
VOLUME,
        N2.N_NAME          AS NATION
FROM    PART,
        SUPPLIER,
        LINEITEM,
        ORDERS,
        CUSTOMER,
        NATION N1,
        NATION N2,
        REGION
WHERE   P_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)

Qualification Query 9

-- 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
PS_PARTKEY = L_PARTKEY AND
P_PARTKEY = L_PARTKEY AND
O_ORDERKEY = L_ORDERKEY AND
S_NATIONKEY = N_NATIONKEY AND
P_NAME LIKE '%green%'
) AS PROFIT
GROUP BY NATION,
O_YEAR
ORDER BY NATION,
O_YEAR DESC
NATION O_YEAR SUM_PROFIT
-----
ALGERIA 1998 31342867.234500
ALGERIA 1997 57138193.023300
ALGERIA 1996 56140140.133000
ALGERIA 1995 53051469.653400
ALGERIA 1994 53867582.128600
ALGERIA 1993 54942718.132400
ALGERIA 1992 54628034.712700
ARGENTINA 1998 30211185.708100
ARGENTINA 1997 50805741.752300
ARGENTINA 1996 51923746.575500
ARGENTINA 1995 49298625.766600
ARGENTINA 1994 50835610.109500
ARGENTINA 1993 51646079.177500
ARGENTINA 1992 50410314.994800
BRAZIL 1998 27217924.383200
BRAZIL 1997 48378669.198900
BRAZIL 1996 50482870.357200
BRAZIL 1995 47623383.634900
BRAZIL 1994 47840165.725600
BRAZIL 1993 49054694.035100
BRAZIL 1992 48667639.084200
```

```
CANADA 1998 30379833.768500
CANADA 1997 50465052.311400
CANADA 1996 52560501.390400
CANADA 1995 52375332.809200
CANADA 1994 52600364.658700
CANADA 1993 52644504.073500
CANADA 1992 53932871.697000
CHINA 1998 31075466.164900
CHINA 1997 50551874.449900
CHINA 1996 51039293.875400
CHINA 1995 49287534.616900
CHINA 1994 50851090.067400
CHINA 1993 54229629.833000
CHINA 1992 52400529.372000
EGYPT 1998 29054433.385600
EGYPT 1997 50627611.452400
EGYPT 1996 49542212.844600
EGYPT 1995 48311550.320700
EGYPT 1994 49790644.736000
EGYPT 1993 48904292.969200
EGYPT 1992 49434932.619200
ETHIOPIA 1998 28040717.267400
ETHIOPIA 1997 47455009.866400
ETHIOPIA 1996 46491097.572900
ETHIOPIA 1995 46804449.300900
ETHIOPIA 1994 48516143.917000
ETHIOPIA 1993 46551891.562900
ETHIOPIA 1992 44934648.642800
FRANCE 1998 32226407.839200
FRANCE 1997 47121485.860200
FRANCE 1996 47263135.496000
FRANCE 1995 47275997.570700
FRANCE 1994 47067209.331500
FRANCE 1993 51163370.106200
FRANCE 1992 47846235.331300
GERMANY 1998 28624942.659800
GERMANY 1997 49309074.877300
GERMANY 1996 49918683.168400
GERMANY 1995 52650718.724200
GERMANY 1994 50346900.422600
GERMANY 1993 50991895.805900
GERMANY 1992 48274126.099100
INDIA 1998 29943144.354400
INDIA 1997 50665453.231200
INDIA 1996 50283092.291200
INDIA 1995 50006774.644600
INDIA 1994 48995190.755600
INDIA 1993 50286902.852500
INDIA 1992 50850329.402300
INDONESIA 1998 27672339.996500
INDONESIA 1997 50512145.725600
INDONESIA 1996 51653060.116600
INDONESIA 1995 51508779.594000
INDONESIA 1994 52817950.321800
INDONESIA 1993 47959994.955100
INDONESIA 1992 51776605.032300
IRAN 1998 29065736.238100
IRAN 1997 50042063.054500
IRAN 1996 50926653.188100
IRAN 1995 51249667.648500
IRAN 1994 50337085.865000
IRAN 1993 51730763.490200
IRAN 1992 49955856.563400
IRAQ 1998 31624551.001700
IRAQ 1997 55121749.019500
IRAQ 1996 55897663.793700
IRAQ 1995 54815472.517000
IRAQ 1994 54408516.126600
IRAQ 1993 53633167.977000
IRAQ 1992 55891939.339600
```

JAPAN	1998	27934179.669500
JAPAN	1997	44517162.546300
JAPAN	1996	42545606.120400
JAPAN	1995	43749356.399600
JAPAN	1994	44840243.070000
JAPAN	1993	44660015.532800
JAPAN	1992	45410249.121600
JORDAN	1998	26901488.578100
JORDAN	1997	45471878.409900
JORDAN	1996	46794325.791800
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)

Qualification Query 10

-- using default substitutions

/* TPC_H Query 10 - Returned Item Reporting */

```

SELECT TOP 20
    C_CUSTKEY,
    C_NAME,
    SUM(L_EXTENDEDPRISE*(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 N_NAME REVENUE
C_ACCTBAL N_NAME
C_ADDRESS C_PHONE
C_COMMENT
-----
-----
57040 Customer#000057040 734235.245500
632.870000 JAPAN
Eioyzzf4pp 22-895-641-3466 sits.
slyly regular requests sleep alongside of the regular inst
143347 Customer#000143347 721002.694800
2557.470000 EGYPT
laReFYv,Kw4 14-742-935-3718
ggle carefully enticing requests. final deposits use bold, bold pinto beans.
ironic, idle re
60838 Customer#000060838 679127.307700
2454.770000 BRAZIL

```

64EaJ5vMAHWJIBOXkIpNc2RJIWE 12-913-494-9813
 need to boost against the slyly regular account
 101998 Customer#000101998 637029.566700
 3790.890000 UNITED KINGDOM
 01c9CILnNtfOQYmZj 33-593-865-6378
 ress foxes wake slyly after the bold excuses. ironic platelets are furiously
 carefully bold theodolites
 125341 Customer#000125341 633508.086000
 4983.510000 GERMANY
 S29ODD6bceU8QSuuEJznkNaK 17-582-695-5962
 arefully even depths. blithely even excuses sleep furiously. foxes use
 except the dependencies. ca
 25501 Customer#000025501 620269.784900
 7725.040000 ETHIOPIA
 W556MXuoiaYCCZamJI,Rn0B4ACUGdkQ8DZ 15-874-808-6793
 he pending instructions wake carefully at the pinto beans. regular, final
 instructions along the slyly fina
 115831 Customer#000115831 596423.867200
 5098.100000 FRANCE
 rFeBbEEyk dl ne7zV5fDrmq1oK09wV7pxqCgIc 16-715-386-3788 1
 somas sleep. furiously final deposits wake blithely regular pinto b
 84223 Customer#000084223 594998.023900
 528.650000 UNITED KINGDOM
 nAVZCs6BaWap rrM27N 2qBnc5WBauxbA 33-442-824-8191
 slyly final deposits haggle regular, pending dependencies. pending
 escapades wake
 54289 Customer#000054289 585603.391800
 5583.020000 IRAN
 vXCxoCsU0Bad5JQI ,oobkZ 20-834-292-4707 ely
 special foxes are quickly finally ironic p
 39922 Customer#000039922 584878.113400
 7321.110000 GERMANY
 Zgy4s50I2GKN4pLDPBU8m342gIw6R 17-147-757-8036
 y final requests. furiously final foxes cajole blithely special platelets. f
 6226 Customer#000006226 576783.760600
 2230.090000 UNITED KINGDOM
 8gPu8,NPGkfyQQ0hcIYUGPIBwC,ybP5g, 33-657-701-3391
 ending platelets along the express deposits cajole carefully final
 922 Customer#00000922 576767.533300
 3869.250000 GERMANY
 Az9RFaut7NkPnc5zSD2PwHgVwr4jRzq 17-945-916-9648
 luffly fluffy deposits. packages c
 147946 Customer#000147946 576455.132000
 2030.130000 ALGERIA
 iANyZHjqhyy7AjahOpTrYyhJ 10-886-956-3143
 ithely ironic deposits haggle blithely ironic requests. quickly regu
 115640 Customer#000115640 569341.193300
 6436.100000 ARGENTINA
 Vtgifia9qI 7EpHgecU1X 11-411-543-4901 ost
 slyly along the patterns: pinto be
 73606 Customer#000073606 568656.857800
 1785.670000 JAPAN
 xuR0Tro5yChDfOCrjkd2ol 22-437-653-6966 he
 furiously regular ideas. slowly
 110246 Customer#000110246 566842.981500
 7763.350000 VIETNAM
 7KzflgX MDOq7sOkI 31-943-426-9837
 egular deposits serve blithely above the fl
 142549 Customer#000142549 563537.236800
 5085.990000 INDONESIA
 ChqEoK43OysjdHbtKCP6dKqjNyvvi9 19-955-562-2398
 sleep pending courts. ironic deposits against the carefully unusual
 platelets cajole carefully express accounts.
 146149 Customer#000146149 557254.986500
 1791.550000 ROMANIA
 s87fvzFQpU 29-744-164-6487 of
 the slyly silent accounts. quickly final accounts across the
 52528 Customer#000052528 556397.350900
 551.790000 ARGENTINA
 NFztyTOR10UOJ 11-208-192-3205

deposits hinder. blithely pending asymptotes breach slyly regular re
 23431 Customer#000023431 554269.536000
 3381.860000 ROMANIA
 HgiV0phqhaIa9aydNoIlb 29-915-458-2654
 nusual, even instructions: furiously stealthy n

(20 row(s) affected)

Qualification Query 11

-- using default substitutions

/* TPC_H Query 11 - Important Stock Identification */

```

SELECT PS_PARTKEY,
       SUM(PS_SUPPLYCOST*PS_AVAILQTY) AS VALUE
FROM PARTSUPP,
     SUPPLIER,
     NATION
WHERE PS_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
  WHERE PS_SUPPKEY = S_SUPPKEY
      AND
      S_NATIONKEY = N_NATIONKEY
      AND
      N_NAME = '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

```

(additional rows deleted here...)

