



Hewlett-Packard Company

TPC Benchmark™ H
Full Disclosure Report
for
HP ProLiant DL580G2 4P
using
Microsoft SQL Server 2000 Enterprise Edition
and
Windows Server 2003, Enterprise Edition

First Edition
August 2003

First Edition – August, 2003

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Abstract

Overview

This report documents the methodology and results of the TPC Benchmark™ H test conducted on the HP ProLiant DL580G2 using Microsoft SQL Server 2000 Enterprise Edition SP3, in conformance with the requirements of the TPC Benchmark™ H Standard Specification, Revision 2.0. The operating system used for the benchmark was Microsoft Windows 2003 Enterprise Edition.

The benchmark results are summarized in the following table.

| Hardware | Software | Total System Cost | QppH @ 100GB | QthH @ 100GB | QphH @ 100GB | \$ / QphH @ 100GB |
|-------------------------------|--|--------------------------|---------------------|---------------------|---------------------|--------------------------|
| HP ProLiant DL580G2 4P | Microsoft SQL Server 2000 SP3 Windows Server 2003, Enterprise Edition | \$97,498 | 3558.5 | 1907.8 | 2605.6 | \$ 38 |

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.

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

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or

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P.O. Box 692000
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Standard and Executive Summary Statements

Pages ii-iv contains the Executive Summary and Numerical Quantities Summary of the benchmark results for the HP ProLiant DL580G2.

Auditor

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



HP ProLiant DL580G2 4P

TPC-H Rev. 2.0

Report Date:
Aug 15, 2003

Total System Cost

\$97,498

Composite Query per Hour Metric

2,605.6
QphH@100GB

Price / Performance

\$38
\$/ QphH@100GB

Database Size

100GB

Database Manager

Microsoft SQL Server 2000 Enterprise Edition

Operating System

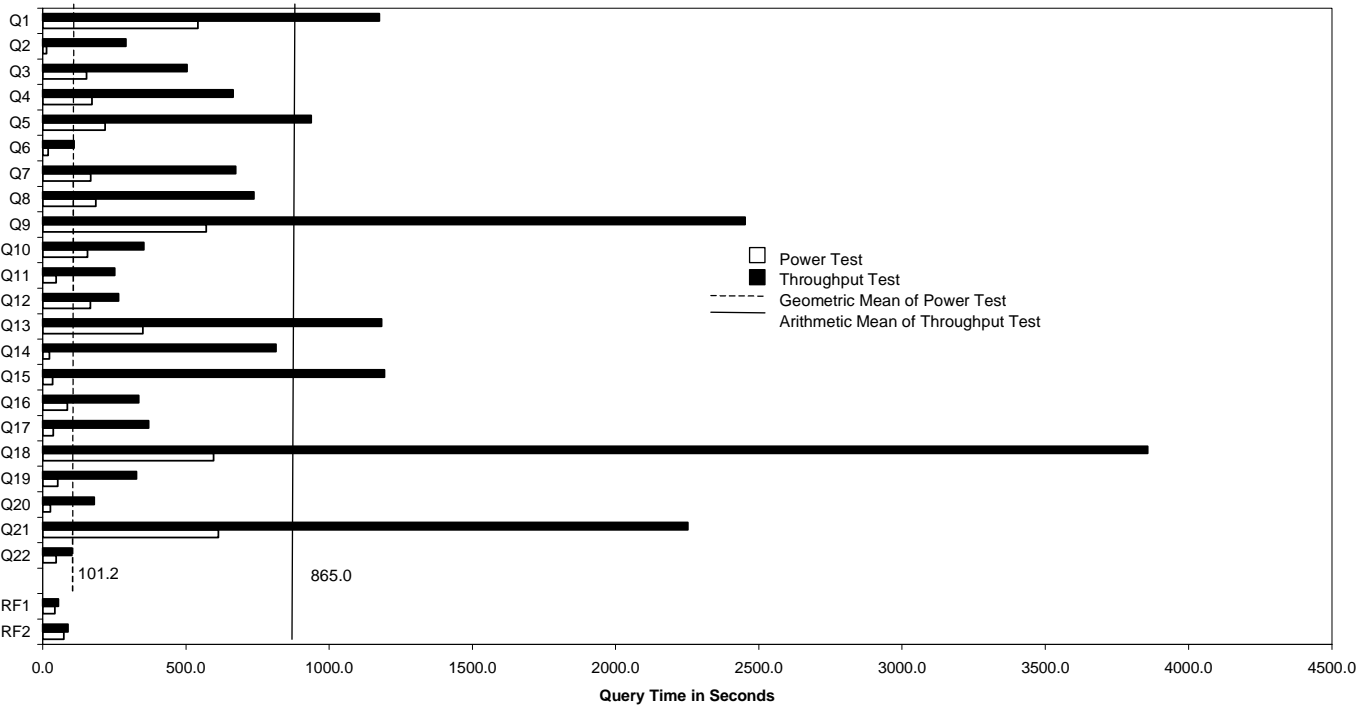
Windows Server 2003, Enterprise Edition

Other Software

Visual C++ .Net Standard

Availability Date

Aug 15, 2003



Database Load Time = 2:54:23

Load Included Backup: Y

Total Data Storage / Database Size = 12.52

RAID (Base tables only): N

RAID (Base tables and auxiliary data structures): N

RAID (All): N

System Configuration:

Processors : 4 x Intel Xeon MP 2.8 GHz with 2MB L2 cache
Memory : 4 GB memory
Disk Controllers : 5x Smart Array 5312
Disks : 74 x 18.2 GB 15K RPM drives
Total Disk Storage: 1252.1 GB

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



HP ProLiant DL580G2 4P

TPC-H Rev. 2.0

Report Date: 15-Aug-03

| Description | Part Number | Third Party | Unit Price | Qty | Extended Price | 3 yr. Maint. Price |
|---|------------------|----------------------|------------|-------|-----------------|--------------------|
| Server Hardware | | | | | | |
| | | Brand Pricing | | | | |
| ProLiant DL580 G2 2P 2.8GHz/2M/2GB | 325134-001 | 1 | 17,299 | 1 | 17,299 | |
| 2.8GHz/2MB processor (ML580 G2) | 325254-B21 | 1 | 5,899 | 2 | 11,798 | |
| 2GB (4x512MB) DDR ECC 200MHz Memory | 202171-B21 | 1 | 1,299 | 1 | 1,299 | |
| \$5500 15" Monitor | 261602-001 | 1 | 129 | 1 | 129 | |
| Scroll Mouse-Carbon | 231947-B21 | 1 | 5 | 1 | 5 | |
| PS/2 Easy Access Internet Keyboard | 265977-001 | 1 | 12 | 1 | 12 | |
| Rack Model 9142 (42U - Opal) - Flat Pallet | 120663-B21 | 1 | 1,321 | 1 | 1,321 | |
| Rack Sidewall Kit | 120670-B21 | 1 | 207 | 1 | 207 | |
| UPS T1500 XR | 204155-002 | 1 | 621 | 1 | 621 | |
| Servers 500 Series CarePak, 3yr 7x24, 4hr resp. | 401782-002 | 1 | 1,795 | 1 | | 1,795 |
| Subtotal | | | | | 32,691 | 1,795 |
| Storage | | | | | | |
| Smart Array 5312 Controller | 238633-B21 | 1 | 1,349 | 5 | 6,745 | |
| StorageWorks Enclosure Model 4354R - Rack-mountable | 190211-001 | 1 | 3,523 | 5 | 17,615 | |
| 18.2GB 15Krpm U320 UNI HDD - internal | 286775-B22 | 1 | 359 | 4 | 1,436 | |
| 18.2GB 15Krpm U320 UNI HDD - external | 286775-B22 | 1 | 359 | 70 | 25,130 | |
| 18.2GB 15Krpm U320 UNI HDD - 10% spares | 286775-B22 | 1 | 359 | 7 | 2,513 | |
| CarePak 43xx Enclosure, 3yr, 7x24, 4hr resp. | 171242-002 | 1 | 157 | 5 | | 785 |
| Subtotal | | | | | 53,439 | 785 |
| Hardware and Maintenance Discount | | | | | | |
| Large Purchase and Net 30 discount | 14.0% | 1 | | | (\$12,058) | (\$361) |
| Hardware Subtotal | | | | | 74,072 | 2,219 |
| Software | | | | | | |
| Microsoft SQL Server 2000 Enterprise Edition | 810-00652 | Microsoft | 2 | 5,549 | 1 | 5,549 |
| Database Server Support Package | PRO-PRORS-16U-01 | Microsoft | 2 | 1,950 | 3 | 5,850 |
| Microsoft SQL Server 2000 Client Licenses | 359-00532 | Microsoft | 2 | 146 | 50 | 7,300 |
| Microsoft Windows Server 2003 - Enterprise Edition | P72-00264 | Microsoft | 2 | 2,399 | 1 | 2,399 |
| Microsoft Visual C++ .NET Standard | 254-00170 | Microsoft | 2 | 109 | 1 | 109 |
| Subtotal | | | | | 15,357 | 5,850 |
| Total | | | | | \$89,429 | \$8,069 |

| | |
|----------------------------------|-----------------|
| 3-Year Cost of Ownership: | \$97,498 |
| QphH Rating: | 2605.6 |
| \$ / QphH@100GB: | \$38 |

Pricing: 1=HP; 2= Microsoft

Note: The benchmark results and test methodology were audited by Lorna Livingtree of Performance Metrics

Audited by: Lorna Livingtree of Performance Metrics Inc.

Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components. Individually negotiated discounts are not permitted. Special prices based on 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 DL580G2 4P

TPC-H Rev. 2.0

Report Date:
Aug 15, 2003

Numerical Quantities

Measurement Results:

| | |
|--|-----------------------|
| Database Scale Factor | = 100 |
| Total Data Storage / Database Size | = 12.52 |
| Start of Database Load | = 2003-07-03 21:05:35 |
| End of Database Load | = 2003-07-03 23:59:58 |
| Database Load Time | = 2:54:23 |
| Query Streams for Throughput Test | = 5 |
| TPC-H Power | = 3558.5 |
| TPC-H Throughput | = 1907.8 |
| TPC-H Composite Query-per-Hour Metric (QphH@100GB) | = 2605.6 |
| Total System Price Over 3 Years | = \$97,498 |
| TPC-H Price/ Performance Metric (\$/QphH@100GB) | = \$38 |

Measurement Intervals:

| | |
|--|-------------------|
| Measurement Interval in Throughput Test (Ts) | = 20757.4 seconds |
|--|-------------------|

Duration of Stream Execution:

| Stream ID | Seed | Start Date | Start time | Stop Date | Stop Time | Duration |
|-----------|-----------|------------|------------|-----------|-----------|----------|
| Stream00 | 703235958 | 7/4/2003 | 7:46:46 | 7/4/2003 | 9:00:06 | 1:13:19 |
| Stream01 | 703235959 | 7/4/2003 | 9:00:06 | 7/4/2003 | 14:13:21 | 5:13:15 |
| Stream02 | 703235960 | 7/4/2003 | 9:00:06 | 7/4/2003 | 14:26:53 | 5:26:46 |
| Stream03 | 703235961 | 7/4/2003 | 9:00:06 | 7/4/2003 | 14:34:09 | 5:34:03 |
| Stream04 | 703235962 | 7/4/2003 | 9:00:06 | 7/4/2003 | 14:30:19 | 5:30:13 |
| Stream05 | 703235963 | 7/4/2003 | 9:00:06 | 7/4/2003 | 13:41:42 | 4:41:35 |
| Refresh00 | | 7/4/2003 | 7:46:46 | 7/4/2003 | 9:00:06 | 1:13:19 |
| Refresh01 | | 7/4/2003 | 14:34:09 | 7/4/2003 | 14:36:21 | 0:02:12 |
| Refresh02 | | 7/4/2003 | 14:36:21 | 7/4/2003 | 14:38:46 | 0:02:25 |
| Refresh03 | | 7/4/2003 | 14:38:46 | 7/4/2003 | 14:41:12 | 0:02:26 |
| Refresh04 | | 7/4/2003 | 14:41:12 | 7/4/2003 | 14:43:39 | 0:02:27 |
| Refresh05 | | 7/4/2003 | 14:43:39 | 7/4/2003 | 14:46:04 | 0:02:25 |



HP ProLiant DL580G2 4P

TPC-H Rev. 2.0

Report Date:
Aug 15, 2003

TPC-H Timing Intervals (in seconds)

| Query | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 |
|-----------|--------|--------|-------|-------|--------|--------|--------|--------|
| Stream 00 | 542.0 | 13.1 | 153.0 | 172.3 | 218.8 | 19.9 | 167.5 | 185.4 |
| Stream 01 | 1069.7 | 87.9 | 644.8 | 509.7 | 1113.6 | 171.0 | 763.3 | 744.0 |
| Stream 02 | 1231.9 | 148.0 | 781.9 | 783.7 | 1000.4 | 39.4 | 638.6 | 732.8 |
| Stream 03 | 1103.3 | 395.2 | 152.1 | 648.1 | 972.9 | 102.6 | 750.1 | 1511.5 |
| Stream 04 | 1172.3 | 424.3 | 409.7 | 709.2 | 836.7 | 93.6 | 591.4 | 423.2 |
| Stream 05 | 1297.2 | 401.2 | 529.4 | 672.6 | 762.7 | 145.1 | 625.8 | 277.6 |
| Min Qi | 1069.7 | 87.9 | 152.1 | 509.7 | 762.7 | 39.4 | 591.4 | 277.6 |
| Max Qi | 1297.2 | 424.3 | 781.9 | 783.7 | 1113.6 | 171.0 | 763.3 | 1511.5 |
| Avg Qi | 1174.9 | 291.3 | 503.6 | 664.7 | 937.3 | 110.3 | 673.8 | 737.8 |
| Query | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 | Q16 |
| Stream 00 | 570.6 | 156.5 | 47.3 | 166.5 | 349.4 | 23.8 | 34.9 | 86.5 |
| Stream 01 | 2917.5 | 277.0 | 264.3 | 335.2 | 1170.6 | 587.4 | 1155.2 | 284.5 |
| Stream 02 | 1626.3 | 376.0 | 324.5 | 294.8 | 1144.3 | 1738.1 | 1216.5 | 399.6 |
| Stream 03 | 2453.8 | 423.8 | 331.6 | 176.2 | 1049.6 | 642.3 | 1428.4 | 239.5 |
| Stream 04 | 2976.6 | 335.0 | 205.3 | 271.3 | 1394.9 | 635.0 | 1434.0 | 425.5 |
| Stream 05 | 2284.4 | 352.0 | 129.9 | 248.2 | 1154.2 | 471.2 | 734.5 | 325.1 |
| Min Qi | 1626.3 | 277.0 | 129.9 | 176.2 | 1049.6 | 471.2 | 734.5 | 239.5 |
| Max Qi | 2976.6 | 423.8 | 331.6 | 335.2 | 1394.9 | 1738.1 | 1434.0 | 425.5 |
| Avg Qi | 2451.7 | 352.8 | 251.1 | 265.1 | 1182.7 | 814.8 | 1193.7 | 334.8 |
| Query | Q17 | Q18 | Q19 | Q20 | Q21 | Q22 | RF1 | RF2 |
| Stream 00 | 37.8 | 596.9 | 52.4 | 26.9 | 613.5 | 47.4 | 42.9 | 74.5 |
| Stream 01 | 368.7 | 3481.2 | 164.3 | 87.3 | 2482.3 | 116.2 | 42.5 | 89.2 |
| Stream 02 | 594.3 | 4307.8 | 384.8 | 98.0 | 1625.5 | 119.5 | 57.8 | 87.5 |
| Stream 03 | 474.5 | 4052.7 | 397.0 | 437.0 | 2195.5 | 104.7 | 57.8 | 88.1 |
| Stream 04 | 255.5 | 3954.8 | 540.2 | 146.0 | 2482.9 | 95.3 | 57.8 | 89.1 |
| Stream 05 | 158.1 | 3490.9 | 153.2 | 131.7 | 2473.5 | 77.1 | 56.5 | 88.4 |
| Min Qi | 158.1 | 3481.2 | 153.2 | 87.3 | 1625.5 | 77.1 | 42.5 | 87.5 |
| Max Qi | 594.3 | 4307.8 | 540.2 | 437.0 | 2482.9 | 119.5 | 57.8 | 89.2 |
| Avg Qi | 370.2 | 3857.5 | 327.9 | 180.0 | 2251.9 | 102.6 | 54.5 | 88.5 |

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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.).*

