



Hewlett-Packard Company

TPC Benchmark™ H
Full Disclosure Report
for
HP ProLiant ML370 G5
using
Microsoft SQL Server 2005 Standard x64 Edition SP2
and
Windows Server 2003 R2 Standard x64 Edition SP2

First Edition
July 2007

First Edition – July, 2007

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HP ProLiant ML370 G5

TPC-H Rev. 2.6.0

Report Date:
Jul 31, 2007

Total System Cost

\$19,437 USD

Composite Query per Hour Metric

4,521.2
QphH@100GB

Price / Performance

\$4.30 USD
\$/QphH@100GB

Database Size

100GB

Database Manager

**Microsoft SQL
Server 2005
Standard Edition
SP2**

Operating System

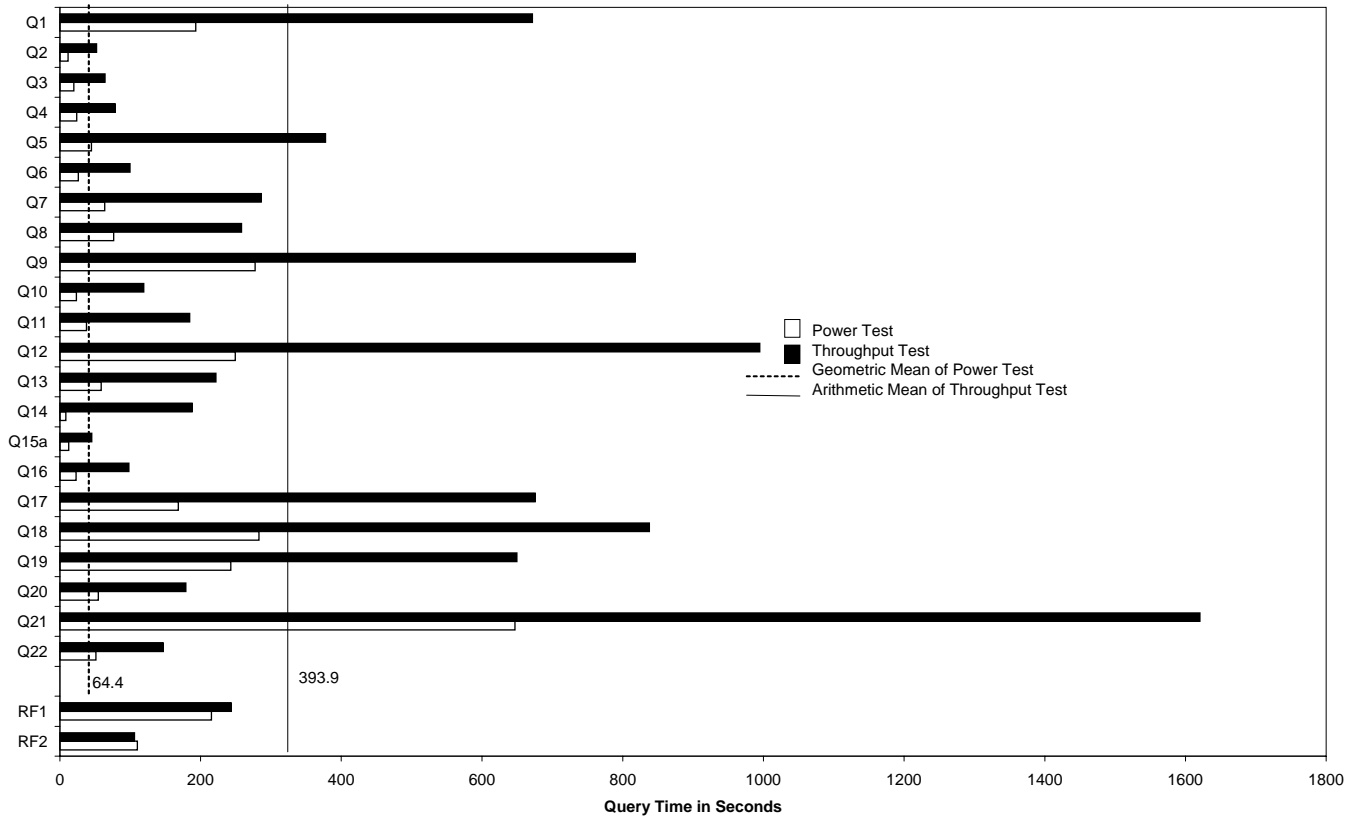
**Windows Server
2003 R2
Standard
Edition SP2**

Other Software

**Visual C++ 2005
Express Edition**

Availability Date

Jul 31, 2007



Database Load Time = 5:43:29

Load Included Backup: Y

Total Data Storage / Database Size = 5.76

RAID (Base tables only): N

RAID (Base tables and auxiliary data structures): Y

RAID (All): N

System Configuration:

Processors : 1x 2.66 GHz Quad Core Intel X5355
Cores : 4
Threads : 4
Memory : 16 GB
Network : 2x on-board GigE
Disk Controllers : 2x Smart Array P400
Disks : 16x 36GB 15K rpm SFF SAS drives (internal)
Total Disk Storage: 576 GB

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

**HP ProLiant ML370 G5**

TPC-H Rev. 2.6.0

Report Date: 31-Jul-07

Description	Part Number	Third Party	Unit Price	Qty	Extended Price	3 yr. Maint. Price
Server Hardware						
Brand Pricing						
HP ML370T05 SAS ModX CTO Svr	400607-B21	1	1,393	1	1,393	
HP X5355 ML370G5 FIO Kit	433104-L21	1	1,399	1	1,399	
HP ML370 G5 Mem Board Kit	403766-B21	1	179	1	179	
HP 4GB FBD PC2-5300 2x2GB Kit	397413-B21	1	749	4	2,996	
HP ML370 G5 SAS SFF DRV Cage Kit	401415-B21	1	199	1	199	
HP s7540 17in CRT Monitor	PF997AA#ABA	1	139	1	139	
HP 3y 4h 24x7 ProLiant ML370 HW Support	U4529E	1	853	1		853
Subtotal					6,305	853
Storage						
HP Smart Array P400/256 Controller	405132-B21	1	449	2	898	
HP SA Cache Battery Kit	383280-B21	1	109	2	218	
HP 36GB 15K SAS Single Port SFF Hard Drive	431933-B21	1	369	16	5,904	
Subtotal					7,020	0
Hardware and Maintenance Discount						
Large Purchase and Net 30 discount	14.0%	1			(\$1,866)	(\$119)
Hardware Subtotal					11,460	734
Software						
SQL Server 2005 Standard Edition x64 per processor license	228-04026	Microsoft	2	5,999	5,999	incl. bellow
Windows Server 2003 R2 Standard x64 Edition	P73-01675	Microsoft	2	999	999	incl. bellow
Visual C++ 2005 Express Edition		Microsoft	2	0	0	incl. bellow
Microsoft Problem Resolution Services		Microsoft	2	245		245
Subtotal					6,998	245
Total					\$18,458	\$979

Three-Year Cost of Ownership:	\$19,437 USD
QpH @ 100GB:	4521.2
\$/ QpH @ 100GB:	\$4.30 USD

Pricing: 1=HP Direct: 800-203-6748; 2=Microsoft

Note 1 = Discount based on HP Direct guidance with large purchase and Net 30 discount. Applies to all lines with 1 in pricing column.

* = These components are not immediately orderable. See the FDR for more information.

Note: The benchmark results and test methodology were audited by Francois Raab for Performance Metrics, Inc. (www.perfmetrics.com)

Audited by: Francois Raab for Performance Metrics, Inc.

Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components. Individually negotiated discounts are not permitted. Special prices based on 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 terms, please inform at pricing@tpc.org. Thank you.



HP ProLiant ML370 G5

TPC-H Rev. 2.6.0

Report Date:
Jul 31, 2007

Numerical Quantities

Measurement Results:

Database Scale Factor	= 100
Total Data Storage / Database Size	= 5.76
Start of Database Load	= 2007-06-28 16:05:02
End of Database Load	= 2007-06-28 21:48:31
Database Load Time	= 5:43:29
Query Streams for Throughput Test	= 5
TPC-H Power	= 5,593.1
TPC-H Throughput	= 3,654.6
TPC-H Composite Query-per-Hour Metric (QphH@100GB)	= 4,521.2
Total System Price Over 3 Years	= \$19,437
TPC-H Price/ Performance Metric (\$/QphH@100GB)	= \$4.30 USD

Measurement Intervals:

Measurement Interval in Throughput Test (Ts)	= 10,835.4 seconds
--	--------------------

Duration of Stream Execution:

Stream ID	Seed	Start Date	Start time	Stop Date	Stop Time	Duration
Stream00	628214831	6/29/2007	20:55:29	6/29/2007	21:44:10	9:36:00
Stream01	628214832	6/29/2007	21:44:10	6/30/2007	0:03:02	4:48:00
Stream02	628214833	6/29/2007	21:44:10	6/30/2007	0:15:07	14:24:00
Stream03	628214834	6/29/2007	21:44:10	6/30/2007	0:15:36	2:24:00
Stream04	628214835	6/29/2007	21:44:10	6/30/2007	0:09:36	12:00:00
Stream05	628214836	6/29/2007	21:44:10	6/29/2007	23:59:33	14:24:00
Refresh00		6/29/2007	20:55:29	6/29/2007	21:44:10	0:48:41
Refresh01		6/30/2007	0:15:37	6/30/2007	0:22:04	0:06:27
Refresh02		6/30/2007	0:22:04	6/30/2007	0:28:09	0:06:05
Refresh03		6/30/2007	0:28:09	6/30/2007	0:33:44	0:05:36
Refresh04		6/30/2007	0:33:44	6/30/2007	0:39:14	0:05:29
Refresh05		6/30/2007	0:39:14	6/30/2007	0:44:46	0:05:32



HP ProLiant ML370 G5

TPC-H Rev. 2.6.0

Report Date:
Jul 31, 2007

TPC-H Timing Intervals (in seconds)

Query	Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08
Stream 00	193.1	11.5	19.8	23.9	44.7	26.1	63.6	76.5
Stream 01	656.4	42.8	69.1	69.8	189.4	73.6	230.5	250.8
Stream 02	708.3	63.9	135.0	94.8	129.7	109.9	297.0	254.9
Stream 03	785.7	48.5	16.3	107.9	1253.5	120.1	288.8	301.9
Stream 04	784.0	57.9	36.3	53.9	188.9	68.1	242.1	263.2
Stream 05	422.8	47.4	63.9	66.7	126.3	126.1	372.6	220.7
Min Qi	422.8	42.8	16.3	53.9	126.3	68.1	230.5	220.7
Max Qi	785.7	63.9	135.0	107.9	1253.5	126.1	372.6	301.9
Avg Qi	671.4	52.1	64.1	78.6	377.6	99.6	286.2	258.3
Query	Q09	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Stream 00	277.5	23.5	37.6	249.4	58.6	8.4	12.5	23.0
Stream 01	866.3	57.2	204.0	952.9	300.3	105.0	48.5	83.5
Stream 02	998.8	172.2	176.7	1012.5	201.4	749.7	52.1	128.4
Stream 03	578.7	141.9	201.7	372.8	129.4	15.6	46.1	61.9
Stream 04	801.1	123.0	196.5	1292.7	289.6	43.4	38.0	94.7
Stream 05	843.3	100.5	143.4	1342.2	187.7	25.8	41.0	122.3
Min Qi	578.7	57.2	143.4	372.8	129.4	15.6	38.0	61.9
Max Qi	998.8	172.2	204.0	1342.2	300.3	749.7	52.1	128.4
Avg Qi	817.6	119.0	184.5	994.6	221.7	187.9	45.1	98.2
Query	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	168.2	282.8	242.7	54.7	646.8	51.2	215.2	110.0
Stream 01	584.5	1158.1	567.2	222.8	1398.9	201.3	268.6	118.8
Stream 02	580.8	702.2	690.6	222.6	1418.7	157.3	259.3	105.1
Stream 03	908.2	685.5	543.8	216.6	2168.0	93.6	235.5	99.9
Stream 04	671.1	804.5	719.7	116.1	1716.8	123.9	225.3	103.9
Stream 05	631.9	838.7	726.3	116.5	1399.2	157.6	228.8	103.1
Min Qi	580.8	685.5	543.8	116.1	1398.9	93.6	225.3	99.9
Max Qi	908.2	1158.1	726.3	222.8	2168.0	201.3	268.6	118.8
Avg Qi	675.3	837.8	649.5	178.9	1620.3	146.7	243.5	106.2

Abstract

Overview

This report documents the methodology and results of the TPC Benchmark™ H test conducted on the HP ProLiant ML370 G5 using Microsoft SQL Server 2005 Standard x64 Edition SP2, in conformance with the requirements of the TPC Benchmark™ H Standard Specification, Revision 2.6.0. The operating system used for the benchmark was Microsoft Windows 2003 R2 Standard x64 Edition SP2.

The benchmark results are summarized in the following table.

Hardware	Software	Total System Cost	QppH @ 100GB	QthH @ 100GB	QphH @ 100GB	\$/ QphH @ 100GB
HP ProLiant ML370 G5	Microsoft SQL Server 2005 Standard x64 Edition SP2, Windows Server 2003 R2 Standard x64 Edition SP2	\$19,437	5593.1	3654.6	4521.2	\$4.30

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 HP ProLiant ML370 G5.

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 Francois Raab for 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 Hewlett-Packard Company. The benchmark was developed and engineered by Hewlett-Packard Company. Testing took place at HP benchmarking laboratories in Houston, Texas.

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*

This requirement can be satisfied by providing a full list of all parameters and options, 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.

Appendix A, "Tunable Parameters," contains a list of all database parameters and operating system 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 HP ProLiant ML370 G5 , depicted in Figure 1.1, consisted of :

- 1x Intel X5355 2.66GHz quad core
- 16 GB of memory
- 2 x HP Smart Array P400 Controller
- 16 x 36GB Pluggable SAS 2.5" 15K rpm drives internal

Figure 1.1 Benchmarked & Priced configuration

ProLiant ML370 G5



1x Intel X5355
16 GB Memory
2x Smart Array P400
16x 36 GB 2.5" SAS 15k rpm drives

The measured configuration was different in that it contained 1 additional HP Smart Array P600 controller and 2x HP StorageWorks MSA50 enclosures which held 20x 36GB 10k SFF SAS disks that held raw data files. This hardware was not priced.

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.

Appendix B, "Database Build Scripts," contains the DDL for the index definitions.

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.

No replication was used.

3.0 Clause 2: Queries and Refresh Functions Related Items

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 and QGEN version 2.6.0 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 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 non-commercial 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 HP ProLiant ML370 G5.

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 ORDER, LINEITEM, and HISTORY tables.

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

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

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 ORDER, LINEITEM, and HISTORY tables.

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

1. The total price from the ORDER table and the extended price from the LINEITEM table were retrieved for a randomly selected order key.
2. The ACID Transaction was performed using the order key from step 1. The transaction was stopped prior to the commit.
3. The ACID Transaction was ROLLED BACK. .
4. The total price from the ORDER table and the extended price from the LINEITEM table were retrieved for the same order key 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 ORDER and LINEITEM defined by (O_ORDERKEY = L_ORDERKEY)

4.2.1 Consistency Tests

Verify that ORDER 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 ORDER 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 ORDER 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 ORDER, 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 ORDER, 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 RAID-1 protected array of two physical drives. The tables for the database were stored on 6 RAID-0 arrays each containing 25 physical drives. A backup of the database was taken. The backup was spread across 6 RAID5 arrays.

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 RAID-1 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 RAID-0 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 HP ProLiant ML370 G5 with the following configuration:

2 x Smart Array P400 disk controller

16 x 36GB SAS 2.5" 15k rpm internal disk drives

All 16 disks were used to hold 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: SMART Array Controller Disk Array to Logical Drive Mapping

SMART Array Controller	SMART Logical Drive Array Letter	Number of Physical Drives in SMART LDA	SMART Logical Drive Number	SMART Fault Tolerance	Disk Format	Size (MB)	Contents
Slot 7	A	8	1	RAID0	RAW	100000	Tpch100g
			2	RAID0	RAW	50000	TempDB
			3	RAID1	RAW	20000	TpchLog
			4	RAID1	RAW	500	Tpch1gLog
			5	RAID1	NTFS	35000	OS
Slot 9	A	8	1	RAID0	RAW	100000	Tpch100g
			2	RAID0	RAW	50000	TempDB
			3	RAID1	RAW	10000	TempDbLog
			4	RAID0	RAW	2000	Tpch1g
			5	RAID5	NTFS	92400	Backup

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 and tempdb, and RAID 1 for database recovery logs.

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

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 5 hours 43 minutes 29 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.

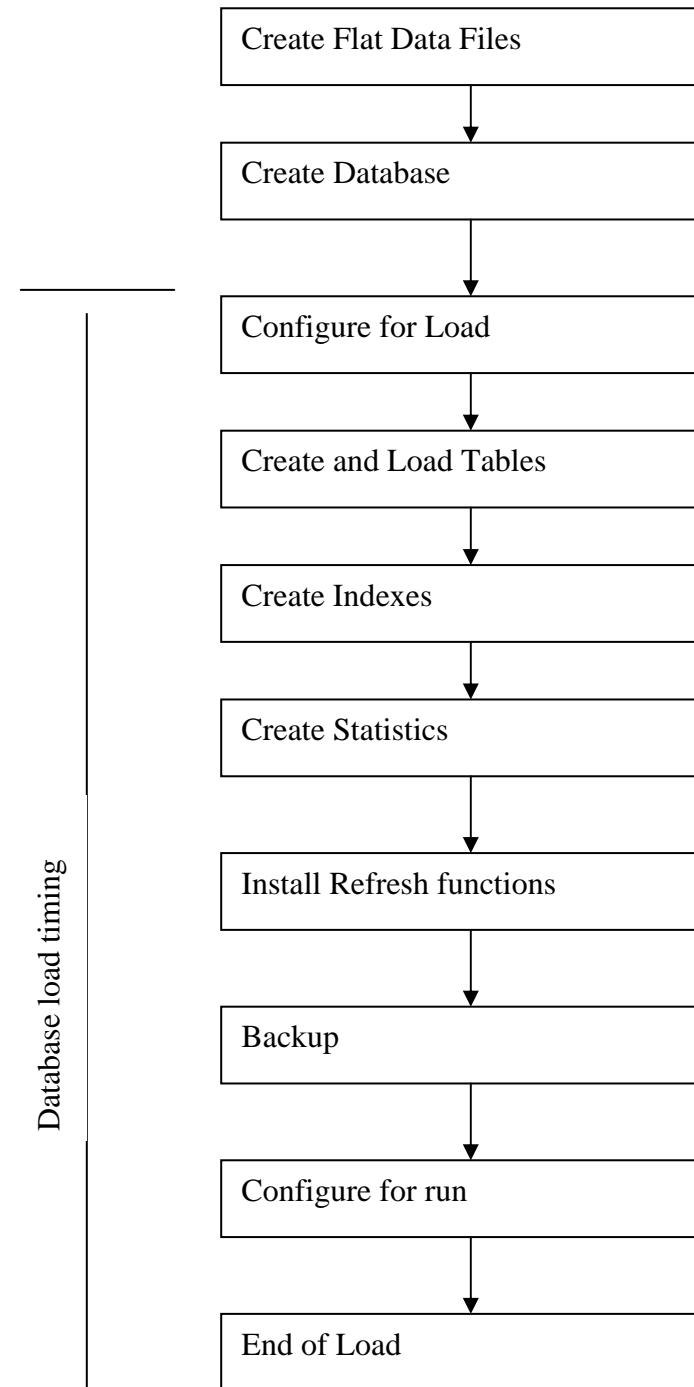
Disk Type	Number of Disks	Total Disk Space	Data Storage Ratio
36 GB	16	576 GB	5.76

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	6/29/2007	20:55:29	6/29/2007	20:59:04
Stream00	RF2	6/29/2007	21:42:20	6/29/2007	21:44:10
Stream01	RF1	6/30/2007	0:15:37	6/30/2007	0:20:05
Stream01	RF2	6/30/2007	0:20:05	6/30/2007	0:22:04
Stream02	RF1	6/30/2007	0:22:04	6/30/2007	0:26:23
Stream02	RF2	6/30/2007	0:26:23	6/30/2007	0:28:09
Stream03	RF1	6/30/2007	0:28:09	6/30/2007	0:32:04
Stream03	RF2	6/30/2007	0:32:04	6/30/2007	0:33:44
Stream04	RF1	6/30/2007	0:33:44	6/30/2007	0:37:30
Stream04	RF2	6/30/2007	0:37:30	6/30/2007	0:39:14
Stream05	RF1	6/30/2007	0:39:14	6/30/2007	0:43:03
Stream05	RF2	6/30/2007	0:43:03	6/30/2007	0:44:46

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
Run 1	6095.8	3850.6	4844.8
Run 2	5593.1	3654.6	4521.2

6.11 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.

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.

Two scripts were used. The first one was used to create and load the database, while the second was used to run the Power and Throughput tests. These scripts are in Appendix F. A C program, semaphore.c, was used for coordination of parallel processes.

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 sixteen 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 sixteen 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. The price quotations are included in Appendix G, at the end of this document.

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. As a large purchase, this purchase qualifies for a 14% discount from Hewlett-Packard Company.

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 HP ProLiant ML370 G5 and all other hardware is generally available at the time of publication. The system software, Microsoft Windows Server 2003 R2, Standard x64 Edition SP2 and the database software, Microsoft SQL Server 2005 Standard 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 the United States of America.

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 Francois Raab for Performance Metrics, Inc. 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.



PERFORMANCE METRICS INC.
TPC Certified Auditors

July 25, 2007

Mr. Daniel Pol
Hewlett-Packard Company
20555 SH 249
Houston, TX 77077

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

Platform: HP Proliant ML370 G5
Database Manager: Microsoft SQL Server 2005 Standard Edition SP2
Operating System: Windows Server 2003, Standard Edition SP2

CPU's	Memory	Total Disks	QppH@100GB	QthH@100GB	QphH@100GB
1 Quad Core Intel X5355 @ 2.66GHz	Main: 16 GB	16 x 36GB 15K rpm SFF SAS	5,593.1	3,654.6	4,521.2

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 qualification database layout was identical to the tested database except for the 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 a standard interactive interface. The version of QGEN was 2.6.0.
- The validation of the query text against the qualification database produced compliant results.

PO Box 984 Klamath, CA 95548
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Page 1
email: LornaL@PerfMetrics.com

PERFORMANCE METRICS INC.
TPC Certified Auditors

- 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,



Lorna Livingtree
President



Francois Raab
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
-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
```

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,	15,	15
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,	0,	0
blocked process threshold	, 0,	86400,	0,	0
c2 audit mode	, 0,	1,	0,	0
clr 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,	1,	1
disallow results from triggers	, 0,	1,	0,	0
fill factor (%)	, 0,	100,	0,	0

ft crawl bandwidth (max)	, 0,	32767,	100,	100
ft crawl bandwidth (min)	, 0,	32767,	0,	0
ft notify bandwidth (max)	, 0,	32767,	100,	100
ft notify bandwidth (min)	, 0,	32767,	0,	0
in-doubt xact resolution	, 0,	2,	0,	0
index create memory (KB)	, 704,	2147483647,	0,	0
lightweight pooling	, 0,	1,	1,	1
locks	, 5000,	2147483647,	0,	0
max degree of parallelism	, 0,	64,	0,	0
max full-text crawl range	, 0,	256,	4,	4
max server memory (MB)	, 16,	2147483647,	31000,	31000
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,	0
nested triggers	, 0,	1,	1,	1
network packet size (B)	, 512,	32767,	32767,	32767
Ole Automation Procedures	, 0,	1,	0,	0
open objects	, 0,	2147483647,	0,	0
PH timeout (s)	, 1,	3600,	60,	60
precompute rank	, 0,	1,	0,	0
priority boost	, 0,	1,	1,	1
query governor cost limit	, 0,	2147483647,	0,	0
query wait (s)	, -1,	2147483647,	2147483647,	2147483647
recovery interval (min)	, 0,	32767,	32767,	32767
remote access	, 0,	1,	1,	1
remote admin connections	, 0,	1,	0,	0
remote login timeout (s)	, 0,	2147483647,	20,	20
remote proc trans	, 0,	1,	0,	0
remote query timeout (s)	, 0,	2147483647,	600,	600
Replication XPs	, 0,	1,	0,	0
scan for startup procs	, 0,	1,	0,	0
server trigger recursion	, 0,	1,	1,	1
set working set size	, 0,	1,	0,	0
show advanced options	, 0,	1,	1,	1
SMO and DMO XPs	, 0,	1,	1,	1
SQL Mail XPs	, 0,	1,	0,	0
transform noise words	, 0,	1,	0,	0
two digit year cutoff	, 1753,	9999,	2049,	2049
user connections	, 0,	32767,	0,	0
user options	, 0,	32767,	0,	0
Web Assistant Procedures	, 0,	1,	0,	0
xp_cmdshell	, 0,	1,	0,	0

A.5 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.6 Smart Array driver settings

Windows Registry Editor Version 5.00

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\HpCIS
Ss2]
```

```
"Type"=dword:00000001
"Start"=dword:00000000
"Group"="SCSI miniport"
"ErrorControl"=dword:00000001
"ImagePath"="system32\drivers\HpCISs2.sys"
"tag"=dword:00000103
```

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\HpCIS
Ss2\Parameters]
```

```
"BusType"=dword:00000008
```

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\HpCIS
Ss2\Parameters\Device]
```

```
"DriverParameter"="CSMI=None;;Prg=Psuite"
"OSVersion"="5.2"
"MaxScatterGather"=dword:00000040
"Tracing"=hex:00
```

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\HpCIS
Ss2\Parameters\PnpInterface]
```

```
"5"=dword:00000001
```

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\HpCIS
Ss2\Enum]
```

```
"0"="PCI\VEN_103C&DEV_3230&SUBSYS_3234103C&REV_01\4&79
c23&0&0030"
"Count"=dword:00000002
"NextInstance"=dword:00000002
"1"="PCI\VEN_103C&DEV_3230&SUBSYS_3234103C&REV_01\4&23
7315c2&0&0020"
```

A.7 System Hardware Information

System Information report written at: 07/23/07 16:35:17

System Name: ML370G5

[System Summary]

Item	Value
OS Name	Microsoft(R) Windows(R) Server 2003 Standard x64 Edition

Version 5.2.3790 Service Pack 2 Build 3790

Other OS Description R2

OS Manufacturer Microsoft Corporation

System Name ML370G5

System Manufacturer HP

System Model ProLiant ML370 G5

System Type x64-based PC

Processor EM64T Family 6 Model 15 Stepping 7 GenuineIntel ~2667 Mhz

Processor EM64T Family 6 Model 15 Stepping 7 GenuineIntel ~2667 Mhz

Processor EM64T Family 6 Model 15 Stepping 7 GenuineIntel ~2667 Mhz

Processor EM64T Family 6 Model 15 Stepping 7 GenuineIntel ~2667 Mhz

BIOS Version/Date HP P57, 6/14/2007

SMBIOS Version 2.4

Windows Directory N:\WINDOWS

System Directory N:\WINDOWS\system32

```
Boot Device          \Device\HarddiskVolume6
Locale               United States
Hardware Abstraction Layer   Version = "5.2.3790.3959
(srv03_sp2_rtm.070216-1710)"
User Name            ML370G5\Administrator
Time Zone            Central Daylight Time
Total Physical Memory      16,381.66 MB
Available Physical Memory  14.96 GB
Total Virtual Memory      19.40 GB
Available Virtual Memory  18.90 GB
Page File Space          4.00 GB
Page File             N:\pagefile.sys

[Hardware Resources]

[Conflicts/Sharing]

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

IRQ 5      Base System Device
IRQ 5      PCI Device

I/O Port 0x000002F8-0x000002FF      Motherboard resources
I/O Port 0x000002F8-0x000002FF      Communications Port (COM2)

IRQ 16     PCI standard PCI-to-PCI bridge
IRQ 16     PCI standard PCI-to-PCI bridge
IRQ 16     HP NC373i Virtual Bus Device
IRQ 16     Standard Universal PCI to USB Host Controller
IRQ 16     Standard Enhanced PCI to USB Host Controller

I/O Port 0x00005000-0x00005FFF      PCI standard PCI-to-PCI bridge
I/O Port 0x00005000-0x00005FFF      Smart Array P400 Controller

IRQ 17     PCI standard PCI-to-PCI bridge
IRQ 17     PCI standard PCI-to-PCI bridge
IRQ 17     HP NC373i Virtual Bus Device
IRQ 17     Standard Universal PCI to USB Host Controller

IRQ 18     PCI standard PCI-to-PCI bridge
IRQ 18     Standard Universal PCI to USB Host Controller

IRQ 19     Smart Array P400 Controller
IRQ 19     Smart Array P400 Controller
IRQ 19     Standard Universal PCI to USB Host Controller

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

Memory Address 0xFA000000-0xFBFFFFFF      PCI standard PCI-to-
PCI bridge
Memory Address 0xFA000000-0xFBFFFFFF      PCI standard PCI-to-
PCI bridge
Memory Address 0xFA000000-0xFBFFFFFF      HP NC373i Virtual
Bus Device

Memory Address 0xF8000000-0xF9FFFFFF      PCI standard PCI-to-
PCI bridge
Memory Address 0xF8000000-0xF9FFFFFF      PCI standard PCI-to-
PCI bridge
```