```

101674 7879324.600000
51968 7879102.210000
72073 7877736.110000
5182 7874521.730000

```

(1048 row(s) affected)

Qualification Query 12

-- using default substitutions

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

```

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

```

```

                O_ORDERPRIORITY <> '2-HIGH'
            THEN 1
            ELSE 0
        END) AS LOW_LINE_COUNT
FROM    ORDERS,
        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          262

```

(2 row(s) affected)

Qualification Query 13

-- 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           50005
9           6641
10          6532
11          6014
8           5937
12          5639
13          5024
19          4793
7           4687
17          4587
18          4529
20          4516
15          4505
14          4446
16          4273
21          4190
22          3623
6           3265
23          3225
24          2742
25          2086
5           1948
26          1612
27          1179
4           1007
28          893
29          593
3           415
30          376

```

```

31          226
32          148
2           134
33          75
34          50
35          37
1           17
36          14
38          5
37          5
40          4
41          2
39          1

```

(42 row(s) affected)

Qualification Query 14

-- using default substitutions

/* TPC_H Query 14 - Promotion Effect */

```

SELECT  100.00 * SUM ( CASEWHEN P_TYPE LIKE
                        'PROMO%'
                        THEN
                        L_EXTENDEDPRI*(1-L_DISCOUNT)
                        ELSE 0
                        END) /
SUM(L_EXTENDEDPRI*(1-L_DISCOUNT)) AS
PROMO_REVENUE
FROM    LINEITEM,
        PART
WHERE   L_PARTKEY = P_PARTKEY    AND
        L_SHIPDATE >= '1995-09-01'    AND
        L_SHIPDATE < dateadd(mm, 1, '1995-09-01')
PROMO_REVENUE
-----
16.380779

```

(1 row(s) affected)

Qualification Query 15

-- 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_EXTENDEDPRI*(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)

Qualification Query 16

-- 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

(additional rows deleted here...)

Brand#52	MEDIUM BRUSHED BRASS	45	3
Brand#53	MEDIUM BRUSHED TIN	45	3
Brand#54	ECONOMY POLISHED BRASS	9	3
Brand#55	PROMO PLATED BRASS	19	3
Brand#55	STANDARD PLATED TIN	49	3

(18314 row(s) affected)

Qualification Query 17

-- using default substitutions

/* TPC_H Query 17 - Small-Quantity-Order Revenue */

```

SELECT SUM(L_EXTENDEDPRICE)/7.0 AS AVG_YEARLY
FROM LINEITEM,
     PART
WHERE P_PARTKEY = L_PARTKEY AND
     P_BRAND = 'Brand#23' AND
     P_CONTAINER = 'MED BOX' AND
     L_QUANTITY < ( SELECT 0.2 *
                    AVG(L_QUANTITY)

```

```

FROM LINEITEM
WHERE L_PARTKEY =

```

```

P_PARTKEY
)

```

```

AVG_YEARLY
-----
348406.054286

```

(1 row(s) affected)

Qualification Query 18

-- using default substitutions

/* TPC_H Query 18 - Large Volume Customer */

```

SELECT TOP 100
     C_NAME,
     C_CUSTKEY,
     O_ORDERKEY,
     O_ORDERDATE,
     O_TOTALPRICE,
     SUM(L_QUANTITY)
FROM CUSTOMER,
     ORDERS,
     LINEITEM
WHERE O_ORDERKEY IN ( SELECT
                     L_ORDERKEY
                     FROM LINEITEM
                     GROUP BY L_ORDERKEY
                     HAVING SUM(L_QUANTITY) > 300
                     ) AND
     C_CUSTKEY = O_CUSTKEY AND
     O_ORDERKEY = L_ORDERKEY
GROUP BY C_NAME,
         C_CUSTKEY,
         O_ORDERKEY,
         O_ORDERDATE,
         O_TOTALPRICE
ORDER BY O_TOTALPRICE DESC,
         O_ORDERDATE

```

```

C_NAME C_CUSTKEY O_ORDERKEY
O_ORDERDATE O_TOTALPRICE
-----

```

Customer#000128120	128120	4722021
1994-04-07 00:00:00.000	544089.090000	323.000000
Customer#000144617	144617	3043270
1997-02-12 00:00:00.000	530604.440000	317.000000
Customer#000013940	13940	2232932
1997-04-13 00:00:00.000	522720.610000	304.000000
Customer#000066790	66790	2199712
1996-09-30 00:00:00.000	515531.820000	327.000000
Customer#000046435	46435	4745607
1997-07-03 00:00:00.000	508047.990000	309.000000
Customer#000015272	15272	3883783
1993-07-28 00:00:00.000	500241.330000	302.000000
Customer#000146608	146608	3342468
1994-06-12 00:00:00.000	499794.580000	303.000000
Customer#000096103	96103	5984582

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

(57 row(s) affected)

Qualification Query 19

-- using default substitutions

/* TPC_H Query 19 - Discounted Revenue */

```

SELECT SUM(L_EXTENDEDPRI* (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)

Qualification Query 20

-- 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
PS_AVAILQTY > (
SELECT 0.5 * sum(L_QUANTITY)
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
Supplier#000000091
YV45D7TkfdQanOOZ7q9QxkyGUapU1oOWU6q3

```

```

Supplier#000000197 YC2Acon6kjY3zj3Fbxs2k4Vdf7X0cd2F
Supplier#000000226 83qOdU2EYRdPQAQhEtn GRZEd
Supplier#000000285 Br7e1nnt1yxrw6ImgpJ7YdhFDjuBf
Supplier#000000378 FfbhyCxWvcPrO8ltp9
Supplier#000000402 i9Sw4DoyMhzhKXCH9By.AYSgmD
Supplier#000000530 0qwCMwobKY
OcmlYfRXlagA8ukENJv,
Supplier#000000688 D
fw5ocppmZpYBBIP1718hCihLDZ5KhKX
Supplier#000000710 f19YPvOyb
QoYwjKC.oPycpGfieBAcwKJo
Supplier#000000736
l6i2nMwVuovfKnuVgaSGK2rDy65DIAFLegiL7

```

(additional rows deleted here...)

```

Supplier#000009753 wLhVEcRmd7PkJF4FBnGK7Z
Supplier#000009796 z,y4ldmr15DOvPUqYG
Supplier#000009799 4wNjXGa4OKW1
Supplier#000009811 E3iuyq7UnZxU7oPZle2Gu6
Supplier#000009812
APFRMy3lCbGfGa53n5t9DxzFPQPgnjrGt32
Supplier#000009862 rJzweWeN58
Supplier#000009868 ROjGgx5gvtkmnUUoeyy7v
Supplier#000009869
ucLqxzrpBTRMewGSM29t0rNTM30g1Tu3Xgg3mKag
Supplier#000009899 7XdpAHrzt1t,UQFZE
Supplier#000009974 7wJ,J5DKcxSU4Kp1cQLpbcAvB5AsvKT

```

(204 row(s) affected)

Qualification Query 21

-- 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
 Supplier#000002095 16
 Supplier#000005799 16
 Supplier#000005842 16
 Supplier#000006450 16
 Supplier#000006939 16
 Supplier#000009200 16
 Supplier#000009727 16
 Supplier#000000486 15
 Supplier#000000565 15
 Supplier#000001046 15
 Supplier#000001047 15
 Supplier#000001161 15
 Supplier#000001336 15
 Supplier#000001435 15
 Supplier#000003075 15
 Supplier#000003335 15
 Supplier#000005649 15
 Supplier#000006027 15
 Supplier#000006795 15
 Supplier#000006800 15
 Supplier#000006824 15
 Supplier#000007131 15
 Supplier#000007382 15
 Supplier#000008913 15
 Supplier#000009787 15
 Supplier#000000633 14
 Supplier#000001960 14
 Supplier#000002323 14
 Supplier#000002490 14
 Supplier#000002993 14
 Supplier#000003101 14
 Supplier#000004489 14
 Supplier#000005435 14
 Supplier#000005583 14
 Supplier#000005774 14
 Supplier#000007579 14
 Supplier#000008180 14
 Supplier#000008695 14
 Supplier#000009224 14
 Supplier#000000357 13
 Supplier#000000436 13
 Supplier#000000610 13
 Supplier#000000788 13
 Supplier#000000889 13
 Supplier#000001062 13
 Supplier#000001498 13
 Supplier#000002056 13
 Supplier#000002312 13
 Supplier#000002344 13
 Supplier#000002596 13
 Supplier#000002615 13
 Supplier#000002978 13
 Supplier#000003048 13
 Supplier#000003234 13
 Supplier#000003727 13
 Supplier#000003806 13
 Supplier#000004472 13
 Supplier#000005236 13
 Supplier#000005906 13

Supplier#000006241 13
 Supplier#000006326 13
 Supplier#000006384 13
 Supplier#000006394 13
 Supplier#000006624 13
 Supplier#000006629 13
 Supplier#000006682 13
 Supplier#000006737 13
 Supplier#000006825 13
 Supplier#000007021 13
 Supplier#000007417 13
 Supplier#000007497 13
 Supplier#000007602 13
 Supplier#000008134 13
 Supplier#000008234 13
 Supplier#000009435 13
 Supplier#000009436 13
 Supplier#000009564 13
 Supplier#000009896 13
 Supplier#000000379 12
 Supplier#000000673 12
 Supplier#000000762 12
 Supplier#000000811 12
 Supplier#000000821 12
 Supplier#000001337 12
 Supplier#000001916 12
 Supplier#000001925 12
 Supplier#000002039 12
 Supplier#000002357 12
 Supplier#000002483 12

(100 row(s) affected)