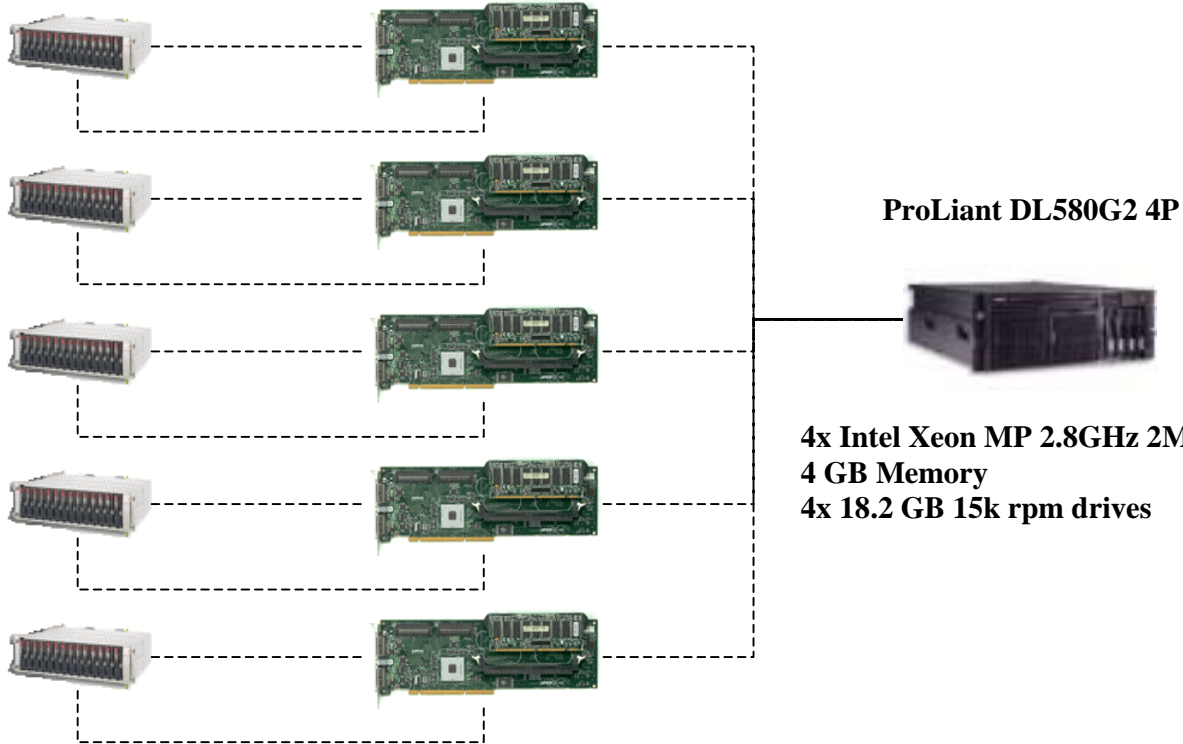
The server System Under Test (SUT), a HP ProLiant DL580G2 4P , depicted in Figure 1.1, consisted of :

- 4x Intel Xeon MP 2.8GHz with 2MB L2 Cache
- 4 GB of memory
- 5 x HP 5312 Array Controllers
- 5 x StorageWorks Enclosure 4354R
- 74 x 18.2GB Pluggable Ultra320 15K rpm 1” height drives

Figure 1.1 Benchmarked & Priced configuration

**5x StorageWorks 4354R
70x 18.2 GB 15k rpm drives**

5x Smart Array 5312



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 1.3.0 and QGEN version 1.3.0 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 1.3.0 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 DL580G2.

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 10 RAID-0 arrays each containing 7 physical drives and 2 RAID-0 arrays each containing 2 physical drives. A backup of the database was taken. The backup was spread across 10 RAID-5 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 DL580G2 with the following configuration:

- 5 x Smart Array 5312 disk controllers
- 5 x StorageWorks Enclosure 4354R
- 70 x 18.2GB 15k rpm external disk drives
- 4 x 18.2GB 15k rpm internal disk drives

All 74 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 1 | A | 7 | 1 | RAID0 | RAW | 20000 | Tpch100g |
| | | | 2 | RAID0 | RAW | 10000 | TempDB |
| | | | 3 | RAID5 | NTFS | 19000 | LoadFg |
| | | | 4 | RAID5 | NTFS | 30000 | Flatfiles |
| Slot 1 | B | 7 | 1 | RAID0 | RAW | 20000 | Tpch100g |
| | | | 2 | RAID0 | RAW | 10000 | TempDB |
| | | | 3 | RAID5 | NTFS | 19000 | LoadFg |
| | | | 4 | RAID5 | NTFS | 30000 | Flatfiles |
| Slot 2 | A | 7 | 1 | RAID0 | RAW | 20000 | Tpch100g |
| | | | 2 | RAID0 | RAW | 10000 | TempDB |
| | | | 3 | RAID5 | NTFS | 19000 | LoadFg |
| | | | 4 | RAID5 | NTFS | 30000 | Flatfiles |
| Slot 2 | B | 7 | 1 | RAID0 | RAW | 20000 | Tpch100g |
| | | | 2 | RAID0 | RAW | 10000 | TempDB |
| | | | 3 | RAID5 | NTFS | 19000 | LoadFg |
| | | | 4 | RAID0 | RAW | 6000 | TempLog |
| Slot 4 | A | 7 | 1 | RAID0 | RAW | 20000 | Tpch100g |
| | | | 2 | RAID0 | RAW | 10000 | TempDB |
| | | | 3 | RAID5 | NTFS | 19000 | LoadFg |
| | | | 4 | RAID5 | NTFS | 30000 | Flatfiles |
| Slot 4 | B | 7 | 1 | RAID0 | RAW | 20000 | Tpch100g |
| | | | 2 | RAID0 | RAW | 10000 | TempDB |
| | | | 3 | RAID5 | NTFS | 19000 | LoadFg |
| | | | 4 | RAID5 | NTFS | 30000 | Flatfiles |
| Slot 5 | A | 7 | 1 | RAID0 | RAW | 20000 | Tpch100g |
| | | | 2 | RAID0 | RAW | 10000 | TempDB |
| | | | 3 | RAID5 | NTFS | 19000 | LoadFg |
| | | | 4 | RAID5 | NTFS | 30000 | Flatfiles |
| Slot 5 | B | 7 | 1 | RAID0 | RAW | 20000 | Tpch100g |
| | | | 2 | RAID0 | RAW | 10000 | TempDB |
| | | | 3 | RAID5 | NTFS | 19000 | LoadFg |
| | | | 4 | RAID0 | RAW | 3000 | Tpch1g |
| Slot 6 | A | 7 | 1 | RAID0 | RAW | 20000 | Tpch100g |
| | | | 2 | RAID0 | RAW | 10000 | TempDB |
| | | | 3 | RAID5 | NTFS | 19000 | LoadFg |
| | | | 4 | RAID5 | NTFS | 30000 | Flatfiles |
| Slot 6 | B | 7 | 1 | RAID0 | RAW | 20000 | Tpch100g |
| | | | 2 | RAID0 | RAW | 10000 | TempDB |
| | | | 3 | RAID5 | NTFS | 19000 | LoadFg |
| | | | 4 | RAID0 | RAW | 3000 | Tpch1g |
| Slot 0 | A | 2 | 1 | RAID0 | RAW | 5500 | Tpch100g |
| | | | 2 | RAID0 | RAW | 3000 | TempDB |
| | | | 3 | RAID1 | NTFS | 4000 | OS |
| Slot 0 | B | 2 | 1 | RAID0 | RAW | 5500 | Tpch100g |
| | | | 2 | RAID0 | RAW | 3000 | TempDB |
| | | | 3 | RAID1 | RAW | 12000 | Tpch100Log |
| | | | 4 | RAID1 | RAW | 1100 | Tpch1gLog |

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.

The standard distribution DBGEN version 1.3.0 was used for database population. No modifications were made.

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 3 hours 19 minutes 19 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.

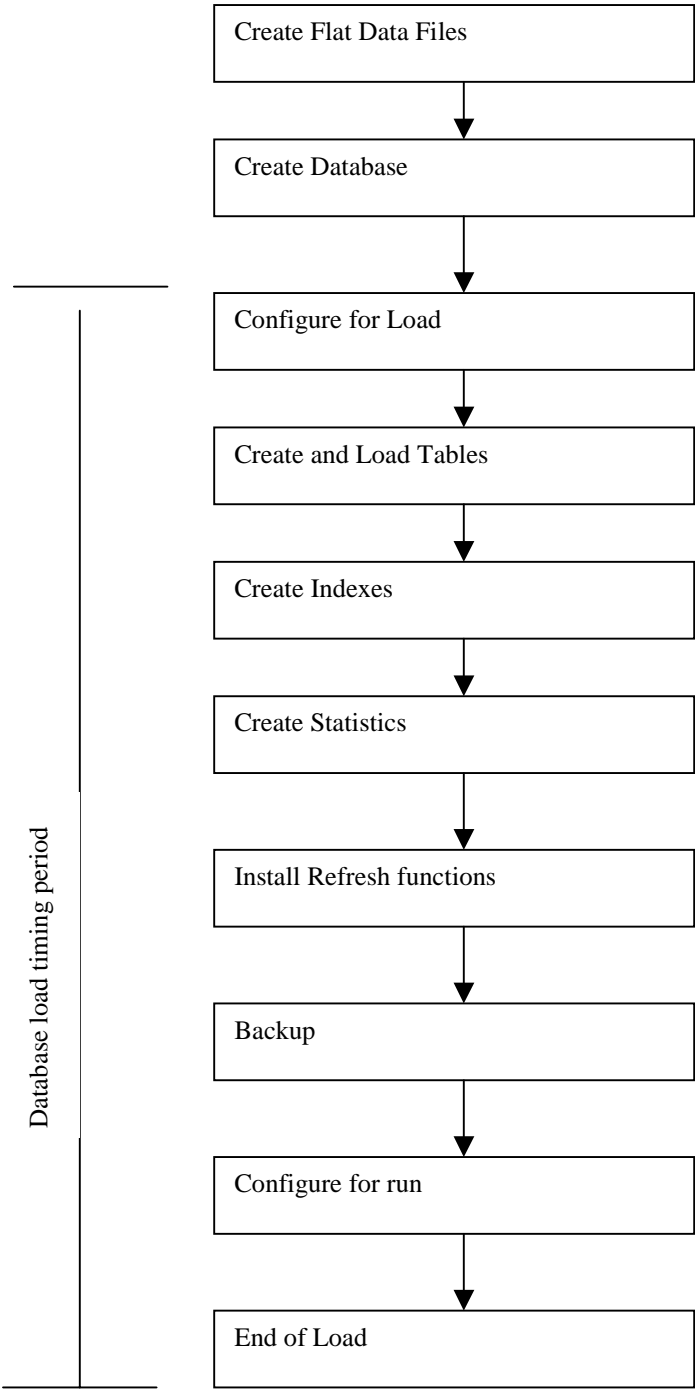
| Disk Type | Number of Disks | Space per Disk | Total Disk Space | Data Storage Ratio |
|-------------------------------|-----------------|----------------|------------------|--------------------|
| 18.2 GB 15k rpm Ultra320 SCSI | 74 | 16.92 GB | 1252.1 GB | 12.52 |

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 | 7/4/2003 | 7:46:46 | 7/4/2003 | 7:47:29 |
| Stream00 | RF2 | 7/4/2003 | 8:58:52 | 7/4/2003 | 9:00:06 |
| Stream01 | RF1 | 7/4/2003 | 14:34:09 | 7/4/2003 | 14:34:52 |
| Stream01 | RF2 | 7/4/2003 | 14:34:52 | 7/4/2003 | 14:36:21 |
| Stream02 | RF1 | 7/4/2003 | 14:36:21 | 7/4/2003 | 14:37:19 |
| Stream02 | RF2 | 7/4/2003 | 14:37:19 | 7/4/2003 | 14:38:46 |
| Stream03 | RF1 | 7/4/2003 | 14:38:46 | 7/4/2003 | 14:39:44 |
| Stream03 | RF2 | 7/4/2003 | 14:39:44 | 7/4/2003 | 14:41:12 |
| Stream04 | RF1 | 7/4/2003 | 14:41:12 | 7/4/2003 | 14:42:10 |
| Stream04 | RF2 | 7/4/2003 | 14:42:10 | 7/4/2003 | 14:43:39 |
| Stream05 | RF1 | 7/4/2003 | 14:43:39 | 7/4/2003 | 14:44:36 |
| Stream05 | RF2 | 7/4/2003 | 14:44:36 | 7/4/2003 | 14:46:04 |

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 | 3592.1 | 1922.2 | 2627.7 |
| Run 2 | 3558.5 | 1907.8 | 2605.6 |

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 indication 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 16% 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 DL580G2, system memory, additional processors, disk controllers and hard drives are available at the time of publication. All other hardware is generally available at the time of publication.

The system software, Microsoft Windows Server 2003, Enterprise Edition, and the database software, Microsoft SQL Server 2000 Enterprise Edition is generally available at the time of publication. Service Pack 3 for Microsoft SQL Server 2000 is generally available at the time of publication.

8.4 Country-Specific Pricing

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

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 Lorna Livingtree of Performance Metrics. Further information regarding the audit process may be obtained from:

Performance Metrics, Inc.
137 Yankton St., Suite 101
Folsom, CA 95630
(phone) (916) 985-1131
(fax) (916) 985-1185
e-mail: lorna@perfmtrics.com

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

Transaction Processing Performance Council
c/o Shanley Public Relations
777 North First Street, Suite 6000
San Jose, CA 95112-6311 USA
Telephone: (408) 295-8894
Fax: (408) 295-9768



PERFORMANCE METRICS INC.
TPC Certified Auditors

August 12, 2003

Mr. Daniel Pol
Hewlett-Packard
Database Performance Lab
20555 SH 249
Houston, TX 77070

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

Platform: Proliant DL580G2 4P
Database Manager: Microsoft SQL Server 2000 Enterprise Edition
Operating System: Microsoft Windows Server 2003, Enterprise Server

| CPU's | Memory | Total Disks | QppH@100GB | QthH@100GB | QphH@100GB |
|------------------------------|--------|-------------------|----------------|----------------|----------------|
| 4 Intel Xeon MP @ 2.8 Ghz | 4 GB | 74 @ 18GB, 15Krpm | 3,558.5 | 1,907.8 | 2,605.6 |

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 1.3.0.
- 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 Microsoft's standard OSQL interactive interface. The version of QGEN was 1.3.0.
- The validation of the query text against the qualification database produced compliant results.

137 Yankton St. Suite 101, Folsom, CA 95630
(916) 985-1131 fax: (916) 985-1185 email: Lorna@PerfMetrics.com

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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 tested and verified.
- Sufficient mirrored log space was present on the tested system.
- 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
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 2000 Version

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

```
Microsoft SQL Server 2000 - 8.00.761 (Intel X86)
Feb 27 2003 12:09:37
Copyright (c) 1988-2003 Microsoft Corporation
Enterprise Edition on Windows NT 5.2 (Build 3790: )
```

A.2 SQL Server 2000 Installation

Microsoft SQL Server 2000 was installed on the SUT. All default options were selected during the install except:

- Database Server Enterprise Edition was installed.
- "Custom installation" was selected. The SQL Server
- Development tools were not installed.
- Binary Sort Order was used. (Collation Settings>SQL Collation>Binary)
- Services Accounts > Customized > SQL Server > Use Local System Account Authentication Mode > Mixed > Blank Password
- Microsoft SQL Server 2000 Service Pack 3 was installed using the default settings during installation.

A.3 SQL Server 2000 Startup Parameters

```
SQLSERVER -x -c -g32
```

Where :

- x Disable the Keeping of CPU time and cache-hit ratio statistics.
- c Start SQL Server independently of Windows NT Service Control Manager
- g Reserve 100MB for non-buffer pool allocations.