Memory Address 0xF8000000-0xF9FFFFFF	HP NC373i Virtual Bus Device		0x00000900-0x0000097F	Motherboard resources	OK
			0x00000010-0x0000001F	Motherboard resources	OK
I/O Port 0x00004000-0x00004FFF	PCI standard PCI-to-PCI bridge		0x00000C80-0x00000C83	Motherboard resources	OK
I/O Port 0x00004000-0x00004FFF	Smart Array P400 Controller		0x00000CD4-0x00000CD7	Motherboard resources	OK
[DMA]			0x00000F50-0x00000F58	Motherboard resources	OK
Resource Device Status			0x000000F0-0x000000F0	Motherboard resources	OK
Channel 7 Direct memory access controller	OK		0x00000CA0-0x00000CA1	Motherboard resources	OK
[Forced Hardware]			0x00000CA4-0x00000CA5	Motherboard resources	OK
Device PNP Device ID			0x000002F8-0x000002FF	Motherboard resources	OK
[I/O]			0x000002F8-0x000002FF	Communications Port (COM2)	OK
Resource Device Status			0x00000CA2-0x00000CA3	OK	
0x00000000-0x00000CF7	PCI bus	OK	0x00000040-0x00000043	System timer	OK
0x00000000-0x00000CF7	Direct memory access controller	OK	0x00000080-0x0000008F	Direct memory access controller	OK
0x00000D00-0x0000FFFF	PCI bus	OK	0x000000C0-0x000000DF	Direct memory access controller	OK
0x00004000-0x00004FFF	PCI standard PCI-to-PCI bridge	OK			
0x00004000-0x00004FFF	Smart Array P400 Controller	OK	0x00000061-0x00000061	System speaker	OK
0x00005000-0x00005FFF	PCI standard PCI-to-PCI bridge	OK	0x00000060-0x00000060	Standard 101/102-Key or Microsoft	OK
0x00005000-0x00005FFF	Smart Array P400 Controller	OK	0x00000064-0x00000064	Standard 101/102-Key or Microsoft	OK
0x00005000-0x00005FFF	Smart Array P400 Controller	OK	Natural PS/2 Keyboard	OK	
0x00001000-0x0000101F	Standard Universal PCI to USB Host Controller	OK	0x0000002E-0x0000002F	Extended IO Bus	OK
0x00001020-0x0000103F	Standard Universal PCI to USB Host Controller	OK	0x0000004E-0x0000004F	Extended IO Bus	OK
0x00001040-0x0000105F	Standard Universal PCI to USB Host Controller	OK	0x00000620-0x0000065F	Extended IO Bus	OK
0x00001060-0x0000107F	Standard Universal PCI to USB Host Controller	OK	0x00000680-0x0000069F	Extended IO Bus	OK
0x00003000-0x000030FF	Standard VGA Graphics Adapter	OK	0x00000600-0x0000061F	Extended IO Bus	OK
0x00003B00-0x00003BB	Standard VGA Graphics Adapter	OK	0x00000660-0x0000067F	Extended IO Bus	OK
0x00003C00-0x00003DF	Standard VGA Graphics Adapter	OK	0x00000300-0x0000030F	Extended IO Bus	OK
0x00002800-0x000028FF	Base System Device	OK	0x000003F8-0x000003FF	Communications Port (COM1)	OK
0x00003400-0x000034FF	Base System Device	OK	0x00000500-0x0000050F	Standard Dual Channel PCI IDE Controller	OK
0x00003800-0x0000381F	Standard Universal PCI to USB Host Controller	OK	0x000001F0-0x000001F7	Primary IDE Channel	OK
0x00000070-0x00000077	Motherboard resources	OK	0x000003F6-0x000003F6	Primary IDE Channel	OK
0x00000408-0x0000040F	Motherboard resources	OK	0x00000170-0x00000177	Secondary IDE Channel	OK
0x000004D0-0x000004D1	Motherboard resources	OK	0x00000376-0x00000376	Secondary IDE Channel	OK
0x00000020-0x0000003F	Motherboard resources	OK			
0x000000A0-0x000000BF	Motherboard resources	OK	[IRQs]		
0x00000090-0x0000009F	Motherboard resources	OK	Resource Device Status		
0x00000050-0x00000053	Motherboard resources	OK	IRQ 9	Microsoft ACPI-Compliant System	OK
0x00000700-0x0000071F	Motherboard resources	OK	IRQ 16	PCI standard PCI-to-PCI bridge	OK
0x00000800-0x0000083F	Motherboard resources	OK	IRQ 16	PCI standard PCI-to-PCI bridge	OK
			IRQ 16	HP NC373i Virtual Bus Device	OK
			IRQ 16	Standard Universal PCI to USB Host Controller	OK
			IRQ 16	Standard Enhanced PCI to USB Host Controller	OK
			IRQ 17	PCI standard PCI-to-PCI bridge	OK
			IRQ 17	PCI standard PCI-to-PCI bridge	OK
			IRQ 17	HP NC373i Virtual Bus Device	OK
			IRQ 17	Standard Universal PCI to USB Host Controller	OK
			IRQ 18	PCI standard PCI-to-PCI bridge	OK
			IRQ 18	Standard Universal PCI to USB Host Controller	OK
			IRQ 19	Smart Array P400 Controller	OK
			IRQ 19	Smart Array P400 Controller	OK

IRQ 19 Standard Universal PCI to USB Host Controller OK
 IRQ 5 Base System Device OK
 IRQ 5 PCI Device OK
 IRQ 10 Base System Device OK
 IRQ 22 Standard Universal PCI to USB Host Controller OK

IRQ 0 System timer OK
 IRQ 1 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard OK
 IRQ 12 PS/2 Compatible Mouse OK
 IRQ 4 Communications Port (COM1) OK
 IRQ 14 Primary IDE Channel OK
 IRQ 3 Communications Port (COM2) OK

[Memory]

Resource	Device	Status
0xA0000-0xBFFFF	PCI bus	OK
0xA0000-0xBFFFF	Standard VGA Graphics Adapter	OK
0xD0000000-0xDFFFFFFF	PCI bus	OK
0xF0000000-0xFEBFFFFF	PCI bus	OK
0xFDB00000-0xFDBFFFFF	PCI standard PCI-to-PCI bridge	OK
0xFDC00000-0xFDDFFFFF	PCI standard PCI-to-PCI bridge	OK
0xFDD00000-0xFDDFFFFF	Smart Array P400 Controller	OK
0xFDCF0000-0xFDCF0FFF	Smart Array P400 Controller	OK
0xFDE00000-0xFDFFFFFF	PCI standard PCI-to-PCI bridge	OK
0xFDF00000-0xFDFFFFFF	Smart Array P400 Controller	OK
0xFDEF0000-0xFDEF0FFF	Smart Array P400 Controller	OK
0xF8000000-0xF9FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF8000000-0xF9FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xF8000000-0xF9FFFFFF	HP NC373i Virtual Bus Device	OK
0xFA000000-0xFBFFFFFF	PCI standard PCI-to-PCI bridge	OK
0xFA000000-0xFBFFFFFF	PCI standard PCI-to-PCI bridge	OK
0xFA000000-0xFBFFFFFF	HP NC373i Virtual Bus Device	OK
0xF7DF0000-0xF7DF03FF	Standard Enhanced PCI to USB Host Controller	OK
0xD8000000-0xDFFFFFFF	Standard VGA Graphics Adapter	OK
0xF7FF0000-0xF7FFFFFF	Standard VGA Graphics Adapter	OK
0xF7FE0000-0xF7FE01FF	Base System Device	OK
0xF7FD0000-0xF7FD07FF	Base System Device	OK
0xF7FC0000-0xF7FC1FFF	Base System Device	OK
0xF7F00000-0xF7F7FFFF	Base System Device	OK
0xF7EF0000-0xF7EF00FF	PCI Device	OK
0xE0000000-0xEFFFFFFF	Motherboard resources	OK
0xFE000000-0xFEBFFFFF	Motherboard resources	OK
0xFED00000-0xFED003FF	High precision event timer	OK

[Components]

[Multimedia]

[Audio Codecs]

CODEC	Manufacturer	Description	Status	File
	Version	Size	Creation Date	
n:\windows\system32\imaadp32.acm	Microsoft Corporation			
	OK			
	N:\WINDOWS\system32\IMAADP32.ACM			
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			24.00 KB
(24,576 bytes)	3/25/2005 6:00 AM			
n:\windows\system32\msg711.acm	Microsoft Corporation			
	OK			
	N:\WINDOWS\system32\MSG711.ACM			
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			13.50 KB
(13,824 bytes)	3/25/2005 6:00 AM			
n:\windows\system32\msgsm32.acm	Microsoft Corporation			
	OK			
	N:\WINDOWS\system32\MSGSM32.ACM			
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			34.50 KB (35,328 bytes)
(34,500 bytes)	3/25/2005 6:00 AM			
n:\windows\system32\tsoft32.acm	DSP GROUP, INC.			
	OK			
	N:\WINDOWS\system32\TSSOFT32.ACM			1.01
	13.50 KB (13,824 bytes)			3/25/2005 6:00 AM
n:\windows\system32\msadp32.acm	Microsoft Corporation			
	OK			
	N:\WINDOWS\system32\MSADP32.ACM			
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			23.50 KB
(24,064 bytes)	3/25/2005 6:00 AM			

[Video Codecs]

CODEC	Manufacturer	Description	Status	File
	Version	Size	Creation Date	
n:\windows\system32\tsbyuv.dll	Microsoft Corporation			
	OK			
	N:\WINDOWS\system32\TSBYUV.DLL			
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			12.50 KB
(12,800 bytes)	3/24/2005 11:34 AM			
n:\windows\system32\msrle32.dll	Microsoft Corporation			
	OK			
	N:\WINDOWS\system32\MSRLE32.DLL			
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			15.50 KB
(15,872 bytes)	3/25/2005 6:00 AM			
n:\windows\system32\msyuv.dll	Microsoft Corporation			
	OK			
	N:\WINDOWS\system32\MSYUV.DLL			
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			21.00 KB
(21,504 bytes)	3/24/2005 11:21 AM			
n:\windows\system32\iyuv_32.dll	Microsoft Corporation			
	OK			
	N:\WINDOWS\system32\IYUV_32.DLL			
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			52.50 KB
(53,760 bytes)	3/24/2005 11:19 AM			
n:\windows\system32\msvide32.dll	Microsoft Corporation			
	OK			
	N:\WINDOWS\system32\MSVIDC32.DLL			
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			43.00 KB (44,032 bytes)
(43,000 bytes)	3/25/2005 6:00 AM			

[CD-ROM]

Item	Value
Drive	M:
Description	CD-ROM Drive
Media Loaded	No
Media Type	CD-ROM
Name	TSSTcorp CD-ROM TS-H192C
Manufacturer	(Standard CD-ROM drives)
Status	OK
Transfer Rate	Not Available
SCSI Target ID	0
PNP Device ID	IDE\CDROMTSSTCORP_CD-ROM_TS-H192C_____B504____\5&5FD9AC6&0&0.0.0

Driver n:\windows\system32\drivers\cdrom.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 75.50 KB (77,312 bytes), 3/25/2005 6:00 AM)

[Sound Device]

Item Value

[Display]

Item Value
Name Standard VGA Graphics Adapter
PNP Device ID PCI\VEN_1002&DEV_515E&SUBSYS_31FB103C&REV_02\4&2014205D&0&18F0
Adapter Type ATI ES1000, (Standard display types) compatible

Adapter Description Standard VGA Graphics Adapter
Adapter RAM 32.00 MB (33,554,432 bytes)
Installed Drivers vga.dll,framebuf.dll,vga256,vga64k
Driver Version 5.2.3790.1830
INF File display.inf (vga section)
Color Planes 1
Color Table Entries 65536
Resolution 1024 x 768 x 1 hertz
Bits/Pixel 16
Memory Address 0xD8000000-0xDFFFFFFF
I/O Port 0x00003000-0x000030FF
Memory Address 0xF7FF0000-0xF7FFFFFF
I/O Port 0x000003B0-0x000003BB
I/O Port 0x000003C0-0x000003DF
Memory Address 0xA0000-0xBFFFFF
Driver n:\windows\system32\drivers\vgapnp.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 33.00 KB (33,792 bytes), 1/31/2007 8:36 AM)

[Infrared]

Item Value

[Input]

[Keyboard]

Item Value
Description USB Human Interface Device
Name Enhanced (101- or 102-key)
Layout 00000409
PNP Device ID USB\VID_03F0&PID_1027&MI_00\7&2CD6FDA9&0&0000
Number of Function Keys 12
Driver n:\windows\system32\drivers\hidusb.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 18.50 KB (18,944 bytes), 3/25/2005 6:00 AM)

Description Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
Name Enhanced (101- or 102-key)
Layout 00000409
PNP Device ID ACPI\PNP0303\4&2AA4AD3D&0
Number of Function Keys 12
I/O Port 0x00000060-0x0000006F
I/O Port 0x00000064-0x0000006B
IRQ Channel IRQ 1
Driver n:\windows\system32\drivers\i8042prt.sys (5.2.3790.3959 (srv03_sp2_rtm.070216-1710), 91.00 KB (93,184 bytes), 3/25/2005 6:00 AM)

[Pointing Device]

Item Value
Hardware Type USB Human Interface Device
Number of Buttons 5
Status OK
PNP Device ID USB\VID_03F0&PID_1027&MI_01\7&2CD6FDA9&0&0001
Power Management Supported No
Double Click Threshold 6
Handedness Right Handed Operation
Driver n:\windows\system32\drivers\hidusb.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 18.50 KB (18,944 bytes), 3/25/2005 6:00 AM)

Hardware Type PS/2 Compatible Mouse
Number of Buttons 5
Status OK
PNP Device ID ACPI\PNP0F13\4&2AA4AD3D&0
Power Management Supported No
Double Click Threshold 6
Handedness Right Handed Operation
IRQ Channel IRQ 12
Driver n:\windows\system32\drivers\i8042prt.sys (5.2.3790.3959 (srv03_sp2_rtm.070216-1710), 91.00 KB (93,184 bytes), 3/25/2005 6:00 AM)

[Modem]

Item Value

[Network]

[Adapter]

Item Value
Name [00000001] RAS Async Adapter
Adapter Type Not Available
Product Type RAS Async Adapter
Installed Yes
PNP Device ID Not Available
Last Reset 7/23/2007 3:38 PM
Index 1
Service Name AsyncMac
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available

Name [00000002] WAN Miniport (L2TP)
Adapter Type Not Available
Product Type WAN Miniport (L2TP)
Installed Yes
PNP Device ID ROOT\MS_L2TPMINIPORT\0000
Last Reset 7/23/2007 3:38 PM
Index 2
Service Name Rasl2tp
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available

DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Driver n:\windows\system32\drivers\rasl2tp.sys (5.2.3790.3959 (srv03_sp2_rtm.070216-1710), 132.00 KB (135,168 bytes), 3/25/2005 6:00 AM)

Name [00000003] WAN Miniport (PPTP)
Adapter Type Wide Area Network (WAN)
Product Type WAN Miniport (PPTP)
Installed Yes
PNP Device ID ROOT\MS_PPTP\MINIPOINT\0000
Last Reset 7/23/2007 3:38 PM
Index 3
Service Name PptpMiniport
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 50:50:54:50:30:30
Driver n:\windows\system32\drivers\raspptp.sys (5.2.3790.3959 (srv03_sp2_rtm.070216-1710), 117.50 KB (120,320 bytes), 3/25/2005 6:00 AM)

Name [00000004] WAN Miniport (PPPOE)
Adapter Type Wide Area Network (WAN)
Product Type WAN Miniport (PPPOE)
Installed Yes
PNP Device ID ROOT\MS_PPPOE\MINIPOINT\0000
Last Reset 7/23/2007 3:38 PM
Index 4
Service Name RasPppoe
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 33:50:6F:45:30:30
Driver n:\windows\system32\drivers\rasppoe.sys (5.2.3790.3959 (srv03_sp2_rtm.070216-1710), 67.50 KB (69,120 bytes), 3/25/2005 6:00 AM)

Name [00000005] Direct Parallel
Adapter Type Not Available
Product Type Direct Parallel
Installed Yes
PNP Device ID ROOT\MS_PT\MINIPOINT\0000
Last Reset 7/23/2007 3:38 PM
Index 5
Service Name Raspti
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Driver n:\windows\system32\drivers\raspti.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 30.50 KB (31,232 bytes), 3/25/2005 6:00 AM)

Name [00000006] WAN Miniport (IP)
Adapter Type Not Available
Product Type WAN Miniport (IP)

Installed Yes
PNP Device ID ROOT\MS_NDISWANIP\0000
Last Reset 7/23/2007 3:38 PM
Index 6
Service Name NdisWan
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Driver n:\windows\system32\drivers\ndiswan.sys (5.2.3790.3959 (srv03_sp2_rtm.070216-1710), 157.50 KB (161,280 bytes), 3/25/2005 6:00 AM)

Name [00000007] HP NC373i Multifunction Gigabit Server Adapter
Adapter Type Ethernet 802.3
Product Type HP NC373i Multifunction Gigabit Server Adapter

Installed Yes
PNP Device ID B06BDRV\L2ND&PCI_164C14E4&SUBSYS_7038103C&REV_12\6&154EFE07&0&20050500
Last Reset 7/23/2007 3:38 PM
Index 7
Service Name l2nd
IP Address 0.0.0.0
IP Subnet 0.0.0.0
Default IP Gateway Not Available
DHCP Enabled Yes
DHCP Server
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:17:A4:F7:2F:9A
Driver n:\windows\system32\drivers\bxnd52a.sys (2.8.13.0 built by: WinDDK, 81.00 KB (82,944 bytes), 1/31/2007 3:06 PM)

Name [00000008] HP NC373i Multifunction Gigabit Server Adapter
Adapter Type Ethernet 802.3
Product Type HP NC373i Multifunction Gigabit Server Adapter

Installed Yes
PNP Device ID B06BDRV\L2ND&PCI_164C14E4&SUBSYS_7038103C&REV_12\6&183F41DD&0&20050300
Last Reset 7/23/2007 3:38 PM
Index 8
Service Name l2nd
IP Address 130.168.250.151
IP Subnet 255.255.0.0
Default IP Gateway Not Available
DHCP Enabled Yes
DHCP Server 130.168.253.2
DHCP Lease Expires 7/24/2007 3:39 PM
DHCP Lease Obtained 7/23/2007 3:39 PM
MAC Address 00:17:A4:F7:2F:98
Driver n:\windows\system32\drivers\bxnd52a.sys (2.8.13.0 built by: WinDDK, 81.00 KB (82,944 bytes), 1/31/2007 3:06 PM)

[Protocol]

Item	Value
Name	MSAFD Tcpip [TCP/IP]
Connectionless Service	No
Guarantees Delivery	Yes
Guarantees Sequencing	Yes

Maximum Address Size 16 bytes
 Maximum Message Size 0 bytes
 Message Oriented No
 Minimum Address Size 16 bytes
 Pseudo Stream Oriented No
 Supports Broadcasting No
 Supports Connect Data No
 Supports Disconnect Data No
 Supports Encryption No
 Supports Expedited Data Yes
 Supports Graceful Closing Yes
 Supports Guaranteed Bandwidth No
 Supports Multicasting No

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

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

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

[WinSock]

Item Value
 File n:\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 (COM2)
 Status OK
 PNP Device ID ROOT*PNP0501\1_0_17_1_0_0
 Maximum Input Buffer Size 0
 Maximum Output Buffer Size No
 Settable Baud Rate Yes
 Settable Data Bits Yes
 Settable Flow Control Yes
 Settable Parity Yes
 Settable Parity Check Yes
 Settable Stop Bits Yes
 Settable RLSD Yes
 Supports RLSD Yes
 Supports 16 Bit Mode No
 Supports Special Characters No
 Baud Rate 9600
 Bits/Byte 8
 Stop Bits 1
 Parity None
 Busy No
 Abort Read/Write on Error No
 Binary Mode Enabled Yes
 Continue XMit on XOff No
 CTS Outflow Control No
 Discard NULL Bytes No
 DSR Outflow Control 0
 DSR Sensitivity 0
 DTR Flow Control Type Enable
 EOF Character 0
 Error Replace Character 0
 Error Replacement Enabled No
 Event Character 0
 Parity Check Enabled No
 RTS Flow Control Type Enable
 XOff Character 19
 XOffXMit Threshold 512
 XOn Character 17
 XOnXMit Threshold 2048
 XOnXOff InFlow Control 0
 XOnXOff OutFlow Control 0
 I/O Port 0x000002F8-0x000002FF
 IRQ Channel IRQ 3
 Driver n:\windows\system32\drivers\serial.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 118.50 KB (121,344 bytes), 3/25/2005 6:00 AM)

Name Communications Port (COM1)
 Status OK
 PNP Device ID ACPI\PNP0501(0)
 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
 IRQ Channel IRQ 4
 I/O Port 0x000003F8-0x000003FF
 Driver n:\windows\system32\drivers\serial.sys (5.2.3790.1830
 (srv03_sp1_rtm.050324-1447), 118.50 KB (121,344 bytes), 3/25/2005 6:00
 AM)

[Parallel]

Item Value

[Storage]

[Drives]

Item Value

Drive M:
 Description CD-ROM Disc

 Drive N:
 Description Local Fixed Disk
 Compressed No
 File System NTFS
 Size 34.17 GB (36,694,650,880 bytes)
 Free Space 19.35 GB (20,781,797,376 bytes)
 Volume Name
 Volume Serial Number DCDF6516

Drive Y:
 Description Local Fixed Disk
 Compressed No
 File System NTFS
 Size 90.23 GB (96,885,944,320 bytes)
 Free Space 6.31 GB (6,770,049,024 bytes)
 Volume Name New Volume
 Volume Serial Number 18A6EAF7

[Disks]

Item Value
 Description Disk drive

Manufacturer (Standard disk drives)
 Model HP LOGICAL VOLUME SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus 0
 SCSI Logical Unit 0
 SCSI Port 3
 SCSI Target ID 4
 Sectors/Track 32
 Size 34.18 GB (36,698,849,280 bytes)
 Total Cylinders 8,784
 Total Sectors 71,677,440
 Total Tracks 2,239,920
 Tracks/Cylinder 255
 Partition Disk #5, Partition #0
 Partition Size 34.17 GB (36,694,654,976 bytes)
 Partition Starting Offset 16,384 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model HP LOGICAL VOLUME SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus 0
 SCSI Logical Unit 0
 SCSI Port 3
 SCSI Target ID 5
 Sectors/Track 32
 Size 48.83 GB (52,428,718,080 bytes)
 Total Cylinders 12,549
 Total Sectors 102,399,840
 Total Tracks 3,199,995
 Tracks/Cylinder 255
 Partition Disk #6, Partition #0
 Partition Size 48.83 GB (52,427,751,424 bytes)
 Partition Starting Offset 131,072 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model HP LOGICAL VOLUME SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus 0
 SCSI Logical Unit 0
 SCSI Port 3
 SCSI Target ID 6
 Sectors/Track 32
 Size 19.53 GB (20,968,980,480 bytes)
 Total Cylinders 5,019
 Total Sectors 40,955,040
 Total Tracks 1,279,845
 Tracks/Cylinder 255
 Partition Disk #7, Partition #0
 Partition Size 19.53 GB (20,968,374,272 bytes)
 Partition Starting Offset 131,072 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model HP LOGICAL VOLUME SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus 0

SCSI Logical Unit 0
 SCSI Port 3
 SCSI Target ID 7
 Sectors/Track 32
 Size 498.05 MB (522,240,000 bytes)
 Total Cylinders 125
 Total Sectors 1,020,000
 Total Tracks 31,875
 Tracks/Cylinder 255
 Partition Disk #8, Partition #0
 Partition Size 494.00 MB (517,996,544 bytes)
 Partition Starting Offset 65,536 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model HP LOGICAL VOLUME SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus 0
 SCSI Logical Unit 0
 SCSI Port 3
 SCSI Target ID 8
 Sectors/Track 32
 Size 97.66 GB (104,857,436,160 bytes)
 Total Cylinders 25,098
 Total Sectors 204,799,680
 Total Tracks 6,399,990
 Tracks/Cylinder 255
 Partition Disk #9, Partition #0
 Partition Size 97.66 GB (104,856,551,424 bytes)
 Partition Starting Offset 131,072 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model HP LOGICAL VOLUME SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus 0
 SCSI Logical Unit 0
 SCSI Port 2
 SCSI Target ID 4
 Sectors/Track 32
 Size 97.66 GB (104,857,436,160 bytes)
 Total Cylinders 25,098
 Total Sectors 204,799,680
 Total Tracks 6,399,990
 Tracks/Cylinder 255
 Partition Disk #0, Partition #0
 Partition Size 97.66 GB (104,856,551,424 bytes)
 Partition Starting Offset 131,072 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model HP LOGICAL VOLUME SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus 0
 SCSI Logical Unit 0
 SCSI Port 2
 SCSI Target ID 5
 Sectors/Track 32
 Size 48.83 GB (52,428,718,080 bytes)
 Total Cylinders 12,549
 Total Sectors 102,399,840

Total Tracks 3,199,995
 Tracks/Cylinder 255
 Partition Disk #1, Partition #0
 Partition Size 48.83 GB (52,427,751,424 bytes)
 Partition Starting Offset 131,072 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model HP LOGICAL VOLUME SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus 0
 SCSI Logical Unit 0
 SCSI Port 2
 SCSI Target ID 6
 Sectors/Track 32
 Size 9.77 GB (10,486,579,200 bytes)
 Total Cylinders 2,510
 Total Sectors 20,481,600
 Total Tracks 640,050
 Tracks/Cylinder 255
 Partition Disk #2, Partition #0
 Partition Size 9.77 GB (10,485,760,000 bytes)
 Partition Starting Offset 131,072 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model HP LOGICAL VOLUME SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus 0
 SCSI Logical Unit 0
 SCSI Port 2
 SCSI Target ID 7
 Sectors/Track 63
 Size 1.95 GB (2,089,221,120 bytes)
 Total Cylinders 254
 Total Sectors 4,080,510
 Total Tracks 64,770
 Tracks/Cylinder 255
 Partition Disk #3, Partition #0
 Partition Size 1.95 GB (2,088,763,392 bytes)
 Partition Starting Offset 65,536 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model HP LOGICAL VOLUME SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus 0
 SCSI Logical Unit 0
 SCSI Port 2
 SCSI Target ID 8
 Sectors/Track 63
 Size 90.23 GB (96,885,573,120 bytes)
 Total Cylinders 11,779
 Total Sectors 189,229,635
 Total Tracks 3,003,645
 Tracks/Cylinder 255
 Partition Disk #4, Partition #0
 Partition Size 90.23 GB (96,885,948,416 bytes)
 Partition Starting Offset 16,384 bytes

[SCSI]

Item Value
 Name Smart Array P400 Controller
 Manufacturer Hewlett-Packard Company
 Status OK
 PNP Device ID
 PCI\VEN_103C&DEV_3230&SUBSYS_3234103C&REV_01\4
 &237315C2&0&0020
 Memory Address 0xFDD00000-0xFDDFFFFF
 I/O Port 0x00004000-0x00004FFF
 Memory Address 0xFDCF0000-0xFDCF0FFF
 IRQ Channel IRQ 19
 Driver n:\windows\system32\drivers\hpciss2.sys (6.6.0.64 Build 5 (x86-64) built by: buildsrv, 59.30 KB (60,728 bytes), 1/31/2007 8:27 AM)

Name Smart Array P400 Controller
 Manufacturer Hewlett-Packard Company
 Status OK
 PNP Device ID
 PCI\VEN_103C&DEV_3230&SUBSYS_3234103C&REV_01\4
 &79C23&0&0030
 Memory Address 0xFDF00000-0xFDFFFFFF
 I/O Port 0x00005000-0x00005FFF
 Memory Address 0xFDEF0000-0xFDEF0FFF
 IRQ Channel IRQ 19
 Driver n:\windows\system32\drivers\hpciss2.sys (6.6.0.64 Build 5 (x86-64) built by: buildsrv, 59.30 KB (60,728 bytes), 1/31/2007 8:27 AM)

[IDE]

Item Value
 Name Standard Dual Channel PCI IDE Controller
 Manufacturer (Standard IDE ATA/ATAPI controllers)
 Status OK
 PNP Device ID
 PCI\VEN_8086&DEV_269E&SUBSYS_31FE103C&REV_09\3
 &61AAA01&0&F9
 I/O Port 0x00000500-0x0000050F
 Driver n:\windows\system32\drivers\pciide.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 6.00 KB (6,144 bytes), 3/25/2005 6:00 AM)

Name Primary IDE Channel
 Manufacturer (Standard IDE ATA/ATAPI controllers)
 Status OK
 PNP Device ID PCI\IDE\IDECHANNEL\4&56E2F28&0&0
 I/O Port 0x000001F0-0x000001F7
 I/O Port 0x000003F6-0x000003F6
 IRQ Channel IRQ 14
 Driver n:\windows\system32\drivers\atapi.sys (5.2.3790.3959 (srv03_sp2_rtm.070216-1710), 146.50 KB (150,016 bytes), 3/25/2005 6:00 AM)

Name Secondary IDE Channel
 Manufacturer (Standard IDE ATA/ATAPI controllers)
 Status OK
 PNP Device ID PCI\IDE\IDECHANNEL\4&56E2F28&0&1
 I/O Port 0x00000170-0x00000177
 I/O Port 0x00000376-0x00000376
 Driver n:\windows\system32\drivers\atapi.sys (5.2.3790.3959 (srv03_sp2_rtm.070216-1710), 146.50 KB (150,016 bytes), 3/25/2005 6:00 AM)

[Printing]

Name Driver Port Name Server Name

[Problem Devices]

Device PNP Device ID Error Code
 Base System Device
 PCI\VEN_0E11&DEV_B203&SUBSYS_3305103C&REV_03\4
 &2014205D&0&22F0 The drivers for this device are not installed.

Base System Device
 PCI\VEN_0E11&DEV_B204&SUBSYS_3305103C&REV_03\4
 &2014205D&0&22F0 The drivers for this device are not installed.

PCI Device
 PCI\VEN_103C&DEV_3302&SUBSYS_3305103C&REV_00\4
 &2014205D&0&26F0 The drivers for this device are not installed.

Not Available ACPI\IPI0001\0 The drivers for this device are not installed.