Qualification Query 22

-- using default substitutions

/* TPC_H Query 22 - Global Sales Opportunity */

```

SELECT  CNTRYCODE,
        COUNT(*) AS NUMCUST,
        SUM(C_ACCTBAL) AS TOTACCTBAL
FROM    ( SELECT  SUBSTRING(C_PHONE,1,2) AS
          CNTRYCODE,
          C_ACCTBAL
        FROM    CUSTOMER
          WHERE  SUBSTRING(C_PHONE,1,2) IN ('13',
          '31', '23', '29', '30', '18', '17') AND
          C_ACCTBAL > ( SELECT
          AVG(C_ACCTBAL)
          FROM
          CUSTOMER
          WHERE
          C_ACCTBAL > 0.00 AND
          SUBSTRING(C_PHONE,1,2) IN ('13', '31', '23', '29', '30', '18',
          '17')
          ) AND
          NOT EXISTS ( SELECT *
          FROM  ORDERS
          WHERE  O_CUSTKEY =
          C_CUSTKEY
          )
        ) AS CUSTSALE
GROUP  BY  CNTRYCODE
ORDER  BY  CNTRYCODE
CNTRYCODE 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 D: Seeds and Query Substitution Parameters

Stream0 Seed : 110011927

1 93
 2 28 COPPER ASIA
 3 MACHINERY 1995-03-14
 4 1995-02-01
 5 AFRICA 1997-01-01
 6 1997-01-01 0.07 25
 7 MOZAMBIQUE MOROCCO
 8 MOROCCO AFRICA LARGE BRUSHED TIN
 9 orange
 10 1994-03-01
 11 ALGERIA 0.0000010000
 12 SHIP TRUCK 1995-01-01
 13 pending requests
 14 1995-01-01
 15 1993-01-01
 16 Brand#12 LARGE PLATED 47 28 33 22 37
 12 7 9
 17 Brand#23 LG CAN
 18 314
 19 Brand#23 Brand#33 Brand#41 3 19 21
 20 metallic 1995-01-01 IRAN
 21 JAPAN
 22 20 10 19 17 27 15 30

Stream1 Seed : 110011928

21 EGYPT
 3 BUILDING 1995-03-30
 18 315
 5 AMERICA 1997-01-01
 11 JORDAN 0.0000010000
 7 INDIA GERMANY
 6 1997-01-01 0.04 24
 20 violet 1993-01-01 ALGERIA
 17 Brand#25 MED CASE
 12 FOB TRUCK 1995-01-01
 16 Brand#42 PROMO POLISHED 22 36 17 49 1
 4 31 37
 15 1995-01-01
 13 unusual accounts
 10 1994-12-01
 2 16 STEEL MIDDLE EAST
 8 GERMANY EUROPE LARGE PLATED TIN
 14 1995-01-01
 19 Brand#35 Brand#11 Brand#41 8 20 28
 9 mint
 22 12 23 13 30 16 29 17
 1 101
 4 1997-09-01

Stream2 Seed : 110011929

6 1997-01-01 0.02 25
 17 Brand#22 MED JAR
 14 1996-01-01
 16 Brand#22 MEDIUM ANODIZED 33 16 44 31

17 19 38 20
 19 Brand#32 Brand#54 Brand#35 3 10 24
 10 1993-09-01
 9 linen
 2 3 BRASS ASIA
 15 1993-01-01
 8 UNITED STATES AMERICA LARGE ANODIZED TIN
 5 ASIA 1997-01-01
 22 22 24 20 16 33 18 27
 12 MAILTRUCK 1995-01-01
 7 ALGERIA UNITED STATES
 13 unusual accounts
 18 313
 1 109
 4 1995-06-01
 20 honeydew 1997-01-01 MOROCCO
 3 HOUSEHOLD 1995-03-16
 11 ARGENTINA 0.0000010000
 21 VIETNAM

Stream3 Seed : 110011930

8 MOZAMBIQUE AFRICA MEDIUM POLISHED TIN
 5 EUROPE 1993-01-01
 4 1993-03-01
 6 1993-01-01 0.07 25
 17 Brand#24 MED CAN
 7 PERUMOZAMBIQUE
 1 117
 18 314
 22 15 23 10 16 29 28 33
 14 1996-01-01
 9 lace
 10 1994-06-01
 15 1995-01-01
 11 KENYA 0.0000010000
 20 saddle 1995-01-01 ETHIOPIA
 2 41 NICKEL AFRICA
 21 JORDAN
 19 Brand#34 Brand#32 Brand#34 8 11 21
 13 unusual accounts
 16 Brand#12 ECONOMY BURNISHED 31 7 1
 29 27 9 10 2
 12 TRUCK MAIL 1996-01-01
 3 BUILDING 1995-03-01

Stream4 Seed : 110011931

5 MIDDLE EAST 1993-01-01
 21 FRANCE
 14 1996-01-01
 19 Brand#42 Brand#24 Brand#33 4 12 28
 15 1993-01-01
 17 Brand#21 JUMBO CASE
 12 RAIL MAIL 1996-01-01
 6 1993-01-01 0.05 24
 4 1995-10-01
 9 grey

8 INDIA ASIA MEDIUM BURNISHED NICKEL
 16 Brand#42 STANDARD POLISHED 32 10 6
 40 23 36 16 12
 11 BRAZIL 0.0000010000
 2 29 COPPER ASIA
 10 1993-04-01
 18 312
 1 64
 13 unusual accounts
 7 INDONESIA INDIA
 22 34 21 24 31 20 10 23
 3 HOUSEHOLD 1995-03-18
 20 cream 1994-01-01 ROMANIA

Stream5 Seed : 110011932

21 UNITED KINGDOM
 15 1996-01-01
 4 1993-07-01
 6 1993-01-01 0.02 24

7 ARGENTINA ALGERIA
 16 Brand#32 MEDIUM BRUSHED 9 32 47 49
 22 18 43 26
 19 Brand#44 Brand#52 Brand#23 9 13 24
 18 313
 14 1996-01-01
 22 27 10 28 30 17 22 29
 11 MOROCCO 0.0000010000
 13 unusual deposits
 3 AUTOMOBILE 1995-03-03
 1 72
 2 17 STEEL AFRICA
 5 AFRICA 1993-01-01
 8 ALGERIA AFRICA SMALL BRUSHED NICKEL
 20 orange 1997-01-01 INDONESIA
 12 AIR MAIL 1996-01-01
 17 Brand#23 JUMBO JAR
 10 1994-01-01
 9 forest

Appendix E: Refresh Function Source Code

E.1 CreateRF1Proc.sql

```
-- File:      CREATERF1PROC.SQL
--           Microsoft TPC-H Benchmark Kit Ver. 2.05
--           Copyright Microsoft, 2006, 2007
--
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

        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 than 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_LINENUMBER,L_QU
ANTITY,
L_EXTENDEDPRI, 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_LINENUMBER,L_QU
ANTITY,
          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

```

E.2 CreateRF2Proc.sql

```

-- File:      CREATERF2PROC.SQL
--           Microsoft TPC-H Benchmark Kit Ver. 2.05
--           Copyright Microsoft, 2006, 2007
--
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 than 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

```

Appendix F: Implementation Specific Layer and Source Code

F.1 print.c

```
/*
 * $Id: print.c,v 1.3 2005/10/28 02:56:22 jms Exp $
 *
 * Revision History
 * =====
 * $Log: print.c,v $
 * Revision 1.3 2005/10/28 02:56:22 jms
 * add platform-specific printf formats to allow for DSS_HUGE data type
 *
 * 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;
#endif 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);
    if (scale <= 3000)
        PR_VSTR(fp, c->name, C_NAME_LEN);
    else
        PR_VSTR(fp, c->name, C_NAME_LEN + 3);
    PR_VSTR(fp, c->address,
        (columnar)?(long)(ceil(C_ADDR_LEN *

```

```

V_STR_HGH)):c->alen);
    PR_HUGE(fp, &c->nation_code);
    PR_STR(fp, c->phone, PHONE_LEN);
    PR_MONEY(fp, &c->acctbal);
    PR_STR(fp, c->mktsegment, C_MSEG_LEN);
    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_HUGE(fp_o, &o->okey);
    PR_HUGE(fp_o, &o->custkey);
    PR_CHR(fp_o, &o->orderstatus);
    PR_MONEY(fp_o, &o->totalprice);
    PR_STR(fp_o, o->odate, DATE_LEN);
    PR_STR(fp_o, o->opriority, O_OPRIO_LEN);
    PR_STR(fp_o, o->clerk, O_CLRK_LEN);
    PR_INT(fp_o, o->spriority);
    PR_VSTR_LAST(fp_o, o->comment,
        (columnar)?(long)(ceil(O_CMNT_LEN *
V_STR_HGH)):o->clen);
    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_HUGE(fp_l, &o->l[i].okey);
            PR_HUGE(fp_l, &o->l[i].partkey);
            PR_HUGE(fp_l, &o->l[i].suppkey);

```

```

PR_HUGE(fp_1, &o->l[i].lcnt);
PR_HUGE(fp_1, &o->l[i].quantity);
PR_MONEY(fp_1, &o->l[i].eprice);
PR_MONEY(fp_1, &o->l[i].discount);
PR_MONEY(fp_1, &o->l[i].tax);
PR_CHR(fp_1, &o->l[i].rflag[0]);
PR_CHR(fp_1, &o->l[i].lstatus[0]);
PR_STR(fp_1, o->l[i].sdate, DATE_LEN);
PR_STR(fp_1, o->l[i].cdate, DATE_LEN);
PR_STR(fp_1, o->l[i].rdate, DATE_LEN);
PR_STR(fp_1, o->l[i].shipinstruct, L_INST_LEN);
PR_STR(fp_1, o->l[i].shipmode, L_SMODE_LEN);
PR_VSTR_LAST(fp_1, o->l[i].comment,
(columnar)?(long)(ceil(L_CMNT_LEN *
V_STR_HGH)):o->l[i].clen);
PR_END(fp_1);
}