A.4 Microsoft SQL Server 2000 Configuration Parameters

| name | ,minimum | ,maximum | ,config_value | ,run_value |
|--------------------------------|---------------|-------------|---------------|------------|
| affinity mask | ,-2147483648, | 2147483647, | 0, | 0 |
| allow updates | , 0, | 1, | 1, | 1 |
| awe enabled | , 0, | 1, | 1, | 1 |
| c2 audit mode | , 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 |
| default full-text language | , 0, | 2147483647, | 1033, | 1033 |
| default language | , 0, | 9999, | 0, | 0 |
| fill factor (%) | , 0, | 100, | 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, | 32, | 8, | 8 |
| max server memory (MB) | , 4, | 2147483647, | 2147483647, | 2147483647 |
| max text repl size (B) | , 0, | 2147483647, | 65536, | 65536 |
| max worker threads | , 32, | 32767, | 512, | 512 |
| media retention | , 0, | 365, | 0, | 0 |
| min memory per query (KB) | , 512, | 2147483647, | 1024, | 1024 |
| min server memory (MB) | , 0, | 2147483647, | 0, | 0 |
| nested triggers | , 0, | 1, | 1, | 1 |
| network packet size (B) | , 512, | 65536, | 32768, | 32768 |
| open objects | , 0, | 2147483647, | 0, | 0 |
| priority boost | , 0, | 1, | 1, | 1 |
| query governor cost limit | , 0, | 2147483647, | 0, | 0 |
| query wait (s) | , -1, | 2147483647, | -1, | -1 |
| recovery interval (min) | , 0, | 32767, | 32767, | 32767 |
| remote access | , 0, | 1, | 1, | 1 |
| remote login timeout (s) | , 0, | 2147483647, | 20, | 20 |
| remote proc trans | , 0, | 1, | 0, | 0 |
| remote query timeout (s) | , 0, | 2147483647, | 600, | 600 |
| scan for startup procs | , 0, | 1, | 0, | 0 |
| set working set size | , 0, | 1, | 0, | 0 |
| show advanced options | , 0, | 1, | 1, | 1 |
| two digit year cutoff | , 1753, | 9999, | 2049, | 2049 |
| user connections | , 0, | 32767, | 0, | 0 |
| user options | , 0, | 32767, | 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)

Boot.ini parameters:

- /3GB - Give SQL Server access to 3GB memory
- /PAE - Allow the system to use addresses above 4GB

A.6 HP SMART Array Controller Cache Settings and registry entries

The HP SMART Array Controller cache settings for all drives was configured for the cache ratio of 0% read / 100% write .

The HP SMART Array Controller cache was enabled for all drives.

Windows Registry Editor Version 5.00

Windows Registry Editor Version 5.00

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\hpcqiss
b]
"Type"=dword:00000001
"Start"=dword:00000000
"ErrorControl"=dword:00000001
"Tag"=dword:00000102
```

```

"ImagePath"=hex(2):73,00,79,00,73,00,74,00,65,00,6d,00,33,00,32,00,5c,00,
44,00,\
52,00,49,00,56,00,45,00,52,00,53,00,5c,00,68,00,70,00,71,00,63,00,69,00,73
.\
00,73,00,62,00,2e,00,73,00,79,00,73,00,00,00
"DisplayName"="Smart Array Controllers Non-Miniport Bus Driver"
"Group"="port"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\hpcqiss
b\Parameters]
"CompletionMode"=dword:00000001