[USB]

Device PNP Device ID
 Standard Universal PCI to USB Host Controller
 PCI\VEN_8086&DEV_2688&SUBSYS_31FE103C&REV_09\3
 &61AAA01&0&E8
 Standard Universal PCI to USB Host Controller
 PCI\VEN_8086&DEV_2689&SUBSYS_31FE103C&REV_09\3
 &61AAA01&0&E9
 Standard Universal PCI to USB Host Controller
 PCI\VEN_8086&DEV_268A&SUBSYS_31FE103C&REV_09\3
 &61AAA01&0&EA
 Standard Universal PCI to USB Host Controller
 PCI\VEN_8086&DEV_268B&SUBSYS_31FE103C&REV_09\3
 &61AAA01&0&EB
 Standard Enhanced PCI to USB Host Controller
 PCI\VEN_8086&DEV_268C&SUBSYS_31FE103C&REV_09\3
 &61AAA01&0&EF
 Standard Universal PCI to USB Host Controller
 PCI\VEN_103C&DEV_3300&SUBSYS_3305103C&REV_00\4
 &2014205D&0&24F0

[Software Environment]

[System Drivers]

Name	Description	File	Type	Started	Start
Mode	State	Status	Error Control	Accept	Pause
abiosdsk	Abiosdsk	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Ignore	No
acpi	Microsoft ACPI Driver	n:\windows\system32\drivers\acpi.sys	Kernel Driver	Yes	Yes
	Yes	Boot	Running	OK	Normal
acpiec	ACPIEC	n:\windows\system32\drivers\acpiec.sys	Kernel Driver	No	No
	No	Disabled	Stopped	OK	Normal
adpu160m	adpu160m	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No
adpu320	adpu320	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No
afd	AFD	n:\windows\system32\drivers\afd.sys	Kernel Driver	Yes	Yes
	Yes	System	Running	OK	Normal
aic78u2	aic78u2	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No

aic78xx	aic78xx Disabled	Not Available Stopped	OK	Kernel Driver Normal	No No	No No	dfsdriver System Driver	DfsDriver Yes	n:\windows\system32\drivers\dfs.sys	File Boot	Running OK	Normal	
aliide	AliIde Disabled	Not Available Stopped	OK	Kernel Driver Normal	No No	No No	disk	Disk Driver Kernel Driver Normal	n:\windows\system32\drivers\disk.sys	Yes Boot	Running OK	OK	
amdide	AmdIde Disabled	Not Available Stopped	OK	Kernel Driver Normal	No No	No No	dmboot Driver	dmboot No	n:\windows\system32\drivers\dmboot.sys	Disabled Stopped	OK Normal	Kernel No	
arc	arc Disabled	Not Available Stopped	OK	Kernel Driver Normal	No No	No No	dmio	Logical Disk Manager Driver n:\windows\system32\drivers\dmio.sys	Kernel Driver	Yes Boot	Running OK	Normal No	
asynmac	RAS Asynchronous Media Driver			n:\windows\system32\drivers\asynmac.sys	Kernel Driver	No No	dmload Driver	dmload Yes	n:\windows\system32\drivers\dmload.sys	Boot Running	OK Normal	Kernel No	
atapi	Standard IDE/ESDI Hard Disk Controller			n:\windows\system32\drivers\atapi.sys	Kernel Driver	Yes Yes	dpti2o	dpti2o Disabled	Not Available Stopped	OK	Kernel Driver Normal	No No	
atdisk	Atdisk Disabled	Not Available Stopped	OK	Kernel Driver Ignore	No No	No No	elxstor	elxstor Disabled	Not Available Stopped	OK	Kernel Driver Normal	No No	
atmarpc	ATM ARP Client Protocol			n:\windows\system32\drivers\atmarpc.sys	Kernel Driver	No No	fastfat System Driver	Fastfat No	n:\windows\system32\drivers\fastfat.sys	Disabled Stopped	OK	File Normal	
audstub	Audio Stub Driver Kernel Driver	Normal	No	Yes	Manual	Running	OK	n:\windows\system32\drivers\audstub.sys	Kernel Driver	Yes	Manual	Running	OK
b06bdrv	HP Virtual Bus Device			n:\windows\system32\drivers\bxvbda.sys	Kernel Driver	Yes Yes	flpydisk Driver	Flpydisk No	n:\windows\system32\drivers\flpydisk.sys	System Stopped	OK	Kernel Ignore	
beep Driver	Beep Yes	n:\windows\system32\drivers\beep.sys	Kernel	System	Running	OK	Normal	No	ftmgr System Driver	FltMgr Yes	Boot	Running	OK
cdac15ba	CdaC15BA Kernel Driver	Normal	No	Yes	Auto	Running	OK	n:\windows\system32\drivers\cdac15ba.sys	Kernel Driver	Yes	Auto	Running	OK
cdad10ba	CdaD10BA Kernel Driver	Normal	No	Yes	Auto	Running	OK	n:\windows\system32\drivers\cdad10ba.sys	Kernel Driver	Yes	Auto	Running	OK
cdfs System Driver	Cdfs No	n:\windows\system32\drivers\cdfs.sys	File	Yes	Disabled	Running	OK	Normal	ftdisk	Volume Manager Driver n:\windows\system32\drivers\ftdisk.sys	Kernel Driver	Yes Boot	Running OK
cdrom	CD-ROM Driver Kernel Driver	Normal	No	Yes	System	Running	OK	n:\windows\system32\drivers\cdrom.sys	Kernel Driver	Yes	Manual	Running	OK
changer	Changer System	Not Available Stopped	OK	Kernel Driver	Ignore	No	No	gpc	Generic Packet Classifier n:\windows\system32\drivers\msgpc.sys	Kernel Driver	Yes	Manual	Running
clusdisk	Cluster Disk Driver Kernel Driver	Normal	No	No	Disabled	Stopped	OK	n:\windows\system32\drivers\clusdisk.sys	Kernel Driver	Yes	Manual	Running	OK
cmdide	CmdIde Disabled	Not Available Stopped	OK	Kernel Driver	Normal	No	No	hidusb	Microsoft HID Class Driver n:\windows\system32\drivers\hidusb.sys	Kernel Driver	Yes	Manual	Running
cpqciism	cpqciism Disabled	Not Available Stopped	OK	Kernel Driver	Normal	No	No	hpciss Driver	hpciss Yes	n:\windows\system32\drivers\hpciss.sys	Boot	Running	OK
cpqteam	HP Network Configuration Utility			n:\windows\system32\drivers\cpqteam.sys	Kernel Driver	No No	hpciss2 Driver	HpCISSs2 Yes	n:\windows\system32\drivers\hpciss2.sys	Boot	Running	OK	
crdisk	CRC Disk Filter Driver n:\windows\system32\drivers\crdisk.sys	Kernel Driver	Yes	Boot	Running	OK	Normal	No	hpqcissb	Smart Array Controllers Non-Miniport Bus Driver n:\windows\system32\drivers\hpqcissb.sys	Kernel Driver	Yes	Boot
								hpqcissd	Smart Array Controllers Non-Miniport Disk Driver n:\windows\system32\drivers\hpqcissd.sys	Kernel Driver	Yes	Boot	Running
								http Driver	HTTP No	n:\windows\system32\drivers\http.sys	Kernel	Manual	Stopped
								i2omgmt	i2omgmt System	Not Available Stopped	OK	Kernel Driver Normal	No No

i8042prt	i8042 Keyboard and PS/2 Mouse Port Driver n:\windows\system32\drivers\i8042prt.sys	Kernel Driver Yes System Running OK	Normal No	No
iirsp	iirsp Not Available Disabled Stopped OK	Kernel Driver Normal No	No	No
imapi	CD-Burning Filter Driver n:\windows\system32\drivers\imapi.sys	Kernel Driver No System Stopped OK	Normal No	No
intelide	IntelIde Not Available Disabled Stopped OK	Kernel Driver Normal No	No	No
intelppm	Intel Processor Driver n:\windows\system32\drivers\intelppm.sys	Kernel Driver Yes Manual Running OK	Normal No Yes	
ip6fw	IPv6 Windows Firewall Driver n:\windows\system32\drivers\ip6fw.sys	Kernel Driver No Manual Stopped OK	Normal No	
ipfilterdriver	IP Traffic Filter Driver n:\windows\system32\drivers\ipfltdrv.sys	Kernel Driver No Manual Stopped OK	Normal No	
ipinip	IP in IP Tunnel Driver n:\windows\system32\drivers\ipinip.sys	Kernel Driver No Manual Stopped OK	Normal No No	
ipnat	IP Network Address Translator n:\windows\system32\drivers\ipnat.sys	Kernel Driver No Manual Stopped OK	Normal No	
ipsec	IPSEC driver n:\windows\system32\drivers\ipsec.sys	Kernel Driver Yes System Running OK	Normal No Yes	
irenum	IR Enumerator Service n:\windows\system32\drivers\irenum.sys	Kernel Driver No Manual Stopped OK	Normal No	
isapnp	PnP ISA/EISA Bus Driver n:\windows\system32\drivers\isapnp.sys	Kernel Driver Yes Boot Running OK	Critical No	
kbdclass	Keyboard Class Driver n:\windows\system32\drivers\kbdclass.sys	Kernel Driver Yes System Running OK	Normal No	
kbdhid	Keyboard HID Driver n:\windows\system32\drivers\kbdhid.sys	Kernel Driver Yes System Running OK	Ignore No Yes	
ksecdd Driver	KSecDD n:\windows\system32\drivers\ksecdd.sys	Kernel Driver Yes Boot Running OK	Normal No	
ksthunk	Kernel Streaming WOW64 Thunk Service n:\windows\system32\drivers\ksthunk.sys	Kernel Driver Yes Manual Running OK	Normal No	
l2nd	HP NC370 Multifunction Gigabit Server Adapter n:\windows\system32\drivers\bxnd52a.sys	Kernel Driver Yes Manual Running OK	Normal No	
lp6nds35	lp6nds35 Not Available Disabled Stopped OK	Kernel Driver Normal No	No	No
mmdd Driver	mmdd n:\windows\system32\drivers\mmdd.sys	Kernel Driver Yes System Running OK	Ignore No	
modem Driver	Modem n:\windows\system32\drivers\modem.sys	Kernel Driver No Manual Stopped OK	Ignore No	
mouclass	Mouse Class Driver n:\windows\system32\drivers\mouclass.sys	Kernel Driver Yes System Running OK	Normal No Yes	
mouhid	Mouse HID Driver n:\windows\system32\drivers\mouhid.sys	Kernel Driver Yes Manual Running OK	Ignore No Yes	
mountmgr	Mount Point Manager n:\windows\system32\drivers\mountmgr.sys	Kernel Driver Yes Boot Running OK	Normal No	
mrraid35x	mrraid35x Not Available Disabled Stopped OK	Kernel Driver Normal No	No	No
mrxdav	WebDav Client Redirector n:\windows\system32\drivers\mrxdav.sys	File System Driver No Manual Stopped OK	Normal No	
mrxsmb	MRXSMB n:\windows\system32\drivers\mrxsmb.sys	File System Driver Yes System Running OK	Normal	
msfs	Msfs n:\windows\system32\drivers\msfs.sys	File System Driver Yes System Running OK	Normal	
mssmbios	Microsoft System Management BIOS Driver n:\windows\system32\drivers\mssmbios.sys	Kernel Driver Yes Manual Running OK	Normal No	
mup	Mup n:\windows\system32\drivers\mup.sys	File System Driver Yes Boot Running OK	Normal	
ndis	NDIS System Driver n:\windows\system32\drivers\ndis.sys	Kernel Driver Yes Boot Running OK	Normal No Yes	
ndistapi	Remote Access NDIS TAPI Driver n:\windows\system32\drivers\ndistapi.sys	Kernel Driver Yes Manual Running OK	Normal No	
ndisuio	NDIS Usermode I/O Protocol n:\windows\system32\drivers\ndisuio.sys	Kernel Driver Yes Manual Running OK	Normal No	
ndiswan	Remote Access NDIS WAN Driver n:\windows\system32\drivers\ndiswan.sys	Kernel Driver Yes Manual Running OK	Normal No	
ndproxy	NDIS Proxy n:\windows\system32\drivers\ndproxy.sys	Kernel Driver Yes Manual Running OK	Normal No Yes	
netbios	NetBIOS Interface n:\windows\system32\drivers\netbios.sys	File System Driver Yes System Running OK	Normal No Yes	
netbt	NetBios over Tcpip n:\windows\system32\drivers\netbt.sys	Kernel Driver Yes System Running OK	Normal No Yes	
nfrd960	nfrd960 Not Available Disabled Stopped OK	Kernel Driver Normal No	No	No
npfs	Npfs n:\windows\system32\drivers\npfs.sys	File System Driver Yes System Running OK	Normal	
ntfs	Ntfs n:\windows\system32\drivers\ntfs.sys	File System Driver Yes Disabled Running OK	Normal	
null Driver	Null n:\windows\system32\drivers\null.sys	Kernel Driver Yes System Running OK	Normal No	
parport Driver	Parport n:\windows\system32\drivers\parport.sys	Kernel Driver No Manual Stopped OK	Ignore No	

partmgr	Partition Manager	n:\windows\system32\drivers\partmgr.sys	Kernel Driver	Yes	Boot	Running	OK		
	Normal	No	Yes						
pci	PCI Bus Driver	n:\windows\system32\drivers\pci.sys	Kernel Driver	Yes	Boot	Running	OK		
	Critical	No	Yes						
pciide	PCIIDE	n:\windows\system32\drivers\pciide.sys	Kernel Driver	Yes	Boot	Running	OK	Normal	No
	Yes								
pcmcia	Pcmcia	n:\windows\system32\drivers\pcmcia.sys	Kernel Driver	No	Disabled	Stopped	OK	Normal	No
	No								
pcycle	pcycle	\\?\n:\psuite\pcycle.sys	Kernel Driver	No	Manual	Stopped	OK	Normal	No
	No								
pdcomp	PDCOMP	Not Available	Kernel Driver	No				No	
	Manual	Stopped	OK	Ignore	No			No	
pdframe	PDFRAME	Not Available	Kernel Driver	No	Manual	Stopped	OK	Ignore	No
	No								
pdreli	PDRELI	Not Available	Kernel Driver	No				No	
	Manual	Stopped	OK	Ignore	No			No	
pdframe	PDRFRAME	Not Available	Kernel Driver	No	Manual	Stopped	OK	Ignore	No
	No								
pptpminiport	WAN Miniport (PPTP)	n:\windows\system32\drivers\rasppp.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
	Yes								
psuite_64	psuite_64	\\?\n:\psuite\psuite_64.sys	Kernel Driver	No	Manual	Stopped	OK	Normal	No
	No								
ptilink	Direct Parallel Link Driver	n:\windows\system32\drivers\ptilink.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
	Yes								
ql2300	ql2300	Not Available	Kernel Driver	No	Disabled	Stopped	OK	Normal	No
	Disabled								
rasacd	Remote Access Auto Connection Driver	n:\windows\system32\drivers\rasacd.sys	Kernel Driver	Yes	System	Running	OK	Normal	No
	Yes								
rasl2tp	WAN Miniport (L2TP)	n:\windows\system32\drivers\rasl2tp.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
	Yes								
rasppoe	Remote Access PPPOE Driver	n:\windows\system32\drivers\rasppoe.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
	Yes								
raspti	Direct Parallel	n:\windows\system32\drivers\raspti.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
	Normal	No	Yes						
rdbss	Rdbss	n:\windows\system32\drivers\rdbss.sys	File System Driver	Yes	System	Running	OK	Normal	No
	No	Yes							
rdpcdd	RDPCDD	n:\windows\system32\drivers\rdpcdd.sys	Kernel Driver	Yes	System	Running	OK	Ignore	No
	Yes								
rdpdr	Terminal Server Device Redirector Driver	n:\windows\system32\drivers\rdpdr.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
	Yes								
rdpwd	RDPWD	n:\windows\system32\drivers\rdpwd.sys	Kernel Driver	Yes	Manual	Running	OK	Ignore	No
	Yes								
redbook	Digital CD Audio Playback Filter Driver	n:\windows\system32\drivers\redbook.sys	Kernel Driver	Yes	System	Running	OK	Normal	No
	Yes								
secdrv	Security Driver	n:\windows\system32\drivers\secdrv.sys	Kernel Driver	Yes	Auto	Running	OK	Normal	No
	Normal	No	Yes						
serenum	Serenum Filter Driver	n:\windows\system32\drivers\serenum.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
	Normal	No	Yes						
serial	Serial port driver	n:\windows\system32\drivers\serial.sys	Kernel Driver	Yes	System	Running	OK	Ignore	No
	Ignore	No	Yes						
sfloppy	Sfloppy	n:\windows\system32\drivers\sfloppy.sys	Kernel Driver	No	System	Stopped	OK	Ignore	No
	No								
simbad	Simbad	Not Available	Kernel Driver	No	Disabled	Stopped	OK	Normal	No
	Disabled								
srv	Srv	n:\windows\system32\drivers\srv.sys	File System Driver	Yes	Manual	Running	OK	Normal	No
	No	Yes							
startdss	HP ProLiant Virtual Install Disk Support Driver	n:\windows\system32\drivers\startdss.sys	Kernel Driver	No	Disabled	Stopped	OK	Normal	No
	No								
swenum	Software Bus Driver	n:\windows\system32\drivers\swenum.sys	Kernel Driver	Normal	No	Yes	Manual	Running	OK
	Normal	No	Yes						
symc8xx	symc8xx	Not Available	Kernel Driver	Disabled	Stopped	OK	Normal	No	No
	Disabled								
symmpi	symmpi	n:\windows\system32\drivers\symmpi.sys	Kernel Driver	Yes	Boot	Running	OK	Normal	No
	Yes								
sym_hi	sym_hi	Not Available	Kernel Driver	Disabled	Stopped	OK	Normal	No	No
	Disabled								
sym_u3	sym_u3	Not Available	Kernel Driver	Disabled	Stopped	OK	Normal	No	No
	Disabled								
tcpip	TCP/IP Protocol Driver	n:\windows\system32\drivers\tcpip.sys	Kernel Driver	Yes	System	Running	OK	Normal	No
	Yes								
tdpipe	TDPIPE	n:\windows\system32\drivers\tdpipe.sys	Kernel Driver	No	Manual	Stopped	OK	Ignore	No
	No								
tdtcp	TDTCP	n:\windows\system32\drivers\tdtcp.sys	Kernel Driver	Yes	Manual	Running	OK	Ignore	No
	Yes								
termdd	Terminal Device Driver	n:\windows\system32\drivers\termdd.sys	Kernel Driver	Yes	System	Running	OK	Normal	No
	Yes								
toside	TosIde	Not Available	Kernel Driver	Disabled	Stopped	OK	Normal	No	No
	Disabled								
udfs	Udfs	n:\windows\system32\drivers\udfs.sys	File System Driver	No	Disabled	Stopped	OK	Normal	No
	No	No							
ultra	ultra	Not Available	Kernel Driver	Disabled	Stopped	OK	Normal	No	No
	Disabled								
update	Microcode Update Driver	n:\windows\system32\drivers\update.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
	Yes								
usbccgp	Microsoft USB Generic Parent Driver	n:\windows\system32\drivers\usbccgp.sys	Kernel Driver						

	Yes	Manual	Running	OK	Normal	No
usbhci	Microsoft USB 2.0 Enhanced Host Controller Miniport Driver	n:\windows\system32\drivers\usbhci.sys	Kernel Driver	Yes	Manual	Running
	Yes	Manual	Running	OK	Normal	No
usbhub	Microsoft USB Standard Hub Driver	n:\windows\system32\drivers\usbhub.sys	Kernel Driver	Yes	Manual	Running
	Yes	Manual	Running	OK	Normal	No
usbstor	USB Mass Storage Driver	n:\windows\system32\drivers\usbstor.sys	Kernel Driver	No	Manual	Stopped
	No	Manual	Stopped	OK	Normal	No
usbuhci	Microsoft USB Universal Host Controller Miniport Driver	n:\windows\system32\drivers\usbuhci.sys	Kernel Driver	Yes	Manual	Running
	Yes	Manual	Running	OK	Normal	No
vga	vga	n:\windows\system32\drivers\vgapnp.sys	Kernel Driver	Yes	Manual	Running
Driver	Yes	Manual	Running	OK	Ignore	No
vgasave	VGA Display Controller.	n:\windows\system32\drivers\vga.sys	Kernel Driver	No	System	Stopped
	No	System	Stopped	OK	Ignore	No
viaide	ViaIde	Not Available	Kernel Driver	Disabled	Stopped	OK
	Disabled	Stopped	OK	Normal	No	No
volsnap	Storage volumes	n:\windows\system32\drivers\volsnap.sys	Kernel Driver	Normal	No	Yes
	Kernel Driver	Yes	Boot	Running	OK	
wanarp	Remote Access IP ARP Driver	n:\windows\system32\drivers\wanarp.sys	Kernel Driver	Yes	Manual	Running
	Yes	Manual	Running	OK	Normal	No
wdica	WDICA	Not Available	Kernel Driver	Manual	Stopped	OK
	Manual	Stopped	OK	Ignore	No	No
wlbs	Network Load Balancing	n:\windows\system32\drivers\wlbs.sys	Kernel Driver	No	Manual	Stopped
	No	Manual	Stopped	OK	Normal	No

[Signed Drivers]

Device Name	Signed	Device Class	Driver Version
Name	Device ID	Manufacturer	INF Name Driver
Communications Port	Yes	PORTS	5.2.3790.1830
Available	10/1/2002 (Standard port types)	mports.inf	Not Available
Microsoft System Management BIOS Driver	Yes	SYSTEM	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	machine.inf	Not Available
Microcode Update Device	Yes	SYSTEM	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	machine.inf	Not Available
Plug and Play Software Device Enumerator	Yes	SYSTEM	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	machine.inf	Not Available
Terminal Server Mouse Driver	Yes	SYSTEM	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	machine.inf	Not Available
Terminal Server Keyboard Driver	Yes	SYSTEM	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	machine.inf	Not Available

Terminal Server Device Redirector	Yes	SYSTEM	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	machine.inf	Not Available
Direct Parallel	Yes	NET	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	netrasa.inf	Not Available
WAN Miniport (PPTP)	Yes	NET	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	netrasa.inf	Not Available
WAN Miniport (PPPOE)	Yes	NET	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	netrasa.inf	Not Available
WAN Miniport (IP)	Yes	NET	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	netrasa.inf	Not Available
WAN Miniport (L2TP)	Yes	NET	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	netrasa.inf	Not Available
Video Codecs	Yes	MEDIA	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	wave.inf	Not Available
Legacy Video Capture Devices	Yes	MEDIA	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	wave.inf	Not Available
Media Control Devices	Yes	MEDIA	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	wave.inf	Not Available
Legacy Audio Drivers	Yes	MEDIA	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	wave.inf	Not Available
Audio Codecs	Yes	MEDIA	5.2.3790.1830
Available	10/1/2002 (Standard system devices)	wave.inf	Not Available
Remote Access IP ARP Driver	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	LEGACYDRIVER	Not Available
volsnap	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	LEGACYDRIVER	Not Available
TDTCP	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	LEGACYDRIVER	Not Available
TCP/IP Protocol Driver	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	LEGACYDRIVER	Not Available
symmpi	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	LEGACYDRIVER	Not Available
HP ProLiant Virtual Install Disk Support Driver	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	LEGACYDRIVER	Not Available
Security Driver	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	LEGACYDRIVER	Not Available
RDPWD	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	LEGACYDRIVER	Not Available
RDPCCDD	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	LEGACYDRIVER	Not Available
Remote Access Auto Connection Driver	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	LEGACYDRIVER	Not Available

	Not Available	Not Available	Not Available
	ROOT\LEGACY_RASACD\0000		
psuite_64	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_PSUITE_64\0000		
Partition Manager	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	Not Available	Not Available
	ROOT\LEGACY_PARTMGR\0000		
Null	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_NULL\0000		
NetBios over Tcpi	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	Not Available	Not Available
	ROOT\LEGACY_NETBT\0000		
NDProxy	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_NDPROXY\0000		
NDIS Usermode I/O Protocol	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_NDISUIO\0000		
Remote Access NDIS TAPI Driver	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_NDISTAPI\0000		
NDIS System Driver	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	Not Available	Not Available
	ROOT\LEGACY_NDIS\0000		
mountmgr	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_MOUNTMGR\0000		
mmdd	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_MNMDD\0000		
ksecdd	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_KSECDD\0000		
IPSEC driver	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	Not Available	Not Available
	ROOT\LEGACY_IPSEC\0000		
IP Network Address Translator	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_IPNAT\0000		
Smart Array Controllers Non-Miniport Disk Driver	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_HPQCISSD\0000		
Smart Array Controllers Non-Miniport Bus Driver	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_HPQCISSB\0000		
hpciss	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_HPCISS\0000		
Generic Packet Classifier	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_GPC\0000		
Fips	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_FIPS\0000		

dmload	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_DMLOAD\0000		
dmboot	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_DMBOOT\0000		
CRC Disk Filter Driver	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_CRCDISK\0000		
CdaD10BA	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	Not Available	Not Available
	ROOT\LEGACY_CDAD10BA\0000		
CdaC15BA	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	Not Available	Not Available
	ROOT\LEGACY_CDAC15BA\0000		
Beep	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_BEEP\0000		
AFD	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	ROOT\LEGACY_AFD\0000		
Generic volume	Yes	VOLUME 5.2.3790.1830	
	10/1/2002 Microsoft	volume.inf	Not Available
	STORAGE\VOLUME\1&30A96598&0&SIGNATURE6227039		
	OFFSET20000LENGTH1869F00000		
Generic volume	Yes	VOLUME 5.2.3790.1830	
	10/1/2002 Microsoft	volume.inf	Not Available
	STORAGE\VOLUME\1&30A96598&0&SIGNATURE622703D		
	OFFSET10000LENGTH1EE00000		
Generic volume	Yes	VOLUME 5.2.3790.1830	
	10/1/2002 Microsoft	volume.inf	Not Available
	STORAGE\VOLUME\1&30A96598&0&SIGNATURE622703A		
	OFFSET20000LENGTH4E1D00000		
Generic volume	Yes	VOLUME 5.2.3790.1830	
	10/1/2002 Microsoft	volume.inf	Not Available
	STORAGE\VOLUME\1&30A96598&0&SIGNATURE622703B		
	OFFSET20000LENGTH34F00000		
Generic volume	Yes	VOLUME 5.2.3790.1830	
	10/1/2002 Microsoft	volume.inf	Not Available
	STORAGE\VOLUME\1&30A96598&0&SIGNATURECA7AC		
	A7AOFFSET4000LENGTH88B2C0000		
Generic volume	Yes	VOLUME 5.2.3790.1830	
	10/1/2002 Microsoft	volume.inf	Not Available
	STORAGE\VOLUME\1&30A96598&0&SIGNATURE5777D9		
	A9OFFSET4000LENGTH168EDA4000		
Generic volume	Yes	VOLUME 5.2.3790.1830	
	10/1/2002 Microsoft	volume.inf	Not Available
	STORAGE\VOLUME\1&30A96598&0&SIGNATURE6227037		
	OFFSET10000LENGTH7C800000		
Generic volume	Yes	VOLUME 5.2.3790.1830	
	10/1/2002 Microsoft	volume.inf	Not Available
	STORAGE\VOLUME\1&30A96598&0&SIGNATURE6227034		
	OFFSET20000LENGTH271000000		
Generic volume	Yes	VOLUME 5.2.3790.1830	
	10/1/2002 Microsoft	volume.inf	Not Available
	STORAGE\VOLUME\1&30A96598&0&SIGNATURE6227032		
	OFFSET20000LENGTHC34F00000		
Generic volume	Yes	VOLUME 5.2.3790.1830	
	10/1/2002 Microsoft	volume.inf	Not Available
	STORAGE\VOLUME\1&30A96598&0&SIGNATURE6227033		
	OFFSET20000LENGTH1869F00000		
Volume Manager	Yes	SYSTEM 5.2.3790.1830	
	10/1/2002 (Standard system devices)	machine.inf	
	Not Available	ROOT\FTDISK\0000	

Logical Disk Manager	Yes	SYSTEM	5.2.3790.1830						PCI\VEN_103C&DEV_3302&SUBSYS_3305103C&REV_00\4
	10/1/2002 (Standard system devices)	machine.inf							&2014205D&0&26F0
	Not Available	ROOT\DMIO\0000							
ACPI Fixed Feature Button	Yes	SYSTEM	5.2.3790.1830						Generic USB Hub Yes USB 5.2.3790.1830
	10/1/2002 (Standard system devices)	machine.inf							10/1/2002 (Generic USB Hub) usb.inf Not Available
	Not Available	ACPI\FIXEDBUTTON\2&DABA3FF&0							USB\VID_03F0&PID_1327\6&18FFBC52&0&2
ACPI Thermal Zone	Yes	SYSTEM	5.2.3790.1830						HID-compliant mouse Yes MOUSE 5.2.3790.1830
	10/1/2002 (Standard system devices)	machine.inf							10/1/2002 Microsoft msmouse.inf Not Available
	Not Available	ACPI\THERMALZONE\THM0							HID\VID_03F0&PID_1027&MI_01\8&25B103E6&0&0000
Secondary IDE Channel	Yes	HDC	5.2.3790.1830						USB Human Interface Device Yes HIDCLASS
	10/1/2002 (Standard IDE ATA/ATAPI controllers)	mshdc.inf							5.2.3790.1830 10/1/2002 (Standard system devices)
	Not Available	PCI\IDE\IDECHANNEL\4&56E2F28&0&1							input.inf Not Available
CD-ROM Drive	Yes	CDROM	5.2.3790.1830						USB\VID_03F0&PID_1027&MI_01\7&2CD6FDA9&0&0001
	10/1/2002 (Standard CD-ROM drives)	cdrom.inf							
Available	IDE\CDROMTSSTCORP_CD-ROM_TS-H192C_____B504____\5&5FD9AC6&0&0.0.0								HID Keyboard Device Yes KEYBOARD
Primary IDE Channel	Yes	HDC	5.2.3790.1830						5.2.3790.1830 10/1/2002 (Standard keyboards)
	10/1/2002 (Standard IDE ATA/ATAPI controllers)	mshdc.inf							keyboard.inf Not Available
	Not Available	PCI\IDE\IDECHANNEL\4&56E2F28&0&0							HID\VID_03F0&PID_1027&MI_00\8&DED77A1&0&0000
Standard Dual Channel PCI IDE Controller	Yes	HDC	5.2.3790.1830						USB Human Interface Device Yes HIDCLASS
	10/1/2002 (Standard IDE ATA/ATAPI controllers)	mshdc.inf							5.2.3790.1830 10/1/2002 (Standard system devices)
	Not Available	PCI\VEN_8086&DEV_269E&SUBSYS_31FE103C&REV_09\3&61AAA01&0&F9							input.inf Not Available
Communications Port	Yes	PORTS	5.2.3790.1830						USB\VID_03F0&PID_1027&MI_00\7&2CD6FDA9&0&0000
	10/1/2002 (Standard port types)	msports.inf							
	Not Available	ACPI\PNP0501\0							USB Composite Device Yes USB 5.2.3790.1830
Extended IO Bus	Yes	SYSTEM	5.2.3790.1830						10/1/2002 (Standard USB Host Controller) usb.inf Not Available
	10/1/2002 (Standard system devices)	machine.inf							USB\VID_03F0&PID_1027\6&18FFBC52&0&1
	Not Available	ACPI\PNP0A06\4&2AA4AD3D&0							USB Root Hub Yes USB 5.2.3790.1830
PS/2 Compatible Mouse	Yes	MOUSE	5.2.3790.1830						10/1/2002 (Standard USB Host Controller) usbport.inf Not Available
	10/1/2002 Microsoft msmouse.inf								Available USB\ROOT_HUB\5&26BC3420&0
	Not Available	ACPI\PNP0F13\4&2AA4AD3D&0							Standard Universal PCI to USB Host Controller Yes USB
Standard 101/102-Key or Microsoft Natural PS/2 Keyboard	Yes	KEYBOARD	5.2.3790.1830						5.2.3790.1830 10/1/2002 (Standard USB Host Controller)
	10/1/2002 (Standard keyboards)	keyboard.inf							usbport.inf Not Available
	Not Available	ACPI\PNP0303\4&2AA4AD3D&0							PCI\VEN_103C&DEV_3300&SUBSYS_3305103C&REV_00\4
System speaker	Yes	SYSTEM	5.2.3790.1830						&2014205D&0&24F0
	10/1/2002 (Standard system devices)	machine.inf							Base System Device Not Available UNKNOWN Not Available
	Not Available	ACPI\PNP0800\4&2AA4AD3D&0							Available Not Available Not Available Not Available
Direct memory access controller	Yes	SYSTEM	5.2.3790.1830						Not Available
	10/1/2002 (Standard system devices)	machine.inf							PCI\VEN_0E11&DEV_B204&SUBSYS_3305103C&REV_03\4
	Not Available	ACPI\PNP0200\4&2AA4AD3D&0							&2014205D&0&22F0
High precision event timer	Yes	SYSTEM	5.2.3790.3959						Base System Device Not Available UNKNOWN Not Available
	10/1/2002 (Standard system devices)	machine.inf							Available Not Available Not Available Not Available
	Not Available	ACPI\PNP0103\0							Not Available
System timer	Yes	SYSTEM	5.2.3790.1830						PCI\VEN_0E11&DEV_B203&SUBSYS_3305103C&REV_03\4
	10/1/2002 (Standard system devices)	machine.inf							&2014205D&0&20F0
	Not Available	ACPI\PNP0100\4&2AA4AD3D&0							Default Monitor Yes MONITOR 5.2.3790.1830
Not Available	Not Available	Not Available	Not Available	Not Available					10/1/2002 (Standard monitor types) monitor.inf
Available	Not Available	Not Available	Not Available	Not Available					Not Available
Not Available	Not Available	ACPI\PI0001\0							DISPLAY\DEFAULT_MONITOR\5&E64F3B&0&12345678&0
Motherboard resources	Yes	SYSTEM	5.2.3790.1830						1&03
	10/1/2002 (Standard system devices)	machine.inf							Standard VGA Graphics Adapter Yes DISPLAY 5.2.3790.1830
	Not Available	ACPI\PNP0C02\0							10/1/2002 (Standard display types) display.inf Not Available
PCI standard ISA bridge	Yes	SYSTEM	5.2.3790.1830						
	10/1/2002 (Standard system devices)	machine.inf							Available
	Not Available	PCI\VEN_8086&DEV_2670&SUBSYS_00000000&REV_09\3&61AAA01&0&F8							PCI\VEN_1002&DEV_515E&SUBSYS_31FB103C&REV_02\4
	Not Available	UNKNOWN	Not Available	Not Available					&2014205D&0&18F0
PCI Device	Not Available	UNKNOWN	Not Available	Not Available					Intel(R) 82801 PCI Bridge - 244E Yes SYSTEM
	Not Available	Not Available	Not Available	Not Available					5.2.3790.3959 10/1/2002 Intel machine.inf
	Not Available	ACPI\IP0001\0							Not Available
	Not Available	ACPI\IP0001\0							PCI\VEN_8086&DEV_244E&SUBSYS_00000000&REV_D9\3
	Not Available	ACPI\PNP0C02\0							&61AAA01&0&F0
	Not Available	ACPI\PNP0C02\0							USB Root Hub Yes USB 5.2.3790.1830
	Not Available	ACPI\PNP0C02\0							10/1/2002 (Standard USB Host Controller) usbport.inf Not Available
	Not Available	ACPI\PNP0C02\0							Available USB\ROOT_HUB20\4&392538C3&0
	Not Available	ACPI\PNP0C02\0							Standard Enhanced PCI to USB Host Controller Yes USB
	Not Available	ACPI\PNP0C02\0							5.2.3790.1830 10/1/2002 (Standard USB Host Controller)
	Not Available	ACPI\PNP0C02\0							usbport.inf Not Available
	Not Available	ACPI\PNP0C02\0							PCI\VEN_8086&DEV_268C&SUBSYS_31FE103C&REV_09\3
	Not Available	ACPI\PNP0C02\0							&61AAA01&0&EF