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->name,
(columnar)?(long)P_NAME_LEN:part->nlen);
    PR_STR(p_fp, part->mfg, P_MFG_LEN);
    PR_STR(p_fp, part->brand, P_BRND_LEN);
    PR_VSTR(p_fp, part->type,
(columnar)?(long)P_TYPE_LEN:part->tlen);
    PR_HUGE(p_fp, &part->size);
    PR_STR(p_fp, part->container, P_CNTR_LEN);
    PR_MONEY(p_fp, &part->retailprice);
    PR_VSTR_LAST(p_fp, part->comment,
(columnar)?(long)(ceil(P_CMNT_LEN *
V_STR_HGH)):part->clen);
    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].suppkey);
    PR_HUGE(ps_fp, &part->s[i].qty);
    PR_MONEY(ps_fp, &part->s[i].scost);
    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_STRT(fp);
    PR_HUGE(fp, &supp->suppkey);
    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_HUGE(fp, &supp->nation_code);
    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_STRT(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->crlen);
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_STRT(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->crlen);
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);
}
}
start = new;
last = new;
}
if (gen_rng)
{
PR_STRT(dfp);
PR_HUGE(dfp, &start);
PR_HUGE(dfp, &last);
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);
}

```

F.2 Create_RF1_Indices.sql

```

create clustered index NEWORDERS_CLUIDX
on NEWORDERS (O_ORDERDATE)
on DATA_FG

create clustered index NEWLINEITEM_CLUIDX
on NEWLINEITEM (L_ORDERKEY)
on DATA_FG

```

F.3 Create_RF1_Tables.sql

```

--
-- Create tables to hold RF1 input data
--

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

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

DATA_FG

if exists (select name from sysobjects where name = 'NEWLINEITEM')
drop table NEWLINEITEM
create table NEWLINEITEM (L_ORDERKEY bigint not null,
    L_PARTKEY int not null,
    L_SUPPKEY int not null,
    L_LINENUMBER int not null,
    L_QUANTITY float not null,
    L_EXTENDEDPRICE float not null,

```

```

L_DISCOUNT float not null,
L_TAX float not null,
L_RETURNFLAG char(1) not null,
L_LINESTATUS char(1) not null,
L_SHIPDATE datetime not null,
L_COMMITDATE datetime not null,
L_RECEIPTDATE datetime not null,
L_SHIPINSTRUCT char(25) not null,
L_SHIPMODE char(10) not null,
L_COMMENT varchar(44) not null) on

```

DATA_FG

F.4 Create_RF2_Indices.sql

```

create clustered index MOD_OLDORDERS_CLUIDX on
MOD_OLDORDERS (O_ORDERDATE)

create index MOD_OLDORDERS_IDX on MOD_OLDORDERS
(O_ORDERKEY)

```

F.5 Create_RF2_Tables.sql

```

--
-- Create the tables to hold input data for RF2
--

declare @segment integer
declare @sql nchar(1000)

if exists (select name from sysobjects where name =
'MOD_OLDORDERS')
drop table MOD_OLDORDERS
create table MOD_OLDORDERS (O_ORDERDATE datetime,
O_ORDERKEY bigint) on DATA_FG

set @segment = 1
while @segment <= $(totalSegments)
begin
    set @sql = 'if exists (select name from sysobjects where name =
"OLDORDERS_'
        +
RTRIM(CONVERT(varchar(30),@segment))+ "')
drop table OLDORDERS_' +
RTRIM(CONVERT(varchar(30),@segment))
exec sp_executesql @sql
    set @sql = 'create table OLDORDERS_' +
RTRIM(CONVERT(varchar(30),@segment))
        + '(O_ORDERKEY int) on DATA_FG'
exec sp_executesql @sql

    set @segment = @segment + 1
end

```

F.6 Execute_RF1_tmpl.sql

```

--
-- Execute the Refresh RF1 Stored Procedure
--

EXEC RF1 $(currExec), $(batchSize), $(numParallelExecs),
$(totalExecs)

```


F.7 Execute_RF2_tmpl.sql

```
--  
-- Execute the Refresh RF2 Stored Procedure  
--  
EXEC RF2 $(currExec), $(batchSize), $(numParallelExecs),  
$(totalExecs)
```

F.8 Increment_Update_Set.sql

```
UPDATE TPCPCH_AUX_TABLE SET updateset=updateset+1
```

F.9 Load_RF1_tmpl.sql

```
declare @sql nchar(1000)  
declare @set integer  
  
select @set = updateset from TPCPCH_AUX_TABLE  
  
set @sql = 'bulk insert NEWLINEITEM  
from "$(ffLoc)\Lineitem.tbl.u' +  
RTRIM(CONVERT(varchar(30),@set))  
+ '.$(partNo)' with (FieldTerminator = "|",  
RowTerminator = "\n",tablock)'  
exec sp_executesql @sql  
  
set @sql = 'bulk insert NEWORDERS  
from "$(ffLoc)\Orders.tbl.u' +  
RTRIM(CONVERT(varchar(30), @set))  
+ '.$(partNo)' with (FieldTerminator = "|",  
RowTerminator = "\n",tablock)'  
exec sp_executesql @sql
```

F.10 Load_RF2_tmpl.sql

```
--  
-- Load the RF2 data for the given segment  
--  
declare @set integer  
declare @sql nchar(1000)  
  
select @set = updateset from TPCPCH_AUX_TABLE  
  
set @sql = 'bulk insert OLDORDERS_$(partNo)  
from "$(ffLoc)\Delete.u' +  
RTRIM(CONVERT(varchar(30),@set))  
+ '.$(partNo)' with (RowTerminator = "|",tablock)'  
exec sp_executesql @sql  
  
insert into MOD_OLDORDERS (O_ORDERDATE, O_ORDERKEY)  
(select B.O_ORDERDATE, B.O_ORDERKEY  
from OLDORDERS_$(partNo) A, ORDERS B  
where A.O_ORDERKEY = B.O_ORDERKEY)
```

F.11 RFQueries.sql

```
DECLARE @startdate DATETIME  
DECLARE @enddate DATETIME  
DECLARE @edate DATETIME
```

```
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)
```

```
INSERT INTO LINEITEM  
(L_ORDERKEY,L_PARTKEY,L_SUPPKEY,L_LINENUMBER,L_QU  
ANTITY,  
L_EXTENDEDPRI, 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_LINENUMBER,L_QU  
ANTITY,  
L_EXTENDEDPRI, 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)
```

```
DELETE FROM LINEITEM WHERE L_ORDERKEY in  
(SELECT O_ORDERKEY FROM  
MOD_OLDORDERS  
WHERE O_ORDERDATE > @startdate AND  
O_ORDERDATE <= @edate)  
option (loop join)
```

```
DELETE FROM ORDERS WHERE O_ORDERKEY in  
(SELECT O_ORDERKEY FROM  
MOD_OLDORDERS  
WHERE O_ORDERDATE > @startdate AND  
O_ORDERDATE <= @edate)  
option (loop join)
```

F.12 RF1_exec.cmd

Rem This File creates load and exec files, launch parallel loads, create indexes and launch parallel execs for the RF1 stored procedure

```
setlocal EnableDelayedExpansion
```

```
REM RF stream num  
set TPCPCH_RF_STREAM_NUM=%1
```

```
REM output dir  
set TPCPCH_RUN_NUM=%2
```

```
REM Master log comment  
set TPCPCH_COMMENT_STR=%3
```

```

set TPCH_NUM_RF_EXEC_STREAMS=%4
set TPCH_NUM_RF_EXEC_TOTAL=%5
set TPCH_RF_EXEC_BATCH_SIZE=%6
set TPCH_UF_DIR=%7
set TPCH_NUM_RF_LOAD_STREAMS=%8
set TPCH_NUM_RF_LOAD_FILES=%9

set
TPCH_OUTPUT_DIR=%TPCH_OUTPUT_DIR_PREFIX%\%TPCH_R
UN_NUM%
if not exist %TPCH_OUTPUT_DIR% md %TPCH_OUTPUT_DIR%
set
TPCH_MASTERLOG_FILE=%TPCH_OUTPUT_DIR%\%TPCH_MAS
TERLOG_NAME%

echo !DATE! !TIME! Start: Executing %TPCH_COMMENT_STR% >>
%TPCH_MASTERLOG_FILE%

pushd %TPCH_OUTPUT_DIR%

REM Create Tables

    echo !DATE! !TIME! Start: create_tables_RF1 >>
%TPCH_MASTERLOG_FILE%

    call
%TPCH_AUTOMATION_CMD_PATH%\execSQLFileList.cmd
create_tables_RF1_%TPCH_RF_STREAM_NUM%.txt
%TPCH_RUN_NUM% no no no

    echo !DATE! !TIME! End: create_tables_RF1 >>
%TPCH_MASTERLOG_FILE%

REM launch parallel loads

    echo !DATE! !TIME! Start: launch_parallel_loads_RF1 >>
%TPCH_MASTERLOG_FILE%
rem call
%TPCH_AUTOMATION_CMD_PATH%\RFs\startCollectWrapper.cm
d %TPCH_RUN_NUM% %TPCH_COMMENT_STR%_Parallel_loads

set
TPCH_SEMAPHORE_NAME=Load.%TPCH_RF_STREAM_NUM%.
%TPCH_RUN_NUM%
start
%TPCH_AUTOMATION_CMD_PATH%\WaitForSemaphore.cmd
%TPCH_SEMAPHORE_NAME%
%TPCH_NUM_RF_EXEC_STREAMS%
%TPCH_SEMAPHORE_NAME%_ALL
set /A LOCAL_CURR_STREAM = 1

:outerLoopLoadRun

start
%TPCH_AUTOMATION_CMD_PATH%\execSQLFileListSemaphore.
cmd %TPCH_SEMAPHORE_NAME%
RF1_Load_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_ST
REAM%.txt %TPCH_RUN_NUM% no no no

set /A LOCAL_CURR_STREAM =
%LOCAL_CURR_STREAM% + 1
if %LOCAL_CURR_STREAM% LEQ
%TPCH_NUM_RF_LOAD_STREAMS% goto outerLoopLoadRun