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\hpcqiss
b\Security]
"Security"=hex:01,00,14,80,90,00,00,00,9c,00,00,00,14,00,00,00,30,00,00,0
0,02,\
00,1c,00,01,00,00,00,02,80,14,00,ff,01,0f,00,01,01,00,00,00,00,01,00,00,\
00,00,02,00,60,00,04,00,00,00,00,14,00,fd,01,02,00,01,01,00,00,00,00,00
.\
05,12,00,00,00,00,18,00,ff,01,0f,00,01,02,00,00,00,00,05,20,00,00,00,\
20,02,00,00,00,00,14,00,8d,01,02,00,01,01,00,00,00,00,05,0b,00,00,00,00
.\
00,18,00,fd,01,02,00,01,02,00,00,00,00,05,20,00,00,00,23,02,00,00,01,01
.\
00,00,00,00,05,12,00,00,00,01,01,00,00,00,00,05,12,00,00,00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\hpcqiss
b\Enum]
"0"="PCI\VEN_0E11&DEV_B178&SUBSYS_40830E11&REV_01\3&10
70020&0&08"
"Count"=dword:00000005
"NextInstance"=dword:00000005
"1"="PCI\VEN_0E11&DEV_B178&SUBSYS_40830E11&REV_01\3&10
70020&0&10"
"2"="PCI\VEN_0E11&DEV_B178&SUBSYS_40830E11&REV_01\3&29
e81982&0&10"
"3"="PCI\VEN_0E11&DEV_B178&SUBSYS_40830E11&REV_01\3&17
2e68dd&0&08"
"4"="PCI\VEN_0E11&DEV_B178&SUBSYS_40830E11&REV_01\3&17
2e68dd&0&10"

```

A.7 System Hardware Information

System Information report written at: 08/14/03 10:44:57

System Name: MINI

[System Summary]

| Item | Value |
|---------------------|---|
| OS Name | Microsoft(R) Windows(R) Server 2003, Enterprise Edition |
| Version | 5.2.3790 Build 3790 |
| OS Manufacturer | Microsoft Corporation |
| System Name | MINI |
| System Manufacturer | Compaq |
| System Model | ProLiant DL580 G2 |
| System Type | X86-based PC |
| Processor | x86 Family 15 Model 2 Stepping 5 GenuineIntel ~2799 Mhz |

| | |
|---|---|
| Processor | x86 Family 15 Model 2 Stepping 5 GenuineIntel ~2799 Mhz |
| Processor | x86 Family 15 Model 2 Stepping 5 GenuineIntel ~2799 Mhz |
| Processor | x86 Family 15 Model 2 Stepping 5 GenuineIntel ~2799 Mhz |
| Processor | x86 Family 15 Model 2 Stepping 5 GenuineIntel ~2799 Mhz |
| Processor | x86 Family 15 Model 2 Stepping 5 GenuineIntel ~2799 Mhz |
| Processor | x86 Family 15 Model 2 Stepping 5 GenuineIntel ~2799 Mhz |
| Processor | x86 Family 15 Model 2 Stepping 5 GenuineIntel ~2799 Mhz |
| BIOS Version/Date | Compaq P27, 4/2/2003 |
| SMBIOS Version | 2.3 |
| Windows Directory | C:\WINDOWS |
| System Directory | C:\WINDOWS\system32 |
| Boot Device | \Device\HarddiskVolume33 |
| Locale | United States |
| Hardware Abstraction Layer | Version = "5.2.3790.0 (srv03_rtm.030324-2048)" |
| User Name | MINI\Administrator |
| Time Zone | Central Daylight Time |
| Total Physical Memory | 4,096.00 MB |
| Available Physical Memory | 71.95 MB |
| Total Virtual Memory | 9.50 GB |
| Available Virtual Memory | 2.11 GB |
| Page File Space | 5.69 GB |
| Page File | C:\pagefile.sys |
| [Hardware Resources] | |
| [Conflicts/Sharing] | |
| Resource | Device |
| I/O Port 0x00000000-0x00000CFF | PCI bus |
| I/O Port 0x00000000-0x00000CFF | PCI bus |
| I/O Port 0x00000000-0x00000CFF | Direct memory access controller |
| I/O Port 0x000003C0-0x000003DF | PCI bus |
| I/O Port 0x000003C0-0x000003DF | Standard VGA Graphics Adapter |
| I/O Port 0x00006000-0x000064FF | PCI bus |
| I/O Port 0x00006000-0x000064FF (Non-Miniport) | Smart Array 5312 Controller |
| I/O Port 0x00003000-0x000030FF | PCI bus |
| I/O Port 0x00003000-0x000030FF | Compaq Smart Array 5i Controller |
| I/O Port 0x00005000-0x000050FF | PCI bus |
| I/O Port 0x00005000-0x000050FF (Non-Miniport) | Smart Array 5312 Controller |
| Memory Address 0xA0000-0xBFFFF | PCI bus |
| Memory Address 0xA0000-0xBFFFF | Standard VGA Graphics Adapter |
| I/O Port 0x000003B0-0x000003BB | PCI bus |
| I/O Port 0x000003B0-0x000003BB | Standard VGA Graphics Adapter |
| I/O Port 0x00004000-0x000044FF | PCI bus |
| I/O Port 0x00004000-0x000044FF (Non-Miniport) | Smart Array 5312 Controller |

| | | | | | |
|---|---|----|-----------------------|---|----|
| | | | 0x00000260-0x00000267 | Motherboard resources | OK |
| [DMA] | | | 0x000004D0-0x000004D1 | Motherboard resources | OK |
| Resource Device Status | | | 0x00000700-0x0000070F | Motherboard resources | OK |
| Channel 7 Direct memory access controller | OK | | 0x00000800-0x0000081F | Motherboard resources | OK |
| Channel 2 Standard floppy disk controller | OK | | 0x00000C80-0x00000C83 | Motherboard resources | OK |
| [Forced Hardware] | | | 0x00000CD4-0x00000CD7 | Motherboard resources | OK |
| Device PNP Device ID | | | 0x00000CF9-0x00000CF9 | Motherboard resources | OK |
| [I/O] | | | 0x00000020-0x00000021 | Programmable interrupt controller | |
| Resource Device Status | | | OK | | |
| 0x00000000-0x00000CFF | PCI bus | OK | 0x000000A0-0x000000A1 | Programmable interrupt controller | |
| 0x00000000-0x00000CFF | PCI bus | OK | OK | | |
| 0x00000000-0x00000CFF | Direct memory access controller | OK | 0x00000C00-0x00000C01 | Programmable interrupt controller | |
| 0x000003B0-0x000003BB | PCI bus | OK | OK | | |
| 0x000003B0-0x000003BB | Standard VGA Graphics Adapter | OK | 0x00000040-0x00000043 | System timer | OK |
| 0x000003C0-0x000003DF | PCI bus | OK | 0x00000080-0x0000008F | Direct memory access controller | OK |
| 0x000003C0-0x000003DF | Standard VGA Graphics Adapter | OK | 0x000000C0-0x000000DF | Direct memory access controller | OK |
| 0x00001800-0x000018FF | HP ProLiant iLO Advanced System Management Controller | OK | 0x0000040B-0x0000040B | Direct memory access controller | OK |
| 0x00002400-0x000024FF | HP iLO Management Interface Driver | OK | 0x000004D6-0x000004D6 | Direct memory access controller | OK |
| 0x00002800-0x000028FF | Standard VGA Graphics Adapter | OK | 0x00000061-0x00000061 | System speaker | OK |
| 0x00000A79-0x00000A79 | ISAPNP Read Data Port | OK | 0x00000060-0x00000060 | Standard 101/102-Key or Microsoft Natural PS/2 Keyboard | OK |
| 0x00000279-0x00000279 | ISAPNP Read Data Port | OK | 0x00000064-0x00000064 | Standard 101/102-Key or Microsoft Natural PS/2 Keyboard | OK |
| 0x00000274-0x00000277 | ISAPNP Read Data Port | OK | 0x0000002E-0x0000002F | Extended IO Bus | OK |
| 0x00000F50-0x00000F58 | Motherboard resources | OK | 0x00000220-0x00000223 | Extended IO Bus | OK |
| 0x00000408-0x0000040F | Motherboard resources | OK | 0x00000240-0x0000025F | Extended IO Bus | OK |
| 0x00000092-0x00000092 | Motherboard resources | OK | 0x00000070-0x00000073 | Extended IO Bus | OK |
| 0x00000900-0x00000903 | Motherboard resources | OK | 0x000003F8-0x000003FF | Communications Port (COM1) | OK |
| 0x00000910-0x00000911 | Motherboard resources | OK | 0x000003F2-0x000003F5 | Standard floppy disk controller | OK |
| 0x00000920-0x00000923 | Motherboard resources | OK | 0x000003F7-0x000003F7 | Standard floppy disk controller | OK |
| 0x00000930-0x00000937 | Motherboard resources | OK | 0x00002000-0x0000200F | CSB5 IDE Controller | OK |
| 0x00000940-0x00000947 | Motherboard resources | OK | 0x000001F0-0x000001F7 | Primary IDE Channel | OK |
| 0x00000950-0x00000957 | Motherboard resources | OK | 0x000003F6-0x000003F6 | Primary IDE Channel | OK |
| 0x00000C06-0x00000C08 | Motherboard resources | OK | 0x00000170-0x00000177 | Secondary IDE Channel | OK |
| 0x00000C14-0x00000C14 | Motherboard resources | OK | 0x00000376-0x00000376 | Secondary IDE Channel | OK |
| 0x00000C49-0x00000C4A | Motherboard resources | OK | 0x00003000-0x000030FF | PCI bus | OK |
| 0x00000C50-0x00000C52 | Motherboard resources | OK | 0x00003000-0x000030FF | Compaq Smart Array 5i Controller | OK |
| 0x00000C6C-0x00000C6F | Motherboard resources | OK | OK | | |
| 0x00000010-0x0000001F | Motherboard resources | OK | 0x00004000-0x000044FF | PCI bus | OK |
| 0x00000230-0x00000233 | Motherboard resources | OK | 0x00004000-0x000044FF | Smart Array 5312 Controller (Non-Miniport) | OK |
| | | | 0x00004400-0x000044FF | Smart Array 5312 Controller (Non-Miniport) | OK |
| | | | 0x00005000-0x000050FF | PCI bus | OK |
| | | | 0x00005000-0x000050FF | Smart Array 5312 Controller (Non-Miniport) | OK |
| | | | 0x00006000-0x000064FF | PCI bus | OK |
| | | | 0x00006000-0x000064FF | Smart Array 5312 Controller (Non-Miniport) | OK |
| | | | 0x00006400-0x000064FF | Smart Array 5312 Controller (Non-Miniport) | OK |
| | | | OK | | |
| | | | [IRQs] | | |

| Resource | Device | Status |
|----------|---|--------|
| IRQ 9 | Microsoft ACPI-Compliant System | OK |
| IRQ 29 | HP ProLiant iLO Advanced System Management Controller | OK |
| IRQ 30 | HP iLO Management Interface Driver | 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 6 | Standard floppy disk controller | OK |
| IRQ 14 | Primary IDE Channel | OK |
| IRQ 11 | ServerWorks (RCC) PCI to USB Open Host Controller | OK |
| IRQ 31 | Compaq Smart Array 5i Controller | OK |
| IRQ 18 | Smart Array 5312 Controller (Non-Miniport) | OK |
| IRQ 16 | Smart Array 5312 Controller (Non-Miniport) | OK |
| IRQ 7 | Compaq PCI Hotplug Controller | OK |
| IRQ 22 | BCM5701 Gigabit Ethernet | OK |
| IRQ 20 | Smart Array 5312 Controller (Non-Miniport) | OK |
| IRQ 3 | Compaq PCI Hotplug Controller | OK |
| IRQ 26 | Smart Array 5312 Controller (Non-Miniport) | OK |
| IRQ 24 | Smart Array 5312 Controller (Non-Miniport) | OK |

[Memory]

| Resource | Device | Status |
|-----------------------|---|--------|
| 0xA0000-0xBFFFF | PCI bus | OK |
| 0xA0000-0xBFFFF | Standard VGA Graphics Adapter | OK |
| 0xF5F00000-0xF77FFFFF | PCI bus | OK |
| 0xF77F0000-0xF77F01FF | HP ProLiant iLO Advanced System Management Controller | OK |
| 0xF77E0000-0xF77E07FF | HP iLO Management Interface Driver | OK |
| 0xF77D0000-0xF77D1FFF | HP iLO Management Interface Driver | OK |
| 0xF7700000-0xF777FFFF | HP iLO Management Interface Driver | OK |
| 0xF6000000-0xF6FFFFFF | Standard VGA Graphics Adapter | OK |
| 0xF5FF0000-0xF5FF0FFF | Standard VGA Graphics Adapter | OK |
| 0xF5FE0000-0xF5FE0FFF | ServerWorks (RCC) PCI to USB Open Host Controller | OK |
| 0xF7800000-0xF79FFFFF | PCI bus | OK |
| 0xF79C0000-0xF79FFFFF | Compaq Smart Array 5i Controller | OK |
| 0xF78F0000-0xF78F3FFF | Compaq Smart Array 5i Controller | OK |
| 0xF7A00000-0xF7BFFFFF | PCI bus | OK |
| 0xF7BC0000-0xF7BFFFFF | Smart Array 5312 Controller (Non-Miniport) | OK |
| 0xF7AF0000-0xF7AF3FFF | Smart Array 5312 Controller (Non-Miniport) | OK |
| 0xF7B80000-0xF7BBFFFF | Smart Array 5312 Controller (Non-Miniport) | OK |
| 0xF7AE0000-0xF7AE3FFF | Smart Array 5312 Controller (Non-Miniport) | OK |
| 0xF7AD0000-0xF7AD0FFF | Compaq PCI Hotplug Controller | OK |
| 0xF7C00000-0xF7DFFFFF | PCI bus | OK |
| 0xF7DF0000-0xF7DFFFFF | BCM5701 Gigabit Ethernet | OK |
| 0xF7D80000-0xF7DBFFFF | Smart Array 5312 Controller (Non-Miniport) | OK |

| | | |
|-----------------------|--|----|
| 0xF7CF0000-0xF7CF3FFF | Smart Array 5312 Controller (Non-Miniport) | OK |
| 0xF7CE0000-0xF7CE0FFF | Compaq PCI Hotplug Controller | OK |
| 0xF7E00000-0xF7FFFFFF | PCI bus | OK |
| 0xF7FC0000-0xF7FFFFFF | Smart Array 5312 Controller (Non-Miniport) | OK |
| 0xF7EF0000-0xF7EF3FFF | Smart Array 5312 Controller (Non-Miniport) | OK |
| 0xF7F80000-0xF7FBFFFF | Smart Array 5312 Controller (Non-Miniport) | OK |
| 0xF7EE0000-0xF7EE3FFF | Smart Array 5312 Controller (Non-Miniport) | OK |

[Components]

[Multimedia]

[Audio Codecs]

| CODEC | Manufacturer | Description | Status | File |
|----------------------------------|---|-----------------------------------|--------------------|------|
| | Version | Size | Creation Date | |
| c:\windows\system32\msaud32.acm | Microsoft Corporation | Windows Media Audio Codec | OK | |
| C:\WINDOWS\system32\MSAUD32.ACM | 8.00.00.4487 | 288.00 KB (294,912 bytes) | 3/25/2003 12:00 AM | |
| c:\windows\system32\tssoft32.acm | DSP GROUP, INC. | | OK | |
| C:\WINDOWS\system32\TSSOFT32.ACM | 1.01 | 9.50 KB (9,728 bytes) | 3/25/2003 12:00 AM | |
| c:\windows\system32\msadp32.acm | Microsoft Corporation | | OK | |
| C:\WINDOWS\system32\MSADP32.ACM | 5.2.3790.0 (srv03_rtm.030324-2048) | 14.50 KB (14,848 bytes) | 3/25/2003 12:00 AM | |
| c:\windows\system32\msg711.acm | Microsoft Corporation | | OK | |
| C:\WINDOWS\system32\MSG711.ACM | 5.2.3790.0 (srv03_rtm.030324-2048) | 10.00 KB (10,240 bytes) | 3/25/2003 12:00 AM | |
| c:\windows\system32\l3codeca.acm | Fraunhofer Institut Integrierte Schaltungen IIS | Fraunhofer IIS MPEG Layer-3 Codec | OK | |
| C:\WINDOWS\system32\L3CODECA.ACM | 1, 9, 0, 0305 | 284.00 KB (290,816 bytes) | 3/25/2003 12:00 AM | |
| c:\windows\system32\msgsm32.acm | Microsoft Corporation | | OK | |
| C:\WINDOWS\system32\MSGSM32.ACM | 5.2.3790.0 (srv03_rtm.030324-2048) | 20.50 KB (20,992 bytes) | 3/25/2003 12:00 AM | |
| c:\windows\system32\sl_anet.acm | Sipro Lab Telecom Inc. | Sipro Lab Telecom Audio Codec | OK | |
| C:\WINDOWS\system32\SL_ANET.ACM | 3.02 | 84.00 KB (86,016 bytes) | 3/25/2003 12:00 AM | |
| c:\windows\system32\msg723.acm | Microsoft Corporation | | OK | |
| C:\WINDOWS\system32\MSG723.ACM | 4.4.4000 | 116.00 KB (118,784 bytes) | 5/2/2003 3:47 PM | |
| c:\windows\system32\imaadp32.acm | Microsoft Corporation | | OK | |
| C:\WINDOWS\system32\IMAADP32.ACM | 5.2.3790.0 (srv03_rtm.030324-2048) | 15.50 KB (15,872 bytes) | 3/25/2003 12:00 AM | |

[Video Codecs]

| CODEC | Manufacturer | Description | Status | File |
|--------------------------------|-----------------------|-------------|---------------|------|
| | Version | Size | Creation Date | |
| c:\windows\system32\msh261.drv | Microsoft Corporation | | OK | |
| C:\WINDOWS\system32\MSH261.DRV | | | | |

4.4.4000 180.00 KB (184,320 bytes) 5/2/2003 3:47 PM

c:\windows\system32\iyuv_32.dll Microsoft Corporation
 OK C:\WINDOWS\system32\IYUV_32.DLL
 5.2.3790.0 (srv03_rtm.030324-2048) 45.00 KB (46,080
 bytes) 3/24/2003 7:49 PM

c:\windows\system32\msyuv.dll Microsoft Corporation
 OK C:\WINDOWS\system32\MSYUV.DLL
 5.2.3790.0 (srv03_rtm.030324-2048) 16.50 KB (16,896
 bytes) 3/24/2003 7:49 PM

c:\windows\system32\msh263.drv Microsoft Corporation
 OK C:\WINDOWS\system32\MSH263.DRV
 4.4.4000 284.00 KB (290,816 bytes) 3/24/2003 7:46 PM

c:\windows\system32\msvidc32.dll Microsoft Corporation
 OK
 C:\WINDOWS\system32\MSVIDC32.DLL 5.2.3790.0
 (srv03_rtm.030324-2048) 26.50 KB (27,136 bytes)
 3/25/2003 12:00 AM

c:\windows\system32\tsbyuv.dll Microsoft Corporation
 OK C:\WINDOWS\system32\TSBYUV.DLL
 5.2.3790.0 (srv03_rtm.030324-2048) 8.00 KB (8,192
 bytes) 3/24/2003 7:50 PM

c:\windows\system32\msrle32.dll Microsoft Corporation
 OK C:\WINDOWS\system32\MSRLE32.DLL
 5.2.3790.0 (srv03_rtm.030324-2048) 10.50 KB (10,752
 bytes) 3/25/2003 12:00 AM

[CD-ROM]

| Item | Value |
|----------------|---|
| Drive | D: |
| Description | CD-ROM Drive |
| Media Loaded | No |
| Media Type | CD-ROM |
| Name | COMPAQ CD-ROM SN-124 |
| Manufacturer | (Standard CD-ROM drives) |
| Status | OK |
| Transfer Rate | Not Available |
| SCSI Target ID | 0 |
| PNP Device ID | IDE\CDROMCOMPAQ_CD-ROM_SN-124\N102\5&FB0C83D&0&0.0.0 |
| Driver | c:\windows\system32\drivers\cdrom.sys (5.2.3790.0 (srv03_rtm.030324-2048), 49.50 KB (50,688 bytes), 3/25/2003 12:00 AM) |

[Sound Device]

| Item | Value |
|------|-------|
|------|-------|

[Display]

| Item | Value |
|---------------------|--|
| Name | Standard VGA Graphics Adapter |
| PNP Device ID | PCI\VEN_1002&DEV_4752&SUBSYS_001E0E11&REV_27\3&267A616A&0&18 |
| Adapter Type | ATI MACH64, (Standard display types) compatible |
| Adapter Description | Standard VGA Graphics Adapter |
| Adapter RAM | 7.94 MB (8,323,072 bytes) |
| Installed Drivers | vga.dll,framebuf.dll,vga256.dll,vga64k.dll |
| Driver Version | 5.2.3790.0 |
| INF File | display.inf (vga section) |
| Color Planes | 1 |
| Color Table Entries | 65536 |
| Resolution | 800 x 600 x 1 hertz |
| Bits/Pixel | 16 |
| Memory Address | 0xF6000000-0xF6FFFFFF |
| I/O Port | 0x00002800-0x000028FF |

| | |
|----------------|--|
| Memory Address | 0xF5FF0000-0xF5FF0FFF |
| I/O Port | 0x000003B0-0x000003BB |
| I/O Port | 0x000003C0-0x000003DF |
| Memory Address | 0xA0000-0xBFFFF |
| Driver | c:\windows\system32\drivers\vgapnp.sys (5.2.3790.0 (srv03_rtm.030324-2048), 23.00 KB (23,552 bytes), 5/2/2003 4:23 PM) |

[Infrared]

| Item | Value |
|------|-------|
|------|-------|

[Input]

[Keyboard]

| Item | Value |
|-------------------------|--|
| 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&35118DFF&0 |
| Number of Function Keys | 12 |
| I/O Port | 0x00000060-0x00000060 |
| I/O Port | 0x00000064-0x00000064 |