USB Root Hub	Yes	USB	5.2.3790.1830							PCI\VEN_8086&DEV_2690&SUBSYS_00000000&REV_09\3										
10/1/2002 (Standard USB Host Controller)		usbport.inf	Not Available							&61AAA01&0&E0										
Available		USB\ROOT_HUB\4&41C0314&0								PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830							
Standard Universal PCI to USB Host Controller	Yes	USB	5.2.3790.1830	10/1/2002 (Standard USB Host Controller)						10/1/2002 (Standard system devices)		machine.inf								
usbport.inf	Not Available									Not Available										
PCI\VEN_8086&DEV_268B&SUBSYS_31FE103C&REV_09\3										PCI\VEN_8086&DEV_25F6&SUBSYS_00000000&REV_B1\3										
&61AAA01&0&EB										&61AAA01&0&B0										
USB Root Hub	Yes	USB	5.2.3790.1830							PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830							
10/1/2002 (Standard USB Host Controller)		usbport.inf	Not Available							10/1/2002 (Standard system devices)		machine.inf								
Available		USB\ROOT_HUB\4&A54F890&0								Not Available										
Standard Universal PCI to USB Host Controller	Yes	USB	5.2.3790.1830	10/1/2002 (Standard USB Host Controller)						PCI\VEN_8086&DEV_25F5&SUBSYS_00000000&REV_B1\3										
usbport.inf	Not Available									PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830							
PCI\VEN_8086&DEV_268A&SUBSYS_31FE103C&REV_09\3										10/1/2002 (Standard system devices)		machine.inf								
&61AAA01&0&EA										Not Available										
USB Root Hub	Yes	USB	5.2.3790.1830							PCI\VEN_8086&DEV_25F3&SUBSYS_00000000&REV_B1\3										
10/1/2002 (Standard USB Host Controller)		usbport.inf	Not Available							&61AAA01&0&98										
Available		USB\ROOT_HUB\4&37897620&0								PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830							
Standard Universal PCI to USB Host Controller	Yes	USB	5.2.3790.1830	10/1/2002 (Standard USB Host Controller)						10/1/2002 (Standard system devices)		machine.inf								
usbport.inf	Not Available									Not Available										
PCI\VEN_8086&DEV_2689&SUBSYS_31FE103C&REV_09\3										PCI\VEN_8086&DEV_25F1&SUBSYS_00000000&REV_B1\3										
&61AAA01&0&E9										&61AAA01&0&88										
USB Root Hub	Yes	USB	5.2.3790.1830							PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830							
10/1/2002 (Standard USB Host Controller)		usbport.inf	Not Available							10/1/2002 (Standard system devices)		machine.inf								
Available		USB\ROOT_HUB\4&7353027&0								Not Available										
Standard Universal PCI to USB Host Controller	Yes	USB	5.2.3790.1830	10/1/2002 (Standard USB Host Controller)						PCI\VEN_8086&DEV_25F0&SUBSYS_00000000&REV_B1\3										
usbport.inf	Not Available									&61AAA01&0&82										
PCI\VEN_8086&DEV_2688&SUBSYS_31FE103C&REV_09\3										PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830							
&61AAA01&0&E8										10/1/2002 (Standard system devices)		machine.inf								
HP NC373i Multifunction Gigabit Server Adapter	Yes	NET	2.8.13.0	6/30/2006 Hewlett-Packard Company						Not Available										
2.8.13.0	6/30/2006	Hewlett-Packard Company		oem2.inf						PCI\VEN_8086&DEV_25F0&SUBSYS_00000000&REV_B1\3										
Not Available										&61AAA01&0&81										
B06BDRV\L2ND&PCI_164C14E4&SUBSYS_7038103C&REV_12\6&154EFE07&0&20050500										PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830							
HP NC373i Virtual Bus Device	Yes	SYSTEM	2.8.15.0	7/12/2006 Hewlett-Packard Company						10/1/2002 (Standard system devices)		machine.inf								
7/12/2006	Hewlett-Packard Company			oem5.inf						Not Available										
Available										PCI\VEN_8086&DEV_25F0&SUBSYS_00000000&REV_B1\3										
PCI\VEN_14E4&DEV_164C&SUBSYS_7038103C&REV_12\5										&61AAA01&0&80										
&1F051E87&0&0000E1										PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830							
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830							10/1/2002 (Standard system devices)		machine.inf								
10/1/2002 (Standard system devices)										Not Available										
Not Available										PCI\VEN_1166&DEV_0103&SUBSYS_00000000&REV_C3\4										
PCI\VEN_1166&DEV_0103&SUBSYS_00000000&REV_C3\4										&110C88BD&0&00E1										
&110C88BD&0&00E1										PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830							
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830							10/1/2002 (Standard system devices)		machine.inf								
10/1/2002 (Standard system devices)										Not Available										
Not Available										PCI\VEN_8086&DEV_2692&SUBSYS_00000000&REV_09\3										
PCI\VEN_8086&DEV_2692&SUBSYS_00000000&REV_09\3										&61AAA01&0&E1										
&61AAA01&0&E1										HP NC373i Multifunction Gigabit Server Adapter	Yes	NET	2.8.13.0	6/30/2006 Hewlett-Packard Company						
HP NC373i Multifunction Gigabit Server Adapter	Yes	NET	2.8.13.0	6/30/2006 Hewlett-Packard Company						oem2.inf										
2.8.13.0	6/30/2006	Hewlett-Packard Company		oem2.inf						Not Available										
Not Available										B06BDRV\L2ND&PCI_164C14E4&SUBSYS_7038103C&REV_12\6&183F41DD&0&20050300										
B06BDRV\L2ND&PCI_164C14E4&SUBSYS_7038103C&REV_12\6&183F41DD&0&20050300										HP NC373i Virtual Bus Device	Yes	SYSTEM	2.8.15.0	7/12/2006 Hewlett-Packard Company						
HP NC373i Virtual Bus Device	Yes	SYSTEM	2.8.15.0	7/12/2006 Hewlett-Packard Company						oem5.inf										
7/12/2006	Hewlett-Packard Company			oem5.inf						Not Available										
Available										PCI\VEN_14E4&DEV_164C&SUBSYS_7038103C&REV_12\5										
PCI\VEN_14E4&DEV_164C&SUBSYS_7038103C&REV_12\5										&43097C6&0&0000E0										
&43097C6&0&0000E0										PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830							
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830							10/1/2002 (Standard system devices)		machine.inf								
10/1/2002 (Standard system devices)										Not Available										
Not Available										PCI\VEN_1166&DEV_0103&SUBSYS_00000000&REV_C3\4										
PCI\VEN_1166&DEV_0103&SUBSYS_00000000&REV_C3\4										&187919FE&0&00E0										
&187919FE&0&00E0										PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830							
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830							10/1/2002 (Standard system devices)		machine.inf								
10/1/2002 (Standard system devices)										Not Available										
Not Available																				

PCI\VEN_103C&DEV_3230&SUBSYS_3234103C&REV_01\4
&79C23&0&0030
PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_25E6&SUBSYS_00000000&REV_B1\3
&61AAA01&0&30
PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_25E5&SUBSYS_00000000&REV_B1\3
&61AAA01&0&28
Disk drive Yes DISKDRIVE 5.2.3790.1830
10/1/2002 (Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
10\5&33426247&0&000800
Disk drive Yes DISKDRIVE 5.2.3790.1830
10/1/2002 (Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
10\5&33426247&0&000700
Disk drive Yes DISKDRIVE 5.2.3790.1830
10/1/2002 (Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
10\5&33426247&0&000600
Disk drive Yes DISKDRIVE 5.2.3790.1830
10/1/2002 (Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
10\5&33426247&0&000500
Disk drive Yes DISKDRIVE 5.2.3790.1830
10/1/2002 (Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_HP&PROD_LOGICAL_VOLUME&REV_2.
10\5&33426247&0&000400
HP Virtual LUN Yes SYSTEM 5.2.3790.1830
10/1/2002 Compaq scsidev.inf Not Available
SCSI\OTHER&VEN_COMPAQ&PROD_SCSI_COMMUNICA
TE&REV_CIS2\5&33426247&0&000000
Smart Array P400 Controller Yes SCSIADAPTER 6.6.0.64
3/20/2007 Hewlett-Packard Company oem12.inf Not
Available
PCI\VEN_103C&DEV_3230&SUBSYS_3234103C&REV_01\4
&237315C2&0&0020
PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_25E4&SUBSYS_00000000&REV_B1\3
&61AAA01&0&20
PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_25E3&SUBSYS_00000000&REV_B1\3
&61AAA01&0&18
PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_350C&SUBSYS_00000000&REV_01\4
&641DA44&0&0310
PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_3518&SUBSYS_00000000&REV_01\5
&38BD847A&0&100010
PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_3514&SUBSYS_00000000&REV_01\5
&38BD847A&0&080010
PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available

PCI\VEN_8086&DEV_3510&SUBSYS_00000000&REV_01\5
&38BD847A&0&000010
PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_3500&SUBSYS_00000000&REV_01\4
&641DA44&0&0010
PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_25E2&SUBSYS_00000000&REV_B1\3
&61AAA01&0&10
PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_25D8&SUBSYS_00000000&REV_B1\3
&61AAA01&0&00
PCI bus Yes SYSTEM 5.2.3790.1830 10/1/2002 (Standard
system devices) machine.inf Not Available
ACPI\PNP0A03\2&DABA3FF&0
Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_6_MODEL_15\3
Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_6_MODEL_15\2
Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_6_MODEL_15\1
Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_6_MODEL_15\0
Microsoft ACPI-Compliant System Yes SYSTEM
5.2.3790.1830 10/1/2002 Microsoft acpi.inf Not
Available ACPI_HAL\PNP0C08\0
ACPI Multiprocessor x64-based PC Yes COMPUTER
5.2.3790.1830 10/1/2002 (Standard computers) hal.inf
Not Available Not Available ROOT\ACPI_HAL\0000
Not Available Not Available Not Available Not
Available Not Available Not Available Not Available
Not Available HTREE\ROOT\0
[Environment Variables]
Variable Value User Name
ComSpec %SystemRoot%\system32\cmd.exe <SYSTEM>
Path
%SystemRoot%\system32;%SystemRoot%;%SystemRoot%\Syst
em32\Wbem;N:\Program Files (x86)\Microsoft SQL
Server\80\Tools\Binn\;N:\Program Files\Microsoft SQL
Server\90\Tools\bin\;N:\Program Files (x86)\Microsoft SQL
Server\90\Tools\bin\;N:\Program Files (x86)\Microsoft SQL
Server\90\DTS\Binn\;N:\Program Files (x86)\Microsoft SQL
Server\90\Tools\Binn\;VSShell\Common7\IDE\;N:\Program Files\Microsoft
SQL Server\90\DTS\Binn\ <SYSTEM>
windir %SystemRoot% <SYSTEM>
FP_NO_HOST_CHECK NO <SYSTEM>
OS Windows_NT <SYSTEM>
PROCESSOR_ARCHITECTURE AMD64 <SYSTEM>
PROCESSOR_LEVEL 6 <SYSTEM>
PROCESSOR_IDENTIFIER EM64T Family 6 Model 15 Stepping 7,
GenuineIntel <SYSTEM>
PROCESSOR_REVISION 0f07 <SYSTEM>
NUMBER_OF_PROCESSORS 4 <SYSTEM>


```

ClusterLogN:\WINDOWS\Cluster\cluster.log      <SYSTEM>
PATHEXT
.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH
<SYSTEM>
TEMP %SystemRoot%\TEMP <SYSTEM>
TMP %SystemRoot%\TEMP <SYSTEM>
TEMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\SYSTEM
TMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\SYSTEM
TEMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\LOCAL SERVICE
TMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\LOCAL SERVICE
TEMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\NETWORK SERVICE
TMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\NETWORK SERVICE
TEMP %USERPROFILE%\Local Settings\Temp
ML370G5\Administrator
TMP %USERPROFILE%\Local Settings\Temp
ML370G5\Administrator

```

[Print Jobs]

Document	Size	Owner	Notify	Status	Time Submitted
Job ID	Priority	Parameters	Driver	Print Processor	Print Processor
Host	Print Queue	Data	Type	Name	

[Network Connections]

Local Name	Remote Name	Type	Status	User
Not Available	\\inforb\audit_fdr	Disk	Current Connection	
	ML370G5\dpol			

[Running Tasks]

Name	Path	Process ID	Priority	Min Working Set	Max Working Set
Working Set	Start Time	Version	Size	File Date	
system idle process	Not Available	Not Available	0	0	Not Available
system	Not Available	4	8	0	1380
smss.exe	Not Available	308	11	200	1380
csrss.exe	Not Available	356	13	Not Available	Not Available
winlogon.exe	n:\windows\system32\winlogon.exe	13	200	1380	7/23/2007 3:38 PM
KB (944,128 bytes)	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	3/27/2007 9:03 PM			922.00
services.exe	n:\windows\system32\services.exe	9	200	1380	7/23/2007 3:39 PM
KB (224,256 bytes)	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	3/25/2005 6:00 AM			219.00
lsass.exe	n:\windows\system32\lsass.exe	1380	7/23/2007 3:39 PM	5.2.3790.1830	200
(srv03_sp1_rtm.050324-1447)	14.00 KB (14,336 bytes)	3/25/2005 6:00 AM			
svchost.exe	n:\windows\system32\svchost.exe	8	200	1380	7/23/2007 3:39 PM
(25,600 bytes)	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	3/27/2007 9:03 PM			25.00 KB

svchost.exe	Not Available	680	8	Not Available	
Available	Not Available	7/23/2007 3:39 PM		Not Available	
svchost.exe	Not Available	752	8	Not Available	
Available	Not Available	7/23/2007 3:39 PM		Not Available	
svchost.exe	Not Available	792	8	Not Available	
Available	Not Available	7/23/2007 3:39 PM		Not Available	
svchost.exe	n:\windows\system32\svchost.exe	8	200	1380	7/23/2007 3:39 PM
(25,600 bytes)	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	3/27/2007 9:03 PM			25.00 KB
spoolsv.exe	n:\windows\system32\spoolsv.exe	8	200	1380	7/23/2007 3:39 PM
(110,080 bytes)	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	3/27/2007 9:03 PM			107.50 KB
msdtc.exe	Not Available	988	8	Not Available	
svchost.exe	n:\windows\system32\svchost.exe	8	200	1380	7/23/2007 3:39 PM
(25,600 bytes)	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	3/27/2007 9:03 PM			25.00 KB
svchost.exe	Not Available	1140	8	Not Available	
Available	Not Available	7/23/2007 3:39 PM		Not Available	
sqlwriter.exe	n:\program files\microsoft sql server\90\shared\sqlwriter.exe	1160	8	200	1380
(156,016 bytes)	7/23/2007 3:39 PM	2005.090.3042.00			152.36 KB
svchost.exe	n:\windows\system32\svchost.exe	8	200	1380	7/23/2007 3:39 PM
(25,600 bytes)	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	3/27/2007 9:03 PM			25.00 KB
explorer.exe	n:\windows\explorer.exe	200	1380	7/23/2007 3:39 PM	6.00.3790.3959
(1,364,480 bytes)	(srv03_sp2_rtm.070216-1710)	3/27/2007 9:04 PM			1.30 MB
cpqteam.exe	n:\windows\system32\cpqteam.exe	8	200	1380	7/23/2007 3:39 PM
(8,550.02 KB)	59.50 KB (60,928 bytes)	10/4/2006 1:56 PM			
sqlservr.exe	n:\program files\microsoft sql server\mssql.1\mssql\binn\sqlservr.exe	1380	7/23/2007 3:39 PM	2005.090.3042.00	36.72
(38,507,376 bytes)	2/10/2007 9:03 AM				
cmd.exe	n:\windows\system32\cmd.exe	1380	7/23/2007 3:40 PM	5.2.3790.3959	200
(550,912 bytes)	(srv03_sp2_rtm.070216-1710)	3/25/2005 6:00 AM			
wmiprvse.exe	Not Available	1624	8	Not Available	
Available	Not Available	7/23/2007 3:40 PM		Not Available	
csrss.exe	Not Available	12240	13	Not Available	
Not Available	Not Available	7/23/2007 4:08 PM		Not Available	
winlogon.exe	n:\windows\system32\winlogon.exe	13	200	1380	7/23/2007 4:08 PM
(922.00 KB)	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	3/27/2007 9:03 PM			922.00 KB
rdpclip.exe	n:\windows\system32\rdpclip.exe	10772	8	200	
(101,376 bytes)	(srv03_sp2_rtm.070216-1710)	3/27/2007 9:03 PM			
explorer.exe	n:\windows\explorer.exe	200	1380	7/23/2007 4:08 PM	6.00.3790.3959
(1,364,480 bytes)	(srv03_sp2_rtm.070216-1710)	3/27/2007 9:04 PM			1.30 MB

cpqteam.exe n:\windows\system32\cpqteam.exe 11252
 8 200 1380 7/23/2007 4:08 PM 8.55.0.2
 59.50 KB (60,928 bytes) 10/4/2006 1:56 PM
 wmiprvse.exe Not Available 11832 8 Not
 Available Not Available 7/23/2007 4:26 PM Not Available
 Not Available Not Available
 cmd.exe n:\windows\system32\cmd.exe 1096 8 200
 1380 7/23/2007 4:32 PM 5.2.3790.3959
 (srv03_sp2_rtm.070216-1710) 538.00 KB (550,912 bytes)
 3/25/2005 6:00 AM
 taskmgr.exe n:\windows\system32\taskmgr.exe 12188
 13 200 1380 7/23/2007 4:33 PM
 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 231.50
 KB (237,056 bytes) 3/25/2005 6:00 AM
 helpctr.exe n:\windows\pchealth\helpctr\binaries\helpctr.exe 2028
 8 200 1380 7/23/2007 4:34 PM
 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 1.30 MB
 (1,363,456 bytes) 1/31/2007 2:42 PM
 helpsvc.exe n:\windows\pchealth\helpctr\binaries\helpsvc.exe
 1716 8 200 1380 7/23/2007 4:34 PM
 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 1.52 MB
 (1,591,296 bytes) 1/31/2007 2:42 PM

[Loaded Modules]

Name	Version	Size	File Date	Manufacturer	Path
winlogon	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	922.00 KB (944,128 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\winlogon.exe
ntdll	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	1.20 MB (1,254,400 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\ntdll.dll
kernel32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	1.43 MB (1,503,232 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\kernel32.dll
advapi32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	1.00 MB (1,051,648 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\advapi32.dll
rpcrt4	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	1.58 MB (1,653,248 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\rpcrt4.dll
secur32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	120.00 KB (122,880 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\secur32.dll
crypt32	5.131.3790.3959 (srv03_sp2_rtm.070216-1710)	1.36 MB (1,429,504 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\crypt32.dll
msvcrt	7.0.3790.3959 (srv03_sp2_rtm.070216-1710)	508.00 KB (520,192 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\msvcrt.dll
user32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	1.04 MB (1,086,976 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\user32.dll
gdi32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	603.50 KB (617,984 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\gdi32.dll
msasn1	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	152.50 KB (156,160 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\msasn1.dll
nddeapi	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	25.00 KB (25,600 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\nddeapi.dll
profmap	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	36.00 KB (36,864 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\profmap.dll
netapi32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	589.00 KB (603,136 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\netapi32.dll

userenv	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	1.02 MB (1,071,104 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\userenv.dll
psapi	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	29.00 KB (29,696 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\psapi.dll
regapi	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	108.50 KB (111,104 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\regapi.dll
setupapi	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	1.45 MB (1,524,224 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\setupapi.dll
version	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	28.00 KB (28,672 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\version.dll
winsta	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	89.00 KB (91,136 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\winsta.dll
ws2_32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	174.50 KB (178,688 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\ws2_32.dll
ws2help	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.50 KB (31,232 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\ws2help.dll
msgina	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	1.14 MB (1,193,472 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\msgina.dll
shsvcs	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	194.00 KB (198,656 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\shsvcs.dll
shlwapi	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	607.00 KB (621,568 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\shlwapi.dll
sfc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.00 KB (6,144 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\sfc.dll
sfc_os	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	183.50 KB (187,904 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\sfc_os.dll
wintrust	5.131.3790.3959 (srv03_sp2_rtm.070216-1710)	297.50 KB (304,640 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\wintrust.dll
imagehlp	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	57.50 KB (58,880 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\imagehlp.dll
ole32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	2.50 MB (2,622,976 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\ole32.dll
comctl32	6.0 (srv03_sp2_rtm.070216-1710)	1.51 MB (1,584,640 bytes)	2/18/2007 11:24 AM	Microsoft Corporation	n:\windows\winsxs\amd64_microsoft.windows.common-controls_6595b64144ccf1df_6.0.3790.3959_x-ww_0a7b2435\comctl32.dll
winscard	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	229.50 KB (235,008 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\winscard.dll
wtsapi32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	29.00 KB (29,696 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\wtsapi32.dll
sxs	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	1.89 MB (1,977,856 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\sxs.dll
winmm	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	303.50 KB (310,784 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\winmm.dll
shell32	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	10.02 MB (10,505,728 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\shell32.dll

rsaenh	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	298.84 KB (306,008 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\rsaenh.dll
wldap32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	390.50 KB (399,872 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\wldap32.dll
cscdll	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	151.50 KB (155,136 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\cscdll.dll
dimsntfy	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	28.00 KB (28,672 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\dimsntfy.dll
wlnotify	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	148.50 KB (152,064 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\wlnotify.dll
winspool	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	247.00 KB (252,928 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\winspool.drv
mpr	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	115.00 KB (117,760 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\mpr.dll
oleaut32	5.2.3790.3959	1.07 MB (1,121,792 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\oleaut32.dll
comctl32	5.82 (srv03_sp2_rtm.070216-1710)	935.00 KB (957,440 bytes)	2/18/2007 11:24 AM	Microsoft Corporation	n:\windows\winsxs\amd64_microsoft.windows.common-controls_6595b64144ccf1df_5.82.3790.3959_x-ww_ab06deb0\comctl32.dll
uxtheme	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	494.50 KB (506,368 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\uxtheme.dll
samlib	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	69.50 KB (71,168 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\samlib.dll
cscui	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	441.00 KB (451,584 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\cscui.dll
clbcatq	2001.12.4720.3959 (srv03_sp2_rtm.070216-1710)	862.50 KB (883,200 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\clbcatq.dll
comres	2001.12.4720.3959 (srv03_sp2_rtm.070216-1710)	779.50 KB (798,208 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\comres.dll
ntmarta	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	222.50 KB (227,840 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\ntmarta.dll
xpsp2res	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	2.77 MB (2,899,456 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\xpsp2res.dll
services	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	219.00 KB (224,256 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\services.exe
scsvr	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	595.00 KB (609,280 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\scsvr.dll
authz	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	171.00 KB (175,104 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\authz.dll
umpnprmgr	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	205.00 KB (209,920 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\umpnprmgr.dll
ncobjapi	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	77.50 KB (79,360 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\ncobjapi.dll
msvcp60	7.0.3790.1830 (srv03_sp1_rtm.050324-1447)	919.50 KB (941,568 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\msvcp60.dll
eventlog	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	127.50 KB (130,560 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\eventlog.dll
lsass	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	14.00 KB (14,336 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\lsass.exe
lsasrv	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	1.49 MB (1,566,720 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\lsasrv.dll
samsrv	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	1.01 MB (1,059,328 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\samsrv.dll
cryptdll	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	47.00 KB (48,128 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\cryptdll.dll
dnsapi	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	298.50 KB (305,664 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\dnsapi.dll
ntdsapi	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	127.50 KB (130,560 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\ntdsapi.dll
msprivs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	47.50 KB (48,640 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\msprivs.dll
kerberos	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	706.00 KB (722,944 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\kerberos.dll
msv1_0	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	253.00 KB (259,072 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\msv1_0.dll
iphlpapi	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	178.50 KB (182,784 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\iphlpapi.dll
netlogon	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	665.50 KB (681,472 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\netlogon.dll
w32time	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	398.00 KB (407,552 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\w32time.dll
schannel	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	248.00 KB (253,952 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\schannel.dll
wdigest	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	131.00 KB (134,144 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\wdigest.dll
rassfm	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.00 KB (36,864 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\rassfm.dll
kdcsvc	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	410.00 KB (419,840 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\kdcsvc.dll
ntlsa	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	2.83 MB (2,967,040 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\ntlsa.dll
ntdsatq	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	51.00 KB (52,224 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\ntdsatq.dll
mswsock	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	480.50 KB (492,032 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\mswsock.dll
esent	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	2.26 MB (2,367,488 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\esent.dll
scecli	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	308.00 KB (315,392 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\scecli.dll
ws03res	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	794.00 KB (813,056 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\ws03res.dll

ipsecsvc	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	361.50 KB (370,176 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\ipsecsvc.dll
oakley	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	385.00 KB (394,240 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\oakley.dll
winiipsec	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	52.50 KB (53,760 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\winiipsec.dll
pstorsvc	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	36.00 KB (36,864 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\pstorsvc.dll
hnetcfg	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	568.00 KB (581,632 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\hnetcfg.dll
wshtcpip	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	29.00 KB (29,696 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\wshtcpip.dll
psbase	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	124.00 KB (126,976 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\psbase.dll
dssenh	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	231.34 KB (236,888 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\dssenh.dll
wlbcstrl	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	137.50 KB (140,800 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\wlbcstrl.dll
svchost	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	25.00 KB (25,600 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\svchost.exe
rpss	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	819.00 KB (838,656 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\rpss.dll
wzcsvc	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	644.50 KB (659,968 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\wzcsvc.dll
rtutils	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	66.00 KB (67,584 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\rtutils.dll
wmi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	5.50 KB (5,632 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\wmi.dll
dhcpcsvc	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	220.50 KB (225,792 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\dhcpcsvc.dll
atl	3.05.2284 96.50 KB (98,816 bytes)		3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\atl.dll
rastls	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	238.50 KB (244,224 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\rastls.dll
cryptui	5.131.3790.3959 (srv03_sp2_rtm.070216-1710)	705.50 KB (722,432 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\cryptui.dll
mprapi	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	154.50 KB (158,208 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\mprapi.dll
activeds	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	348.50 KB (356,864 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\activeds.dll
adslidpc	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	240.50 KB (246,272 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\adslidpc.dll
credui	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	202.00 KB (206,848 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\credui.dll
rasapi32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	410.00 KB (419,840 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\rasapi32.dll
rasman	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	95.50 KB (97,792 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\rasman.dll
tapi32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	332.50 KB (340,480 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\tapi32.dll
raschap	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	141.00 KB (144,384 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\raschap.dll
schedsvc	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	308.00 KB (315,392 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\schedsvc.dll
msidle	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	9.00 KB (9,216 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\msidle.dll
audiosrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	77.00 KB (78,848 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\audiosrv.dll
wkssvc	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	221.00 KB (226,304 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\wkssvc.dll
wiarpc	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	57.00 KB (58,368 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\wiarpc.dll
aelupsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.50 KB (32,256 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\aelupsvc.dll
apphelp	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	241.00 KB (246,784 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\apphelp.dll
cryptsvc	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	114.00 KB (116,736 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\cryptsvc.dll
certcli	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	371.50 KB (380,416 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\certcli.dll
vssapi	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	1.26 MB (1,320,960 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\vssapi.dll
dmserver	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	36.50 KB (37,376 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\dmserver.dll
pchsvc	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	75.50 KB (77,312 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\pchealth\helpctr\binaries\pchsvc.dll
srvsvc	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	156.50 KB (160,256 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	n:\windows\system32\srvsvc.dll
es	2001.12.4720.3959 (srv03_sp2_rtm.070216-1710)	357.00 KB (365,568 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\es.dll
seclogon	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	27.50 KB (28,160 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\seclogon.dll
trkwks	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	177.50 KB (181,760 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\trkwks.dll
wmisvc	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	227.50 KB (232,960 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\wbem\wmisvc.dll
wuauerv	5.7.3790.1830 (srv03_sp1_rtm.050324-1447)	12.00 KB (12,288 bytes)	1/31/2007 2:42 PM	Microsoft Corporation	n:\windows\system32\wuauerv.dll
wuaueng	5.7.3790.3959 (srv03_sp2_rtm.070216-1710)	2.16 MB (2,269,184 bytes)	3/27/2007 9:03 PM	Microsoft Corporation	n:\windows\system32\wuaueng.dll
advpack	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	146.00 KB (149,504 bytes)	3/27/2007 9:04 PM	Microsoft Corporation	n:\windows\system32\advpack.dll