REM wait for all loads to complete

```

```

%TPCH_AUTOMATION_EXEC%\semaphore -wait
%TPCH_SEMAPHORE_NAME%_ALL

rem call
%TPCH_AUTOMATION_CMD_PATH%\RFs\stopCollectWrapper.cmd
%TPCH_RUN_NUM% %TPCH_COMMENT_STR%_Parallel_loads
echo !DATE! !TIME! End: launch_parallel_loads_RF1 >>
%TPCH_MASTERLOG_FILE%

REM create indexes
echo !DATE! !TIME! Start: create_indexes_RF1 >>
%TPCH_MASTERLOG_FILE%
rem call
%TPCH_AUTOMATION_CMD_PATH%\RFs\startCollectWrapper.cm
d %TPCH_RUN_NUM% %TPCH_COMMENT_STR%_Create_Indexes

call
%TPCH_AUTOMATION_CMD_PATH%\execSQLFileList.cmd
create_indices_RF1_%TPCH_RF_STREAM_NUM%.txt
%TPCH_RUN_NUM% no no no

rem call
%TPCH_AUTOMATION_CMD_PATH%\RFs\stopCollectWrapper.cmd
%TPCH_RUN_NUM% %TPCH_COMMENT_STR%_Create_Indexes
echo !DATE! !TIME! End: create_indexes_RF1 >>
%TPCH_MASTERLOG_FILE%

REM launch parallel execs

    echo !DATE! !TIME! Start: launch_parallel_execs_RF1 >>
%TPCH_MASTERLOG_FILE%
rem call
%TPCH_AUTOMATION_CMD_PATH%\RFs\startCollectWrapper.cm
d %TPCH_RUN_NUM% %TPCH_COMMENT_STR%_Parallel_Execs

set
TPCH_SEMAPHORE_NAME=Exec.%TPCH_RF_STREAM_NUM%.
%TPCH_RUN_NUM%
start
%TPCH_AUTOMATION_CMD_PATH%\WaitForSemaphore.cmd
%TPCH_SEMAPHORE_NAME%
%TPCH_NUM_RF_EXEC_STREAMS%
%TPCH_SEMAPHORE_NAME%_ALL
set /A LOCAL_CURR_STREAM = 1

:outerLoopExecRun

start
%TPCH_AUTOMATION_CMD_PATH%\execSQLFileListSemaphore.
cmd %TPCH_SEMAPHORE_NAME%
RF1_Execute_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_
STREAM%.txt %TPCH_RUN_NUM% no no no

set /A LOCAL_CURR_STREAM =
%LOCAL_CURR_STREAM% + 1
if %LOCAL_CURR_STREAM% LEQ
%TPCH_NUM_RF_EXEC_STREAMS% goto outerLoopExecRun

REM wait for all execs to complete

%TPCH_AUTOMATION_EXEC%\semaphore -wait
%TPCH_SEMAPHORE_NAME%_ALL

rem call
%TPCH_AUTOMATION_CMD_PATH%\RFs\stopCollectWrapper.cmd
%TPCH_RUN_NUM% %TPCH_COMMENT_STR%_Parallel_Execs
echo !DATE! !TIME! End: launch_parallel_execs_RF1 >>

```

```
%TPCH_MASTERLOG_FILE%
```

```
echo !DATE! !TIME! End : Executing %TPCH_COMMENT_STR% >>  
%TPCH_MASTERLOG_FILE%
```

```
rem sqlcmd -E -i  
%TPCH_AUTOMATION_SQL%\Dump_Row_Count.sql -o  
Post_RF1_Row_count_%TPCH_RF_STREAM_NUM%.txt  
  
endlocal
```

F.13 RF1_preCreate.cmd

Rem This File creates load and exec files, launch parallel loads, create indexes and launch parallel execs for the RF1 stored procedure

```
setlocal EnableDelayedExpansion
```

```
REM RF stream num  
set TPCH_RF_STREAM_NUM=%1
```

```
REM output dir  
set TPCH_RUN_NUM=%2
```

```
REM Master log comment  
set TPCH_COMMENT_STR=%3
```

```
set TPCH_NUM_RF_EXEC_STREAMS=%4  
set TPCH_NUM_RF_EXEC_TOTAL=%5  
set TPCH_RF_EXEC_BATCH_SIZE=%6  
set TPCH_UF_DIR=%7  
set TPCH_NUM_RF_LOAD_STREAMS=%8  
set TPCH_NUM_RF_LOAD_FILES=%9
```

```
set  
TPCH_OUTPUT_DIR=%TPCH_OUTPUT_DIR_PREFIX%\%TPCH_R  
UN_NUM%  
if not exist %TPCH_OUTPUT_DIR% md %TPCH_OUTPUT_DIR%  
set  
TPCH_MASTERLOG_FILE=%TPCH_OUTPUT_DIR%\%TPCH_MAS  
TERLOG_NAME%
```

```
pushd %TPCH_OUTPUT_DIR%
```

REM create tables and indexes

```
copy  
%TPCH_AUTOMATION_SQL%\RF_tmp\Create_RF1_Tables.sql  
echo Create_RF1_Tables.sql >  
create_tables_RF1_%TPCH_RF_STREAM_NUM%.txt
```

```
copy  
%TPCH_AUTOMATION_SQL%\RF_tmp\Create_RF1_Indices.sql  
echo Create_RF1_Indices.sql >  
create_indices_RF1_%TPCH_RF_STREAM_NUM%.txt
```

REM create load files

```
set /A LOCAL_CURR_STREAM = 1  
:outerLoopLoadCreate
```

```
set /A LOCAL_CURR_LOAD = %LOCAL_CURR_STREAM%  
if exist  
(RF1_Load_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_S  
TREAM%.txt) del  
RF1_Load_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_ST  
REAM%.txt
```

```
:innerLoopLoadCreate
```

```
REM create load file  
set SET_FILE_NUM=%LOCAL_CURR_LOAD%
```

```
echo :setvar ffLoc !TPCH_UF_DIR! >  
load_RF1_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_LO  
AD%.sql
```

```
echo :setvar partNo %LOCAL_CURR_LOAD%
```

```
>>
```

```
load_RF1_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_LO  
AD%.sql
```

```
type
```

```
%TPCH_AUTOMATION_SQL%\RF_tmp\Load_RF1_tmpl.sql
```

```
>>
```

```
load_RF1_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_LO  
AD%.sql
```

```
REM add it to load file list
```

```
echo
```

```
load_RF1_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_LO  
AD%.sql >>
```

```
RF1_Load_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_ST  
REAM%.txt
```

```
set /A LOCAL_CURR_LOAD = %LOCAL_CURR_LOAD% +  
%TPCH_NUM_RF_LOAD_STREAMS%  
if %LOCAL_CURR_LOAD% LEQ  
%TPCH_NUM_RF_LOAD_FILES% goto innerLoopLoadCreate
```

```
set /A LOCAL_CURR_STREAM = %LOCAL_CURR_STREAM% + 1  
if %LOCAL_CURR_STREAM% LEQ  
%TPCH_NUM_RF_LOAD_STREAMS% goto outerLoopLoadCreate
```

REM create exec files

```
set /A LOCAL_CURR_STREAM = 1  
:outerLoopExecCreate
```

```
set /A LOCAL_CURR_EXEC = %LOCAL_CURR_STREAM%  
if exist
```

```
(RF1_Execute_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR  
_STREAM%.txt) del  
RF1_Execute_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_  
STREAM%.txt
```

```
:innerLoopExecCreate
```

REM create exec file

```
echo :setvar currExec %LOCAL_CURR_EXEC% >  
exec_RF1_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_E  
XEC%.sql
```

```
echo :setvar batchSize %TPCH_RF_EXEC_BATCH_SIZE%
```

```
>>
```

```
exec_RF1_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_E  
XEC%.sql
```

```
echo :setvar numParallelExecs
```

```
%TPCH_NUM_RF_EXEC_STREAMS% >>
```

```
exec_RF1_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_E  
XEC%.sql
```

```
echo :setvar totalExecs %TPCH_NUM_RF_EXEC_TOTAL%
```

```
>>
```

```
exec_RF1_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_E  
XEC%.sql
```

```
type
```

```
%TPCH_AUTOMATION_SQL%\RF_tmp\Execute_RF1_tmpl.sql >>
```

```

exec_RF1_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_EXEC%.sql

    REM add it to exec file list
    echo
exec_RF1_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_EXEC%.sql >>
RF1_Execute_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_STREAM%.txt

    set /A LOCAL_CURR_EXEC = %LOCAL_CURR_EXEC% +
%TPCH_NUM_RF_EXEC_STREAMS%
    if %LOCAL_CURR_EXEC% LEQ
%TPCH_NUM_RF_EXEC_TOTAL% goto innerLoopExecCreate

set /A LOCAL_CURR_STREAM = %LOCAL_CURR_STREAM% + 1
if %LOCAL_CURR_STREAM% LEQ
%TPCH_NUM_RF_EXEC_STREAMS% goto outerLoopExecCreate

endlocal

```

F.14 RF2_exec.cmd

Rem This File creates load and exec files, launch parallel loads, create indexes and launch parallel execs for the RF2 stored procedure setlocal EnableDelayedExpansion