| IRQ Channel | IRQ 1 |
| Driver | c:\windows\system32\drivers\i8042prt.sys (5.2.3790.0 (srv03_rtm.030324-2048), 68.50 KB (70,144 bytes), 3/25/2003 12:00 AM) |

[Pointing Device]

| Item | Value |
|----------------------------|--|
| Hardware Type | PS/2 Compatible Mouse |
| Number of Buttons | 3 |
| Status | OK |
| PNP Device ID | ACPI\PNP0F13\4&35118DFF&0 |
| Power Management Supported | No |
| Double Click Threshold | 6 |
| Handedness | Right Handed Operation |
| IRQ Channel | IRQ 12 |
| Driver | c:\windows\system32\drivers\i8042prt.sys (5.2.3790.0 (srv03_rtm.030324-2048), 68.50 KB (70,144 bytes), 3/25/2003 12:00 AM) |

[Modem]

| Item | Value |
|------|-------|
|------|-------|

[Network]

[Adapter]

| Item | Value |
|---------------|--|
| Name | [00000001] BCM5701 Gigabit Ethernet |
| Adapter Type | Ethernet 802.3 |
| Product Type | BCM5701 Gigabit Ethernet |
| Installed | Yes |
| PNP Device ID | PCI\VEN_14E4&DEV_1645&SUBSYS_007C0E11&REV_15\3&29E81982&0&08 |
| Last Reset | 5/9/2003 12:35 AM |
| Index | 1 |
| Service Name | b57w2k |
| IP Address | 130.168.253.55 |
| IP Subnet | 255.255.0.0 |

Default IP Gateway Not Available
 DHCP Enabled Yes
 DHCP Server 130.168.253.2
 DHCP Lease Expires 5/11/2003 12:36 PM
 DHCP Lease Obtained 5/10/2003 12:36 PM
 MAC Address 00:08:02:ED:29:7B
 Memory Address 0xF7DF0000-0xF7DFFFFF
 IRQ Channel IRQ 22
 Driver c:\windows\system32\drivers\b57xp32.sys (2.91.0.0 built by:
 WinDDK, 137.00 KB (140,288 bytes), 5/2/2003 10:39 AM)

Name [00000002] RAS Async Adapter
 Adapter Type Not Available
 Product Type RAS Async Adapter
 Installed Yes
 PNP Device ID Not Available
 Last Reset 5/9/2003 12:35 AM
 Index 2
 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 [00000003] WAN Miniport (L2TP)
 Adapter Type Not Available
 Product Type WAN Miniport (L2TP)
 Installed Yes
 PNP Device ID ROOT\MS_L2TPMINIPOINT\0000
 Last Reset 5/9/2003 12:35 AM
 Index 3
 Service Name Rasl2tp
 IP Address Not Available
 IP Subnet Not Available
 Default IP Gateway Not Available
 DHCP Enabled No
 DHCP Server Not Available
 DHCP Lease Expires Not Available
 DHCP Lease Obtained Not Available
 MAC Address Not Available
 Driver c:\windows\system32\drivers\rasl2tp.sys (5.2.3790.0
 (srv03_rtm.030324-2048), 77.00 KB (78,848 bytes), 3/25/2003 12:00 AM)

Name [00000004] WAN Miniport (PPTP)
 Adapter Type Wide Area Network (WAN)
 Product Type WAN Miniport (PPTP)
 Installed Yes
 PNP Device ID ROOT\MS_PPTPMINIPOINT\0000
 Last Reset 5/9/2003 12:35 AM
 Index 4
 Service Name PptpMiniport
 IP Address Not Available
 IP Subnet Not Available
 Default IP Gateway Not Available
 DHCP Enabled No
 DHCP Server Not Available
 DHCP Lease Expires Not Available
 DHCP Lease Obtained Not Available
 MAC Address 50:50:54:50:30:30
 Driver c:\windows\system32\drivers\raspptp.sys (5.2.3790.0
 (srv03_rtm.030324-2048), 70.50 KB (72,192 bytes), 3/25/2003 12:00 AM)

Name [00000005] WAN Miniport (PPPOE)
 Adapter Type Wide Area Network (WAN)

Product Type WAN Miniport (PPPOE)
 Installed Yes
 PNP Device ID ROOT\MS_PPPOEMINIPOINT\0000
 Last Reset 5/9/2003 12:35 AM
 Index 5
 Service Name RasPppoe
 IP Address Not Available
 IP Subnet Not Available
 Default IP Gateway Not Available
 DHCP Enabled No
 DHCP Server Not Available
 DHCP Lease Expires Not Available
 DHCP Lease Obtained Not Available
 MAC Address 33:50:6F:45:30:30
 Driver c:\windows\system32\drivers\rasppoe.sys (5.2.3790.0
 (srv03_rtm.030324-2048), 38.00 KB (38,912 bytes), 3/25/2003 12:00 AM)

Name [00000006] Direct Parallel
 Adapter Type Not Available
 Product Type Direct Parallel
 Installed Yes
 PNP Device ID ROOT\MS_PTMINIPOINT\0000
 Last Reset 5/9/2003 12:35 AM
 Index 6
 Service Name Raspti
 IP Address Not Available
 IP Subnet Not Available
 Default IP Gateway Not Available
 DHCP Enabled No
 DHCP Server Not Available
 DHCP Lease Expires Not Available
 DHCP Lease Obtained Not Available
 MAC Address Not Available
 Driver c:\windows\system32\drivers\raspti.sys (5.2.3790.0
 (srv03_rtm.030324-2048), 18.50 KB (18,944 bytes), 3/25/2003 12:00 AM)

Name [00000007] WAN Miniport (IP)
 Adapter Type Not Available
 Product Type WAN Miniport (IP)
 Installed Yes
 PNP Device ID ROOT\MS_NDISWANIP\0000
 Last Reset 5/9/2003 12:35 AM
 Index 7
 Service Name NdisWan
 IP Address Not Available
 IP Subnet Not Available
 Default IP Gateway Not Available
 DHCP Enabled No
 DHCP Server Not Available
 DHCP Lease Expires Not Available
 DHCP Lease Obtained Not Available
 MAC Address Not Available
 Driver c:\windows\system32\drivers\ndiswan.sys (5.2.3790.0
 (srv03_rtm.030324-2048), 96.50 KB (98,816 bytes), 3/25/2003 12:00 AM)

[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

Name MSAFD NetBIOS [\\Device\NetBT_Tcpip_{B6F7AAFD-48C7-443D-9A4B-5EBA03433078}] SEQUENCE 0
 Connectionless Service No
 Guarantees Delivery Yes
 Guarantees Sequencing Yes
 Maximum Address Size 20 bytes
 Maximum Message Size 62.50 KB (64,000 bytes)

Message Oriented Yes
 Minimum Address Size 20 bytes
 Pseudo Stream Oriented No
 Supports Broadcasting No
 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 No

Name MSAFD NetBIOS [\\Device\NetBT_Tcpip_{B6F7AAFD-48C7-443D-9A4B-5EBA03433078}] DATAGRAM 0
 Connectionless Service Yes
 Guarantees Delivery No
 Guarantees Sequencing No
 Maximum Address Size 20 bytes
 Maximum Message Size 62.50 KB (64,000 bytes)
 Message Oriented Yes
 Minimum Address Size 20 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 No

Name MSAFD NetBIOS [\\Device\NetBT_Tcpip_{14ECDA81-6EF5-4077-8E1E-A2C3E6D2AF19}] SEQUENCE 1
 Connectionless Service No
 Guarantees Delivery Yes
 Guarantees Sequencing Yes
 Maximum Address Size 20 bytes
 Maximum Message Size 62.50 KB (64,000 bytes)
 Message Oriented Yes
 Minimum Address Size 20 bytes
 Pseudo Stream Oriented No
 Supports Broadcasting No
 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 No

Name MSAFD NetBIOS [\\Device\NetBT_Tcpip_{14ECDA81-6EF5-4077-8E1E-A2C3E6D2AF19}] DATAGRAM 1
 Connectionless Service Yes
 Guarantees Delivery No
 Guarantees Sequencing No
 Maximum Address Size 20 bytes
 Maximum Message Size 62.50 KB (64,000 bytes)
 Message Oriented Yes
 Minimum Address Size 20 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 No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{4A860E3E-E867-495E-B476-1AD77909BB5D}] SEQPACKET 2

Connectionless Service No

Guarantees Delivery Yes

Guarantees Sequencing Yes

Maximum Address Size 20 bytes

Maximum Message Size 62.50 KB (64,000 bytes)

Message Oriented Yes

Minimum Address Size 20 bytes

Pseudo Stream Oriented No

Supports Broadcasting No

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 No

Name MSAFD NetBIOS [\Device\NetBT_Tcpip_{4A860E3E-E867-495E-B476-1AD77909BB5D}] DATAGRAM 2

Connectionless Service Yes

Guarantees Delivery No

Guarantees Sequencing No

Maximum Address Size 20 bytes

Maximum Message Size 62.50 KB (64,000 bytes)

Message Oriented Yes

Minimum Address Size 20 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 No

[WinSock]

| | |
|---------|------------------------------------|
| Item | Value |
| File | c:\windows\system32\winsock.dll |
| Size | 2.80 KB (2,864 bytes) |
| Version | 3.10 |
| File | c:\windows\system32\wsock32.dll |
| Size | 22.00 KB (22,528 bytes) |
| Version | 5.2.3790.0 (srv03_rtm.030324-2048) |

[Ports]

[Serial]

| | |
|----------------------------|----------------------------|
| Item | Value |
| 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 | c:\windows\system32\drivers\serial.sys (5.2.3790.0 (srv03_rtm.030324-2048), 76.00 KB (77,824 bytes), 3/25/2003 12:00 AM) |

[Parallel]

| | |
|------|-------|
| Item | Value |
|------|-------|

[Storage]

[Drives]

| | |
|----------------------|-----------------------------------|
| Item | Value |
| Drive | A: |
| Description | 3 1/2 Inch Floppy Drive |
| Drive | C: |
| Description | Local Fixed Disk |
| Compressed | No |
| File System | NTFS |
| Size | 3.90 GB (4,190,433,280 bytes) |
| Free Space | 513.32 MB (538,255,360 bytes) |
| Volume Name | |
| Volume Serial Number | 74C0AB70 |
| Drive | D: |
| Description | CD-ROM Disc |
| Drive | Z: |
| Description | Local Fixed Disk |
| Compressed | No |
| File System | NTFS |
| Size | 146.46 GB (157,265,424,384 bytes) |
| Free Space | 34.52 GB (37,067,603,968 bytes) |
| Volume Name | New Volume |
| Volume Serial Number | D010BE59 |

[Disks]

| | |
|------|-------|
| Item | Value |
|------|-------|

Description \\.\PHYSICALDRIVE15
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 19.53 GB (20,966,238,720 bytes)
 Total Cylinders 2,549
 Total Sectors 40,949,685
 Total Tracks 649,995
 Tracks/Cylinder 255
 Partition Disk #15, Partition #0
 Partition Size 19.53 GB (20,966,206,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE16
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 9.76 GB (10,479,006,720 bytes)
 Total Cylinders 1,274
 Total Sectors 20,466,810
 Total Tracks 324,870
 Tracks/Cylinder 255
 Partition Disk #16, Partition #0
 Partition Size 9.76 GB (10,478,974,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE17
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 18.55 GB (19,913,402,880 bytes)
 Total Cylinders 2,421
 Total Sectors 38,893,365
 Total Tracks 617,355
 Tracks/Cylinder 255
 Partition Disk #17, Partition #0
 Partition Size 18.55 GB (19,913,370,624 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE18
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1

SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 19.53 GB (20,966,238,720 bytes)
 Total Cylinders 2,549
 Total Sectors 40,949,685
 Total Tracks 649,995
 Tracks/Cylinder 255
 Partition Disk #18, Partition #0
 Partition Size 19.53 GB (20,966,206,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE19
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 9.76 GB (10,479,006,720 bytes)
 Total Cylinders 1,274
 Total Sectors 20,466,810
 Total Tracks 324,870
 Tracks/Cylinder 255
 Partition Disk #19, Partition #0
 Partition Size 9.76 GB (10,478,974,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE20
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 18.55 GB (19,913,402,880 bytes)
 Total Cylinders 2,421
 Total Sectors 38,893,365
 Total Tracks 617,355
 Tracks/Cylinder 255
 Partition Disk #20, Partition #0
 Partition Size 18.55 GB (19,913,370,624 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE21
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 29.29 GB (31,453,470,720 bytes)
 Total Cylinders 3,824

Total Sectors 61,432,560
Total Tracks 975,120
Tracks/Cylinder 255
Partition Disk #21, Partition #0
Partition Size 29.29 GB (31,453,438,464 bytes)
Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE7
Manufacturer Not Available
Model Not Available
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus Not Available
SCSI Logical Unit Not Available
SCSI Port Not Available
SCSI Target ID Not Available
Sectors/Track 63
Size 19.53 GB (20,966,238,720 bytes)
Total Cylinders 2,549
Total Sectors 40,949,685
Total Tracks 649,995
Tracks/Cylinder 255
Partition Disk #7, Partition #0
Partition Size 19.53 GB (20,966,206,464 bytes)
Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE8
Manufacturer Not Available
Model Not Available
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus Not Available
SCSI Logical Unit Not Available
SCSI Port Not Available
SCSI Target ID Not Available
Sectors/Track 63
Size 9.76 GB (10,479,006,720 bytes)
Total Cylinders 1,274
Total Sectors 20,466,810
Total Tracks 324,870
Tracks/Cylinder 255
Partition Disk #8, Partition #0
Partition Size 9.76 GB (10,478,974,464 bytes)
Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE9
Manufacturer Not Available
Model Not Available
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus Not Available
SCSI Logical Unit Not Available
SCSI Port Not Available
SCSI Target ID Not Available
Sectors/Track 63
Size 18.55 GB (19,913,402,880 bytes)
Total Cylinders 2,421
Total Sectors 38,893,365
Total Tracks 617,355
Tracks/Cylinder 255
Partition Disk #9, Partition #0
Partition Size 18.55 GB (19,913,370,624 bytes)
Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE10
Manufacturer Not Available
Model Not Available
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus Not Available
SCSI Logical Unit Not Available
SCSI Port Not Available
SCSI Target ID Not Available
Sectors/Track 63
Size 19.53 GB (20,966,238,720 bytes)
Total Cylinders 2,549
Total Sectors 40,949,685
Total Tracks 649,995
Tracks/Cylinder 255
Partition Disk #10, Partition #0
Partition Size 19.53 GB (20,966,206,464 bytes)
Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE11
Manufacturer Not Available
Model Not Available
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus Not Available
SCSI Logical Unit Not Available
SCSI Port Not Available
SCSI Target ID Not Available
Sectors/Track 63
Size 9.76 GB (10,479,006,720 bytes)
Total Cylinders 1,274
Total Sectors 20,466,810
Total Tracks 324,870
Tracks/Cylinder 255
Partition Disk #11, Partition #0
Partition Size 9.76 GB (10,478,974,464 bytes)
Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE12
Manufacturer Not Available
Model Not Available
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1
SCSI Bus Not Available
SCSI Logical Unit Not Available
SCSI Port Not Available
SCSI Target ID Not Available
Sectors/Track 63
Size 18.55 GB (19,913,402,880 bytes)
Total Cylinders 2,421
Total Sectors 38,893,365
Total Tracks 617,355
Tracks/Cylinder 255
Partition Disk #12, Partition #0
Partition Size 18.55 GB (19,913,370,624 bytes)
Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE13
Manufacturer Not Available
Model Not Available
Bytes/Sector 512
Media Loaded Yes
Media Type Fixed hard disk
Partitions 1

SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 29.29 GB (31,453,470,720 bytes)
 Total Cylinders 3,824
 Total Sectors 61,432,560
 Total Tracks 975,120
 Tracks/Cylinder 255
 Partition Disk #13, Partition #0
 Partition Size 29.29 GB (31,453,438,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE14
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 2.93 GB (3,142,056,960 bytes)
 Total Cylinders 382
 Total Sectors 6,136,830
 Total Tracks 97,410
 Tracks/Cylinder 255
 Partition Disk #14, Partition #0
 Partition Size 2.93 GB (3,142,024,704 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE29
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 19.53 GB (20,966,238,720 bytes)
 Total Cylinders 2,549
 Total Sectors 40,949,685
 Total Tracks 649,995
 Tracks/Cylinder 255
 Partition Disk #29, Partition #0
 Partition Size 19.53 GB (20,966,206,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE30
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 9.76 GB (10,479,006,720 bytes)
 Total Cylinders 1,274

Total Sectors 20,466,810
 Total Tracks 324,870
 Tracks/Cylinder 255
 Partition Disk #30, Partition #0
 Partition Size 9.76 GB (10,478,974,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE31
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 18.55 GB (19,913,402,880 bytes)
 Total Cylinders 2,421
 Total Sectors 38,893,365
 Total Tracks 617,355
 Tracks/Cylinder 255
 Partition Disk #31, Partition #0
 Partition Size 18.55 GB (19,913,370,624 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE32
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 19.53 GB (20,966,238,720 bytes)
 Total Cylinders 2,549
 Total Sectors 40,949,685
 Total Tracks 649,995
 Tracks/Cylinder 255
 Partition Disk #32, Partition #0
 Partition Size 19.53 GB (20,966,206,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE33
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 9.76 GB (10,479,006,720 bytes)
 Total Cylinders 1,274
 Total Sectors 20,466,810
 Total Tracks 324,870
 Tracks/Cylinder 255
 Partition Disk #33, Partition #0
 Partition Size 9.76 GB (10,478,974,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE34
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 18.55 GB (19,913,402,880 bytes)
 Total Cylinders 2,421
 Total Sectors 38,893,365
 Total Tracks 617,355
 Tracks/Cylinder 255
 Partition Disk #34, Partition #0
 Partition Size 18.55 GB (19,913,370,624 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE35
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 29.29 GB (31,453,470,720 bytes)
 Total Cylinders 3,824