shfolder 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) 34.00 KB (34,816 bytes) 3/25/2005 6:00 AM Microsoft Corporation n:\windows\system32\shfolder.dll	rasadhlp 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 12.00 KB (12,288 bytes) 3/27/2007 9:03 PM Microsoft Corporation n:\windows\system32\rasadhlp.dll
winhttp 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 511.50 KB (523,776 bytes) 2/18/2007 11:24 AM Microsoft Corporation n:\windows\winsxs\amd64_microsoft.windows.winhttp_6595b64144ccf1df_5.1.3790.3959_x-ww_03aca661\winhttp.dll	ncprov 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 73.00 KB (74,752 bytes) 1/31/2007 2:40 PM Microsoft Corporation n:\windows\system32\wbem\ncprov.dll
cabinet 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 138.50 KB (141,824 bytes) 2/18/2007 10:50 AM Microsoft Corporation n:\windows\system32\cabinet.dll	spoolsv 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 107.50 KB (110,080 bytes) 3/27/2007 9:03 PM Microsoft Corporation n:\windows\system32\spoolsv.exe
mspatcha 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 48.00 KB (49,152 bytes) 3/25/2005 6:00 AM Microsoft Corporation n:\windows\system32\mspachta.dll	spoolss 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 164.00 KB (167,936 bytes) 3/27/2007 9:03 PM Microsoft Corporation n:\windows\system32\spoolss.dll
sens 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 63.50 KB (65,024 bytes) 3/27/2007 9:03 PM Microsoft Corporation n:\windows\system32\sens.dll	localspl 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 732.50 KB (750,080 bytes) 3/25/2005 6:00 AM Microsoft Corporation n:\windows\system32\localspl.dll
browser 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 125.50 KB (128,512 bytes) 3/27/2007 9:04 PM Microsoft Corporation n:\windows\system32\browser.dll	cnbjmon 5.2.3790.1224 (dnsvr(skatar).040514-1058) 63.00 KB (64,512 bytes) 3/24/2005 11:15 AM Microsoft Corporation n:\windows\system32\cnbjmon.dll
comsvcs 2001.12.4720.3959 (srv03_sp2_rtm.070216-1710) 2.13 MB (2,234,880 bytes) 3/27/2007 9:04 PM Microsoft Corporation n:\windows\system32\comsvcs.dll	pjlmon 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 25.50 KB (26,112 bytes) 3/24/2005 11:22 AM Microsoft Corporation n:\windows\system32\pjlmon.dll
netrap 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 26.00 KB (26,624 bytes) 3/25/2005 6:00 AM Microsoft Corporation n:\windows\system32\netrap.dll	tcpmon 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 90.50 KB (92,672 bytes) 3/27/2007 9:03 PM Microsoft Corporation n:\windows\system32\tcpmon.dll
netman 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 454.50 KB (465,408 bytes) 3/27/2007 9:03 PM Microsoft Corporation n:\windows\system32\netman.dll	wsnmp32 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 67.50 KB (69,120 bytes) 3/27/2007 9:03 PM Microsoft Corporation n:\windows\system32\wsnmp32.dll
netshell 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 2.33 MB (2,438,656 bytes) 3/27/2007 9:03 PM Microsoft Corporation n:\windows\system32\netshell.dll	tcpmib 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 25.00 KB (25,600 bytes) 3/27/2007 9:03 PM Microsoft Corporation n:\windows\system32\tcpmib.dll
clusapi 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 127.00 KB (130,048 bytes) 3/27/2007 9:04 PM Microsoft Corporation n:\windows\system32\clusapi.dll	wsock32 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 24.50 KB (25,088 bytes) 3/25/2005 6:00 AM Microsoft Corporation n:\windows\system32\wsock32.dll
wininet 6.00.3790.3959 (srv03_sp2_rtm.070216-1710) 1.14 MB (1,190,912 bytes) 3/27/2007 9:03 PM Microsoft Corporation n:\windows\system32\wininet.dll	mgmtapi 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 22.50 KB (23,040 bytes) 3/25/2005 6:00 AM Microsoft Corporation n:\windows\system32\mgmtapi.dll
wzcsapi 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 50.50 KB (51,712 bytes) 3/27/2007 9:03 PM Microsoft Corporation n:\windows\system32\wzcsapi.dll	snmpapi 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 31.50 KB (32,256 bytes) 3/25/2005 6:00 AM Microsoft Corporation n:\windows\system32\snmpapi.dll
wbemcomn 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 518.00 KB (530,432 bytes) 3/27/2007 9:04 PM Microsoft Corporation n:\windows\system32\wbem\wbemcomn.dll	usbmon 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 28.50 KB (29,184 bytes) 3/27/2007 9:03 PM Microsoft Corporation n:\windows\system32\usbmon.dll
wbemcore 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 1.22 MB (1,282,560 bytes) 3/27/2007 9:04 PM Microsoft Corporation n:\windows\system32\wbem\wbemcore.dll	winmr 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 30.00 KB (30,720 bytes) 3/27/2007 9:03 PM Microsoft Corporation n:\windows\system32\winmr.dll
esscli 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 626.50 KB (641,536 bytes) 3/27/2007 9:04 PM Microsoft Corporation n:\windows\system32\wbem\esscli.dll	wshqos 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 33.50 KB (34,304 bytes) 3/25/2005 6:00 AM Microsoft Corporation n:\windows\system32\wshqos.dll
fastprox 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 866.50 KB (887,296 bytes) 3/27/2007 9:04 PM Microsoft Corporation n:\windows\system32\wbem\fastprox.dll	win32spl 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 167.00 KB (171,008 bytes) 3/25/2005 6:00 AM Microsoft Corporation n:\windows\system32\win32spl.dll
wbemsvc 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 58.00 KB (59,392 bytes) 1/31/2007 2:40 PM Microsoft Corporation n:\windows\system32\wbem\wbemsvc.dll	inetpp 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 148.50 KB (152,064 bytes) 3/27/2007 9:03 PM Microsoft Corporation n:\windows\system32\inetpp.dll
wmiutils 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 171.00 KB (175,104 bytes) 3/27/2007 9:04 PM Microsoft Corporation n:\windows\system32\wbem\wmiutils.dll	icmp 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 3.50 KB (3,584 bytes) 3/25/2005 6:00 AM Microsoft Corporation n:\windows\system32\icmp.dll
repdrvfs 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 353.50 KB (361,984 bytes) 3/27/2007 9:04 PM Microsoft Corporation n:\windows\system32\wbem\repdrvfs.dll	ersvc 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 31.00 KB (31,744 bytes) 3/25/2005 6:00 AM Microsoft Corporation n:\windows\system32\ersvc.dll
wmiprvsd 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 743.00 KB (760,832 bytes) 3/27/2007 9:04 PM Microsoft Corporation n:\windows\system32\wbem\wmiprvsd.dll	sqlwriter 2005.090.3042.00 152.36 KB (156,016 bytes) 2/10/2007 9:03 AM Microsoft Corporation n:\program files\microsoft sql server\90\shared\sqlwriter.exe
wbemess 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 532.50 KB (545,280 bytes) 3/27/2007 9:04 PM Microsoft Corporation n:\windows\system32\wbem\wbemess.dll	msvcr80 8.00.50727.42 803.50 KB (822,784 bytes) 9/23/2005 12:26 AM Microsoft Corporation n:\windows\winsxs\amd64_microsoft.vc80.crt_1fc8b3b9a1e18e3b_8.0.50727.42_x-ww_3fea50ad\msvcr80.dll
rasdlg 5.2.3790.3959 (srv03_sp2_rtm.070216-1710) 859.50 KB (880,128 bytes) 3/25/2005 6:00 AM Microsoft Corporation n:\windows\system32\rasdlg.dll	sqlwvss 2005.090.3042.00 365.86 KB (374,640 bytes) 2/10/2007 9:03 AM Microsoft Corporation

n:\program files\microsoft sql server\90\shared\sqlwvss.dll	netui0	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	130.00 KB (133,120 bytes)	3/25/2005 6:00 AM	Microsoft Corporation
msvc80	8.00.50727.42	1.05 MB (1,097,728 bytes)			
	9/23/2005 12:28 AM	Microsoft Corporation			
n:\windows\winsxs\amd64_microsoft.vc80.crt_1fc8b3b9a1e18e3b_8.0.50727.42_x-ww_3fea50ad\msvc80.dll	netui1	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	338.50 KB (346,624 bytes)	3/25/2005 6:00 AM	Microsoft Corporation
termsrv	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	355.50 KB (364,032 bytes)		3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\termsrv.dll				
icaapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	27.50 KB (28,160 bytes)		1/31/2007 2:41 PM	Microsoft Corporation
	n:\windows\system32\icaapi.dll				
mstlsapi	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	188.00 KB (192,512 bytes)		3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\mstlsapi.dll				
rdpwsx	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	170.13 KB (174,216 bytes)		3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\rdpwsx.dll				
explorer	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	1.30 MB (1,364,480 bytes)		3/27/2007 9:04 PM	Microsoft Corporation
	n:\windows\explorer.exe				
browseui	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	1.53 MB (1,605,120 bytes)		3/27/2007 9:04 PM	Microsoft Corporation
	n:\windows\system32\browseui.dll				
shdocvw	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	2.33 MB (2,438,144 bytes)		3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\shdocvw.dll				
themeui	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	531.50 KB (544,256 bytes)		3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\themeui.dll				
msimg32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.50 KB (6,656 bytes)		3/25/2005 6:00 AM	Microsoft Corporation
	n:\windows\system32\msimg32.dll				
actxprxy	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	220.50 KB (225,792 bytes)		3/27/2007 9:04 PM	Microsoft Corporation
	n:\windows\system32\actxprxy.dll				
linkinfo	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	31.00 KB (31,744 bytes)		3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\linkinfo.dll				
ntshrui	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	184.00 KB (188,416 bytes)		3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\ntshrui.dll				
urlmon	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	1.04 MB (1,088,000 bytes)		3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\urlmon.dll				
webcheck	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	438.50 KB (449,024 bytes)		3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\webcheck.dll				
stobject	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	142.50 KB (145,920 bytes)		3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\stobject.dll				
batmeter	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	41.50 KB (42,496 bytes)		3/27/2007 9:04 PM	Microsoft Corporation
	n:\windows\system32\batmeter.dll				
powrprof	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	32.50 KB (33,280 bytes)		3/25/2005 6:00 AM	Microsoft Corporation
	n:\windows\system32\powrprof.dll				
browsecl	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	63.00 KB (64,512 bytes)		3/25/2005 6:00 AM	Microsoft Corporation
	n:\windows\system32\browsecl.dll				
shdoclc	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	589.50 KB (603,648 bytes)		3/25/2005 6:00 AM	Microsoft Corporation
	n:\windows\system32\shdoclc.dll				
drprov	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB (24,576 bytes)		3/25/2005 6:00 AM	Microsoft Corporation
	n:\windows\system32\drprov.dll				
ntlanman	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	72.00 KB (73,728 bytes)		3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\ntlanman.dll				
server\mssql.1\mssql\bin\sqlservr.exe	opends60	2005.090.1399.00	22.21 KB (22,744 bytes)	10/14/2005 2:31 PM	Microsoft Corporation
	n:\program files\microsoft sql server\mssql.1\mssql\bin\opends60.dll				
server\mssql.1\mssql\bin\instapi	instapi	2005.090.1399.00	40.71 KB (41,688 bytes)	10/14/2005 2:23 PM	Microsoft Corporation
	n:\program files\microsoft sql server\90\shared\instapi.dll				
server\mssql.1\mssql\bin\sqlservr.exe	sqllevn70	2005.090.3042.00	1.66 MB (1,740,656 bytes)	2/10/2007 9:02 AM	Microsoft Corporation
	n:\program files\microsoft sql server\mssql.1\mssql\bin\resources\1033\sqllevn70.rll				
server\mssql.1\mssql\bin\sqlservr.exe	sqlos	2005.090.3042.00	17.86 KB (18,288 bytes)	2/10/2007 9:03 AM	Microsoft Corporation
	n:\program files\microsoft sql server\mssql.1\mssql\bin\sqlos.dll				
server\mssql.1\mssql\bin\sqlservr.exe	mscoree	2.0.50727.42 (RTM.050727-4200)	441.00 KB (451,584 bytes)	9/23/2005 12:37 AM	Microsoft Corporation
	n:\windows\system32\mscoree.dll				
server\mssql.1\mssql\bin\sqlservr.exe	xolehlp	2001.12.4720.3959 (srv03_sp2_rtm.070216-1710)	10.50 KB (10,752 bytes)	3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\xolehlp.dll				
server\mssql.1\mssql\bin\sqlservr.exe	msdtcprx	2001.12.4720.3959 (srv03_sp2_rtm.070216-1710)	814.00 KB (833,536 bytes)	3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\msdtcprx.dll				
server\mssql.1\mssql\bin\sqlservr.exe	mtxclu	2001.12.4720.3959 (srv03_sp2_rtm.070216-1710)	142.00 KB (145,408 bytes)	3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\mtxclu.dll				
server\mssql.1\mssql\bin\sqlservr.exe	resutils	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	98.50 KB (100,864 bytes)	3/25/2005 6:00 AM	Microsoft Corporation
	n:\windows\system32\resutils.dll				
server\mssql.1\mssql\bin\sqlservr.exe	security	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.00 KB (6,144 bytes)	3/25/2005 6:00 AM	Microsoft Corporation
	n:\windows\system32\security.dll				
server\mssql.1\mssql\bin\sqlservr.exe	cmd	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	538.00 KB (550,912 bytes)	3/25/2005 6:00 AM	Microsoft Corporation
	n:\windows\system32\cmd.exe				
server\mssql.1\mssql\bin\sqlservr.exe	rdpsnd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	25.00 KB (25,600 bytes)	3/25/2005 6:00 AM	Microsoft Corporation
	n:\windows\system32\rdpsnd.dll				
server\mssql.1\mssql\bin\sqlservr.exe	scredir	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	38.50 KB (39,424 bytes)	3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\scredir.dll				
server\mssql.1\mssql\bin\sqlservr.exe	msacm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.00 KB (31,744 bytes)	3/25/2005 6:00 AM	Microsoft Corporation
	n:\windows\system32\msacm32.drv				
server\mssql.1\mssql\bin\sqlservr.exe	msacm32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	112.00 KB (114,688 bytes)	3/27/2007 9:03 PM	Microsoft Corporation
	n:\windows\system32\msacm32.dll				
server\mssql.1\mssql\bin\sqlservr.exe	imaadp32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB (24,576 bytes)	3/25/2005 6:00 AM	Microsoft Corporation
	n:\windows\system32\imaadp32.acm				

msadp32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	23.50 KB	mshtml	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	905.50 KB
(24,064 bytes)	3/25/2005 6:00 AM Microsoft Corporation		KB (927,232 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
n:\windows\system32\msadp32.acm			n:\windows\system32\mshtml.dll		
msg711	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	13.50 KB	vbscript	5.6.0.8832 647.00 KB (662,528 bytes)	3/25/2005 6:00 AM
(13,824 bytes)	3/25/2005 6:00 AM Microsoft Corporation		Microsoft Corporation		
n:\windows\system32\msg711.acm			n:\windows\system32\vbscript.dll		
msgsm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	34.50 KB	msinfo	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	635.50 KB
(35,328 bytes)	3/25/2005 6:00 AM Microsoft Corporation		KB (650,752 bytes)	1/31/2007 2:42 PM Microsoft Corporation	
n:\windows\system32\msgsm32.acm			n:\windows\pchealth\helpctr\binaries\msinfo.dll		
tssoft32	1.01 13.50 KB (13,824 bytes)	3/25/2005 6:00 AM	mfc42u	6.50.9146.0 1.39 MB (1,460,992 bytes)	
DSP GROUP, INC.	n:\windows\system32\tssoft32.acm		3/25/2005 6:00 AM Microsoft Corporation		
n:\windows\system32\mfc42u.dll			n:\windows\system32\mfc42u.dll		
tsd32	1.03 24.50 KB (25,088 bytes)	3/25/2005 6:00 AM	comdlg32	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	447.00 KB
DSP GROUP, INC.	n:\windows\system32\tsd32.dll		KB (457,728 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
n:\windows\system32\tsd32.dll			n:\windows\system32\comdlg32.dll		
printui	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	928.00 KB	riched32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	7.00 KB
(950,272 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(7,168 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
n:\windows\system32\printui.dll			n:\windows\system32\riched32.dll		
cfgmgr32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	18.00 KB	riched20	5.31.23.1225 1.11 MB (1,160,192 bytes)	
(18,432 bytes)	3/25/2005 6:00 AM Microsoft Corporation		3/25/2005 6:00 AM Microsoft Corporation		
n:\windows\system32\cfgmgr32.dll			n:\windows\system32\riched20.dll		
rdpclip	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	99.00 KB	wbemprox	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	38.00 KB
(101,376 bytes)	3/27/2007 9:03 PM Microsoft Corporation		(38,912 bytes)	1/31/2007 2:40 PM Microsoft Corporation	
n:\windows\system32\rdpclip.exe			n:\windows\system32\wbem\wbemprox.dll		
mydocs	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	101.00 KB	helpsvc	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	1.52 MB
(103,424 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(1,591,296 bytes)	1/31/2007 2:42 PM Microsoft Corporation	
n:\windows\system32\mydocs.dll			n:\windows\pchealth\helpctr\binaries\helpsvc.exe		
taskmgr	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	231.50 KB			
(237,056 bytes)	3/25/2005 6:00 AM Microsoft Corporation		[Services]		
n:\windows\system32\taskmgr.exe			Display Name	Name	State
util.dll	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	37.00 KB	Path	Error Control	Start Mode
(37,888 bytes)	3/25/2005 6:00 AM Microsoft Corporation				Service Type
n:\windows\system32\util.dll					Tag ID
helpctr	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	1.30 MB	Application Experience Lookup Service	AeLookupSvc	Running
(1,363,456 bytes)	1/31/2007 2:42 PM Microsoft Corporation		Auto Share Process		
n:\windows\pchealth\helpctr\binaries\helpctr.exe			n:\windows\system32\svchost.exe -k netsvcs	Normal	
hcappres	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	7.50 KB	LocalSystem	0	
(7,680 bytes)	1/31/2007 2:42 PM Microsoft Corporation		Alerter	Stopped	Disabled
n:\windows\pchealth\helpctr\binaries\hcappres.dll			n:\windows\system32\svchost.exe -k localservice	Share Process	Normal
itss	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	208.50 KB	NT AUTHORITY\LocalService	0	
(213,504 bytes)	3/25/2005 6:00 AM Microsoft Corporation		Application Layer Gateway Service	ALG	Stopped
n:\windows\system32\itss.dll			Own Process	n:\windows\system32\alg.exe	Manual
msxml3	8.80.1185.0 2.04 MB (2,144,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation	NT AUTHORITY\LocalService	0	Normal
n:\windows\system32\msxml3.dll			Application Management	AppMgmt	Stopped
pchshell	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	155.00 KB	Process	n:\windows\system32\svchost.exe -k netsvcs	Manual
(158,720 bytes)	1/31/2007 2:42 PM Microsoft Corporation		LocalSystem	0	Share
n:\windows\pchealth\helpctr\binaries\pchshell.dll			ASP.NET State Service	aspnet_state	Stopped
mlang	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	686.00 KB	Own Process	n:\windows\microsoft.net\framework64\v2.0.50727\aspnet_state.exe	Manual
(702,464 bytes)	3/25/2005 6:00 AM Microsoft Corporation		n:\windows\microsoft.net\framework64\v2.0.50727\aspnet_state.exe	Normal	NT AUTHORITY\NetworkService
n:\windows\system32\mlang.dll			Windows Audio	AudioSrv	Running
mshtml	6.00.3790.3959 (srv03_sp2_rtm.070216-1710)	5.72 MB	n:\windows\system32\svchost.exe -k netsvcs	Auto	Share Process
(5,999,616 bytes)	3/25/2005 6:00 AM Microsoft Corporation		LocalSystem	0	
n:\windows\system32\mshtml.dll			Background Intelligent Transfer Service	BITS	Stopped
msls31	3.10.349.0 357.00 KB (365,568 bytes)	3/25/2005 6:00 AM Microsoft Corporation	Share Process	n:\windows\system32\svchost.exe -k	Manual
n:\windows\system32\msls31.dll			netsvcs	Normal	LocalSystem
msimtf	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	380.50 KB	0		
(389,632 bytes)	3/25/2005 6:00 AM Microsoft Corporation		Computer Browser	Browser	Running
n:\windows\system32\msimtf.dll			n:\windows\system32\svchost.exe -k netsvcs	Auto	Share Process
msctf	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	617.50 KB	LocalSystem	0	Normal
(632,320 bytes)	3/25/2005 6:00 AM Microsoft Corporation		Indexing Service	CiSvc	Stopped
n:\windows\system32\msctf.dll			n:\windows\system32\cisvc.exe	Disabled	Share Process
jscrip	5.6.0.8832 976.00 KB (999,424 bytes)	3/25/2005 6:00 AM Microsoft Corporation	0		LocalSystem
n:\windows\system32\jscrip.dll			ClipBook	ClipSrv	Stopped
imm32	5.2.3790.3959 (srv03_sp2_rtm.070216-1710)	208.00 KB	n:\windows\system32\clipsrv.exe	Disabled	Own Process
(212,992 bytes)	3/27/2007 9:03 PM Microsoft Corporation		0		Normal
n:\windows\system32\imm32.dll			.NET Runtime Optimization Service v2.0.50727_X86	clr_optimization_v2.0.50727_32	Stopped
			Process	n:\windows\microsoft.net\framework\v2.0.50727\mscorsvw.exe	Manual
			Ignore	LocalSystem	Own
			0		

Process	.NET Runtime Optimization Service v2.0.50727_x64	clr_optimization_v2.0.50727_64	Stopped	Manual	Own	TCP/IP NetBIOS Helper	LmHosts	Running	Auto	Share								
Process	n:\windows\microsoft.net\framework64\v2.0.50727\mscorsvw.exe	Ignore	LocalSystem	0	0	Process	n:\windows\system32\svchost.exe -k localservice	NT AUTHORITY\LocalService	0	Normal								
COM+ System Application	COMSysApp	Stopped	Manual	Own Process	n:\windows\system32\dlhst.exe	Messenger Messenger	Stopped	Disabled	Share Process	Normal								
/processid:{02d4b3f1-fd88-11d1-960d-00805fc79235}	Normal	LocalSystem	0	Cryptographic Services	CryptSvc	Running	Auto	Share	Process	n:\windows\system32\svchost.exe -k netsvcs								
Process	n:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	DCOM Server Process Launcher	DcomLaunch	Running	Auto	Share Process	n:\windows\system32\svchost.exe -k dcomlaunch								
Share Process	n:\windows\system32\svchost.exe -k dcomlaunch	Normal	LocalSystem	0	Distributed File System	Dfs	Stopped	Manual	Own Process	n:\windows\system32\dfssvc.exe								
Normal	LocalSystem	0	DHCP Client	Dhcp	Running	Auto	Share Process	Normal	Process	n:\windows\system32\svchost.exe -k networkservice								
NT AUTHORITY\NetworkService	0	Logical Disk Manager Administrative Service	dmadmin	Stopped	Manual	Share Process	Normal	LocalSystem	0	Logical Disk Manager								
Running	Auto	Share Process	n:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	DNS Client	Dnscache	Running	Auto								
Share Process	Normal	LocalSystem	0	Error Reporting Service	ERSvc	Running	Auto	Share	Process	n:\windows\system32\svchost.exe -k winerr								
Ignore	LocalSystem	0	Event Log	Eventlog	Running	Auto	Share Process	Normal	LocalSystem	0								
COM+ Event System	EventSystem	Running	Auto	Share	Process	n:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Help and Support								
Help and Support	helpsvc	Running	Auto	Share Process	Normal	LocalSystem	0	Human Interface Device Access	HidServ	Stopped								
Disabled	Share	Process	n:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	HTTP SSLHTTPFilter	Stopped	Manual	Share Process								
Normal	LocalSystem	0	IAS Jet Database Access	IASJet	Stopped	Manual	Share Process	Normal	LocalSystem	0								
Normal	LocalSystem	0	IMAPI CD-Burning COM Service	ImapiService	Stopped	Own Process	n:\windows\system32\imapi.exe	Normal	LocalSystem	0								
Intersite Messaging	IsmServ	Stopped	Disabled	Own Process	Normal	LocalSystem	0	Kerberos Key Distribution Center	kdc	Stopped								
Disabled	Share Process	Normal	LocalSystem	0	Server	lanmanserver	Running	Auto	Share Process	n:\windows\system32\svchost.exe -k netsvcs								
Normal	LocalSystem	0	Workstation	lanmanworkstation	Running	Auto	Share Process	Normal	LocalSystem	0								
License Logging	LicenseService	Stopped	Disabled	Own Process	Normal	LocalSystem	0	LmHosts	Running	Auto								
NT AUTHORITY\NetworkService	0	NT AUTHORITY\NetworkService	0	NT AUTHORITY\NetworkService	0	NT AUTHORITY\NetworkService	0	MSIServer	Stopped	Manual								
Share Process	Normal	LocalSystem	0	MSQLSERVER	Stopped	Manual	Process	n:\windows\system32\mssqlserver\sqlservr.exe" -smssqlserver	Normal	LocalSystem								
0	SQL Server Active Directory Helper	MSSQLServerADHelper	Stopped	Disabled	Own Process	"n:\program files\microsoft sql server\90\shared\sqladhlp90.exe"	Normal	NT AUTHORITY\NetworkService	0	Network DDE								
0	NetMeeting Remote Desktop Sharing	nmmsrv	Stopped	Disabled	Share Process	Normal	LocalSystem	0	Network DDE DSDM	NetDDEdsdm	Stopped							
Disabled	Share Process	Normal	LocalSystem	0	Network Location Awareness (NLA)	Nla	Running	Manual	Share Process	Normal	LocalSystem	0						
0	Distributed Transaction Coordinator	MSDTC	Running	Auto	Normal	LocalSystem	0	Net Logon	Netlogon	Stopped	Manual	Share Process	Normal	LocalSystem	0			
Normal	LocalSystem	0	Windows Installer	MSIServer	Stopped	Manual	Share Process	Normal	LocalSystem	0	Network Connections	Netman	Running	Manual	Share Process	Normal	LocalSystem	0
0	SQL Server (MSSQLSERVER)	MSSQLSERVER	Stopped	Manual	Process	"n:\program files\microsoft sql server\mssql.1\mssql\binn\sqlservr.exe" -smssqlserver	Normal	LocalSystem	0	Network DDE	NetDDE	Stopped	Disabled	Share Process	Normal	LocalSystem	0	
0	SQL Server Active Directory Helper	MSSQLServerADHelper	Stopped	Disabled	Own Process	"n:\program files\microsoft sql server\90\shared\sqladhlp90.exe"	Normal	NT AUTHORITY\NetworkService	0	Network DDE	NetDDE	Stopped	Disabled	Share Process	Normal	LocalSystem	0	
0	Network DDE	NetDDE	Stopped	Disabled	Share Process	Normal	LocalSystem	0	Network DDE DSDM	NetDDEdsdm	Stopped	Disabled	Share Process	Normal	LocalSystem	0		
0	Net Logon	Netlogon	Stopped	Manual	Share Process	Normal	LocalSystem	0	Network Location Awareness (NLA)	Nla	Running	Manual	Share Process	Normal	LocalSystem	0		
0	Network Connections	Netman	Running	Manual	Share Process	Normal	LocalSystem	0	File Replication	NtFrs	Stopped	Manual	Own Process	Ignore	LocalSystem	0		
0	NT LM Security Support Provider	NtLmSsp	Stopped	Manual	Share Process	Normal	LocalSystem	0	Removable Storage	NtmsSvc	Stopped	Manual	Share Process	Normal	LocalSystem	0		
0	Removable Storage	NtmsSvc	Stopped	Manual	Share Process	Normal	LocalSystem	0	Office Source Engine	ose	Stopped	Manual	Own Process	Normal	LocalSystem	0		
0	Protected Storage	ProtectedStorage	Running	Auto	Share Process	Normal	LocalSystem	0	Plug and Play	PlugPlay	Running	Auto	Share Process	Normal	LocalSystem	0		
0	IPSEC Services	PolicyAgent	Running	Auto	Share Process	Normal	LocalSystem	0	Protected Storage	ProtectedStorage	Running	Auto	Share Process	Normal	LocalSystem	0		
0	Remote Access Auto Connection Manager	RasAuto	Stopped	Manual	Share Process	Normal	LocalSystem	0	Remote Access Connection Manager	RasMan	Stopped	Manual	Share Process	Normal	LocalSystem	0		
0	Remote Access Connection Manager	RasMan	Stopped	Manual	Share Process	Normal	LocalSystem	0	Remote Desktop Help Session Manager	RDSessMgr	Stopped	Manual	Own Process	Normal	LocalSystem	0		
0	Remote Desktop Help Session Manager	RDSessMgr	Stopped	Manual	Own Process	Normal	LocalSystem	0										