```

REM RF stream num
set TPCH_RF_STREAM_NUM=%1

REM output dir
set TPCH_RUN_NUM=%2

REM Master log comment
set TPCH_COMMENT_STR=%3

set TPCH_NUM_RF_EXEC_STREAMS=%4
set TPCH_NUM_RF_EXEC_TOTAL=%5
set TPCH_RF_EXEC_BATCH_SIZE=%6
set TPCH_UF_DIR=%7
set TPCH_NUM_RF_LOAD_STREAMS=%8
set TPCH_NUM_RF_LOAD_FILES=%9

set
TPCH_OUTPUT_DIR=%TPCH_OUTPUT_DIR_PREFIX%\%TPCH_RUN_NUM%
if not exist %TPCH_OUTPUT_DIR% md %TPCH_OUTPUT_DIR%
set
TPCH_MASTERLOG_FILE=%TPCH_OUTPUT_DIR%\%TPCH_MASTERLOG_NAME%

echo !DATE! !TIME! Start: Executing %TPCH_COMMENT_STR% >>
%TPCH_MASTERLOG_FILE%

pushd %TPCH_OUTPUT_DIR%

REM create tables

REM Diff from RF1

call %TPCH_AUTOMATION_CMD_PATH%\execSQLFileList.cmd
create_tables_RF2_%TPCH_RF_STREAM_NUM%.txt
%TPCH_RUN_NUM% no no no

REM launch parallel loads

```

```

    echo !DATE! !TIME! Start: launch_parallel_loads_RF2 >>
%TPCH_MASTERLOG_FILE%
    rem call
%TPCH_AUTOMATION_CMD_PATH%\RFs\startCollectWrapper.cmd
d %TPCH_RUN_NUM% %TPCH_COMMENT_STR%_Parallel_loads

    set
TPCH_SEMAPHORE_NAME=Load.%TPCH_RF_STREAM_NUM%.
%TPCH_RUN_NUM%
    start
%TPCH_AUTOMATION_CMD_PATH%\WaitForSemaphore.cmd
%TPCH_SEMAPHORE_NAME%
%TPCH_NUM_RF_LOAD_STREAMS%
%TPCH_SEMAPHORE_NAME%_all

    set /A LOCAL_CURR_STREAM = 1
:outerLoopLoadRun

    start
%TPCH_AUTOMATION_CMD_PATH%\execSQLFileListSemaphore.
cmd %TPCH_SEMAPHORE_NAME%
RF2_Load_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_STREAM%.txt
%TPCH_RUN_NUM% no no no

    set /A LOCAL_CURR_STREAM =
%LOCAL_CURR_STREAM% + 1
    if %LOCAL_CURR_STREAM% LEQ
%TPCH_NUM_RF_LOAD_STREAMS% goto outerLoopLoadRun

    REM wait for all loads to complete
%TPCH_AUTOMATION_EXEC%\semaphore -wait
%TPCH_SEMAPHORE_NAME%_all -count 1

    rem call
%TPCH_AUTOMATION_CMD_PATH%\RFs\stopCollectWrapper.cmd
%TPCH_RUN_NUM% %TPCH_COMMENT_STR%_Parallel_loads
    echo !DATE! !TIME! End: launch_parallel_loads_RF2 >>
%TPCH_MASTERLOG_FILE%

REM create indexes
    echo !DATE! !TIME! Start: create_indexes_RF2 >>
%TPCH_MASTERLOG_FILE%
    rem call
%TPCH_AUTOMATION_CMD_PATH%\RFs\startCollectWrapper.cmd
d %TPCH_RUN_NUM% %TPCH_COMMENT_STR%_Create_Indexes

    call
%TPCH_AUTOMATION_CMD_PATH%\execSQLFileList.cmd
create_indices_RF2_%TPCH_RF_STREAM_NUM%.txt
%TPCH_RUN_NUM% no no no

    rem call
%TPCH_AUTOMATION_CMD_PATH%\RFs\stopCollectWrapper.cmd
%TPCH_RUN_NUM% %TPCH_COMMENT_STR%_Create_Indexes
    echo !DATE! !TIME! End: create_indexes_RF2 >>
%TPCH_MASTERLOG_FILE%

REM launch parallel execs

    echo !DATE! !TIME! Start: launch_parallel_execs_RF2 >>
%TPCH_MASTERLOG_FILE%
    rem call
%TPCH_AUTOMATION_CMD_PATH%\RFs\startCollectWrapper.cmd
d %TPCH_RUN_NUM% %TPCH_COMMENT_STR%_Parallel_Execs

    set
TPCH_SEMAPHORE_NAME=Exec.%TPCH_RF_STREAM_NUM%.

```

```

%TPCH_RUN_NUM%
start
%TPCH_AUTOMATION_CMD_PATH%\WaitForSemaphore.cmd
%TPCH_SEMAPHORE_NAME%
%TPCH_NUM_RF_EXEC_STREAMS%
%TPCH_SEMAPHORE_NAME%_all

set /A LOCAL_CURR_STREAM = 1
:outerLoopExecRun

start
%TPCH_AUTOMATION_CMD_PATH%\execSQLFileListSemaphore.
cmd %TPCH_SEMAPHORE_NAME%
RF2_Execute_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_
STREAM%.txt %TPCH_RUN_NUM% no no no

set /A LOCAL_CURR_STREAM =
%LOCAL_CURR_STREAM% + 1
if %LOCAL_CURR_STREAM% LEQ
%TPCH_NUM_RF_EXEC_STREAMS% goto outerLoopExecRun

REM wait for all execs to complete

%TPCH_AUTOMATION_EXEC%\semaphore -wait
%TPCH_SEMAPHORE_NAME%_all -count 1

rem call
%TPCH_AUTOMATION_CMD_PATH%\execSQLFileList.cmd
Increment_Update_Set_RF2_%TPCH_RF_STREAM_NUM%.txt
%TPCH_RUN_NUM% no no no

rem call
%TPCH_AUTOMATION_CMD_PATH%\RFs\stopCollectWrapper.cmd
%TPCH_RUN_NUM% %TPCH_COMMENT_STR%_Parallel_Execs
echo !DATE! !TIME! End: launch_parallel_execs_RF2 >>
%TPCH_MASTERLOG_FILE%

echo !DATE! !TIME! End : Executing %TPCH_COMMENT_STR% >>
%TPCH_MASTERLOG_FILE%

rem sqlcmd -E -i
%TPCH_AUTOMATION_SQL%\Dump_Row_Count.sql -o
Post_RF2_Row_count_%TPCH_RF_STREAM_NUM%.txt

endlocal

```

F.15 RF2_preCreate.cmd

Rem This File creates load and exec files, launch parallel loads, create indexes and launch parallel execs for the RF2 stored procedure
setlocal EnableDelayedExpansion

```

REM RF stream num
set TPCH_RF_STREAM_NUM=%1

REM output dir
set TPCH_RUN_NUM=%2

REM Master log comment
set TPCH_COMMENT_STR=%3

set TPCH_NUM_RF_EXEC_STREAMS=%4
set TPCH_NUM_RF_EXEC_TOTAL=%5
set TPCH_RF_EXEC_BATCH_SIZE=%6
set TPCH_UF_DIR=%7
set TPCH_NUM_RF_LOAD_STREAMS=%8
set TPCH_NUM_RF_LOAD_FILES=%9

```

```

set
TPCH_OUTPUT_DIR=%TPCH_OUTPUT_DIR_PREFIX%\%TPCH_R
UN_NUM%
if not exist %TPCH_OUTPUT_DIR% md %TPCH_OUTPUT_DIR%
set
TPCH_MASTERLOG_FILE=%TPCH_OUTPUT_DIR%\%TPCH_MAS
TERLOG_NAME%

pushd %TPCH_OUTPUT_DIR%

REM create tables and indexes etc

REM Diff from RF1
echo :setvar totalSegments %TPCH_NUM_RF_LOAD_FILES% >
Create_RF2_Tables.sql
type
%TPCH_AUTOMATION_SQL%\RF_temp\Create_RF2_Tables.sql
>> Create_RF2_Tables.sql
copy
%TPCH_AUTOMATION_SQL%\RF_temp\Increment_Update_Set.sql

echo Create_RF2_Tables.sql >
create_tables_RF2_%TPCH_RF_STREAM_NUM%.txt

copy
%TPCH_AUTOMATION_SQL%\RF_temp\Create_RF2_Indices.sql
echo Create_RF2_Indices.sql >
create_indices_RF2_%TPCH_RF_STREAM_NUM%.txt

rem echo Increment_Update_Set.sql >>
Increment_Update_Set_RF2_%TPCH_RF_STREAM_NUM%.txt

REM create load files

set /A LOCAL_CURR_STREAM = 1
:outerLoopLoadCreate

set /A LOCAL_CURR_LOAD = %LOCAL_CURR_STREAM%
if exist
(RF2_Load_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_S
TREAM%.txt) del
RF2_Load_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_ST
REAM%.txt

:innerLoopLoadCreate

REM create load file
set SET_FILE_NUM=%LOCAL_CURR_LOAD%

echo :setvar ffLoc !TPCH_UF_DIR!
>
load_RF2_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_LO
AD%.sql
echo :setvar partNo %LOCAL_CURR_LOAD%
>>
load_RF2_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_LO
AD%.sql
type
%TPCH_AUTOMATION_SQL%\RF_temp\Load_RF2_tmpl.sql
>>
load_RF2_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_LO
AD%.sql

REM add it to load file list
echo
load_RF2_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_LO

```

```
AD%.sql >>
RF2_Load_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_ST
REAM%.txt
```

```
    set /A LOCAL_CURR_LOAD = %LOCAL_CURR_LOAD% +
%TPCH_NUM_RF_LOAD_STREAMS%
    if %LOCAL_CURR_LOAD% LEQ
%TPCH_NUM_RF_LOAD_FILES% goto innerLoopLoadCreate
```

```
set /A LOCAL_CURR_STREAM = %LOCAL_CURR_STREAM% + 1
if %LOCAL_CURR_STREAM% LEQ
%TPCH_NUM_RF_LOAD_STREAMS% goto outerLoopLoadCreate
```

REM create exec files

```
set /A LOCAL_CURR_STREAM = 1
:outerLoopExecCreate
```

```
    set /A LOCAL_CURR_EXEC = %LOCAL_CURR_STREAM%
    if exist
(RF2_Execute_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR
_STREAM%.txt) del
RF2_Execute_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR
_STREAM%.txt
```