 Total Sectors 61,432,560
 Total Tracks 975,120
 Tracks/Cylinder 255
 Partition Disk #35, Partition #0
 Partition Size 29.29 GB (31,453,438,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE36
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 5.85 GB (6,284,113,920 bytes)
 Total Cylinders 764
 Total Sectors 12,273,660
 Total Tracks 194,820
 Tracks/Cylinder 255
 Partition Disk #36, Partition #0
 Partition Size 5.85 GB (6,284,081,664 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE22
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1

SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 19.53 GB (20,966,238,720 bytes)
 Total Cylinders 2,549
 Total Sectors 40,949,685
 Total Tracks 649,995
 Tracks/Cylinder 255
 Partition Disk #22, Partition #0
 Partition Size 19.53 GB (20,966,206,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE23
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 9.76 GB (10,479,006,720 bytes)
 Total Cylinders 1,274
 Total Sectors 20,466,810
 Total Tracks 324,870
 Tracks/Cylinder 255
 Partition Disk #23, Partition #0
 Partition Size 9.76 GB (10,478,974,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE24
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 18.55 GB (19,913,402,880 bytes)
 Total Cylinders 2,421
 Total Sectors 38,893,365
 Total Tracks 617,355
 Tracks/Cylinder 255
 Partition Disk #24, Partition #0
 Partition Size 18.55 GB (19,913,370,624 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE25
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 19.53 GB (20,966,238,720 bytes)
 Total Cylinders 2,549

Total Sectors 40,949,685
 Total Tracks 649,995
 Tracks/Cylinder 255
 Partition Disk #25, Partition #0
 Partition Size 19.53 GB (20,966,206,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE26
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 9.76 GB (10,479,006,720 bytes)
 Total Cylinders 1,274
 Total Sectors 20,466,810
 Total Tracks 324,870
 Tracks/Cylinder 255
 Partition Disk #26, Partition #0
 Partition Size 9.76 GB (10,478,974,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE27
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 18.55 GB (19,913,402,880 bytes)
 Total Cylinders 2,421
 Total Sectors 38,893,365
 Total Tracks 617,355
 Tracks/Cylinder 255
 Partition Disk #27, Partition #0
 Partition Size 18.55 GB (19,913,370,624 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE28
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 29.29 GB (31,453,470,720 bytes)
 Total Cylinders 3,824
 Total Sectors 61,432,560
 Total Tracks 975,120
 Tracks/Cylinder 255
 Partition Disk #28, Partition #0
 Partition Size 29.29 GB (31,453,438,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE0
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 19.53 GB (20,966,238,720 bytes)
 Total Cylinders 2,549
 Total Sectors 40,949,685
 Total Tracks 649,995
 Tracks/Cylinder 255
 Partition Disk #0, Partition #0
 Partition Size 19.53 GB (20,966,206,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE1
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 9.76 GB (10,479,006,720 bytes)
 Total Cylinders 1,274
 Total Sectors 20,466,810
 Total Tracks 324,870
 Tracks/Cylinder 255
 Partition Disk #1, Partition #0
 Partition Size 9.76 GB (10,478,974,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE2
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 18.55 GB (19,913,402,880 bytes)
 Total Cylinders 2,421
 Total Sectors 38,893,365
 Total Tracks 617,355
 Tracks/Cylinder 255
 Partition Disk #2, Partition #0
 Partition Size 18.55 GB (19,913,370,624 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE3
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1

SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 19.53 GB (20,966,238,720 bytes)
 Total Cylinders 2,549
 Total Sectors 40,949,685
 Total Tracks 649,995
 Tracks/Cylinder 255
 Partition Disk #3, Partition #0
 Partition Size 19.53 GB (20,966,206,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE4
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1

SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 9.76 GB (10,479,006,720 bytes)
 Total Cylinders 1,274
 Total Sectors 20,466,810
 Total Tracks 324,870
 Tracks/Cylinder 255
 Partition Disk #4, Partition #0
 Partition Size 9.76 GB (10,478,974,464 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE5
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 18.55 GB (19,913,402,880 bytes)
 Total Cylinders 2,421
 Total Sectors 38,893,365
 Total Tracks 617,355
 Tracks/Cylinder 255
 Partition Disk #5, Partition #0
 Partition Size 18.55 GB (19,913,370,624 bytes)
 Partition Starting Offset 32,256 bytes

Description \\.\PHYSICALDRIVE6
 Manufacturer Not Available
 Model Not Available
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus Not Available
 SCSI Logical Unit Not Available
 SCSI Port Not Available
 SCSI Target ID Not Available
 Sectors/Track 63
 Size 29.29 GB (31,453,470,720 bytes)
 Total Cylinders 3,824

Total Sectors 61,432,560
 Total Tracks 975,120
 Tracks/Cylinder 255
 Partition Disk #6, Partition #0
 Partition Size 29.29 GB (31,453,438,464 bytes)
 Partition Starting Offset 32,256 bytes

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

SCSI Bus 4
 SCSI Logical Unit 0
 SCSI Port 2
 SCSI Target ID 0
 Sectors/Track 32
 Size 3.91 GB (4,194,631,680 bytes)
 Total Cylinders 1,004
 Total Sectors 8,192,640
 Total Tracks 256,020
 Tracks/Cylinder 255
 Partition Disk #37, Partition #0
 Partition Size 3.90 GB (4,190,437,376 bytes)
 Partition Starting Offset 16,384 bytes

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

SCSI Bus 4
 SCSI Logical Unit 0
 SCSI Port 2
 SCSI Target ID 1
 Sectors/Track 32
 Size 2.93 GB (3,145,973,760 bytes)
 Total Cylinders 753
 Total Sectors 6,144,480
 Total Tracks 192,015
 Tracks/Cylinder 255
 Partition Disk #38, Partition #0
 Partition Size 2.93 GB (3,141,779,456 bytes)
 Partition Starting Offset 16,384 bytes

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

SCSI Bus 4
 SCSI Logical Unit 0
 SCSI Port 2
 SCSI Target ID 2
 Sectors/Track 32
 Size 5.37 GB (5,765,529,600 bytes)
 Total Cylinders 1,380
 Total Sectors 11,260,800
 Total Tracks 351,900
 Tracks/Cylinder 255
 Partition Disk #39, Partition #0
 Partition Size 5.37 GB (5,761,335,296 bytes)
 Partition Starting Offset 16,384 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model COMPAQ LOGICAL VOLUME SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus 4
 SCSI Logical Unit 0
 SCSI Port 2
 SCSI Target ID 3
 Sectors/Track 32
 Size 2.93 GB (3,145,973,760 bytes)
 Total Cylinders 753
 Total Sectors 6,144,480
 Total Tracks 192,015
 Tracks/Cylinder 255
 Partition Disk #40, Partition #0
 Partition Size 2.93 GB (3,141,779,456 bytes)
 Partition Starting Offset 16,384 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model COMPAQ LOGICAL VOLUME SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus 4
 SCSI Logical Unit 0
 SCSI Port 2
 SCSI Target ID 4
 Sectors/Track 32
 Size 5.37 GB (5,765,529,600 bytes)
 Total Cylinders 1,380
 Total Sectors 11,260,800
 Total Tracks 351,900
 Tracks/Cylinder 255
 Partition Disk #41, Partition #0
 Partition Size 5.37 GB (5,761,335,296 bytes)
 Partition Starting Offset 16,384 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model COMPAQ LOGICAL VOLUME SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 1
 SCSI Bus 4
 SCSI Logical Unit 0
 SCSI Port 2
 SCSI Target ID 5
 Sectors/Track 32
 Size 11.72 GB (12,583,895,040 bytes)
 Total Cylinders 3,012
 Total Sectors 24,577,920
 Total Tracks 768,060
 Tracks/Cylinder 255
 Partition Disk #42, Partition #0
 Partition Size 11.72 GB (12,579,700,736 bytes)
 Partition Starting Offset 16,384 bytes

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

SCSI Bus 4
 SCSI Logical Unit 0
 SCSI Port 2
 SCSI Target ID 6
 Sectors/Track 32
 Size 1.08 GB (1,161,461,760 bytes)
 Total Cylinders 278
 Total Sectors 2,268,480
 Total Tracks 70,890
 Tracks/Cylinder 255
 Partition Disk #43, Partition #0
 Partition Size 1.08 GB (1,157,267,456 bytes)
 Partition Starting Offset 16,384 bytes

[SCSI]

Item Value
 Name Compaq Smart Array 5i Controller
 Manufacturer Compaq
 Status OK
 PNP Device ID
 PCI\VEN_0E11&DEV_B178&SUBSYS_40800E11&REV_01\3
 &13C0B0C5&0&08
 Memory Address 0xF79C0000-0xF79FFFFF
 I/O Port 0x00003000-0x000030FF
 Memory Address 0xF78F0000-0xF78F3FFF
 IRQ Channel IRQ 31
 Driver c:\windows\system32\drivers\cpqcissm.sys (5.8.74.1 built by:
 Microsoft, 13.00 KB (13,312 bytes), 3/25/2003 12:00 AM)

Name Smart Array 5312 Controller (Non-Miniport)
 Manufacturer Hewlett-Packard
 Status OK
 PNP Device ID
 PCI\VEN_0E11&DEV_B178&SUBSYS_40830E11&REV_01\3
 &1070020&0&08
 Memory Address 0xF7BC0000-0xF7BFFFFF
 I/O Port 0x00004000-0x000044FF
 Memory Address 0xF7AF0000-0xF7AF3FFF
 IRQ Channel IRQ 18
 Driver c:\windows\system32\drivers\hpqcissb.sys (5.6.2.32 built by:
 WinDDK, 38.00 KB (38,912 bytes), 5/2/2003 3:57 PM)

Name Smart Array 5312 Controller (Non-Miniport)
 Manufacturer Hewlett-Packard
 Status OK
 PNP Device ID
 PCI\VEN_0E11&DEV_B178&SUBSYS_40830E11&REV_01\3
 &1070020&0&10
 Memory Address 0xF7B80000-0xF7BBFFFF
 I/O Port 0x00004400-0x000044FF
 Memory Address 0xF7AE0000-0xF7AE3FFF
 IRQ Channel IRQ 16
 Driver c:\windows\system32\drivers\hpqcissb.sys (5.6.2.32 built by:
 WinDDK, 38.00 KB (38,912 bytes), 5/2/2003 3:57 PM)

Name Smart Array 5312 Controller (Non-Miniport)
 Manufacturer Hewlett-Packard
 Status OK
 PNP Device ID
 PCI\VEN_0E11&DEV_B178&SUBSYS_40830E11&REV_01\3
 &29E81982&0&10
 Memory Address 0xF7D80000-0xF7DBFFFF
 I/O Port 0x00005000-0x000050FF
 Memory Address 0xF7CF0000-0xF7CF3FFF
 IRQ Channel IRQ 20
 Driver c:\windows\system32\drivers\hpqcissb.sys (5.6.2.32 built by:
 WinDDK, 38.00 KB (38,912 bytes), 5/2/2003 3:57 PM)

Name Smart Array 5312 Controller (Non-Miniport)

Manufacturer Hewlett-Packard
 Status OK
 PNP Device ID
 PCI\VEN_0E11&DEV_B178&SUBSYS_40830E11&REV_01\3
 &172E68DD&0&08
 Memory Address 0xF7FC0000-0xF7FFFFFF
 I/O Port 0x00006000-0x000064FF
 Memory Address 0xF7EF0000-0xF7EF3FFF
 IRQ Channel IRQ 26
 Driver c:\windows\system32\drivers\hpqcissb.sys (5.6.2.32 built by:
 WinDDK, 38.00 KB (38,912 bytes), 5/2/2003 3:57 PM)

Name Smart Array 5312 Controller (Non-Miniport)
 Manufacturer Hewlett-Packard
 Status OK
 PNP Device ID
 PCI\VEN_0E11&DEV_B178&SUBSYS_40830E11&REV_01\3
 &172E68DD&0&10
 Memory Address 0xF7F80000-0xF7FBFFFF
 I/O Port 0x00006400-0x000064FF
 Memory Address 0xF7EE0000-0xF7EE3FFF
 IRQ Channel IRQ 24
 Driver c:\windows\system32\drivers\hpqcissb.sys (5.6.2.32 built by:
 WinDDK, 38.00 KB (38,912 bytes), 5/2/2003 3:57 PM)

[IDE]

Item Value
 Name CSB5 IDE Controller
 Manufacturer ServerWorks
 Status OK
 PNP Device ID
 PCI\VEN_1166&DEV_0212&SUBSYS_02121166&REV_93\3
 &267A616A&0&79
 I/O Port 0x00002000-0x0000200F
 Driver c:\windows\system32\drivers\pciide.sys (5.2.3790.0
 (srv03_rtm.030324-2048), 5.50 KB (5,632 bytes), 3/25/2003 12:00 AM)

Name Primary IDE Channel
 Manufacturer (Standard IDE ATA/ATAPI controllers)
 Status OK
 PNP Device ID PCI\IDE\IDECHANNEL\4&1024D5C6&0&0
 I/O Port 0x000001F0-0x000001F7
 I/O Port 0x000003F6-0x000003F6
 IRQ Channel IRQ 14
 Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.0
 (srv03_rtm.030324-2048), 89.00 KB (91,136 bytes), 3/25/2003 12:00 AM)

Name Secondary IDE Channel
 Manufacturer (Standard IDE ATA/ATAPI controllers)
 Status OK
 PNP Device ID PCI\IDE\IDECHANNEL\4&1024D5C6&0&1
 I/O Port 0x00000170-0x00000177
 I/O Port 0x00000376-0x00000376
 Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.0
 (srv03_rtm.030324-2048), 89.00 KB (91,136 bytes), 3/25/2003 12:00 AM)

[Printing]

Name Driver Port Name Server Name

[Problem Devices]

Device PNP Device ID Error Code

[USB]

Device PNP Device ID
 ServerWorks (RCC) PCI to USB Open Host Controller
 PCI\VEN_1166&DEV_0220&SUBSYS_02201166&REV_05\3
 &267A616A&0&7A
 USB Root Hub USB\ROOT_HUB\4&AF5358C&0

[Software Environment]

[System Drivers]

| Name | Description | File | Type | Started | Start |
|----------|---|--|---------------|---------|--------|
| Mode | State | Status | Error Control | Accept | Pause |
| | Accept Stop | | | | |
| abiosdsk | Abiosdsk | Not Available | Kernel Driver | No | No |
| | Disabled | Stopped | OK | Ignore | No |
| acpi | Microsoft ACPI Driver | | Kernel Driver | | |
| | c:\windows\system32\drivers\acpi.sys | | Kernel Driver | | |
| | Yes | Boot | Running | OK | Normal |
| | Yes | | | | No |
| acpiec | ACPIEC | c:\windows\system32\drivers\acpiec.sys | Kernel | | |
| Driver | No | Disabled | Stopped | OK | Normal |
| | No | | | | No |
| adpu160m | adpu160m | Not Available | Kernel Driver | No | No |
| | Disabled | Stopped | OK | Normal | No |
| adpu320 | adpu320 | Not Available | Kernel Driver | No | No |
| | Disabled | Stopped | OK | Normal | No |
| afent | afent | Not Available | Kernel Driver | No | No |
| | Disabled | Stopped | OK | Normal | No |
| afd | AFD Networking Support Environment | | Kernel Driver | | |
| | c:\windows\system32\drivers\afd.sys | | Kernel Driver | | |
| | Yes | Auto | Running | OK | Normal |
| | Yes | | | | No |
| aha154x | Aha154x | Not Available | Kernel Driver | No | No |
| | Disabled | Stopped | OK | Normal | No |
| aic78u2 | aic78u2 | Not Available | Kernel Driver | No | No |
| | Disabled | Stopped | OK | Normal | No |
| aic78xx | aic78xx | Not Available | Kernel Driver | No | No |
| | Disabled | Stopped | OK | Normal | No |
| aliide | AliIde | Not Available | Kernel Driver | No | No |
| | Disabled | Stopped | OK | Normal | No |
| asynmac | RAS Asynchronous Media Driver | | Kernel Driver | | |
| | c:\windows\system32\drivers\asynmac.sys | | Kernel Driver | | |
| | No | Manual | Stopped | OK | Normal |
| | No | | | | No |
| atapi | Standard IDE/ESDI Hard Disk Controller | | Kernel Driver | | |
| | c:\windows\system32\drivers\atapi.sys | | Kernel Driver | | |
| | Yes | Boot | Running | OK | Normal |
| | Yes | | | | No |
| atdisk | Atdisk | Not Available | Kernel Driver | No | No |
| | Disabled | Stopped | OK | Ignore | No |
| ati2mpad | ati2mpad | c:\windows\system32\drivers\ati2mpad.sys | Kernel | | |
| Driver | No | Manual | Stopped | OK | Ignore |
| | No | | | | No |
| atmarpc | ATM ARP Client Protocol | | Kernel Driver | | |
| | c:\windows\system32\drivers\atmarpc.sys | | Kernel Driver | | |
| | No | Manual | Stopped | OK | Normal |
| | No | | | | No |

| | | | | | | | | | | | | | | | | | | | | |
|----------------|---|--|--------------------|----------|----------|----------|----------|---------|--------|--|--|--|--|--|--|--|--|--|--|--|
| audstub | Audio Stub Driver | c:\windows\system32\drivers\audstub.sys | Kernel Driver | Yes | Manual | Running | OK | | | | | | | | | | | | | |
| | Normal | No | Yes | | | | | | | | | | | | | | | | | |
| b57w2k | BCM5701 Gigabit Ethernet | c:\windows\system32\drivers\b57xp32.sys | Kernel Driver | Yes | Manual | Running | OK | Normal | No | | | | | | | | | | | |
| beep | Beep | c:\windows\system32\drivers\beep.sys | Kernel Driver | Yes | System | Running | OK | Normal | No | | | | | | | | | | | |
| cbidf2k | cbidf2k | c:\windows\system32\drivers\cbidf2k.sys | Kernel Driver | No | Disabled | Stopped | OK | Normal | No | | | | | | | | | | | |
| cd20xmt | cd20xmt | Not Available | Kernel Driver | Disabled | Stopped | OK | | Normal | No | | | | | | | | | | | |
| cdfs | Cdfs | c:\windows\system32\drivers\cdfs.sys | File System Driver | Yes | Disabled | Running | OK | Normal | | | | | | | | | | | | |
| cdrom | CD-ROM Driver | c:\windows\system32\drivers\cdrom.sys | Kernel Driver | Normal | No | Yes | System | Running | OK | | | | | | | | | | | |
| changer | Changer | Not Available | Kernel Driver | System | Stopped | OK | Ignore | No | No | | | | | | | | | | | |
| clusdisk | Cluster Disk Driver | c:\windows\system32\drivers\clusdisk.sys | Kernel Driver | Normal | No | No | Disabled | Stopped | OK | | | | | | | | | | | |
| cmdide | CmdIde | Not Available | Kernel Driver | Disabled | Stopped | OK | | Normal | No | | | | | | | | | | | |
| cpqarray | Cpqarray | Not Available | Kernel Driver | Disabled | Stopped | OK | | Normal | No | | | | | | | | | | | |
| cpqarray2 | cpqarray2 | Not Available | Kernel Driver | Disabled | Stopped | OK | | Normal | No | | | | | | | | | | | |