Routing and Remote Access	RemoteAccess	Stopped	Disabled	Share Process	Themes	Themes	Stopped	Disabled	Share Process
Share Process	n:\windows\system32\svchost.exe -k				n:\windows\system32\svchost.exe -k	LocalSystem	0		netsvcsNormal
Remote Registry	RemoteRegistry	Running	Auto	Share	Telnet	TlntSvr	Stopped	Disabled	Own Process
Process	n:\windows\system32\svchost.exe -k regsvc	Normal	NT		n:\windows\system32\tlntsvr.exe	LocalSystem	0		AUTHORITY\LocalService
Remote Procedure Call (RPC) Locator	RpcLocator			Stopped	Distributed Link Tracking Server	TrkSvr	Stopped	Disabled	Share
Manual	Own Process				Process	n:\windows\system32\svchost.exe -k	Normal		LocalSystem
n:\windows\system32\locator.exe	Normal	NT			LocalSystem	0			Distributed Link Tracking Client
AUTHORITY\NetworkService	0				Process	n:\windows\system32\svchost.exe -k	Normal		LocalSystem
Remote Procedure Call (RPC)	RpcSs	Running	Auto	Share	Terminal Services Session Directory	Tssdis	Stopped	Disabled	Share
Process	n:\windows\system32\svchost.exe -k rpcss	Normal	NT		Own Process	n:\windows\system32\tssdis.exe	Normal		LocalSystem
Authority\NetworkService	0				Windows User Mode Driver Framework	UMWdf	Stopped	Manual	Own Process
Resultant Set of Policy Provider	RSOPProv	Stopped	Manual	Share	Own Process	n:\windows\system32\wdfmgr.exe	Normal		AUTHORITY\LocalService
Process	n:\windows\system32\rsopprov.exe	Normal			Uninterruptible Power Supply	UPS	Stopped	Manual	Own
LocalSystem	0				Process	n:\windows\system32\ups.exe	Normal	NT	AUTHORITY\LocalService
Special Administration Console Helper	sacsvr	Stopped	Manual		Virtual Disk Service	vds	Stopped	Manual	Own Process
Share Process	n:\windows\system32\svchost.exe -k				Process	n:\windows\system32\vds.exe	Normal	LocalSystem	0
netsvcs	Normal	LocalSystem	0		Volume Shadow Copy	VSS	Stopped	Manual	Own
Security Accounts Manager	SamSs	Running	Auto	Share	Process	n:\windows\system32\vssvc.exe	Normal	LocalSystem	0
Process	n:\windows\system32\lsass.exe	Normal	LocalSystem		Windows Time	W32Time	Running	Auto	Share Process
0					Process	n:\windows\system32\svchost.exe -k	localservice	Normal	NT AUTHORITY\LocalService
Smart Card	SCardSvr	Stopped	Manual	Share Process	WebClient	WebClient	Stopped	Disabled	Share Process
n:\windows\system32\scardsvr.exe				Ignore	Process	n:\windows\system32\svchost.exe -k	localservice	Normal	NT AUTHORITY\LocalService
AUTHORITY\LocalService	0				WinHTTP	Web Proxy Auto-Discovery Service			WinHttpAutoProxySvc
Task Scheduler	Schedule	Running	Auto	Share Process	Process	n:\windows\system32\svchost.exe -k	localservice	Normal	NT AUTHORITY\LocalService
n:\windows\system32\svchost.exe -k	Normal	LocalSystem	0		Windows Management Instrumentation	winmgmt	Running	Auto	Share Process
LocalSystem	0				Share Process	n:\windows\system32\svchost.exe -k			Ignore
Secondary Logon	seclogon	Running	Auto	Share Process	netsvcs	Ignore	LocalSystem	0	
n:\windows\system32\svchost.exe -k	Ignore	LocalSystem	0		Portable Media Serial Number Service	WmdmPmSN			Stopped
LocalSystem	0				Manual	Share Process			n:\windows\system32\svchost.exe -k
System Event Notification	SENS	Running	Auto	Share	Process	n:\windows\system32\svchost.exe -k	Normal		LocalSystem
Process	n:\windows\system32\svchost.exe -k	Normal	LocalSystem	0	Windows Management Instrumentation Driver Extensions				Wmi
LocalSystem	0				Stopped	Manual	Share Process		n:\windows\system32\svchost.exe -k
Windows Firewall/Internet Connection Sharing (ICS)	SharedAccess				Process	n:\windows\system32\svchost.exe -k	Normal		LocalSystem
Stopped	Disabled	Share Process			WMI Performance Adapter	WmiApSrv	Stopped	Manual	Own Process
n:\windows\system32\svchost.exe -k	Normal	LocalSystem	0		Normal	LocalSystem	0		n:\windows\system32\wbem\wmiaprv.exe
LocalSystem	0				Automatic Updates	wuauerv	Running	Auto	Share Process
Shell Hardware Detection	ShellHWDetection	Running	Auto		Process	n:\windows\system32\svchost.exe -k	Normal		LocalSystem
Share Process	n:\windows\system32\svchost.exe -k				Wireless Configuration	WZCSVC	Running	Auto	Share
netsvcs	Ignore	LocalSystem	0		Process	n:\windows\system32\svchost.exe -k	Normal		LocalSystem
Print Spooler	Spooler	Running	Auto	Own Process	Network Provisioning Service	xmlprov	Stopped	Manual	Share
n:\windows\system32\spoolsv.exe				Normal	Process	n:\windows\system32\svchost.exe -k	Normal		LocalSystem
LocalSystem	0				0				
SQL Server Browser	SQLBrowser	Stopped	Disabled	Own	[Program Groups]				
Process	"n:\program files (x86)\microsoft sql server\90\shared\sqlbrowser.exe"	Normal	LocalSystem	0	Group Name	Name	User Name		
server\90\shared\sqlbrowser.exe"	Normal	LocalSystem	0		Accessories	Default User:Accessories	Default User		
SQL Server Agent (MSSQLSERVER)	SQLSERVERAGENT	Stopped	Manual	Own Process	Accessories\Accessibility		Default User:Accessories\Accessibility		
files\microsoft sql server\mssql.1\mssql\bin\sqlagent90.exe" -i mssqlserver	Normal	LocalSystem	0		Default User				
Normal	LocalSystem	0			Accessories\Entertainment		Default User:Accessories\Entertainment		
SQL Server VSS Writer	SQLWriter	Running	Auto	Own	Default User				
Process	"n:\program files\microsoft sql server\90\shared\sqlwriter.exe"	Normal	LocalSystem	0					
Normal	LocalSystem	0							
Windows Image Acquisition (WIA)	stisvc	Stopped	Disabled						
Share Process	n:\windows\system32\svchost.exe -k								
imgsvc	Normal	NT AUTHORITY\LocalService	0						
Microsoft Software Shadow Copy Provider	swprv	Stopped	Manual						
Own Process	n:\windows\system32\svchost.exe -k	Normal	LocalSystem	0					
Normal	LocalSystem	0							
Performance Logs and Alerts	SysmonLog	Stopped	Auto						
Own Process	n:\windows\system32\smlogsvc.exe	Normal	NT Authority\NetworkService	0					
Normal	NT Authority\NetworkService	0							
Telephony TapiSrv	Stopped	Manual	Share Process						
n:\windows\system32\svchost.exe -k	tapisrv	Normal	LocalSystem	0					
LocalSystem	0								
Terminal Services	TermService	Running	Manual	Share					
Process	n:\windows\system32\svchost.exe -k	Normal	LocalSystem	0					
LocalSystem	0								

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
 HP System Tools All Users:HP System Tools All Users
 HP System Tools\HP Array Configuration Utility All Users:HP
 System Tools\HP Array Configuration Utility All Users
 HP System Tools\HP Array Diagnostic Utility All Users:HP
 System Tools\HP Array Diagnostic Utility All Users
 Microsoft SQL Server 2005 All Users:Microsoft SQL Server 2005
 All Users
 Microsoft SQL Server 2005\Analysis Services All Users:Microsoft
 SQL Server 2005\Analysis Services All Users
 Microsoft SQL Server 2005\Configuration Tools All Users:Microsoft
 SQL Server 2005\Configuration Tools All Users
 Microsoft SQL Server 2005\Documentation and Tutorials All
 Users:Microsoft SQL Server 2005\Documentation and Tutorials All Users
 Microsoft SQL Server 2005\Documentation and Tutorials\Tutorials
 All Users:Microsoft SQL Server 2005\Documentation and
 Tutorials\Tutorials All Users
 Microsoft SQL Server 2005\Performance Tools All Users:Microsoft
 SQL Server 2005\Performance Tools All Users
 Startup All Users:Startup All Users
 Accessories NT AUTHORITY\SYSTEM:Accessories NT
 AUTHORITY\SYSTEM
 Accessories\Accessibility NT
 AUTHORITY\SYSTEM:Accessories\Accessibility NT
 AUTHORITY\SYSTEM
 Accessories\Entertainment NT
 AUTHORITY\SYSTEM:Accessories\Entertainment NT
 AUTHORITY\SYSTEM
 Startup NT AUTHORITY\SYSTEM:Startup NT
 AUTHORITY\SYSTEM
 Accessories ML370G5\Administrator:Accessories
 ML370G5\Administrator
 Accessories\Accessibility
 ML370G5\Administrator:Accessories\Accessibility
 ML370G5\Administrator
 Accessories\Entertainment
 ML370G5\Administrator:Accessories\Entertainment
 ML370G5\Administrator
 Administrative Tools ML370G5\Administrator:Administrative Tools
 ML370G5\Administrator
 Startup ML370G5\Administrator:Startup ML370G5\Administrator

[Startup Programs]

Program	Command	User Name	Location
desktop	desktop.ini	NT AUTHORITY\SYSTEM	Startup
desktop	desktop.ini	ML370G5\Administrator	Startup
desktop	desktop.ini	.DEFAULT	Startup
desktop	desktop.ini	All Users	Common Startup
CPQTEAM	cpqteam.exe	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 /mid
 Sound Not Available
 Media Clip Not Available
 WordPad Document "%programfiles%\windows
 nt\accessories\wordpad.exe"
 Bitmap Image mspaint.exe

[Windows Error Reporting]

Time	Type	Details
7/23/2007 3:36 PM	Application Hang	Hanging application IEXPLORE.EXE, version 6.0.3790.1830, hang module hungapp, version 0.0.0.0, hang address 0x00000000.

7/23/2007 2:41 PM	Application Hang	Hanging application IEXPLORE.EXE, version 6.0.3790.1830, hang module hungapp, version 0.0.0.0, hang address 0x00000000.

7/23/2007 2:40 PM	Application Hang	Hanging application IEXPLORE.EXE, version 6.0.3790.1830, hang module hungapp, version 0.0.0.0, hang address 0x00000000.

7/23/2007 2:37 PM	Application Hang	Hanging application IEXPLORE.EXE, version 6.0.3790.1830, hang module hungapp, version 0.0.0.0, hang address 0x00000000.

7/23/2007 2:36 PM	Application Hang	Hanging application IEXPLORE.EXE, version 6.0.3790.1830, hang module hungapp, version 0.0.0.0, hang address 0x00000000.

[Internet Settings]

[Internet Explorer]

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

Item	Value
Version	6.0.3790.3959
Build	63790.3959
Application Path	N:\Program Files\Internet Explorer
Language	English (United States)
Active Printer	Not Available
Cipher Strength	128-bit
Content Advisor	Disabled
IEAK Install	No

[File Versions]

File	Version	Size	Date	Path	Company
actxprxy.dll	6.0.3790.3959	221 KB	2/17/2007 1:02:52	N:\WINDOWS\system32	Microsoft Corporation
advpack.dll	6.0.3790.3959	146 KB	2/17/2007 1:03:10	N:\WINDOWS\system32	Microsoft Corporation
asctrls.ocx	6.0.3790.1830	147 KB	3/25/2005 7:00:00 AM	N:\WINDOWS\system32	Microsoft Corporation
browsecl.dll	6.0.3790.1830	63 KB	3/25/2005 7:00:00	N:\WINDOWS\system32	Microsoft Corporation
browseui.dll	6.0.3790.3959	1,568 KB	2/17/2007 1:05:24	N:\WINDOWS\system32	Microsoft Corporation
cdfview.dll	6.0.3790.3959	216 KB	2/17/2007 1:05:40	N:\WINDOWS\system32	Microsoft Corporation

comctl32.dll	5.82.3790.3959	935 KB	2/17/2007 1:09:08 AM	N:\WINDOWS\system32	Microsoft Corporation
dxtrans.dll	6.3.3790.3959	325 KB	2/17/2007 1:18:34 AM	N:\WINDOWS\system32	Microsoft Corporation
dxtmsft.dll	6.3.3790.3959	549 KB	2/17/2007 1:18:32 AM	N:\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	2/17/2007 1:29:36 AM	N:\WINDOWS\system32	Microsoft Corporation
iepeers.dll	6.0.3790.3959	362 KB	2/17/2007 1:29:38 AM	N:\WINDOWS\system32	Microsoft Corporation
iesetup.dll	6.0.3790.1830	71 KB	3/25/2005 7:00:00 AM	N:\WINDOWS\system32	Microsoft Corporation
ieuinit.inf	Not Available	24 KB	3/25/2005 7:00:00 AM	N:\WINDOWS\system32	Not Available
ieexplore.exe	6.0.3790.1830	94 KB	3/25/2005 7:00:00 AM	N:\Program Files\Internet Explorer	Microsoft Corporation
imgutil.dll	6.0.3790.3959	61 KB	2/17/2007 1:30:36 AM	N:\WINDOWS\system32	Microsoft Corporation
inetctl.cpl	6.0.3790.3959	431 KB	2/17/2007 1:30:40 AM	N:\WINDOWS\system32	Microsoft Corporation
inetctl.dll	6.0.3790.1830	110 KB	3/25/2005 7:00:00 AM	N:\WINDOWS\system32	Microsoft Corporation
inseng.dll	6.0.3790.3959	147 KB	2/17/2007 1:30:52 AM	N:\WINDOWS\system32	Microsoft Corporation
mlang.dll	6.0.3790.3959	686 KB	2/17/2007 1:36:42 AM	N:\WINDOWS\system32	Microsoft Corporation
msencode.dll	<File Missing>	Not Available	Not Available		
mshta.exe	6.0.3790.1830	38 KB	3/25/2005 7:00:00 AM	N:\WINDOWS\system32	Microsoft Corporation
mshtml.dll	6.0.3790.3959	5,859 KB	2/17/2007 1:38:38 AM	N:\WINDOWS\system32	Microsoft Corporation
mshtml.tlb	6.0.3790.1830	1,320 KB	3/25/2005 7:00:00 AM	N:\WINDOWS\system32	Microsoft Corporation
mshtmlmed.dll	6.0.3790.3959	906 KB	2/17/2007 1:38:42 AM	N:\WINDOWS\system32	Microsoft Corporation
mshtmlmer.dll	6.0.3790.1830	56 KB	3/25/2005 7:00:00 AM	N:\WINDOWS\system32	Microsoft Corporation
msident.dll	6.0.3790.1830	69 KB	3/25/2005 7:00:00 AM	N:\WINDOWS\system32	Microsoft Corporation
msidentld.dll	6.0.3790.1830	16 KB	3/25/2005 7:00:00 AM	N:\WINDOWS\system32	Microsoft Corporation
msieftpl.dll	6.0.3790.3959	369 KB	2/17/2007 1:38:50 AM	N:\WINDOWS\system32	Microsoft Corporation

msrating.dll	6.0.3790.3959	240 KB	2/17/2007 1:39:20 AM	N:\WINDOWS\system32	Microsoft Corporation
mstime.dll	6.0.3790.3959	880 KB	2/17/2007 1:39:26 AM	N:\WINDOWS\system32	Microsoft Corporation
occache.dll	6.0.3790.3959	126 KB	2/17/2007 1:41:48 AM	N:\WINDOWS\system32	Microsoft Corporation
proctexe.ocx	<File Missing>	Not Available	Not Available		
sendmail.dll	6.0.3790.3959	64 KB	2/17/2007 1:54:24 AM	N:\WINDOWS\system32	Microsoft Corporation
shdoclc.dll	6.0.3790.1830	590 KB	3/25/2005 7:00:00 AM	N:\WINDOWS\system32	Microsoft Corporation
shdocvw.dll	6.0.3790.3959	2,381 KB	2/17/2007 1:54:58 AM	N:\WINDOWS\system32	Microsoft Corporation
shfolder.dll	6.0.3790.1830	34 KB	3/25/2005 7:00:00 AM	N:\WINDOWS\system32	Microsoft Corporation
shlwapi.dll	6.0.3790.3959	607 KB	2/17/2007 1:55:32 AM	N:\WINDOWS\system32	Microsoft Corporation
tdc.ocx	1.3.0.3130	91 KB	3/25/2005 7:00:00 AM	N:\WINDOWS\system32	Microsoft Corporation
url.dll	6.0.3790.1830	40 KB	3/25/2005 7:00:00 AM	N:\WINDOWS\system32	Microsoft Corporation
urlmon.dll	6.0.3790.3959	1,063 KB	2/17/2007 2:00:44 AM	N:\WINDOWS\system32	Microsoft Corporation
webcheck.dll	6.0.3790.3959	439 KB	2/17/2007 2:02:26 AM	N:\WINDOWS\system32	Microsoft Corporation
wininet.dll	6.0.3790.3959	1,163 KB	2/17/2007 2:02:54 AM	N:\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	N:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files
Total Disk Space	Not Available
Available Disk Space	Not Available
Maximum Cache Size	Not Available
Available Cache Size	Not Available

[List of Objects]

Program File	Status	CodeBase
No cached object information available		

[Content]

[Following are sub-categories of this main category]

[Summary]

Item	Value
Content Advisor	Disabled

[Personal Certificates]

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

[Other People Certificates]

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

[Publishers]

Name
No publisher information available

[Security]

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

Appendix B: Database Build Scripts

B.1 CreateDatabase.sql

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

--
-- Drop the existing database
--
if exists (select name from sysdatabases where name = 'tpch100g')
    drop database tpch100g

CREATE DATABASE tpch100g
ON PRIMARY
(
    NAME = tpch100g_root,
    FILENAME = "N:\dev\tpch100g.mdf",
    SIZE = 10MB,
    FILEGROWTH = 10MB),
FILEGROUP DATA_FG
(name=tpch100g_data1,filename='N:\dev\tpch_1\',size=99000mb,filegrowt
h=0),
(name=tpch100g_data2,filename='N:\dev\tpch_2\',size=99000mb,filegrowt
h=0),
FILEGROUP LOAD_FG
(name=tpch100g_load1,
filename='z:\load\load1.ldf',size=100000mb,filegrowth=0),
(name=tpch100g_load2,
filename='z:\load\load2.ldf',size=100000mb,filegrowth=0)
LOG ON
(
    NAME = tpchlog1,
    FILENAME = 'N:\dev\tpchlog\',
    SIZE = 19500MB,
    FILEGROWTH = 0)
```

B.2 CreateTables.sql

```
-- File: CREATETABLES.SQL
-- Microsoft TPC-H Benchmark Kit Ver. 1.00
-- Copyright Microsoft, 1999
--
create table PART
(P_PARTKEY int not null,
P_TYPE varchar(25) not null,
P_SIZE int not null,
P_BRAND char(10) not null,
P_NAME varchar(55) not null,
P_CONTAINER char(10) not null,
P_MFGR char(25) not null,
P_RETAILPRICE float not null,
P_COMMENT varchar(23) not null)
on LOAD_FG

create table SUPPLIER
```

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

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

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

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

create table LINEITEM
(L_SHIPDATE datetime not null,
L_ORDERKEY bigint not null,
L_DISCOUNT float not null,
L_EXTENDEDPRI float not null,
L_SUPPKEY int not null,
L_QUANTITY float not null,
L_RETURNFLAG char(1) not null,
L_PARTKEY int not null,
L_LINestatus char(1) not null,
L_TAX float not null,
L_COMMITDATE datetime not null,
L_RECEIPTDATE datetime not null,
L_SHIPMODE char(10) not null,
L_LINENUMBER int not null,
L_SHIPINSTRUCT char(25) not null,
L_COMMENT varchar(44) not null)
on 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. 1.00
-- Copyright Microsoft, 1999
--

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 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 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 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. 1.00
-- Copyright Microsoft, 1999
--

create index PS_SUPPKEY_IDX

```

```

  on PARTSUPP(PS_SUPPKEY)
  with fillfactor=100, SORT_IN_TEMPDB
  on DATA_FG

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

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

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

```

B.5 CreateFK.sql

```

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

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

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

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

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

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

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

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

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

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

```

B.6 Backup.sql

```

backup database tpch100g to
disk=y:\hp_backup\hp_backup1.bak',
disk=y:\hp_backup\hp_backup2.bak',
disk=y:\hp_backup\hp_backup3.bak',
disk=y:\hp_backup\hp_backup4.bak',
disk=y:\hp_backup\hp_backup5.bak',
disk=y:\hp_backup\hp_backup6.bak',
disk=y:\hp_backup\hp_backup7.bak',
disk=y:\hp_backup\hp_backup8.bak'

```

```
with init,format, maxtransfersize=1048576,  
BUFFERCOUNT=1000,stats=1
```

B.7 Restore.sql

```
restore database tpch100g from  
disk='y:\hp_backup\hp_backup1.bak',  
disk='y:\hp_backup\hp_backup2.bak',  
disk='y:\hp_backup\hp_backup3.bak',  
disk='y:\hp_backup\hp_backup4.bak',  
disk='y:\hp_backup\hp_backup5.bak',  
disk='y:\hp_backup\hp_backup6.bak',  
disk='y:\hp_backup\hp_backup7.bak',  
disk='y:\hp_backup\hp_backup8.bak'  
with stats=1, maxtransfersize=1048576, BUFFERCOUNT=1000, replace
```

B.8 MoveTempDB.sql

```
-- File:  MOVETEMPDB.SQL  
--        Microsoft TPC-H Benchmark Kit Ver. 2.00  
--        Copyright Microsoft, 1999  
  
alter database tempdb modify file  
    (name=tempdev,filename='N:\dev\tempdev\',size=126MB)  
alter database tempdb modify file  
    (name=templog,filename='N:\dev\templog\',size=126MB)
```

B.9 ResizeTempDB.sql

```
-- File:  RESIZETEMPDB.SQL  
--        Microsoft TPC-H Benchmark Kit Ver. 2.00  
--        Copyright Microsoft, 1999  
  
alter database tempdb modify file  
    (name=tempdev,  
filename='n:\dev\tempdev\',size=49500mb,filegrowth=0)  
alter database tempdb modify file  
    (name=templog, filename='n:\dev\templog\',size=7500mb,filegrowth=0)  
alter database tempdb add file  
    (name=tempdev2,  
filename='n:\dev\tempdev_2\',size=49500mb,filegrowth=0)
```

B.10 DelLoadFg.sql

```
alter database tpch100g remove file tpch100g_load1  
alter database tpch100g remove file tpch100g_load2  
alter database tpch100g remove filegroup LOAD_FG
```

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    56586554400.730301
53758257134.870041    55909065222.827415    25.522006
38273.129735        0.049985        1478493
N      F      991417.000000        1487504710.380000
1413082168.054097    1469649223.194375    25.516472
38284.467761        0.050093        38854
N      O      74476040.000000        111701729697.739110
106118230307.605260    110367043872.498210    25.502227
38249.117989        0.049997        2920374
R      F      37719753.000000        56568041380.899857
53741292684.604156    55889619119.832260    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      N_NAME
P_PARTKEY P_MFGR      S_ADDRESS
S_PHONE      S_COMMENT
-----
9938.530000      Supplier#000005359      UNITED KINGDOM
185358      Manufacturer#4      QKuHYh,vZGiwu2FWEJoLDx04
33-429-790-6131 blithely silent pinto beans are furiously. slyly final deposits
acros
9937.840000      Supplier#000005969      ROMANIA
108438      Manufacturer#1
ANDENSOSmk,miq23Xfb5RWt6dvUcvt6Qa      29-520-692-3537
carefully slow deposits use furiously. slyly ironic platelets above the ironic
9936.220000      Supplier#000005250      UNITED KINGDOM
249      Manufacturer#4      B3rqp0xbSEim4Mpy2RH J      33-
320-228-2957 blithely special packages are. stealthily express deposits
across the closely final instructi
9923.770000      Supplier#000002324      GERMANY
29821      Manufacturer#4      y3OD9UywSTok      17-
779-299-1839 quickly express packages breach quiet pinto beans. requ

```



```

9871.220000 Supplier#000006373 GERMANY
43868 Manufacturer#5 J8fcXW5TqM 17-813-
485-8637 never silent deposits integrate furiously blit
9870.780000 Supplier#000001286 GERMANY
81285 Manufacturer#2
YKA,E2fjiVd7eUrzp2Ef8j1QxGo2DFnosaTEH 17-516-924-4574 final
theodolites cajole slyly special,
9870.780000 Supplier#000001286 GERMANY
181285 Manufacturer#4
YKA,E2fjiVd7eUrzp2Ef8j1QxGo2DFnosaTEH 17-516-924-4574 final
theodolites cajole slyly special,
9852.520000 Supplier#000008973 RUSSIA 18972
Manufacturer#2 t5L67YdBYH6o,Vz24jpDyQ9 32-188-
594-7038 quickly regular instructions wake-- carefully unusual braids into
the expres
9847.830000 Supplier#000008097 RUSSIA 130557
Manufacturer#2 xMe97bpE69NzdwLoX 32-375-640-
3593 slyly regular dependencies sleep slyly furiously express dep
9847.570000 Supplier#000006345 FRANCE 86344
Manufacturer#1 VSt3rzK3qG698u6ld8HhOByvrTcSTSvQIDQDag
16-886-766-7945 silent pinto beans should have to snooze carefully along
the final reques
9847.570000 Supplier#000006345 FRANCE
173827 Manufacturer#2
VSt3rzK3qG698u6ld8HhOByvrTcSTSvQIDQDag 16-886-766-7945 silent
pinto beans should have to snooze carefully along the final reques
9836.930000 Supplier#000007342 RUSSIA 4841
Manufacturer#4 JOIK7C1,7xrEZSSow 32-399-414-
5385 final accounts haggle. bold accounts are furiously dugouts. furiously
silent asymptotes are slyly

```

..... additional rows deleted

```

7887.080000 Supplier#000009792 GERMANY
164759 Manufacturer#3 Y28ITVeYriT3kIGdV2K8fSZ
V2UqT5HI0tz 17-988-938-4296 pending, ironic packages sleep among
the carefully ironic accounts. quickly final accounts
7871.500000 Supplier#000007206 RUSSIA 104695
Manufacturer#1 3w fNcNrVmvJJE95sgWZzvW 32-432-
452-7731 furiously dogged pinto beans cajole. bold, express notornis until
the slyly pending
7852.450000 Supplier#000005864 RUSSIA 8363
Manufacturer#4 WCNfBPZeSXh3h,c 32-454-883-
3821 blithely regular deposits
7850.660000 Supplier#000001518 UNITED KINGDOM
86501 Manufacturer#1 ONda3YJiHKJOC 33-
730-383-3892 furiously final accounts wake carefully idle requests. even
dolphins wake acc
7843.520000 Supplier#000006683 FRANCE 11680
Manufacturer#4 2Z0JGkiv01Y0oCFwUGfviIbhZCdy 16-464-
517-8943 carefully bold accounts doub

```

(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(Y, 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
        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_EXTENDEDPRI*(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

```

```

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

```

..... additional rows deleted

```

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_EXTENDEDPRI*(1-L_DISCOUNT)) AS
REVENUE,
C_ACCTBAL,
N_NAME,

```

```

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

```

```

57040 Customer#000057040 734235.245500 632.870000
JAPAN Eioyzjf4pp 22-895-641-3466
requests sleep blithely about the furiously i
143347 Customer#000143347 721002.694800 2557.470000
EGYPT 1aReFYv,Kw4 14-742-935-3718
fluffily bold excuses haggle finally after the u
60838 Customer#000060838 679127.307700 2454.770000
BRAZIL 64EaJ5vMAHWJIBOXkIpNc2RJiWE 12-913-
494-9813 furiously even pinto beans integrate under the ruthless foxes;
ironic, even dolphins across the slyl
101998 Customer#000101998 637029.566700 3790.890000
UNITED KINGDOM 01c9CILnNtfOQYmZj 33-593-
865-6378 accounts doze blithely! enticing, final deposits sleep blithely
special accounts. slyly express accounts pla
125341 Customer#000125341 633508.086000 4983.510000
GERMANY S29ODD6bceJ8QSuuEJznkNaK 17-582-
695-5962 quickly express requests wake quickly blithely
25501 Customer#000025501 620269.784900 7725.040000
ETHIOPIA W556MXuoiaYCCZamJI,Rn0B4ACUGdkQ8DZ
15-874-808-6793 quickly special requests sleep evenly among the special
deposits. special deposi
115831 Customer#000115831 596423.867200 5098.100000
FRANCE rFeBbEEyk dl ne7zV5fDrmiq1oK09wV7pxqCgIc 16-
715-386-3788 carefully bold excuses sleep alongside of the thinly idle
84223 Customer#000084223 594998.023900 528.650000
UNITED KINGDOM nAVZCs6BaWap rrM27N 2qBnze5WBauxbA
33-442-824-8191 pending, final ideas haggle final requests. unusual, regular
asymptotes affix according to the even foxes.
54289 Customer#000054289 585603.391800 5583.020000
IRAN vXCxoCsU0Bad5JQI ,oobkZ 20-834-292-
4707 express requests sublate blithely regular requests. regular, even ideas
solve.
39922 Customer#000039922 584878.113400 7321.110000
GERMANY Zgy4s50l2GKN4pLDPBU8m342glw6R 17-
147-757-8036 even pinto beans haggle. slyly bold accounts inte
6226 Customer#000006226 576783.760600 2230.090000
UNITED KINGDOM 8gPu8,NPGkfyQQ0hcIYUGPIBwC,ybP5g,
33-657-701-3391 quickly final requests against the regular instructions wake
blithely final instructions. pa

```

```

922 Customer#000000922 576767.533300 3869.250000
GERMANY Az9RFaut7NkPnc5zSD2PwHgVvr4JRzq 17-
945-916-9648 boldly final requests cajole blith
147946 Customer#000147946 576455.132000 2030.130000
ALGERIA iANyZHjqhyy7AJahOpTrYyhJ 10-886-956-
3143 furiously even accounts are blithely above the furiousl
115640 Customer#000115640 569341.193300 6436.100000
ARGENTINA Vtgfia9ql 7EpHgecU1X 11-411-543-
4901 final instructions are slyly according to the
73606 Customer#000073606 568656.857800 1785.670000
JAPAN xuR0Tro5yChDfOCrjkd2ol 22-437-653-
6966 furiously bold orbits about the furiously busy requests wake across the
furiously quiet theodolites. d
110246 Customer#000110246 566842.981500 7763.350000
VIETNAM 7KzflgX MDOq7sOkI 31-943-426-
9837 dolphins sleep blithely among the slyly final
142549 Customer#000142549 563537.236800 5085.990000
INDONESIA ChqEoK43OysjdHbtKCP6dKqjNyyvi9 19-
955-562-2398 regular, unusual dependencies boost slyly; ironic attainments
nag fluffily into the unusual packages?
146149 Customer#000146149 557254.986500 1791.550000
ROMANIA s87fvzFQpU 29-744-164-6487
silent, unusual requests detect quickly slyly regul
52528 Customer#000052528 556397.350900 551.790000
ARGENTINA NFztyTOR10UOJ 11-208-192-
3205 unusual requests detect. slyly dogged theodolites use slyly. deposit
23431 Customer#000023431 554269.536000 3381.860000
ROMANIA HgiV0phqhaIa9aydNoIib 29-915-458-
2654 instructions nag quickly. furiously bold accounts cajol

```

(20 row(s) affected)

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
154358 15212937.880000
38823 15064802.860000
85606 15053957.150000
33354 14408297.400000
154747 14407580.680000
82865 14235489.780000
76094 14094247.040000
222 13937777.740000
121271 13908336.000000
55221 13716120.470000
22819 13666434.280000
76281 13646853.680000
85298 13581154.930000
85158 13554904.000000
139684 13535538.720000
31034 13498025.250000

```

... additional rows deleted ...