```
:innerLoopExecCreate
```

REM create exec file

```
    echo :setvar currExec %LOCAL_CURR_EXEC% >
exec_RF2_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_E
XEC%.sql
    echo :setvar batchSize %TPCH_RF_EXEC_BATCH_SIZE%
    >>
exec_RF2_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_E
XEC%.sql
    echo :setvar numParallelExecs
%TPCH_NUM_RF_EXEC_STREAMS% >>
exec_RF2_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_E
XEC%.sql
    echo :setvar totalExecs %TPCH_NUM_RF_EXEC_TOTAL%
    >>
exec_RF2_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_E
XEC%.sql
    type
%TPCH_AUTOMATION_SQL%\RF_tmpl\Execute_RF2_tmpl.sql>>
exec_RF2_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_E
XEC%.sql
```

REM add it to exec file list

```
    echo
exec_RF2_input.%TPCH_RF_STREAM_NUM%.%LOCAL_CURR_E
XEC%.sql >>
RF2_Execute_List_%TPCH_RF_STREAM_NUM%.%LOCAL_CURR
_STREAM%.txt
```

```
    set /A LOCAL_CURR_EXEC = %LOCAL_CURR_EXEC% +
%TPCH_NUM_RF_EXEC_STREAMS%
    if %LOCAL_CURR_EXEC% LEQ
%TPCH_NUM_RF_EXEC_TOTAL% goto innerLoopExecCreate
```

```
set /A LOCAL_CURR_STREAM = %LOCAL_CURR_STREAM% + 1
if %LOCAL_CURR_STREAM% LEQ
%TPCH_NUM_RF_EXEC_STREAMS% goto outerLoopExecCreate
```

```
rem echo Increment_Update_Set.sql >>
Increment_Update_Set_RF2_%TPCH_RF_STREAM_NUM%.txt
endlocal
```

F.16 RFStreams_exec.cmd

Rem This File launches %TPCH_NUM_THROUGHPUT_STREAMS% RF Streams in the Throughput RF phase

```
setlocal EnableDelayedExpansion
```

REM output dir

```
set TPCH_RUN_NUM=%1
```

```
set
```

```
TPCH_OUTPUT_DIR=%TPCH_OUTPUT_DIR_PREFIX%\%TPCH_R
UN_NUM%
```

```
set TPCH_NUM_RF_EXEC_STREAMS=%2
```

```
set TPCH_NUM_RF_EXEC_TOTAL=%3
```

```
set TPCH_RF_EXEC_BATCH_SIZE=%4
```

```
set TPCH_UF_DIR=%5
```

```
set TPCH_NUM_RF_LOAD_STREAMS=%6
```

```
set TPCH_NUM_RF_LOAD_FILES=%7
```

```
pushd %TPCH_OUTPUT_DIR%
```

REM Exec each stream

```
set /A LOCAL_CURR_STREAM = 1
```

```
:outerRFLoop
```

REM exec RF1

```
    call %TPCH_AUTOMATION_CMD_PATH%\RF1_exec.cmd
```

```
%LOCAL_CURR_STREAM% %TPCH_RUN_NUM%
```

```
Throughput_RF1_Stream%LOCAL_CURR_STREAM%
```

```
%TPCH_NUM_RF_EXEC_STREAMS%
```

```
%TPCH_NUM_RF_EXEC_TOTAL%
```

```
%TPCH_RF_EXEC_BATCH_SIZE% %TPCH_UF_DIR%
```

```
%TPCH_NUM_RF_LOAD_STREAMS%
```

```
%TPCH_NUM_RF_LOAD_FILES%
```

REM exec RF2

```
    call %TPCH_AUTOMATION_CMD_PATH%\RF2_exec.cmd
```

```
%LOCAL_CURR_STREAM% %TPCH_RUN_NUM%
```

```
Throughput_RF2_Stream%LOCAL_CURR_STREAM%
```

```
%TPCH_NUM_RF_EXEC_STREAMS%
```

```
%TPCH_NUM_RF_EXEC_TOTAL%
```

```
%TPCH_RF_EXEC_BATCH_SIZE% %TPCH_UF_DIR%
```

```
%TPCH_NUM_RF_LOAD_STREAMS%
```

```
%TPCH_NUM_RF_LOAD_FILES%
```

```
set /A LOCAL_CURR_STREAM =
```

```
%LOCAL_CURR_STREAM% + 1
```

```
if %LOCAL_CURR_STREAM% LEQ
```

```
%TPCH_NUM_THROUGHPUT_STREAMS% goto outerRFLoop
```

```
if exist %TPCH_AUTOMATION_CMD_PATH%\CollectRFPlans.cmd (
```

```
    call
```

```
%TPCH_AUTOMATION_CMD_PATH%\CollectRFPlans.cmd
```

```
%TPCH_RUN_NUM%
```

```
)
```

```
popd
```

```
endlocal
```

F.17

RFStreams_preCreate.cmd

Rem This File launches %TPCH_NUM_THROUGHPUT_STREAMS% RF Streams in the Throughput RF phase

```
setlocal EnableDelayedExpansion

REM output dir
set TPCH_RUN_NUM=%1
set
TPCH_OUTPUT_DIR=%TPCH_OUTPUT_DIR_PREFIX%\%TPCH_R
UN_NUM%

set TPCH_NUM_RF_EXEC_STREAMS=%2
set TPCH_NUM_RF_EXEC_TOTAL=%3
set TPCH_RF_EXEC_BATCH_SIZE=%4
set TPCH_UF_DIR=%5
set TPCH_NUM_RF_LOAD_STREAMS=%6
set TPCH_NUM_RF_LOAD_FILES=%7
set TPCH_NUM_THROUGHPUT_STREAMS=%8

pushd %TPCH_OUTPUT_DIR%
REM Exec each stream

set /A LOCAL_CURR_STREAM = 1
:outerRFLoop

    REM  exec RF1
    call
%TPCH_AUTOMATION_CMD_PATH%\RFs\RF1_preCreate.cmd
%LOCAL_CURR_STREAM% %TPCH_RUN_NUM%
Throughput_RF1_Stream%LOCAL_CURR_STREAM%
%TPCH_NUM_RF_EXEC_STREAMS%
%TPCH_NUM_RF_EXEC_TOTAL%
%TPCH_RF_EXEC_BATCH_SIZE% %TPCH_UF_DIR%
%TPCH_NUM_RF_LOAD_STREAMS%
%TPCH_NUM_RF_LOAD_FILES%

    REM  exec RF2
    call
%TPCH_AUTOMATION_CMD_PATH%\RFs\RF2_preCreate.cmd
%LOCAL_CURR_STREAM% %TPCH_RUN_NUM%
Throughput_RF2_Stream%LOCAL_CURR_STREAM%
%TPCH_NUM_RF_EXEC_STREAMS%
%TPCH_NUM_RF_EXEC_TOTAL%
%TPCH_RF_EXEC_BATCH_SIZE% %TPCH_UF_DIR%
%TPCH_NUM_RF_LOAD_STREAMS%
%TPCH_NUM_RF_LOAD_FILES%

    set /A LOCAL_CURR_STREAM =
%LOCAL_CURR_STREAM% + 1

ECHO
*****
*****
ECHO LOCAL_CURR_STREAM = %LOCAL_CURR_STREAM%
ECHO TPCH_NUM_THOUGHPUT_STREAMS =
%TPCH_NUM_THROUGHPUT_STREAMS%
ECHO
*****
*****

if %LOCAL_CURR_STREAM% LEQ
%TPCH_NUM_THROUGHPUT_STREAMS% goto outerRFLoop
```

)

popd

endlocal

F.18 startCollectWrapper.cmd

setlocal EnableDelayedExpansion

set TPCH_RUN_NUM=%1
set CommentStr=%2

```
start
%TPCH_AUTOMATION_CMD_PATH%\startPerfmonCollection.cmd
%TPCH_RUN_NUM% %CommentStr%
```

endlocal

F.19 stopCollectWrapper.cmd

setlocal EnableDelayedExpansion

set TPCH_RUN_NUM=%1
set CommentStr=%2

```
call
%TPCH_AUTOMATION_CMD_PATH%\stopPerfmonCollection.cmd
%CommentStr%
```

endlocal

F.20 envVarsConfig.cmd

:: this file is not executed??

setlocal EnableDelayedExpansion

```
pushd ..
set TPCH_AUTOMATION_PATH=%CD%
popd
set CURRENT_DRIVE=%~d0
set
TPCH_AUTOMATION_CMD_PATH=%TPCH_AUTOMATION_PAT
H%\cmd
set
TPCH_AUTOMATION_SQL=%TPCH_AUTOMATION_PATH%\sql
set
TPCH_AUTOMATION_CONFIG=%TPCH_AUTOMATION_PATH%\
config
set
TPCH_AUTOMATION_EXEC=%TPCH_AUTOMATION_PATH%\ex
ecs
set TPCH_OUTPUT_DIR_PREFIX=%CURRENT_DRIVE%\tpchRuns
set TPCH_MASTERLOG_NAME=MasterLog.txt

set TPCH_SQL_DIR=%systemdrive%\Program Files\Microsoft SQL
Server\MSSQL.1\MSSQL
set
TPCH_SQL_LOG_DIR=%systemdrive%\MyAutoMSSQL\Installed\MS
SQL.1\MSSQL
set TPCH_SQL_START_COMMAND_LINE =-c -E -T 834 -T 2301 -T
2442
```

```

set TPCH_SQL_SHELL=sqlcmd -E -I -b -w 65535 -l 60 -y 0

set
TPCH_LOGMAN_COUNTERS_FILE=%TPCH_AUTOMATION_CO
NFIG%\perfCounters\TPCH.ini
set TPCH_LOGMAN_SAMPLE_INTERVAL=1
set TPCH_LOGMAN_SAMPLE_FORMAT=csv

set TPCH_DATABASE=tpch100g

set TPCH_EXEC_WINDOW_COLOR=9F

```

F.21 execSQLFileList.cmd

REM This file is an execution engine that runs multiple sql files and coordinates collection of data
 REM usage execSQLFileList fileList runNum no [perfmon] [yes | no]