| cpqasm2 | HP ProLiant iLO Advanced System Management Controller | c:\windows\system32\drivers\cpqasm2.sys | Kernel Driver | Yes | Manual | Running | OK | Normal | No | | | | | | | | | | | |
| cpqcidrv | HP Integrated Lights-Out | c:\windows\system32\drivers\cpqcidrv.sys | Kernel Driver | Yes | Manual | Running | OK | Normal | No | | | | | | | | | | | |
| cpqcissm | cpqcissm | c:\windows\system32\drivers\cpqcissm.sys | Kernel Driver | Yes | Boot | Running | OK | Normal | No | | | | | | | | | | | |
| cpqfcalm | cpqfcalm | Not Available | Kernel Driver | Disabled | Stopped | OK | | Normal | No | | | | | | | | | | | |
| crdisk | CRC Disk Filter Driver | c:\windows\system32\drivers\crdisk.sys | Kernel Driver | Yes | Boot | Running | OK | Normal | No | | | | | | | | | | | |
| dac960nt | dac960nt | Not Available | Kernel Driver | Disabled | Stopped | OK | | Normal | No | | | | | | | | | | | |
| dellcerc | dellcerc | Not Available | Kernel Driver | Disabled | Stopped | OK | | Normal | No | | | | | | | | | | | |
| dfsdriver | DfsDriver | c:\windows\system32\drivers\dfs.sys | File System Driver | No | Yes | | Boot | Running | OK | | | | | | | | | | | |
| disk | Disk Driver | c:\windows\system32\drivers\disk.sys | Kernel Driver | Normal | No | Yes | Boot | Running | OK | | | | | | | | | | | |
| dmboot | dmboot | c:\windows\system32\drivers\dmboot.sys | Kernel Driver | Yes | Disabled | Running | OK | Normal | No | | | | | | | | | | | |
| dmio | Logical Disk Manager Driver | c:\windows\system32\drivers\dmio.sys | Kernel Driver | Yes | Boot | Running | OK | Normal | No | | | | | | | | | | | |
| dmload | dmload | c:\windows\system32\drivers\dmload.sys | Kernel Driver | Yes | Boot | Running | OK | Normal | No | | | | | | | | | | | |
| dpti2o | dpti2o | Not Available | Kernel Driver | Disabled | Stopped | OK | | Normal | No | | | | | | | | | | | |
| fastfat | Fastfat | c:\windows\system32\drivers\fastfat.sys | File System Driver | No | No | Disabled | Stopped | OK | Normal | | | | | | | | | | | |
| fdc | Floppy Disk Controller Driver | c:\windows\system32\drivers\fdc.sys | Kernel Driver | Yes | Manual | Running | OK | Normal | No | | | | | | | | | | | |
| fips | Fips | c:\windows\system32\drivers\fips.sys | Kernel Driver | Yes | System | Running | OK | Normal | No | | | | | | | | | | | |
| flpydisk | Floppy Disk Driver | c:\windows\system32\drivers\flpydisk.sys | Kernel Driver | Normal | No | Yes | Manual | Running | OK | | | | | | | | | | | |
| ftdisk | Volume Manager Driver | c:\windows\system32\drivers\ftdisk.sys | Kernel Driver | Yes | Boot | Running | OK | Normal | No | | | | | | | | | | | |
| gpc | Generic Packet Classifier | c:\windows\system32\drivers\msgpc.sys | Kernel Driver | Yes | Manual | Running | OK | Normal | No | | | | | | | | | | | |
| hpn | hpn | Not Available | Kernel Driver | Disabled | Stopped | OK | | Normal | No | | | | | | | | | | | |
| hpqcissb | Smart Array Controllers Non-Miniport Bus Driver | c:\windows\system32\drivers\hpqcissb.sys | Kernel Driver | Yes | Boot | Running | OK | Normal | No | | | | | | | | | | | |
| hpqcissd | Smart Array Controllers Non-Miniport Disk Driver | c:\windows\system32\drivers\hpqcissd.sys | Kernel Driver | Yes | Boot | Running | OK | Normal | No | | | | | | | | | | | |
| hpt3xx | hpt3xx | Not Available | Kernel Driver | Disabled | Stopped | OK | | Normal | No | | | | | | | | | | | |
| http | HTTP | c:\windows\system32\drivers\http.sys | Kernel Driver | No | Manual | Stopped | OK | Normal | No | | | | | | | | | | | |
| i2omgmt | i2omgmt | Not Available | Kernel Driver | System | Stopped | OK | | Normal | No | | | | | | | | | | | |
| i2omp | i2omp | Not Available | Kernel Driver | Disabled | Stopped | OK | | Normal | No | | | | | | | | | | | |
| i8042prt | i8042 Keyboard and PS/2 Mouse Port Driver | c:\windows\system32\drivers\i8042prt.sys | Kernel Driver | Yes | System | Running | OK | Normal | No | | | | | | | | | | | |
| iirsp | iirsp | Not Available | Kernel Driver | Disabled | Stopped | OK | | Normal | No | | | | | | | | | | | |
| imapi | CD-Burning Filter Driver | c:\windows\system32\drivers\imapi.sys | Kernel Driver | No | System | Stopped | OK | Normal | No | | | | | | | | | | | |
| intellide | IntellIde | Not Available | Kernel Driver | Disabled | Stopped | OK | | Normal | No | | | | | | | | | | | |
| ipfilterdriver | IP Traffic Filter Driver | c:\windows\system32\drivers\ipfltdrv.sys | Kernel Driver | | | | | | | | | | | | | | | | | |

| | | | | | | |
|---------------|---|---------|---------|---------|--------------------|----|
| | No | Manual | Stopped | OK | Normal | No |
| ipinip | IP in IP Tunnel Driver:c:\windows\system32\drivers\ipinip.sys | | | | | |
| | Kernel Driver | No | Manual | Stopped | OK | |
| | Normal | No | No | | | |
| ipnat | IP Network Address Translator | | | | | |
| | c:\windows\system32\drivers\ipnat.sys | | | | Kernel Driver | |
| | No | Manual | Stopped | OK | Normal | No |
| ipsecc | IPSEC driver | | | | | |
| | c:\windows\system32\drivers\ipsecc.sys | | | | Kernel Driver | |
| | Kernel Driver | Yes | System | Running | OK | |
| | Normal | No | Yes | | | |
| ipsraidn | ipsraidn Not Available | | | | | |
| | Disabled | Stopped | OK | | Kernel Driver | No |
| | | | | | Normal | No |
| isapnp | PnP ISA/EISA Bus Driver | | | | | |
| | c:\windows\system32\drivers\isapnp.sys | | | | Kernel Driver | |
| | Yes | Boot | Running | OK | Critical | No |
| | Yes | | | | | |
| kbdclass | Keyboard Class Driver | | | | | |
| | c:\windows\system32\drivers\kbdclass.sys | | | | Kernel Driver | |
| | Yes | System | Running | OK | Normal | No |
| | Yes | | | | | |
| ksecdd | KSecDD | | | | | |
| Driver | c:\windows\system32\drivers\ksecdd.sys | | | | Kernel | |
| | Yes | Boot | Running | OK | Normal | No |
| | Yes | | | | | |
| lp6nds35 | lp6nds35 Not Available | | | | | |
| | Disabled | Stopped | OK | | Kernel Driver | No |
| | | | | | Normal | No |
| mnmd | mnmd c:\windows\system32\drivers\mnmd.sys | | | | | |
| Driver | Yes | System | Running | OK | Kernel | |
| | Yes | | | | Ignore | No |
| | Yes | | | | | |
| modem | Modem c:\windows\system32\drivers\modem.sys | | | | | |
| Driver | No | Manual | Stopped | OK | Kernel | |
| | No | | | | Ignore | No |
| | No | | | | | |
| mouclass | Mouse Class Driver c:\windows\system32\drivers\mouclass.sys | | | | | |
| | Kernel Driver | Yes | System | Running | OK | |
| | Normal | No | Yes | | | |
| mountmgr | Mount Point Manager | | | | | |
| | c:\windows\system32\drivers\mountmgr.sys | | | | Kernel Driver | |
| | Yes | Boot | Running | OK | Normal | No |
| | Yes | | | | | |
| mraid35x | mraid35x Not Available | | | | | |
| | Disabled | Stopped | OK | | Kernel Driver | No |
| | | | | | Normal | No |
| mrxdav | WebDav Client Redirector | | | | | |
| | c:\windows\system32\drivers\mrxdav.sys | | | | File System Driver | |
| | No | Manual | Stopped | OK | Normal | No |
| | No | | | | | |
| mrxsmb | MRXSMB c:\windows\system32\drivers\mrxsmb.sys | | | | | |
| System Driver | Yes | System | Running | OK | File | |
| | No | Yes | | | Normal | |
| msfs | Msfs c:\windows\system32\drivers\msfs.sys | | | | | |
| System Driver | Yes | System | Running | OK | File | |
| | No | Yes | | | Normal | |
| mup | Mup c:\windows\system32\drivers\mup.sys | | | | | |
| System Driver | Yes | Boot | Running | OK | File | |
| | No | Yes | | | Normal | |
| ndis | NDIS System Driver c:\windows\system32\drivers\ndis.sys | | | | | |
| | Kernel Driver | Yes | Boot | Running | OK | |
| | Normal | No | Yes | | | |
| ndistapi | Remote Access NDIS TAPI Driver | | | | | |
| | c:\windows\system32\drivers\ndistapi.sys | | | | Kernel Driver | |
| | Yes | Manual | Running | OK | Normal | No |
| | Yes | | | | | |
| ndisuio | NDIS Usermode I/O Protocol | | | | | |
| | c:\windows\system32\drivers\ndisuio.sys | | | | Kernel Driver | |
| | Yes | Manual | Running | OK | Normal | No |
| | Yes | | | | | |

| | | | | | | |
|---------------|--|----------|---------|----|--------------------|----|
| ndiswan | Remote Access NDIS WAN Driver | | | | | |
| | c:\windows\system32\drivers\ndiswan.sys | | | | Kernel Driver | |
| | Yes | Manual | Running | OK | Normal | No |
| | Yes | | | | | |
| ndproxy | NDIS Proxy | | | | | |
| | c:\windows\system32\drivers\ndproxy.sys | | | | Kernel Driver | |
| | Yes | Manual | Running | OK | | |
| | Normal | No | Yes | | | |
| netbios | NetBIOS Interface | | | | | |
| | c:\windows\system32\drivers\netbios.sys | | | | File System Driver | |
| | Yes | System | Running | OK | | |
| | Normal | No | Yes | | | |
| netbt | NetBios over Tcpip | | | | | |
| | c:\windows\system32\drivers\netbt.sys | | | | Kernel Driver | |
| | Yes | System | Running | OK | | |
| | Normal | No | Yes | | | |
| nfrd960 | nfrd960 Not Available | | | | | |
| | Disabled | Stopped | OK | | Kernel Driver | No |
| | | | | | Normal | No |
| npfs | Npfs | | | | | |
| | c:\windows\system32\drivers\npfs.sys | | | | File | |
| System Driver | Yes | System | Running | OK | Normal | |
| | No | Yes | | | | |
| ntfs | Ntfs | | | | | |
| | c:\windows\system32\drivers\ntfs.sys | | | | File | |
| System Driver | Yes | Disabled | Running | OK | Normal | |
| | No | Yes | | | | |
| null | Null | | | | | |
| Driver | c:\windows\system32\drivers\null.sys | | | | Kernel | |
| | Yes | System | Running | OK | Normal | No |
| | Yes | | | | | |
| parport | Parport | | | | | |
| Driver | c:\windows\system32\drivers\parport.sys | | | | Kernel | |
| | No | Manual | Stopped | OK | Ignore | No |
| | No | | | | | |
| partmgr | Partition Manager | | | | | |
| | c:\windows\system32\drivers\partmgr.sys | | | | Kernel Driver | |
| | Yes | Boot | Running | OK | | |
| | Normal | No | Yes | | | |
| pci | PCI Bus Driver | | | | | |
| | c:\windows\system32\drivers\pci.sys | | | | Kernel Driver | |
| | Yes | Boot | Running | OK | | |
| | Critical | No | Yes | | | |
| pciide | PCIIde | | | | | |
| Driver | c:\windows\system32\drivers\pciide.sys | | | | Kernel | |
| | Yes | Boot | Running | OK | Normal | No |
| | Yes | | | | | |
| pcmcia | Pcmcia | | | | | |
| Driver | c:\windows\system32\drivers\pcmcia.sys | | | | Kernel | |
| | No | Disabled | Stopped | OK | Normal | No |
| | No | | | | | |
| pdcomp | PDCOMP | | | | | |
| | Not Available | | | | Kernel Driver | No |
| | Manual | Stopped | OK | | Ignore | No |
| | | | | | | |
| pdframe | PDFFRAME | | | | | |
| | Not Available | | | | Kernel Driver | No |
| | No | Manual | Stopped | OK | Ignore | No |
| | No | | | | | |
| pdreli | PDRELI | | | | | |
| | Not Available | | | | Kernel Driver | No |
| | Manual | Stopped | OK | | Ignore | No |
| | | | | | | |
| pdrframe | PDRFRAME | | | | | |
| | Not Available | | | | Kernel Driver | No |
| | No | Manual | Stopped | OK | Ignore | No |
| | No | | | | | |
| perc2 | perc2 | | | | | |
| | Not Available | | | | Kernel Driver | No |
| | Disabled | Stopped | OK | | Normal | No |
| | | | | | | |
| perc2hib | perc2hib | | | | | |
| | Not Available | | | | Kernel Driver | No |
| | Disabled | Stopped | OK | | Normal | No |
| | | | | | | |
| pptpminiport | WAN Miniport (PPTP) | | | | | |
| | c:\windows\system32\drivers\rasppptp.sys | | | | Kernel Driver | |
| | Yes | Manual | Running | OK | Normal | No |
| | Yes | | | | | |
| processor | Processor Driver | | | | | |
| | c:\windows\system32\drivers\processr.sys | | | | Kernel Driver | |
| | Yes | Manual | Running | OK | | |
| | Normal | No | Yes | | | |
| ptlink | Direct Parallel Link Driver | | | | | |
| | c:\windows\system32\drivers\ptlink.sys | | | | Kernel Driver | |
| | Yes | Manual | Running | OK | Normal | No |
| | Yes | | | | | |

| | | | | | | | | | |
|---------|---|---|-------------------------|-------------------------|--|--|---|-------------------------|-------------------------|
| ql1080 | ql1080 Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No | simbad | Simbad Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No |
| ql10wnt | Ql10wnt Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No | sparrow | Sparrow Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No |
| ql12160 | ql12160 Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No | srv | Srv System Driver | c:\windows\system32\drivers\srv.sys Yes Manual Running No Yes | Kernel Driver OK | File Normal |
| ql1240 | ql1240 Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No | swenum | Software Bus Driver | c:\windows\system32\drivers\swenum.sys Kernel Driver Yes Manual Running Normal No Yes | Kernel Driver OK | File Normal |
| ql1280 | ql1280 Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No | symc810 | symc810 Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No |
| ql2100 | ql2100 Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No | symc8xx | symc8xx Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No |
| ql2200 | ql2200 Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No | symmpi | symmpi Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No |
| ql2300 | ql2300 Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No | sym_hi | sym_hi Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No |
| rasacd | Remote Access Auto Connection Driver c:\windows\system32\drivers\rasacd.sys Yes System Running OK | | | Kernel Driver Normal No | sym_u3 | sym_u3 Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No |
| rasl2tp | WAN Miniport (L2TP) c:\windows\system32\drivers\rasl2tp.sys Yes Manual Running OK | | | Kernel Driver Normal No | sysmgmt | HP ProLiant System Management Interface Driver c:\windows\system32\drivers\sysmgmt.sys Yes Manual Running OK | | | Kernel Driver Normal No |
| rasppoe | Remote Access PPPOE Driver c:\windows\system32\drivers\rasppoe.sys Yes Manual Running OK | | | Kernel Driver Normal No | tcpip | TCP/IP Protocol Driver c:\windows\system32\drivers\tcpip.sys Yes System Running OK | | | Kernel Driver Normal No |
| raspti | Direct Parallel Kernel Driver | c:\windows\system32\drivers\raspti.sys Yes Manual Running OK | Kernel Driver Normal No | tdpipe | TDPIPE Driver | c:\windows\system32\drivers\tdpipe.sys No Manual Stopped OK | Kernel Driver Ignore | No No | |
| rdbss | Rdbss System Driver | c:\windows\system32\drivers\rdbss.sys Yes System Running OK | File Normal | tdtcp | TDTCP Driver | c:\windows\system32\drivers\tdtcp.sys Yes Manual Running OK | Kernel Driver Ignore | No No | |
| rdpcdd | RDPCDD Driver | c:\windows\system32\drivers\rdpcdd.sys Yes System Running OK | Kernel Driver Ignore | termdd | Terminal Device Driver c:\windows\system32\drivers\termdd.sys Yes System Running OK | | | Kernel Driver Normal No | |
| rdpdr | Terminal Server Device Redirector Driver | c:\windows\system32\drivers\rdpdr.sys Yes Manual Running OK | Kernel Driver Normal No | toside | TosIde | Not Available Stopped OK | Kernel Driver Normal No | No No | |
| rdpwd | RDPWD Driver | c:\windows\system32\drivers\rdpwd.sys Yes Manual Running OK | Kernel Driver Ignore | udfs | Udfs System Driver | c:\windows\system32\drivers\udfs.sys No No Disabled Stopped OK | File Normal | No No | |
| redbook | Digital CD Audio Playback Filter Driver c:\windows\system32\drivers\redbook.sys Yes System Running OK | | | Kernel Driver Normal No | ultra | ultra Disabled | Not Available Stopped OK | Kernel Driver Normal No | No No |
| secdrv | Secdrv Driver | c:\windows\system32\drivers\secdrv.sys No Manual Stopped OK | Kernel Driver Normal No | update | Microcode Update Driver c:\windows\system32\drivers\update.sys Yes Manual Running OK | | | Kernel Driver Normal No | |
| serenum | Serenum Filter Driver | c:\windows\system32\drivers\serenum.sys Kernel Driver Yes Manual Running OK Normal No Yes | Kernel Driver Normal No | usbhub | USB2 Enabled Hub | c:\windows\system32\drivers\usbhub.sys Kernel Driver Yes Manual Running OK Normal No Yes | Kernel Driver Normal No | File Normal | |
| serial | Serial port driver | c:\windows\system32\drivers\serial.sys Kernel Driver Yes System Running OK Ignore No Yes | Kernel Driver Normal No | usbohci | Microsoft USB Open Host Controller Miniport Driver c:\windows\system32\drivers\usbohci.sys Yes Manual Running OK | | | Kernel Driver Normal No | |