```

122819 7888881.020000
154731 7888301.330000
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 9262

(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)
ORDER BY C_COUNT
        CUSTDIST DESC,
        C_COUNT DESC

```

C_COUNT CUSTDIST

```

-----
0 50004
9 6641
10 6566
11 6058
8 5949
12 5553
13 4989
19 4748
7 4707
18 4625
15 4552
17 4530
14 4484
20 4461
16 4323
21 4217
22 3730
6 3334
23 3129
24 2622
25 2079
5 1972
26 1593
27 1185
4 1033
28 869
29 559
3 398
30 373
31 235
2 144
32 128
33 71
34 48
35 33
1 23
36 17
37 7
40 4
38 4

```

39 2
41 1

(42 row(s) affected)

Qualification Query 14

-- using default substitutions

/* TPC_H Query 14 - Promotion Effect */

```

SELECT 100.00 * SUM ( CASE WHEN 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
Brand#15 SMALL BURNISHED NICKEL 19 24
Brand#21 MEDIUM ANODIZED COPPER 3 24
Brand#22 SMALL BRUSHED NICKEL 3 24
Brand#22 SMALL BURNISHED BRASS 19 24
Brand#25 MEDIUM BURNISHED COPPER 36 24
Brand#31 PROMO POLISHED COPPER 36 24
Brand#33 LARGE POLISHED TIN 23 24
Brand#33 PROMO POLISHED STEEL 14 24

```

.... Additional rows deleted

```

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_EXTENDEDPRI)/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	323.000000
00:00:00.000 544089.090000				3043270
Customer#000144617	144617	3043270	1997-02-12	317.000000
00:00:00.000 530604.440000				2232932
Customer#000013940	13940	2232932	1997-04-13	304.000000
00:00:00.000 522720.610000				2199712
Customer#000066790	66790	2199712	1996-09-30	327.000000
00:00:00.000 515531.820000				4745607
Customer#000046435	46435	4745607	1997-07-03	309.000000
00:00:00.000 508047.990000				3883783
Customer#000015272	15272	3883783	1993-07-28	302.000000
00:00:00.000 500241.330000				3342468
Customer#000146608	146608	3342468	1994-06-12	303.000000
00:00:00.000 499794.580000				5984582
Customer#000096103	96103	5984582	1992-03-16	312.000000
00:00:00.000 494398.790000				1474818
Customer#000024341	24341	1474818	1992-11-15	302.000000
00:00:00.000 491348.260000				5489475
Customer#000137446	137446	5489475	1997-05-23	311.000000
00:00:00.000 487763.250000				4267751
Customer#000107590	107590	4267751	1994-11-04	301.000000
00:00:00.000 485141.380000				2366755
Customer#000050008	50008	2366755	1996-12-09	302.000000
00:00:00.000 483891.260000				3767271
Customer#000015619	15619	3767271	1996-08-07	318.000000
00:00:00.000 480083.960000				1436544
Customer#000077260	77260	1436544	1992-09-12	307.000000
00:00:00.000 479499.430000				5746311
Customer#000109379	109379	5746311	1996-10-10	302.000000
00:00:00.000 478064.110000				5832321
Customer#000054602	54602	5832321	1997-02-09	307.000000
00:00:00.000 471220.080000				2096705
Customer#000105995	105995	2096705	1994-07-03	307.000000
00:00:00.000 469692.580000				2942469
Customer#000148885	148885	2942469	1992-05-31	313.000000
00:00:00.000 469630.440000				551136
Customer#000114586	114586	551136	1993-05-19	308.000000
00:00:00.000 469605.590000				5296167
Customer#000105260	105260	5296167	1996-09-06	303.000000
00:00:00.000 469360.570000				1263015
Customer#000147197	147197	1263015	1997-02-02	320.000000
00:00:00.000 467149.670000				2745894
Customer#000064483	64483	2745894	1996-07-04	304.000000
00:00:00.000 466991.350000				2761378
Customer#000136573	136573	2761378	1996-05-31	301.000000
00:00:00.000 461282.730000				502886
Customer#000016384	16384	502886	1994-04-12	312.000000
00:00:00.000 458378.920000				2869152
Customer#000117919	117919	2869152	1996-06-20	317.000000
00:00:00.000 456815.920000				735366
Customer#000012251	12251	735366	1993-11-24	309.000000
00:00:00.000 455107.260000				1971680
Customer#000120098	120098	1971680	1995-06-14	308.000000
00:00:00.000 453451.230000				5007490
Customer#000066098	66098	5007490	1992-08-07	304.000000
00:00:00.000 453436.160000				4290656
Customer#000117076	117076	4290656	1997-02-05	301.000000
00:00:00.000 449545.850000				4720454
Customer#000129379	129379	4720454	1997-06-07	303.000000
00:00:00.000 448665.790000				4702759
Customer#000126865	126865	4702759	1994-11-07	320.000000
00:00:00.000 447606.650000				983201
Customer#000088876	88876	983201	1993-12-30	304.000000
00:00:00.000 446717.460000				4806726
Customer#000036619	36619	4806726	1995-01-17	328.000000
00:00:00.000 446704.090000				

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	1998-07-03
00:00:00.000 433525.970000		301.000000	
Customer#000113131	113131	967334	1995-12-15
00:00:00.000 432957.750000		301.000000	
Customer#000141098	141098	565574	1995-09-24
00:00:00.000 430986.690000		301.000000	
Customer#000093392	93392	5200102	1997-01-22
00:00:00.000 425487.510000		304.000000	
Customer#000015631	15631	1845057	1994-05-12
00:00:00.000 419879.590000		302.000000	
Customer#000112987	112987	4439686	1996-09-17
00:00:00.000 418161.490000		305.000000	
Customer#000012599	12599	4259524	1998-02-12
00:00:00.000 415200.610000		304.000000	
Customer#000105410	105410	4478371	1996-03-05
00:00:00.000 412754.510000		302.000000	
Customer#000149842	149842	5156581	1994-05-30
00:00:00.000 411329.350000		302.000000	
Customer#000010129	10129	5849444	1994-03-21
00:00:00.000 409129.850000		309.000000	
Customer#000069904	69904	1742403	1996-10-19
00:00:00.000 408513.000000		305.000000	
Customer#000017746	17746	6882	1997-04-09
00:00:00.000 408446.930000		303.000000	
Customer#000013072	13072	1481925	1998-03-15
00:00:00.000 399195.470000		301.000000	
Customer#000082441	82441	857959	1994-02-07
00:00:00.000 382579.740000		305.000000	
Customer#000088703	88703	2995076	1994-01-30
00:00:00.000 363812.120000		302.000000	

(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
Supplier#000000761 zlSLelQUj2XrvTTFnv7WAcyZGvvMTx882d4
Supplier#000000884 bmhEShejaS
Supplier#000000887 urEaTejH5POADP2ARrf
Supplier#000000935 ij98czM 2KzWe7dDToxB8sq0UfCdvX
Supplier#000000975 ,AC e,tBpNwKb5xMUzeohxIRn, hdZJo73gFQF8y
Supplier#000001263 rQWr6nf8ZhB2TAiIDlvo5Io
... additional rows deleted ....
Supplier#000009812 APFRMy3lCbgFga53n5t9DxzFPQPgnjrGt32
Supplier#000009862 rJzweWeN58
Supplier#000009868 ROjGgx5gvtkmnUUoey7v
Supplier#000009869 ucLqxzrpBTRMewGSM29t0rNTM30g1Tu3Xgg3mKag
Supplier#000009899 7XdpaHRzr1t,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
      ( SELECT *
      FROM LINEITEM L3
      WHERE L3.L_ORDERKEY =
      L1.L_ORDERKEY
      AND
      L3.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
... additional rows deleted ...
Supplier#00000811 12
Supplier#00000821 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  C_NTRYCODE,
        COUNT(*)          AS NUMCUST,
        SUM(C_ACCTBAL) AS TOTACCTBAL
FROM    (
        SELECT  SUBSTRING(C_PHONE,1,2) AS
C_NTRYCODE,
            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 C_NTRYCODE
ORDER BY C_NTRYCODE

```

C_NTRYCODE	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

C_NTRYCODE	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 : 628214831

14	1993-01-01					
2	40	BRASS	AFRICA			
9	pale					
20	snow	1995-01-01	CANADA			
6	1996-01-01	0.05	25			
17	Brand#42	WRAP PKG				
18	312					
8	ROMANIA	EUROPE	LARGE BRUSHED COPPER			
21	IRAN					
13	unusual packages					
3	AUTOMOBILE	1995-03-01				
22	22	20	12	34	11	19
	26					
16	Brand#54	SMALL PLATED	33	45	43	
	14	15	50	49	16	
4	1993-02-01					
11	INDONESIA	0.0000010000				
15	1995-01-01					
1	81					
10	1994-09-01					
19	Brand#55	Brand#31	Brand#21	10	13	24
5	AMERICA	1996-01-01				
7	INDONESIA	ROMANIA				
12	TRUCK	MAIL	1993-01-01			

Stream1 Seed : 628214832

21	BRAZIL					
3	FURNITURE	1995-03-17				
18	314					
5	ASIA	1996-01-01				
11	RUSSIA	0.0000010000				
7	ARGENTINA	IRAQ				
6	1996-01-01	0.02	24			
20	forest	1993-01-01	CHINA			
17	Brand#44	SM CASE				
12	RAIL	MAIL	1993-01-01			
16	Brand#34	LARGE POLISHED	22	27	9	
	15	12	32	25	29	
15	1997-01-01					
13	unusual packages					
10	1993-06-01					
2	28	TIN	ASIA			
8	IRAQ	MIDDLE EAST	LARGE PLATED COPPER			
14	1993-01-01					
19	Brand#12	Brand#14	Brand#25	5	14	20
9	moccasin					
22	10	16	34	22	19	23
	30					
1	89					
4	1995-09-01					

Stream2 Seed : 628214833

6	1996-01-01	0.07	24			
17	Brand#41	SM JAR				
14	1993-01-01					
16	Brand#24	STANDARD ANODIZED	24	29		
	41	43	8	2	5	4
19	Brand#14	Brand#52	Brand#15	1	15	27
10	1994-03-01					
9	maroon					
2	15	COPPER	AFRICA			
15	1995-01-01					
8	CANADA	AMERICA	LARGE ANODIZED COPPER			
5	EUROPE	1996-01-01				
22	15	31	25	18	10	19
	28					
12	REG AIR	MAIL	1993-01-01			
7	CHINA	CANADA				
13	unusual packages					
18	312					
1	97					
4	1993-06-01					
20	powder	1997-01-01	INDIA			
3	AUTOMOBILE	1995-03-03				
11	IRAN	0.0000010000				
21	SAUDI ARABIA					

Stream3 Seed : 628214834

8	SAUDI ARABIA	MIDDLE EAST	MEDIUM			
	POLISHED COPPER					
5	MIDDLE EAST	1996-01-01				
4	1996-01-01					
6	1996-01-01	0.05	25			
17	Brand#42	SM PKG				
7	IRAN	SAUDI ARABIA				
1	105					
18	313					
22	33	12	26	23	24	18
	32					
14	1994-01-01					
9	lawn					
10	1994-12-01					
15	1993-01-01					
11	UNITED KINGDOM	0.0000010000				
20	chartreuse	1995-01-01	UNITED KINGDOM			
2	3	STEEL	EUROPE			
21	JAPAN					
19	Brand#11	Brand#35	Brand#14	6	16	23
13	unusual packages					
16	Brand#54	MEDIUM BURNISHED	31	1		
	39	47	5	33	28	16
12	SHIP	MAIL	1993-01-01			
3	FURNITURE	1995-03-19				

Stream4 Seed : 628214835

5 AFRICA 1997-01-01
 21 EGYPT
 14 1994-01-01
 19 Brand#23 Brand#13 Brand#13 1 17 20
 15 1995-01-01
 17 Brand#44 LG CASE
 12 FOB MAIL 1994-01-01
 6 1997-01-01 0.02 25
 4 1993-10-01
 9 hot
 8 JAPAN ASIA MEDIUM BURNISHED COPPER
 16 Brand#34 ECONOMY POLISHED 3 25
 9 43 11 14 42 34
 11 IRAQ 0.0000010000
 2 41 BRASS AFRICA
 10 1993-09-01
 18 315
 1 113
 13 unusual packages
 7 BRAZIL JAPAN
 22 15 13 20 22 26 32
 18
 3 MACHINERY 1995-03-05
 20 midnight 1993-01-01 JAPAN

Stream5 Seed : 628214836

21 VIETNAM
 15 1993-01-01
 4 1996-05-01
 6 1997-01-01 0.08 24
 7 ROMANIA EGYPT
 16 Brand#24 STANDARD BRUSHED 22 42
 36 6 41 16 30 47
 19 Brand#25 Brand#51 Brand#52 6 18 27
 18 312
 14 1994-01-01
 22 11 33 21 30 13 10
 28
 11 UNITED STATES 0.0000010000
 13 unusual requests
 3 FURNITURE 1995-03-21
 1 60
 2 29 NICKEL EUROPE
 5 AMERICA 1997-01-01
 8 EGYPT MIDDLE EAST MEDIUM ANODIZED TIN
 20 wheat 1997-01-01 BRAZIL
 12 MAIL FOB 1994-01-01
 17 Brand#41 LG JAR
 10 1994-07-01
 9 gainsboro

Appendix E: Refresh Function Source Code

E.1 CreateRF1Proc.sql

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

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

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

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

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

            SET @rangeStart = @div * @rangeSize
            SET @i = @mod
            while (@i > 0)
                BEGIN
                    SET @rangeSize = (@totRangeSize - @rangeSum)/2
                    SET @rangeSum = @rangeSum + @rangeSize
                    SET @rangeStart = @rangeStart + @rangeSize
                    SET @insert_sets = @insert_sets/2
                    SET @i = @i - 1
                end

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

        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_SHIPRIORITY, O_COMMENT)
    (SELECT O_ORDERKEY, O_CUSTKEY,
    O_ORDERSTATUS, O_TOTALPRICE,
    O_ORDERDATE,
    O_ORDERPRIORITY, O_CLERK, O_SHIPRIORITY, 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_QUAN
    TITY,
    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_QUAN
    TITY,
```

```

                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)'

--
-- 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. 1.00
-- Copyright Microsoft, 1999
--
IF exists (SELECT name FROM sysobjects WHERE name = 'RF2')
    DROP PROCEDURE RF2
GO

--
-- Create a stored Refresh Delete procedure which will catch the deadlock
-- victim abort and restart the delete transaction.
--
CREATE PROCEDURE RF2
    @current_execution INTEGER, @delete_sets INTEGER,
    @parallel_executions INTEGER, @total_executions INTEGER
AS
BEGIN

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

    declare @success INTEGER
    declare @index INTEGER
    declare @div INTEGER
    declare @mod INTEGER
    declare @skip INTEGER
    declare @i INTEGER
    declare @rangeSum INTEGER
    declare @totRangeSize INTEGER
    declare @sql NCHAR(1000)
    declare @orderSql NCHAR(1000)
    declare @liSql NCHAR(1000)

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

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

    IF (@total_executions > @parallel_executions)
        BEGIN
            SET @div = (@index-1)/@skip
            SET @mod = (@index-1) - @div * @skip
            SET @rangeSize = datediff(day, @startdate,
@enddate)/@parallel_executions + 1
            SET @totRangeSize = @rangeSize
            SET @rangeSum = 0
            SET @rangeStart = @div * @rangeSize
            SET @i = @mod
            WHILE (@i > 0)
                BEGIN
                    SET @rangeSize = (@totRangeSize - @rangeSum)/2
                    SET @rangeSum = @rangeSum + @rangeSize
                    SET @rangeStart = @rangeStart + @rangeSize
                    SET @delete_sets = @delete_sets/2
                    SET @i = @i - 1
                END
        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 Setup.cmd

```
echo off

rem
rem Modify the following parameters for your configuration
rem

set DB=tpch100g
rem
rem set sql's 'sa' user password here
rem
set PW=

set HOMEDRIVE=N:
set HOMEDIR=\HP_TPC_H_KIT\Setup
set OUTPUTDRIVE=N:
set OUTPUTDIR=\HP_TPC_H_KIT\Output
set SCALEFACTOR=100
set DBGEN_SEGMENTS=16
set DBGEN_PARALLELISM=8
set FLATFILEDRIVE=z:
set FLATFILEDIR=HP_Flatfiles\
set FLATFILESUBDIR=\
set RF1_PARALLELISM=16
set RF2_PARALLELISM=16
set UPDATEDRIVE=N:
set UPDATEDIR=\HP_UF_Flatfiles
set UPDATE_SETS=18

set DoDBGEN=FALSE
set DoDBCREATE=TRUE
set DoBULKINSERT=TRUE
set DoCREATEINDEX=TRUE
set DoCLEANUP=TRUE
set DoBACKUP=TRUE
set DoENDSTATS=TRUE

%HOMEDRIVE%
cd %HOMEDIR%

if '%1' == 'DBGEN' goto :DBGEN
if '%1' == 'BULKINSERTn' goto :BULKINSERTn

echo Checking for existence of HOMEDIR and OUTPUTDIR
if NOT EXIST %HOMEDRIVE%%HOMEDIR% goto :ERROR_EXIT
if NOT EXIST %OUTPUTDRIVE%%OUTPUTDIR% goto :ERROR_EXIT
if NOT EXIST %UPDATEDRIVE%%UPDATEDIR% goto :ERROR_EXIT

echo Finding next output directory in
%OUTPUTDRIVE%%OUTPUTDIR%
set OUTPUTNUMBER=1
:OUTPUTLOOP
if NOT EXIST
%HOMEDRIVE%%HOMEDIR%\%OUTPUTDRIVE%%OUTPUTDIR%\%OUTPUTNUMBER% goto
:OUTPUTLOOPEND
set /a OUTPUTNUMBER=%OUTPUTNUMBER%+1
goto :OUTPUTLOOP
:OUTPUTLOOPEND

set
OUTPUTPATH=%OUTPUTDRIVE%%OUTPUTDIR%\%OUTPUTNUMBER%
BER%
echo Output will be found at %OUTPUTPATH%
mkdir %OUTPUTPATH%

if NOT '%DoDBGEN%' == 'TRUE' goto :DBCREATE

rem
rem DBGEN invokes dbgen.exe in parallel
rem

echo Starting DBGGEN of FlatFiles
for /1 %i in (1,1,%DBGEN_SEGMENTS%) do copy dists.dss
%FLATFILEDRIVE%\%FLATFILEDIR%\%i%\FLATFILESUBDIR%
Copy dists.dss %UPDATEDRIVE%%UPDATEDIR%
for /1 %i in (1,%DBGEN_PARALLELISM%,%DBGEN_SEGMENTS%)
do call :DBGEN_ITERATE %i

echo Starting DBGGEN of Update Files
%UPDATEDRIVE%
cd %UPDATEDIR%
%HOMEDRIVE%%HOMEDIR%\dbgen -U %UPDATE_SETS% -s
%SCALEFACTOR% -qf -C %UPDATE_SETS% -i
%RF1_PARALLELISM% -d %RF2_PARALLELISM%
2>%OUTPUTPATH%\dbgen_Update.out
%HOMEDRIVE%
cd %HOMEDIR%
goto :DBCREATE

:DBGEN_ITERATE
set FIRST=%1
set /a LAST=%FIRST%+%DBGEN_PARALLELISM%-1
echo DBGGening sets %FIRST% through %LAST%
for /1 %i in (%FIRST%,1,%LAST%) do start cmd /C Setup DBGGEN %i
semaphore -wait DBGGEN -count %DBGEN_PARALLELISM%
goto :EOF

:DBGEN
%FLATFILEDRIVE%
cd %FLATFILEDRIVE%\%FLATFILESUBDIR%
%HOMEDRIVE%%HOMEDIR%\dbgen -qf -s%SCALEFACTOR% -
C%DBGEN_SEGMENTS% -S%2 2>%OUTPUTPATH%\dbgen_%2%.out
%HOMEDRIVE%
cd %HOMEDIR%
semaphore -release DBGGEN
goto :EOF

:DBCREATE
if NOT '%DoDBCREATE%' == 'TRUE' goto :BULKINSERT
rem
rem DBCREATE invokes the file %DBNAME%\CreateDatabase.sql
rem
echo Starting database creation

osql -Usa -P%PW% -Q"if exists (select * from sysdatabases where
name='%DB%')drop database %DB%" -o
%OUTPUTPATH%\DropDatabase.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -i %DB%\CreateDatabase.sql -o
%OUTPUTPATH%\CreateDatabase.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
```



```

osql -Usa -P%PW% -Q"sp_dboption %DB%, 'trunc. log on chkpt.', TRUE" -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -Q"sp_dboption %DB%, 'auto create statistics', OFF" -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -Q"sp_dboption %DB%, 'auto update statistics', OFF" -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -Q"alter database %DB% set PAGE_VERIFY NONE" -
b
if ERRORLEVEL 1 goto :ERROR_EXIT

:BULKINSERT
if NOT %DoBULKINSERT% == 'TRUE' goto :CREATEINDEX
rem
rem BULKINSERT starts a process per %DBGEN_PARALLELISM%
rem Each process inserts one or more segments
rem

osql -Usa -P%PW% -Q"sp_dboption %DB%, 'trunc', TRUE" -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -Q"sp_dboption %DB%, 'select into', TRUE" -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -Q"sp_dboption %DB%, 'torn', FALSE" -b
if ERRORLEVEL 1 goto :ERROR_EXIT

echo Dropping and Re-Creating Tables
osql -Usa -P%PW% -d%DB% -Q"if exists (select * from sysobjects where
name = 'LOADTIMES') drop table LOADTIMES" -b -o
%OUTPUTPATH%\Drop_Loadtimes.out
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"create table LOADTIMES(STEP
char(35), TIME_stamp datetime)" -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values ('LOAD
begin', getdate())" -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values ('Create
Tables begin', getdate())" -1 300
if ERRORLEVEL 1 goto :ERROR_EXIT
for %i in (REGION NATION SUPPLIER PARTSUPP PART
CUSTOMER ORDERS LINEITEM) do osql -Usa -P%PW% -d%DB% -
Q"drop table %i" -o %OUTPUTPATH%\Drop_Table_%i.out
osql -Usa -P%PW% -d%DB% -i%DB%\CreateTables.sql -o
%OUTPUTPATH%\CreateTables.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values ('Create
Tables end', getdate())" -1 300
if ERRORLEVEL 1 goto :ERROR_EXIT

echo Starting bulk inserts
for %i in (LINEITEM ORDERS CUSTOMER PART PARTSUPP
SUPPLIER) do call :BULKINSERT %i
echo for NATION and REGION
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values
('Nation/Region insert begin', getdate())" -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"bulk insert NATION from
%FLATFILEDRIVE%\%FLATFILEDIR%\%FLATFILESUBDIR%\Natio
n.tbl" with (FieldTerminator = '|', RowTerminator = '\n', tablock)" -o
%OUTPUTPATH%\BulkInsert_Nation.out -b -1 300
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"bulk insert REGION from
%FLATFILEDRIVE%\%FLATFILEDIR%\%FLATFILESUBDIR%\Regio
n.tbl" with (FieldTerminator = '|', RowTerminator = '\n', tablock)" -o
%OUTPUTPATH%\BulkInsert_Region.out -b -1 300
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values
('Nation/Region insert end', getdate())" -b -1 300
if ERRORLEVEL 1 goto :ERROR_EXIT
goto :CREATEINDEX

:BULKINSERTi
echo Starting bulk inserts for %i
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values (%i bulk
insert begin', getdate())" -1 300
for /l %j in (1, 1, %DBGEN_PARALLELISM%) do start cmd /C Setup
BULKINSERTn %i %j
semaphore -wait %1 -count %DBGEN_PARALLELISM%
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values (%i
end', getdate())" -b -1 300
if ERRORLEVEL 1 goto :ERROR_EXIT
goto :EOF

:BULKINSERTn
for /l %k in
(%3, %DBGEN_PARALLELISM%, %DBGEN_SEGMENTS%) do call
:BULKINSERTn2 BULKINSERTn2 %2 %k
semaphore -release %2
goto :EOF

:BULKINSERTn2
osql -Usa -P%PW% -d%DB% -Q"bulk insert %2 from
%FLATFILEDRIVE%\%FLATFILEDIR%\%3%FLATFILESUBDIR%\%2.
tbl.%3" with (FieldTerminator = '|', RowTerminator = '\n', tablock)" -o
%OUTPUTPATH%\BulkInsert_%2_%3.out -b -1 300
goto :EOF

:CREATEINDEX
if NOT %DoCREATEINDEX% == 'TRUE' goto :CLEANUP
rem
rem Create indexes
rem

echo %TIME% Starting create indexes
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values ('Create
indexes begin', getdate())" -b -1 300
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -i %DB%\CreateIndexes_1.sql -o
%OUTPUTPATH%\CreateIndexes_1.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -i %DB%\CreateFK.sql -o
%OUTPUTPATH%\CreateFK.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -i %DB%\CreateIndexes_2.sql -o
%OUTPUTPATH%\CreateIndexes_2.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
echo Starting create indexes
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values ('Create
indexes end', getdate())" -b -1 300
if ERRORLEVEL 1 goto :ERROR_EXIT
echo %TIME% Done creating indexes indexes

:CLEANUP
if NOT %DoCLEANUP% == 'TRUE' goto :BACKUP
rem
rem CLEANUP sets statistics and lock options
rem

echo Setting Cleanup Options
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values ('Cleanup
start', getdate())" -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"sp_createstats" -o
%OUTPUTPATH%\CreateStats.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -I -Usa -P%PW% -d%DB% -Q"alter database %DB% set
date_correlation_optimization ON" -o
%OUTPUTPATH%\DateCorrelation.out -b

```

```

if ERRORLEVEL 1 goto :ERROR_EXIT

osql -Usa -P%PW% -d%DB% -Q"sp_dboption '%DB%', 'auto create
statistics', 'OFF'" -o %OUTPUTPATH%\AutoCreateStats.out
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"sp_dboption '%DB%', 'auto update
statistics', 'OFF'" -o %OUTPUTPATH%\AutoUpdateStats.out
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"sp_indexoption 'LINEITEM',
'disallowpagelocks', 'FALSE'" -o
%OUTPUTPATH%\DisallowPageLocksLINEITEM.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"sp_indexoption 'ORDERS',
'disallowpagelocks', 'FALSE'" -o
%OUTPUTPATH%\DisallowPageLocksOrders.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -I -d%DB% -i CreateRF1Proc.sql -o
%OUTPUTPATH%\CreateRF1Proc.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -I -d%DB% -i CreateRF2Proc.sql -o
%OUTPUTPATH%\CreateRF2Proc.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"exec sp_tableoption
'NATION', 'pintable', '1'" -o %OUTPUTPATH%\pinNATION.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"exec sp_tableoption
'REGION', 'pintable', '1'" -o %OUTPUTPATH%\pinREGION.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
rem
rem osql -Usa -P%PW% -d%DB% -Q"exec sp_tableoption
'SUPPLIER', 'pintable', '1'" -o %OUTPUTPATH%\pinSUPPLIER.out -b
rem if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -Q"sp_dboption %DB%, 'torn', 'FALSE'" -b
>%OUTPUTPATH%\dboptionTornOFF.out
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -Q"sp_dboption %DB%, 'trunc', 'FALSE'" -b
>%OUTPUTPATH%\dboptionTrunOFF.out
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -Q"sp_dboption %DB%, 'select', 'FALSE'" -b
>%OUTPUTPATH%\dboptionSelOFF.out
if ERRORLEVEL 1 goto :ERROR_EXIT

osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values ('Cleanup
end', getdate())" -b
if ERRORLEVEL 1 goto :ERROR_EXIT

:BACKUP
rem
rem BACKUP is the final step, using a script
rem

if NOT '%DoBACKUP%' == 'TRUE' goto :ENDSTATS

echo Starting Backup
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values ('Backup
start', getdate())" -b
if ERRORLEVEL 1 goto :ERROR_EXIT
echo Deleting LoadFg filegroup
osql -Usa -P%PW% -d%DB% -i %DB%\DelLoadFG.sql -o
%OUTPUTPATH%\DelLoadFG.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -i %DB%\Backup.sql -o
%OUTPUTPATH%\Backup.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values ('Backup
end', getdate())" -b
if ERRORLEVEL 1 goto :ERROR_EXIT

:ENDSTATS

```

```

if NOT '%DoENDSTATS%' == 'TRUE' goto :EOF

osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values ('LOAD
end', getdate())"
osql -Usa -P%PW% -d%DB% -Q"select TIMESTAMP from LOADTIMES
where STEP='LOAD end'" -o %OUTPUTPATH%\LoadEND.out
bcp %DB%..LOADTIMES out %OUTPUTPATH%\LOADTIMES.bcp -Usa
-P%PW% -n
echo Last step is to run Francois' dbtables-ms.sql script
osql -Usa -P%PW% -d%DB% -i dbtables-ms.sql -o
%OUTPUTPATH%\dbtables-ms.out
osql -Usa -P%PW% -d%DB% -i SetupReport.sql -o
%OUTPUTPATH%\SetupReport.out
rem echo Optional step to check database validity
rem osql -Usa -P%PW% -dtpch300g -Q"dbcc checkdb('tpch300g') with
PHYSICAL_ONLY" -o %OUTPUTPATH%\CheckDb.out
rem echo Optional, and very expensive, step to check LINEITEM and
ORDERS validity
rem osql -Usa -P%PW% -dtpch300g -Q"dbcc checktable('LINEITEM')" -o
%OUTPUTPATH%\CheckLINEITEM.out
rem osql -Usa -P%PW% -dtpch300g -Q"dbcc checktable('ORDERS')" -o
%OUTPUTPATH%\CheckORDERS.out
echo Done! Check for output in %OUTPUTPATH%
goto :EOF