```

setlocal EnableDelayedExpansion

echo on

set TPCH_INPUT_LIST=%1
set TPCH_INPUT_LIST_DIR=%~dp1
set TPCH_INPUT_LIST_NAME=%~n1

set TPCH_RUN_NUM=%2
set
TPCH_OUTPUT_DIR=%TPCH_OUTPUT_DIR_PREFIX%\%TPCH_R
UN_NUM%

For /f "delims=;" %%i in
(%TPCH_AUTOMATION_CMD_PATH%\splitlist.cmd
"%TPCH_RUN_NUM%\*" ) do (

    if "!NAME!" EQU "" (
        set NAME=%%i
    ) else (
        set NAME=!NAME!_%%i
    )

)

set
TPCH_RUNLOG_FILE=%TPCH_OUTPUT_DIR_PREFIX%\%TPCH_
RUN_NUM%\%NAME%_%RANDOM%_%TPCH_INPUT_LIST_NA
ME%.log
set
TPCH_MASTERLOG_FILE=%TPCH_OUTPUT_DIR%\%TPCH_MAS
TERLOG_NAME%

set TPCH_COLLECT_SHOWPLAN=%3
set TPCH_COLLECT_PERFMON=%4
set TPCH_WRITE_TO_MASTER=%5

```

```

if not exist %TPCH_OUTPUT_DIR% md %TPCH_OUTPUT_DIR%

COLOR %TPCH_EXEC_WINDOW_COLOR%

for /F "tokens=1" %%i in (%TPCH_INPUT_LIST%) do (

    set TPCH_CURRENT_FILE_NAME=%~nxi
    set
TPCH_CURRENT_FILE=%TPCH_INPUT_LIST_DIR%\%~nxi

```

```

set
TPCH_CURRENT_OUTPUT_FILE=%TPCH_OUTPUT_DIR%\%~ni
.out
set TPCH_EXEC_FILE=!TPCH_CURRENT_FILE!

if not exist !TPCH_CURRENT_FILE! goto :missingfile

REM start perfmon

title %~ni

REM plan profile data collector

REM perfmon data collector
if /i '%TPCH_COLLECT_PERFMON%'=='perfmon' (
    call
%TPCH_AUTOMATION_CMD_PATH%\startPerfmonCollection
%TPCH_RUN_NUM% !TPCH_CURRENT_FILE_NAME!
)

echo !DATE! !TIME! Start: Executing !TPCH_CURRENT_FILE!
echo !DATE! !TIME! Start: Executing !TPCH_CURRENT_FILE!
>> %TPCH_RUNLOG_FILE% 2>&1

if /i '%TPCH_WRITE_TO_MASTER%'=='yes' (
    echo !DATE! !TIME! Start:
Executing !TPCH_CURRENT_FILE! >>
%TPCH_MASTERLOG_FILE%
)

set ERRORLEVEL=0
%TPCH_SQL_SHELL% -d %TPCH_DATABASE%
-i !TPCH_EXEC_FILE! -o !TPCH_CURRENT_OUTPUT_FILE! >>
%TPCH_RUNLOG_FILE% 2>&1

echo %ERRORLEVEL%
if not errorlevel 0 goto :errorexit

echo !DATE! !TIME! End : Executing !TPCH_CURRENT_FILE!
echo !DATE! !TIME! End : Executing !TPCH_CURRENT_FILE!
>> %TPCH_RUNLOG_FILE% 2>&1

if /i '%TPCH_WRITE_TO_MASTER%'=='yes' (
    echo !DATE! !TIME! End :
Executing !TPCH_CURRENT_FILE! >>
%TPCH_MASTERLOG_FILE%
)

REM end perfmon
if /i '%TPCH_COLLECT_PERFMON%'=='perfmon' (
    call
%TPCH_AUTOMATION_CMD_PATH%\stopPerfmonCollection !TPC
H_CURRENT_FILE_NAME!
)

)

goto finish

:errorexit

echo !DATE! !TIME! End : Executing !TPCH_CURRENT_FILE!
echo !DATE! !TIME! End : Executing !TPCH_CURRENT_FILE! >>
%TPCH_RUNLOG_FILE% 2>&1
REM end perfmon

```



```
echo Program returned with error when executing
%TPCH_CURRENT_FILE%
goto finish
```

```
:missingfile
echo File %TPCH_CURRENT_FILE% missing
goto finish
```

```
:finish
```

```
endlocal
```

F.22

execSQLFileListSemaphore.c md

```
setlocal EnableDelayedExpansion
```

```
set TPCH_SEMAPHORE_NAME=%1
```

```
REM pass allparams we get to the call
shift
```

```
call %TPCH_AUTOMATION_CMD_PATH%\execSQLFileList
%1 %2 %3 %4 %5 %6 %7 %8 %9
```

```
%TPCH_AUTOMATION_EXEC%\semaphore -release
%TPCH_SEMAPHORE_NAME%
```

```
exit
```

```
endlocal
```

F.23 SplitList.cmd

```
@echo off
```

```
setlocal EnableDelayedExpansion
```

```
set str=%1
```

```
if "%2" EQU "" (
```

```
set DL=,
```

```
) else (
```

```
set DL=%2
```

```
)
```

```
set paramNo=1
```

```
set barr=
```

```
:loopStart
```

```
set loop=false
```

```
for /F "tokens=%paramNo% delims=%DL%" %%i in (%str%) do (set
val=%%i)
```

```
if "%val%" NEQ "*" (
```

```
set loop=true
```

```
echo %val%;
```

```
set /A paramNo=%paramNo%+1
```

```
)
```

```
if "%loop%" EQU "true" goto loopStart
```

```
endlocal
```

F.24

startPerfmonCollection.cmd

```
setlocal EnableDelayedExpansion
```

```
REM this is used to create and start a new collection
```

```
REM the corresponding file stops and deletes the collection
```

```
set
```

```
TPCH_PERMON_OUTPUT_DIR=%TPCH_OUTPUT_DIR_PREFIX%\
%1
```

```
set TPCH_PERFMON_COLLECTION_NAME=%2
```

```
IF NOT "%3"==" " (
```

```
set TPCH_LOGMAN_SAMPLE_INTERVAL=%3
```

```
)
```

```
REM echo logman create counter
```

```
%TPCH_PERFMON_COLLECTION_NAME% -cf
```

```
%TPCH_LOGMAN_COUNTERS_FILE% -si
```

```
%TPCH_LOGMAN_SAMPLE_INTERVAL% -f csv -v mmddhhmm -o
```

```
%TPCH_PERMON_OUTPUT_DIR%\tpch_%TPCH_PERFMON_COL
LECTION_NAME% >
```

```
%TPCH_PERMON_OUTPUT_DIR%\%TPCH_PERFMON_COLLECT
ION_NAME%.plog
```

```
logman stop %TPCH_PERFMON_COLLECTION_NAME%
```

```
logman delete %TPCH_PERFMON_COLLECTION_NAME%
```

```
logman create counter %TPCH_PERFMON_COLLECTION_NAME%
```

```
-cf %TPCH_LOGMAN_COUNTERS_FILE% -si
```

```
%TPCH_LOGMAN_SAMPLE_INTERVAL% -f csv -v mmddhhmm -o
```

```
%TPCH_PERMON_OUTPUT_DIR%\tpch_%TPCH_PERFMON_COL
LECTION_NAME%
```

```
logman start %TPCH_PERFMON_COLLECTION_NAME%
```

```
endlocal
```

```
exit
```

F.25

stopPerfmonCollection.cmd

```
setlocal EnableDelayedExpansion
```

```
REM this file stops and deletes the collection
```

```
REM the corresponding file is used to create and start a new collection
```

```
set TPCH_PERFMON_COLLECTION_NAME=%1
```

```
echo %TPCH_PERFMON_COLLECTION_NAME%
```

```
logman stop %TPCH_PERFMON_COLLECTION_NAME%
```

```
logman delete %TPCH_PERFMON_COLLECTION_NAME%
```

```
endlocal
::exit
```

F.26 WaitForSemaphore.cmd

Rem this file is used to synchronize the parallel streams and avoids racing conditions
setlocal EnableDelayedExpansion

```
set others=%1
set waitcount=%2
set me=%3
```

```
%TPCH_AUTOMATION_EXEC%\semaphore -wait %others%
-count %waitcount%
%TPCH_AUTOMATION_EXEC%\semaphore -release %me%
```

```
endlocal
exit
```

F.27 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
```

F.28 TPCHReports.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

```

F.29 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
    IStructSize 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
    lpstrFileTitle As String
    nMaxFileTitle As Long
    lpstrInitialDir As String
    lpstrTitle As String
    Flags As Long
    nFileOffset As Integer
    nFileExtension As Integer
    lpstrDefExt As String
    ICustData 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 ShowFileOpenDialog(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 ofile As OPENFILENAME

```

```

Dim sFile As String

```

```

On Error GoTo ShowFileOpenDialogErr

```

```

If Not strOldFile <> gsEmptyString Then
    intPos = InstrR(strOldFile, gsPeriod)

```

```

        If intPos > 0 Then
            strInitDir = Left$(strOldFile, intPos - 1)
        End If
    End If

With opfile
    .IStructSize = 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
    ShowFileOpenDialog = Left$(opfile.lpstrFile,
InStr(opfile.lpstrFile, vbNullChar) - 1)
Else
    ShowFileOpenDialog = strOldFile
End If

Exit Function

ShowFileOpenDialogErr:
    Call DisplayErrors
    ' Reset the selection to the passed in file, if any
    ShowFileOpenDialog = 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 ShowFileOpenDialog to set these properties and
    ' display the File Open dialog to the user

    On Error GoTo BrowseStpFileErr

    BrowseStpFile = ShowFileOpenDialog(_
        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 ShowFileOpenDialog 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
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

```