:ERROR_EXIT
echo Setup aborted due to errors
echo Check output in %OUTPUTPATH%
exit /B

F.2 Run.cmd

echo off

rem
rem Modify the following parameters for your configuration
rem
rem This version pulls the Update Files from
rem %UPDATEDRIVE%<segment>%UPDATEDIR%
rem

set DB=tpch100g
set HOMEDRIVE=N:
set HOMEDIR=\HP_TPCH_KIT\Run
set OUTPUTDRIVE=N:
set OUTPUTDIR=\HP_TPCH_KIT\Output
set UPDATEDRIVE=N:
set UPDATEDIR=\HP_UF_Flatfiles
set UPDATESSET=7
set UPDATESEGMENTS=16
set SEED=628214831
set SCALEFACTOR=100
set STREAMS=5

set DoRESTORE=FALSE
set DoSETUP=TRUE
set DoPOWER=TRUE
set DoPOWERRefresh=TRUE
set DoPOWERStream0=TRUE
set DoTHROUGHPUT=TRUE

%HOMEDRIVE%
cd %HOMEDIR%

if %1' == 'RF1' goto RF1
if %1' == 'RF1_LOAD' goto RF1_LOAD
if %1' == 'RF2' goto RF2

```

```

if '%1' == 'RF2_LOAD' goto RF2_LOAD
if '%1' == 'THROUGHPUT_STREAM' goto :THROUGHPUT_STREAM

echo Checking for existence of HOMEDIR and OUTPUTDIR
if NOT EXIST %HOMEDRIVE%%HOMEDIR% goto :ERROR_EXIT
if NOT EXIST %OUTPUTDRIVE%%OUTPUTDIR% goto :ERROR_EXIT

set OUTPUTNUMBER=1
:OUTPUTLOOP
if NOT EXIST
%OUTPUTDRIVE%%OUTPUTDIR%\%OUTPUTNUMBER% goto
:OUTPUTLOOPEND
set /a OUTPUTNUMBER=%OUTPUTNUMBER%+1
goto :OUTPUTLOOP
:OUTPUTLOOPEND
set
OUTPUTPATH=%OUTPUTDRIVE%%OUTPUTDIR%\%OUTPUTNUM
BER%
echo Output will be found at %OUTPUTPATH%
mkdir %OUTPUTPATH%
rem
rem Create the TIMES table
rem
sqlcmd -I -E -d%DB% -Q"if exists (select * from sysindexes where name =
'TIMES') drop table TIMES"
sqlcmd -I -E -d%DB% -Q"create table TIMES(QUERY char(5),STREAM
int,START datetime)"

if NOT '%DoRESTORE%' == 'TRUE' goto :SETUP

rem
rem Use the Restore.sql script in SETUP
rem

echo Starting Restore
sqlcmd -I -E -i ..\Setup\%DB%\Restore.sql -b
sqlcmd -I -E -d%DB% -i ..\Setup\CreateRF1Proc.sql
sqlcmd -I -E -d%DB% -i ..\Setup\CreateRF2Proc.sql
if ERRORLEVEL 1 goto :ERROR_EXIT

:SETUP
if NOT '%DoSETUP%' == 'TRUE' goto :POWER

rem
rem Create the Power and five Throughput Streams
rem

echo QGening the Power and Throughput Streams
pushd templates
for /l %%i in (0,1,%STREAMS%) do call :SETUP1 %%i
for /l %%i in (1,1,%STREAMS%) do echo insert into TIMES values
('QXX',%%i,getdate())>> %HOMEDIR%\Stream%%i.sql
for /l %%i in (1,1,%STREAMS%) do echo go>>
%HOMEDIR%\Stream%%i.sql
for /l %%i in (0,1,%STREAMS%) do copy %HOMEDIR%\Stream%%i.sql
%OUTPUTPATH%
popd
goto :SETUP2

:SETUP1
echo Qgening using seed %SEED%
%HOMEDIR%\qgen -s %SCALEFACTOR% -r %SEED% -p%1 >
%HOMEDIR%\Stream%1.sql
set /a SEED=%SEED% + 1
goto :EOF

:SETUP2

rem

```

```

rem Begin POWER run
rem

rem
rem Execute the RF1 Transaction set in parallel
rem

:POWER
if NOT '%DoPOWER%' == 'TRUE' goto :THROUGHPUT
sqlcmd -I -E -d%DB% -Q"truncate table TIMES"
echo Beginning Power Run
if NOT '%DoPOWERRefresh%' == 'TRUE' goto :STREAM0

echo Running the RF1s
set /a UPDATE_SEGMENT=%1+%UPDATESET%
sqlcmd -I -E -d%DB% -Q"insert into TIMES values ('RF1',0,getdate())"
sqlcmd -I -E -d%DB% -iRF_Procs\RF1_init.sql -o
%OUTPUTPATH%\RF1_%UPDATE_SEGMENT%_init.out -b
for /l %%i in (1,1,%UPDATESEGMENTS%) do start /HIGH cmd /c Run
RF1_LOAD %%i %UPDATE_SEGMENT%
semaphore -wait RF1_LOAD -count %UPDATESEGMENTS%
sqlcmd -I -E -d%DB% -iRF_Procs\RF1_index.sql -o
%OUTPUTPATH%\RF1_%UPDATE_SEGMENT%_index.out -b
for /l %%i in (1,1,%UPDATESEGMENTS%) do start /HIGH cmd /C Run
RF1 %%i 10 %UPDATESEGMENTS% %UPDATESEGMENTS%
%UPDATE_SEGMENT%
semaphore -wait RF1 -count %UPDATESEGMENTS%

rem
rem Execute the PowerRun Queries
rem

:STREAM0
if NOT '%DoPOWERStream0%' == 'TRUE' goto :STREAM0_DONE
echo Running Stream0
sqlcmd -I -E -d%DB% -iStream0.sql -o %OUTPUTPATH%\Stream0.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
:STREAM0_DONE

rem
rem Execute the RF2 Transaction set in Parallel
rem

if NOT '%DoPOWERRefresh%' == 'TRUE' goto :POWERDONE
echo Running the RF2s
sqlcmd -I -E -d%DB% -Q"insert into TIMES values ('RF2',0,getdate())"
sqlcmd -I -E -d%DB% -iRF_Procs\RF2_init.sql -o
%OUTPUTPATH%\RF2_%UPDATE_SEGMENT%_init.out -b
for /l %%i in (1,1,%UPDATESEGMENTS%) do start /HIGH cmd /c Run
RF2_LOAD %%i %UPDATE_SEGMENT%
semaphore -wait RF2_LOAD -count %UPDATESEGMENTS%
sqlcmd -I -E -d%DB% -iRF_Procs\RF2_index.sql -o
%OUTPUTPATH%\RF2_%UPDATE_SEGMENT%_index.out -b
for /l %%i in (1,1,%UPDATESEGMENTS%) do start /HIGH cmd /C Run
RF2 %%i 10 %UPDATESEGMENTS% %UPDATESEGMENTS%
%UPDATE_SEGMENT%
semaphore -wait RF2 -count %UPDATESEGMENTS%

:POWERDONE
sqlcmd -I -E -d%DB% -Q"insert into TIMES values ('QXX',0,getdate())" -
1300

rem
rem Execute the THROUGHPUT Run
rem

:THROUGHPUT
if NOT '%DoTHROUGHPUT%' == 'TRUE' goto :DONE

```

echo Running the Throughput Streams

```
for /I %%i in (1,1,%STREAMS%) do start /abovenormal cmd /C Run
THROUGHPUT_STREAM %%i
sqlcmd -I -E -d%DB% -Q"insert into TIMES values ('RF1',1,getdate())"
semaphore -wait THROUGHPUT_QUERIES -count %STREAMS%

for /I %%j in (1,1,%STREAMS%) do call :THROUGHPUT_REFRESH
%%j
goto :DONE

:THROUGHPUT_STREAM
sqlcmd -I -E -d%DB% -iStream%2.sql -o
%OUTPUTPATH%\Stream%2.out
semaphore -release THROUGHPUT_QUERIES
goto :EOF

:THROUGHPUT_REFRESH
if %1 neq 1 sqlcmd -I -E -d%DB% -Q"insert into TIMES values
('RF1',%1,getdate())"
set /a UPDATE_SEGMENT=%1+%UPDATESET%

sqlcmd -I -E -d%DB% -iRF_Procs\RF1_init.sql -o
%OUTPUTPATH%\RF1_%UPDATE_SEGMENT%_init.out -b
for /I %%i in (1,1,%UPDATESEGMENTS%) do start /HIGH cmd /c Run
RF1_LOAD %%i %UPDATE_SEGMENT%
semaphore -wait RF1_LOAD -count %UPDATESEGMENTS%
sqlcmd -I -E -d%DB% -iRF_Procs\RF1_index.sql -o
%OUTPUTPATH%\RF1_%UPDATE_SEGMENT%_index.out -b
for /I %%i in (1,1,%UPDATESEGMENTS%) do start /HIGH cmd /C Run
RF1 %%i 10 %UPDATESEGMENTS% %UPDATESEGMENTS%
%UPDATE_SEGMENT%
semaphore -wait RF1 -count %UPDATESEGMENTS%

sqlcmd -I -E -d%DB% -Q"insert into TIMES values ('RF2',%1,getdate())"
sqlcmd -I -E -d%DB% -iRF_Procs\RF2_init.sql -o
%OUTPUTPATH%\RF2_%UPDATE_SEGMENT%_init.out -b
for /I %%i in (1,1,%UPDATESEGMENTS%) do start /HIGH cmd /c Run
RF2_LOAD %%i %UPDATE_SEGMENT%
semaphore -wait RF2_LOAD -count %UPDATESEGMENTS%
sqlcmd -I -E -d%DB% -iRF_Procs\RF2_index.sql -o
%OUTPUTPATH%\RF2_%UPDATE_SEGMENT%_index.out -b
for /I %%i in (1,1,%UPDATESEGMENTS%) do start /HIGH cmd /C Run
RF2 %%i 10 %UPDATESEGMENTS% %UPDATESEGMENTS%
%UPDATE_SEGMENT%
semaphore -wait RF2 -count %UPDATESEGMENTS%

sqlcmd -I -E -d%DB% -Q"insert into TIMES values ('RFX',%1,getdate())"
goto :EOF

rem
rem Final Step -- Write out completion to Log
rem

:DONE
sqlcmd -E -d%DB% -iReport.sql -o%OUTPUTPATH%\Report.out -w120
bcp %DB%..TIMES out %OUTPUTPATH%\TIMES.bcp -Usa -P -n
osql -E -e -I -w300 -d %DB% -Q"select * from TIMES" -
o%OUTPUTPATH%\times.out
rem ----- Get SQL Configuration
sqlcmd -I -E -Q"sp_configure 'show advanced',1"
sqlcmd -I -E -Q"reconfigure with override"
sqlcmd -I -E -n -s, -w300 -Q"sp_configure" -
o%OUTPUTPATH%\configure.out
rem ----- Get SQL Version
sqlcmd -I -E -n -w300 -e -Q"select @@version" -
o%OUTPUTPATH%\sqlversion.out
sqlcmd -I -E -n -w300 -e -Q"sp_helpdb %DB%" -
o%OUTPUTPATH%\db.out
```

```
sqlcmd -I -E -n -w300 -e -Q"sp_dboption %DB%" -
o%OUTPUTPATH%\dboption.out
sqlcmd -I -E -n -w300 -e -Q"sp_helpsort" -o%OUTPUTPATH%\sort.out
sqlcmd -I -E -n -w300 -e -d%DB% -locking.sql -
o%OUTPUTPATH%\locking.out
rem ----- Get query plans
@echo set showplan_all on >%OUTPUTPATH%\stream.sql
@echo go >>%OUTPUTPATH%\stream.sql
type stream0.sql >>%OUTPUTPATH%\stream.sql
sqlcmd -I -E -d%DB% -n -w3000 -i%OUTPUTPATH%\stream.sql -
o%OUTPUTPATH%\plans.out

rem ----- Get Boot.ini
TYPE c:\boot.ini >%OUTPUTPATH%\boot.ini
reg query "HKLM\SYSTEM\CurrentControlSet\Control\Session
Manager\IO System" /s >%OUTPUTPATH%\session.reg
reg query
"HKLM\SYSTEM\CurrentControlSet\Services\hpqcissb\Parameters" /s
>%OUTPUTPATH%\array.reg
reg query "HKLM\SYSTEM\CurrentControlSet\Control\PriorityControl" /s
>%OUTPUTPATH%\priority.reg

echo Done! Output can be found at %OUTPUTPATH%
goto :EOF

rem
rem Subroutine for Loading data for RF1s
rem called from RF1 and THROUGHPUT_RF1
rem

:RF1_LOAD
set "SQLTEXT=bulk insert NEWLINEITEM from
'%UPDATEDRIVE%%UPDATEDIR%\Lineitem.tbl.u%3.%2' with
(FieldTerminator = '|', RowTerminator ='\n',tablock)"
OSQL -I -E -l 120 -d%DB% -Q"%SQLTEXT%" -o
%OUTPUTPATH%\RF1_load_lineitem_%2_%3.out
set "SQLTEXT=bulk insert NEWORDERS from
'%UPDATEDRIVE%%UPDATEDIR%\Orders.tbl.u%3.%2' with
(FieldTerminator = '|', RowTerminator ='\n',tablock)"
OSQL -I -E -l 120 -d%DB% -Q"%SQLTEXT%" -o
%OUTPUTPATH%\RF1_load_orders_%2_%3.out
semaphore -release RF1_LOAD
goto :EOF

rem
rem Subroutine for Executing RF1s
rem called from RF1 and THROUGHPUT_RF1
rem

:RF1
OSQL -I -E -l 120 -d%DB% -Q"exec RF1 %2,%3,%4,%5" -o
%OUTPUTPATH%\RF1_%2_%6.out
semaphore -release RF1
goto :EOF

rem
rem Subroutine for Executing RF2s
rem called from RF2 and THROUGHPUT_RF2
rem

:RF2_LOAD
set "SQLTEXT=bulk insert OLDORDERS_%2 from
'%UPDATEDRIVE%%UPDATEDIR%\Delete.u%3.%2' with
(FieldTerminator = '|', RowTerminator ='\n',tablock)"
sqlcmd -I -E -l 120 -d%DB% -Q"%SQLTEXT%" -o
%OUTPUTPATH%\RF2_load_orders_%2_%3.out
```

```

sqlcmd -I -E -I 120 -d%DB% -Q"insert into MOD_OLDORDERS
(O_ORDERDATE, O_ORDERKEY) (select B.O_ORDERDATE,
B.O_ORDERKEY from OLDORDERS_%2 A, ORDERS B where
A.O_ORDERKEY = B.O_ORDERKEY)" -o
%OUTPUTPATH%\RF2_insert_orders_%2_%3.out
semaphore -release RF2_LOAD
goto :EOF

```

```

:RF2
OSQL -I -E -I 120 -d%DB% -Q"exec RF2 %2,%3,%4,%5" -o
%OUTPUTPATH%\RF2_%2_%3.out
semaphore -release RF2
goto :EOF

```

```

:ERROR_EXIT
echo Run aborted due to error
echo Check output in %OUTPUTPATH%
exit /B

```

F.3 Semaphore.cpp

```

#define _WIN32_WINNT 0x0400
#include <windows.h>
#include <string.h>
#include <iostream.h>
#include <stdlib.h>
#include <stdio.h>
#include <assert.h>
void main(int argc, char **argv)
{
typedef enum { eUnknown, eWait, eSignal, eRelease, eWaitList,
eWaitGroup } OPERATION;
OPERATION eOP = eUnknown;
int iCount;
int i;
HANDLE hSemaphore;
HANDLE *pHandles;
SYSTEMTIME Time;
if (argc < 3)
goto usage;
if (_stricmp(argv[1], "-wait") == 0)
eOP = eWait;
else if (_stricmp(argv[1], "-signal") == 0)
eOP = eSignal;
else if (_stricmp(argv[1], "-release") == 0)
eOP = eRelease;
else if (_stricmp(argv[1], "-waitlist") == 0)
eOP = eWaitList;
else if (_stricmp(argv[1], "-waitgroup") == 0)
eOP = eWaitGroup;
else goto usage;
if ((eOP == eWait) || (eOP == eRelease))
{
// argv[2] is the semaphore name
// if -count option specified, then there must be exactly 5 args
if ((argc == 5) && (_stricmp(argv[3], "-count") == 0))
{
iCount = atoi(argv[4]);
if (iCount < 1)
goto usage;
}
// check that

```

```

else if (argc != 3)
goto usage;
else
iCount = 1;
}
else if (eOP == eWaitGroup)
{
if ((argc != 5) || (_stricmp(argv[3], "-count") != 0))
goto usage;
iCount = atoi(argv[4]);
if (iCount < 1)
goto usage;
}
else
// eWaitList or eSignal
iCount = argc - 2;
if (eOP == eWait)
{
printf("semaphore name = %s\n", argv[2]);
printf("semaphore count = %d\n", iCount);
hSemaphore = CreateSemaphore( NULL, 0, 200000000,
argv[2] );
if (hSemaphore == NULL)
{
DWORD dwError = GetLastError();
cout << "ERROR* CreateSemaphore returned "
<< dwError << endl;
exit(EXIT_FAILURE);
}
for (i=0; i<iCount; i++)
{
WaitForSingleObject( hSemaphore, INFINITE );
GetLocalTime( &Time );
printf( "%4.4d-%2.2d-%2.2d %2.2d:%2.2d:%2.2d
- released\n",
Time.wYear, Time.wMonth,
Time.wDay, Time.wHour, Time.wMinute, Time.wSecond );
}
CloseHandle( hSemaphore );
}
else if ((eOP == eWaitGroup) || (eOP == eWaitList))
{
char **szEventNames;
szEventNames = new char*[iCount];
char szTmp[128];
printf("event-list =");
for (i=0; i<iCount; i++)
{
if (eOP == eWaitGroup)
{
wsprintf( szTmp, "%s.%d", argv[2],
i+1 );
szEventNames[i] = new
char[strlen(szTmp)+1];
strcpy( szEventNames[i], szTmp );
}
else
{
szEventNames[i] = new
char[strlen(argv[i+2])+1];
strcpy( szEventNames[i], argv[i+2] );
}
printf( " %s", szEventNames[i] );
}
printf( "\n" );
pHandles = new HANDLE[iCount-1];
for (i=0; i<iCount; i++)
{
pHandles[i] = CreateEvent( NULL, TRUE /*
manual reset */, FALSE /* initially non-signaled */, szEventNames[i] );

```

```

if (pHandles[i] == NULL)
{
    DWORD dwError = GetLastError();
    cout << "ERROR" CreateEvent
    returned " << dwError << endl;
    exit(EXIT_FAILURE);
}
}
for (i=iCount; i>0;i--)
{
    int idx = WaitForMultipleObjects( i, pHandles,
    FALSE /* wait for all */, INFINITE ) - WAIT_OBJECT_0;
    GetLocalTime( &Time );
    printf( "%4.4d-%2.2d-%2.2d %2.2d:%2.2d:%2.2d
    - signaled: %s \n",
    Time.wYear, Time.wMonth,
    Time.wDay, Time.wHour, Time.wMinute, Time.wSecond, szEventNames[idx] );
    HANDLE hTmp = pHandles[idx];
    pHandles[idx] = pHandles[i-1];
    pHandles[i-1] = hTmp;
    char* szTmp = szEventNames[idx];
    szEventNames[idx] = szEventNames[i-1];
    szEventNames[i-1] = szTmp;
}
for (i=0; i<iCount; i++)
CloseHandle( pHandles[i] );
}
else if (eOP == eRelease)
{
    hSemaphore = OpenSemaphore(
    SEMAPHORE_MODIFY_STATE, FALSE, argv[2] );
    if (hSemaphore == NULL)
    {
        DWORD dwError = GetLastError();
        cout << "ERROR" OpenSemaphore returned "
        << dwError << endl;
        exit(EXIT_FAILURE);
    }
    if (!ReleaseSemaphore( hSemaphore, iCount, NULL ))
    {
        DWORD dwError = GetLastError();
        cout << "ERROR" ReleaseSemaphore returned
        " << dwError << endl;
        exit(EXIT_FAILURE);
    }
    CloseHandle( hSemaphore );
}
else if (eOP == eSignal)
{
    for (i=0; i<iCount; i++)
    {
        HANDLE hHandle = OpenEvent(
        EVENT_MODIFY_STATE, FALSE, argv[i+2] );
        if (hHandle == NULL)
        {
            DWORD dwError = GetLastError();
            cout << "ERROR" OpenEvent
            returned " << dwError << endl;
            exit(EXIT_FAILURE);
        }
        SetEvent( hHandle );
        CloseHandle( hHandle );
    }
}
exit(EXIT_SUCCESS);
// syntax was bad; show usage and quit
usage:
printf(
"Semaphore Utility - Ver. 1.2 - 26-Jul-99 \n"
"Copyright (C) Microsoft Corp 1999. All rights reserved.\n\n"

```

```

"usage: \n"
" semaphore { -wait | -release } <semaphore-name> [ -count
<count> ] \n"
" semaphore { -waitlist | -signal } <event-list> \n"
" semaphore -waitgroup <event-prefix> -count <count>\n"
"\n"
"<semaphore-name> == alpha-numeric identifier \n"
"<count> == integer > 0; default value = 1 \n"
"<event-list> == { <event-name> ... } \n"
"<event-name> == alpha-numeric identifier \n"
"<event-prefix> == alpha-numeric identifier \n"
"\n"
"There are two modes to choose from: a semaphore or a list
of events. \n"
"\n"
"Semaphore mode: \n"
"A semaphore is a single identifier with an associated count.
Each time \n"
"the semaphore is released, the count is decremented by one
(or the amount \n"
"specified). When the count reaches zero, the waiter
completes. If there \n"
"are multiple waiters on the same semaphore, each release
releases only \n"
"the number of waiters specified in count.\n"
"\n"
"List of Events: \n"
"A list of events (alpha-numeric tags) is specified for the
waiter. The \n"
"waiter doesn't complete until all of the events have been
signaled. A \n"
"given event may be signaled more than once. There are two
ways to define \n"
"the list of events, either explicitly (-waitlist) by naming all of
them or \n"
"implicitly (-waitgroup) with a prefix and a count. Using the -waitgroup
\n"
"option, you provide an alpha-numeric tag which is used as
the prefix for a \n"
"group of events. The event names are generated by
concatenating the prefix \n"
"with \"<n>\", where <n> is 1 to the specified count. \n"
);
exit(EXIT_FAILURE);
}

```

F.4 Print.C for DBGEN

```

/*
 * $Id: print.c,v 1.2 2005/01/03 20:08:59 jms Exp $
 *
 * Revision History
 * =====
 * $Log: print.c,v $
 * Revision 1.2 2005/01/03 20:08:59 jms
 * change line terminations
 *
 * Revision 1.1.1.1 2004/11/24 23:31:47 jms
 * re-establish external server
 *
 * Revision 1.4 2004/02/18 16:26:49 jms
 * 32/64 bit changes for overflow handling needed additional changes when ported
back to windows
 *
 * Revision 1.3 2004/02/18 14:05:53 jms

```

```

* porting changes for LINUX and 64 bit RNG
*
* Revision 1.2 2004/01/22 05:49:29 jms
* AIX porting (AIX 5.1)
*
* Revision 1.1.1.1 2003/08/07 17:58:34 jms
* recreation after CVS crash
*
* Revision 1.2 2003/08/07 17:58:34 jms
* Convery RNG to 64bit space as preparation for new large scale RNG
*
* Revision 1.1.1.1 2003/04/03 18:54:21 jms
* initial checkin
*
*/
/* generate flat files for data load */
#include <stdio.h>
#ifdef VMS
#include <sys/types.h>
#endif
#ifdef SUN
#include <unistd.h>
#endif
#include <math.h>

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

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

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

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

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

                            this_segment=++insert_orders_segment;
                        else

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

                            env_config(PATH_TAG, PATH_DFLT),

                                PATH_SEP,

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

                            PATH_DFLT),

                                PATH_SEP,

                                    tdefs[table].name,

                                        update);
                    }
                else /* deletes */

```

```

if ( delete_segments )
    {
        ++delete_segment;
        sprintf(upath,

"%s%cdelete.u%d.%d",

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

env_config(PATH_TAG,

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

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

    switch(format)
    {
        case DT_STR:
            if (columnar)
                fprintf(target, "%-s", len, (char *)data);
            else
                fprintf(target, "%s", (char *)data);
            break;

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

```

```

        case DT_CHR:
            if (columnar)
                fprintf(target, "%c", *(char *)data);
            else
                fprintf(target, "%c", *(char *)data);
            break;
        }
#ifdef EOL_HANDLING
        if (sep)
#endif /* EOL_HANDLING */
        if (!columnar)
            fprintf(target, "%c", SEPARATOR);

        return(0);
    }

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

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

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

    return(0);
}

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

    if (fp_o == NULL || mode != last_mode)
    {
        if (fp_o)
            fclose(fp_o);
        fp_o = print_prep(ORDER, mode);
        last_mode = mode;
    }
    PR_START(fp_o);
    PR_STR(fp_o, o->odate, DATE_LEN);
    PR_HUGE(fp_o, &o->okey);
    PR_HUGE(fp_o, &o->custkey);
    PR_STR(fp_o, o->opriority, O_OPRIO_LEN);
    PR_INT(fp_o, o->spriority);
    PR_STR(fp_o, o->clerk, O_CLRK_LEN);
    PR_CHR(fp_o, &o->orderstatus);
    PR_MONEY(fp_o, &o->totalprice);
    PR_VSTR_LAST(fp_o, o->comment,
                (columnar)?(long)(ceil(O_CMNT_LEN * V_STR_HGH)):o->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_START(fp_l);
        PR_STR(fp_l, o->l[i].sdate, DATE_LEN);
        PR_HUGE(fp_l, &o->l[i].okey);
        PR_MONEY(fp_l, &o->l[i].discount);
        PR_MONEY(fp_l, &o->l[i].eprice);
        PR_HUGE(fp_l, &o->l[i].suppkey);
        PR_HUGE(fp_l, &o->l[i].quantity);
        PR_CHR(fp_l, &o->l[i].rflag[0]);
        PR_HUGE(fp_l, &o->l[i].partkey);
        PR_CHR(fp_l, &o->l[i].lstatus[0]);
        PR_MONEY(fp_l, &o->l[i].tax);
        PR_STR(fp_l, o->l[i].cdate, DATE_LEN);
        PR_STR(fp_l, o->l[i].rdate, DATE_LEN);
        PR_STR(fp_l, o->l[i].shipmode, L_SMODE_LEN);
        PR_HUGE(fp_l, &o->l[i].lcnt);
        PR_STR(fp_l, o->l[i].shipinstruct, L_INST_LEN);
        PR_VSTR_LAST(fp_l, o->l[i].comment,
                    (columnar)?(long)(ceil(L_CMNT_LEN * V_STR_HGH)):o->l[i].clen);
        PR_END(fp_l);
    }

    return(0);
}

/*
 * print the numbered order *and* its associated lineitems
 */
int
pr_order_line(order_t *o, int mode)
{
    tdefs[ORDER].name = tdefs[ORDER_LINE].name;
    pr_order(o, mode);
    pr_line(o, mode);

    return(0);
}

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

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

```



```

PR_START(p_fp);
PR_HUGE(p_fp, &part->partkey);
PR_VSTR(p_fp, part->type,
  (columnar)?(long)P_TYPE_LEN:part->tlen);
PR_HUGE(p_fp, &part->size);
PR_STR(p_fp, part->brand, P_BRND_LEN);
PR_VSTR(p_fp, part->name,
  (columnar)?(long)P_NAME_LEN:part->nlen);
PR_STR(p_fp, part->container, P_CNTR_LEN);
PR_STR(p_fp, part->mfgr, P_MFG_LEN);
PR_MONEY(p_fp, &part->retailprice);
PR_VSTR_LAST(p_fp, part->comment,
  (columnar)?(long)(ceil(P_CMNT_LEN * V_STR_HGH)):part->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_START(ps_fp);
    PR_HUGE(ps_fp, &part->s[i].partkey);
    PR_HUGE(ps_fp, &part->s[i].supkey);
    PR_MONEY(ps_fp, &part->s[i].scost);
    PR_HUGE(ps_fp, &part->s[i].qty);
    PR_VSTR_LAST(ps_fp, part->s[i].comment,
      (columnar)?(long)(ceil(PS_CMNT_LEN * V_STR_HGH)):part->s[i].clen);
    PR_END(ps_fp);
  }

  return(0);
}

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

  return(0);
}

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

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

  PR_START(fp);
  PR_HUGE(fp, &supp->suppkey);
  PR_HUGE(fp, &supp->nation_code);

```

```

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

return(0);
}

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

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

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

  return(0);
}

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

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

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

  return(0);
}

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

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

  if (last_num != num)
  {
    if (dfp)
      fclose(dfp);

```

```

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

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

            print_prep(tbl, -num);

            NULL) return(-1);

            num;

            rows_this_segment=1;

        }

        PR_START(dfp);
        PR_HUGE(dfp, &new);
        PR_END(dfp);
    }
    start = new;
    last = new;
}
if (gen_rng)
{
    PR_START(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_START(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_START(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_START(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);
}

```

Appendix G: Price Quotations & Verification

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

Tel 425 882 8080
Fax 425 936 7329
<http://www.microsoft.com/>

Microsoft

July 25, 2007

Hewlett-Packard Company
Daniel Pol
20555 SH 249
Houston, TX 77070

Mr. Pol:

Here is the information you requested regarding pricing for several Microsoft products to be used in conjunction with your TPC-H benchmark testing.

All pricing shown is in US Dollars (\$).

Part Number	Description	Unit Price	Quantity	Price
228-04026	SQL Server 2005 Standard Edition (x64) <i>Per Processor License</i> <i>Discount Schedule: No Discounts Applied</i>	\$5,999	1	\$5,999
P73-01675	Windows Server 2003 R2 Standard x64 Edition <i>Server License Only - No CALs</i> <i>Discount Schedule: No Discounts Applied</i>	\$999	1	\$999
N/A	Microsoft Problem Resolution Services <i>Professional Support</i> <i>(1 Incident)</i>	\$245	1	\$245

All products are currently orderable through Microsoft's normal distribution channels. A list of Microsoft's authorized resellers can be found at:
<http://www.microsoft.com/products/info/render.aspx?view=22&type=mpn&content=22/licensing>.

Defect support is included in the purchase price. Additional support is available from Microsoft PSS on an incident by incident basis at \$245 per call.

This quote is valid for the next 90 days.

If we can be of any further assistance, please contact Jamie Reding at (425) 703-0510 or jamiere@microsoft.com.

Reference ID: PHdapo0707251336.
Please include this Reference ID in any correspondence regarding this price quote.