| sfloppy | Sfloppy Driver | c:\windows\system32\drivers\sfloppy.sys No System Stopped OK | Kernel Driver Ignore | vga | vga Driver | c:\windows\system32\drivers\vgapnp.sys Yes Manual Running OK | Kernel Driver Ignore | No No | |
| | | | | vgasave | VGA Display Controller. c:\windows\system32\drivers\vgasave.sys | | | Kernel Driver | |

| | | | | | | |
|---------|-----------------------------|---|---------------|---------------|---------|---------|
| | No | System | Stopped | OK | Ignore | No |
| viaide | No | Not Available | Not Available | Kernel Driver | Normal | No |
| | Disabled | Stopped | OK | Normal | No | No |
| volsnap | Storage volumes | c:\windows\system32\drivers\volsnap.sys | Kernel Driver | Yes | Boot | Running |
| | Normal | No | Yes | Normal | No | OK |
| wanarp | Remote Access IP ARP Driver | c:\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 | c:\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 | Driver Date | Manufacturer | INF Name Driver |
| Device ID | Device ID | Device ID | Device ID |
| Not Available | Not Available | Not Available | Not Available |
| Available | Not Available | Not Available | Not Available |
| ACPI Multiprocessor PC | Yes | COMPUTER | 5.2.3790.0 10/1/2002 (Standard computers) |
| Available | ROOT\ACPL_HAL\0000 | HTREE\ROOT\0 | hal.inf Not |
| Microsoft ACPI-Compliant System | Yes | SYSTEM | 5.2.3790.0 10/1/2002 Microsoft acpi.inf Not Available |
| Processor | Yes | PROCESSOR | 5.2.3790.0 10/1/2002 (Standard processor types) |
| Processor | Yes | PROCESSOR | 5.2.3790.0 10/1/2002 (Standard processor types) |
| Processor | Yes | PROCESSOR | 5.2.3790.0 10/1/2002 (Standard processor types) |
| Processor | Yes | PROCESSOR | 5.2.3790.0 10/1/2002 (Standard processor types) |
| PCI bus | Yes | SYSTEM | 5.2.3790.0 10/1/2002 (Standard system devices) |
| ServerWorks Grand Champion | Yes | CMIC_HE - NorthBridge High End | 5.2.3790.0 10/1/2002 ServerWorks (RCC) |
| ServerWorks Grand Champion | Yes | CMIC_HE - NorthBridge High End | 5.2.3790.0 10/1/2002 ServerWorks (RCC) |
| ServerWorks Grand Champion | Yes | CMIC_HE - NorthBridge High End | 5.2.3790.0 10/1/2002 ServerWorks (RCC) |
| ServerWorks Grand Champion | Yes | CMIC_HE - NorthBridge High End | 5.2.3790.0 10/1/2002 ServerWorks (RCC) |

| | | |
|--------------------------|---------------------------|---|
| machine.inf | Not Available | PCI\VEN_1166&DEV_0011&SUBSYS_00000000&REV_00\3 |
| &267A616A&0&03 | | HP ProLiant iLO Advanced System Management Controller |
| SYSTEM | 5.27.2195.0 | 12/30/2002 |
| oem1.inf | Not Available | PCI\VEN_0E11&DEV_B203&SUBSYS_B2060E11&REV_01\3 |
| &267A616A&0&10 | | HP iLO Management Interface Driver |
| 1.4.0.0 | 9/4/2002 | Hewlett-Packard Company |
| Not Available | | PCI\VEN_0E11&DEV_B204&SUBSYS_B2060E11&REV_01\3 |
| &267A616A&0&12 | | Standard VGA Graphics Adapter |
| 10/1/2002 | (Standard display types) | display.inf Not |
| Available | | PCI\VEN_1002&DEV_4752&SUBSYS_001E0E11&REV_27\3 |
| &267A616A&0&18 | | Default Monitor |
| Yes | MONITOR | 5.1.2001.0 6/6/2001 |
| (Standard monitor types) | monitor.inf | Not |
| Available | | DISPLAY\DEFAULT_MONITOR\4&89B5141&0&12345678& |
| 00&03 | | PCI standard ISA bridge |
| 10/1/2002 | (Standard system devices) | machine.inf |
| Not Available | | PCI\VEN_1166&DEV_0201&SUBSYS_00000000&REV_93\3 |
| &267A616A&0&78 | | ISAPNP Read Data Port |
| Yes | SYSTEM | 5.2.3790.0 |
| 10/1/2002 | (Standard system devices) | machine.inf |
| Not Available | | Motherboard resources |
| Yes | SYSTEM | 5.2.3790.0 |
| 10/1/2002 | (Standard system devices) | machine.inf |
| Not Available | | Programmable interrupt controller |
| Yes | SYSTEM | 5.2.3790.0 10/1/2002 (Standard system devices) |
| Not Available | | System timer |
| Yes | SYSTEM | 5.2.3790.0 10/1/2002 (Standard system devices) |
| Not Available | | Direct memory access controller |
| Yes | SYSTEM | 5.2.3790.0 10/1/2002 (Standard system devices) |
| Not Available | | System speaker |
| Yes | SYSTEM | 5.2.3790.0 10/1/2002 (Standard system devices) |
| Not Available | | Standard 101/102-Key or Microsoft Natural PS/2 Keyboard |
| Yes | KEYBOARD | 5.2.3790.0 10/1/2002 (Standard keyboards) |
| Not Available | | PS/2 Compatible Mouse |
| Yes | MOUSE | 5.2.3790.0 10/1/2002 Microsoft |
| Not Available | | Extended IO Bus |
| Yes | SYSTEM | 5.2.3790.0 10/1/2002 (Standard system devices) |
| Not Available | | Communications Port |
| Yes | PORTS | 5.2.3790.0 10/1/2002 (Standard port types) |
| Not Available | | Standard floppy disk controller |
| Yes | FDC | 5.2.3790.0 10/1/2002 (Standard floppy disk controllers) |
| Not Available | | Floppy disk drive |
| Yes | FLOPPYDISK | 5.2.3790.0 10/1/2002 (Standard floppy disk drives) |
| Not Available | | FDC\GENERIC_FLOPPY_DRIVE\6&1C650E5D&0&0 |

| | | | | | | | |
|--|-----------|-------------|------------|--------------------------------------|-------------------|---------------|--|
| CSB5 IDE Controller Yes | HDC | 5.2.3790.0 | 10/1/2002 | ServerWorks | mshdc.inf | Not Available | SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&REV_2.38\4&3349E2F1&0&420 |
| PCI\VEN_1166&DEV_0212&SUBSYS_02121166&REV_93\3 | | | | | | | Disk drive Yes |
| &267A616A&0&79 | | | | | | | disk.inf Not Available |
| Primary IDE Channel Yes | HDC | 5.2.3790.0 | 10/1/2002 | (Standard IDE ATA/ATAPI controllers) | mshdc.inf | Not Available | SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&REV_2.38\4&3349E2F1&0&430 |
| PCI\IDE\IDECHANNEL\4&1024D5C6&0&0 | | | | | | | Disk drive Yes |
| CD-ROM Drive Yes | CDROM | 5.2.3790.0 | 10/1/2002 | (Standard CD-ROM drives) | cdrom.inf | Not Available | disk.inf Not Available |
| IDE\CDROMCOMPAQ_CD-ROM_SN-124_____N102_____5&FB0C83D&0&0.0.0 | | | | | | | SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&REV_2.38\4&3349E2F1&0&440 |
| Secondary IDE Channel Yes | HDC | 5.2.3790.0 | 10/1/2002 | (Standard IDE ATA/ATAPI controllers) | mshdc.inf | Not Available | Disk drive Yes |
| PCI\IDE\IDECHANNEL\4&1024D5C6&0&1 | | | | | | | disk.inf Not Available |
| ServerWorks (RCC) PCI to USB Open Host Controller Yes | USB | 5.2.3790.0 | 10/1/2002 | ServerWorks (RCC) | usbport.inf | Not Available | SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&REV_2.38\4&3349E2F1&0&450 |
| Available | | | | | | | Disk drive Yes |
| PCI\VEN_1166&DEV_0220&SUBSYS_02201166&REV_05\3 | | | | | | | disk.inf Not Available |
| &267A616A&0&7A | | | | | | | SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&REV_2.38\4&3349E2F1&0&450 |
| USB Root Hub Yes | USB | 5.2.3790.0 | 10/1/2002 | (Standard USB Host Controller) | usbport.inf | Not Available | Disk drive Yes |
| USB\ROOT_HUB\4&AF5358C&0 | | | | | | | disk.inf Not Available |
| Serverworks Champion CSB5 - SouthBridge 5 LPC | Yes | SYSTEM | 5.2.3790.0 | 10/1/2002 | ServerWorks (RCC) | machine.inf | Not Available |
| Not Available | | | | | | | SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&REV_2.38\4&3349E2F1&0&460 |
| PCI\VEN_1166&DEV_0225&SUBSYS_00000000&REV_00\3 | | | | | | | PCI bus Yes |
| &267A616A&0&7B | | | | | | | SYSTEM 5.2.3790.0 |
| ServerWorks Grand Champion CIOB_X - I/O Bridge 100 Mhz | Yes | SYSTEM | 5.2.3790.0 | 10/1/2002 | ServerWorks (RCC) | machine.inf | Not Available |
| Not Available | | | | | | | machine.inf Not Available |
| PCI\VEN_1166&DEV_0010&SUBSYS_00000000&REV_03\3 | | | | | | | SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&REV_2.38\4&3349E2F1&0&460 |
| &267A616A&0&80 | | | | | | | PCI bus Yes |
| ServerWorks Grand Champion CIOB_X - I/O Bridge 100 Mhz | Yes | SYSTEM | 5.2.3790.0 | 10/1/2002 | ServerWorks (RCC) | machine.inf | Not Available |
| Not Available | | | | | | | SYSTEM 5.2.3790.0 |
| PCI\VEN_1166&DEV_0010&SUBSYS_00000000&REV_03\3 | | | | | | | machine.inf Not Available |
| &267A616A&0&82 | | | | | | | SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&REV_2.38\4&3349E2F1&0&460 |
| ServerWorks Grand Champion CIOB_X - I/O Bridge 100 Mhz | Yes | SYSTEM | 5.2.3790.0 | 10/1/2002 | ServerWorks (RCC) | machine.inf | Not Available |
| Not Available | | | | | | | machine.inf Not Available |
| PCI\VEN_1166&DEV_0010&SUBSYS_00000000&REV_03\3 | | | | | | | SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&REV_2.38\4&3349E2F1&0&460 |
| &267A616A&0&88 | | | | | | | PCI bus Yes |
| ServerWorks Grand Champion CIOB_X - I/O Bridge 100 Mhz | Yes | SYSTEM | 5.2.3790.0 | 10/1/2002 | ServerWorks (RCC) | machine.inf | Not Available |
| Not Available | | | | | | | SYSTEM 5.2.3790.0 |
| PCI\VEN_1166&DEV_0010&SUBSYS_00000000&REV_03\3 | | | | | | | machine.inf Not Available |
| &267A616A&0&8A | | | | | | | SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&REV_2.38\4&3349E2F1&0&460 |
| PCI bus Yes | SYSTEM | 5.2.3790.0 | 10/1/2002 | (Standard system devices) | machine.inf | Not Available | ACPI\PNP0A03\1 |
| Compaq Smart Array 5i Controller | Yes | SCSIADAPTER | 5.2.3790.0 | 10/1/2002 | Compaq | pnpscsi.inf | Not Available |
| Not Available | | | | | | | PCI\VEN_0E11&DEV_B178&SUBSYS_4080E11&REV_01\3 |
| &13C0B0C5&0&08 | | | | | | | Compaq Virtual LUN Yes |
| Compaq Virtual LUN Yes | SYSTEM | 5.2.3790.0 | 10/1/2002 | Compaq | scsdev.inf | Not Available | SYSTEM 5.2.3790.0 |
| Not Available | | | | | | | SCSI\OTHER&VEN_COMPAQ&PROD_SCSI_COMMUNICA |
| TE&REV_CISS\4&3349E2F1&0&000 | | | | | | | TE&REV_CISS\4&3349E2F1&0&000 |
| Disk drive Yes | DISKDRIVE | 5.2.3790.0 | 10/1/2002 | (Standard disk drives) | disk.inf | Not Available | SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&REV_2.38\4&3349E2F1&0&400 |
| Not Available | | | | | | | Disk drive Yes |
| SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&REV_2.38\4&3349E2F1&0&400 | | | | | | | DISKDRIVE 5.2.3790.0 |
| Disk drive Yes | DISKDRIVE | 5.2.3790.0 | 10/1/2002 | (Standard disk drives) | disk.inf | Not Available | 10/1/2002 (Standard disk drives) |
| Not Available | | | | | | | SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&REV_2.38\4&3349E2F1&0&410 |
| SCSI\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME&REV_2.38\4&3349E2F1&0&410 | | | | | | | Disk drive Yes |
| Disk drive Yes | DISKDRIVE | 5.2.3790.0 | 10/1/2002 | (Standard disk drives) | disk.inf | Not Available | DISKDRIVE 5.2.3790.0 |
| Not Available | | | | | | | 10/1/2002 (Standard disk drives) |

| | |
|--|--|
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&2AEB327C&0&0200004000000000 | PCI\VEN_0E11&DEV_A0F7&SUBSYS_A2FE0E11&REV_14\3&29E81982&0&F0 |
| Smart Array Logical Volume No DISKDRIVE 5.6.56.32 | PCI bus Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ACPI\PNP0A03\4 |
| 4/8/2003 Hewlett-Packard oem3.inf Not Available | |
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&2AEB327C&0&0300004000000000 | Smart Array 5312 Controller (Non-Miniport) No |
| Smart Array Logical Volume No DISKDRIVE 5.6.56.32 | SCSIADAPTER 5.6.59.32 4/8/2003 Hewlett-Packard |
| 4/8/2003 Hewlett-Packard oem3.inf Not Available | oem0.inf Not Available |
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&2AEB327C&0&0400004000000000 | PCI\VEN_0E11&DEV_B178&SUBSYS_40830E11&REV_01\3&172E68DD&0&08 |
| Smart Array Logical Volume No DISKDRIVE 5.6.56.32 | Smart Array Logical Volume No DISKDRIVE 5.6.56.32 |
| 4/8/2003 Hewlett-Packard oem3.inf Not Available | 4/8/2003 Hewlett-Packard oem3.inf Not Available |
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&2AEB327C&0&0500004000000000 | HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&3523E4BF&0&0000004000000000 |
| Smart Array Logical Volume No DISKDRIVE 5.6.56.32 | Smart Array Logical Volume No DISKDRIVE 5.6.56.32 |
| 4/8/2003 Hewlett-Packard oem3.inf Not Available | 4/8/2003 Hewlett-Packard oem3.inf Not Available |
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&2AEB327C&0&0600004000000000 | HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&3523E4BF&0&0100004000000000 |
| Smart Array Logical Volume No DISKDRIVE 5.6.56.32 | Smart Array Logical Volume No DISKDRIVE 5.6.56.32 |
| 4/8/2003 Hewlett-Packard oem3.inf Not Available | 4/8/2003 Hewlett-Packard oem3.inf Not Available |
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&2AEB327C&0&0700004000000000 | HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&3523E4BF&0&0200004000000000 |
| Compaq PCI Hotplug Controller Yes SYSTEM 5.2.3790.0 | Smart Array Logical Volume No DISKDRIVE 5.6.56.32 |
| 10/1/2002 Compaq machine.inf Not Available | 4/8/2003 Hewlett-Packard oem3.inf Not Available |
| PCI\VEN_0E11&DEV_A0F7&SUBSYS_A2FE0E11&REV_14\3&1070020&0&F0 | HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&3523E4BF&0&0300004000000000 |
| PCI bus Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available ACPI\PNP0A03\3 | Smart Array Logical Volume No DISKDRIVE 5.6.56.32 |
| BCM5701 Gigabit Ethernet Yes NET 2.91.0.0 | 4/8/2003 Hewlett-Packard oem3.inf Not Available |
| 10/1/2002 Narrowcom netb57xp.inf Not Available | HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&3523E4BF&0&0400004000000000 |
| Available | Smart Array Logical Volume No DISKDRIVE 5.6.56.32 |
| PCI\VEN_14E4&DEV_1645&SUBSYS_007C0E11&REV_15\3&29E81982&0&08 | 4/8/2003 Hewlett-Packard oem3.inf Not Available |
| Smart Array 5312 Controller (Non-Miniport) No | HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&3523E4BF&0&0500004000000000 |
| SCSIADAPTER 5.6.59.32 4/8/2003 Hewlett-Packard | Smart Array Logical Volume No DISKDRIVE 5.6.56.32 |
| oem0.inf Not Available | 4/8/2003 Hewlett-Packard oem3.inf Not Available |
| PCI\VEN_0E11&DEV_B178&SUBSYS_40830E11&REV_01\3&29E81982&0&10 | HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&3523E4BF&0&0600004000000000 |
| Smart Array Logical Volume No DISKDRIVE 5.6.56.32 | Smart Array 5312 Controller (Non-Miniport) No |
| 4/8/2003 Hewlett-Packard oem3.inf Not Available | SCSIADAPTER 5.6.59.32 4/8/2003 Hewlett-Packard |
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&1B252EFF&0&0000004000000000 | oem0.inf Not Available |
| Smart Array Logical Volume No DISKDRIVE 5.6.56.32 | PCI\VEN_0E11&DEV_B178&SUBSYS_40830E11&REV_01\3&172E68DD&0&10 |
| 4/8/2003 Hewlett-Packard oem3.inf Not Available | Smart Array Logical Volume No DISKDRIVE 5.6.56.32 |
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&1B252EFF&0&0100004000000000 | 4/8/2003 Hewlett-Packard oem3.inf Not Available |
| Smart Array Logical Volume No DISKDRIVE 5.6.56.32 | HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&349D8482&0&0000004000000000 |
| 4/8/2003 Hewlett-Packard oem3.inf Not Available | Smart Array Logical Volume No DISKDRIVE 5.6.56.32 |
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&1B252EFF&0&0200004000000000 | 4/8/2003 Hewlett-Packard oem3.inf Not Available |
| Smart Array Logical Volume No DISKDRIVE 5.6.56.32 | HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&349D8482&0&0100004000000000 |
| 4/8/2003 Hewlett-Packard oem3.inf Not Available | Smart Array Logical Volume No DISKDRIVE 5.6.56.32 |
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&1B252EFF&0&0300004000000000 | 4/8/2003 Hewlett-Packard oem3.inf Not Available |
| Smart Array Logical Volume No DISKDRIVE 5.6.56.32 | HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&349D8482&0&0200004000000000 |
| 4/8/2003 Hewlett-Packard oem3.inf Not Available | Smart Array Logical Volume No DISKDRIVE 5.6.56.32 |
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&1B252EFF&0&0400004000000000 | 4/8/2003 Hewlett-Packard oem3.inf Not Available |
| Smart Array Logical Volume No DISKDRIVE 5.6.56.32 | HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&349D8482&0&0300004000000000 |
| 4/8/2003 Hewlett-Packard oem3.inf Not Available | Smart Array Logical Volume No DISKDRIVE 5.6.56.32 |
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&1B252EFF&0&0500004000000000 | 4/8/2003 Hewlett-Packard oem3.inf Not Available |
| Smart Array Logical Volume No DISKDRIVE 5.6.56.32 | HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&349D8482&0&0400004000000000 |
| 4/8/2003 Hewlett-Packard oem3.inf Not Available | Smart Array Logical Volume No DISKDRIVE 5.6.56.32 |
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&1B252EFF&0&0600004000000000 | 4/8/2003 Hewlett-Packard oem3.inf Not Available |
| Compaq PCI Hotplug Controller Yes SYSTEM 5.2.3790.0 | HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLUME\4&349D8482&0&0500004000000000 |
| 10/1/2002 Compaq machine.inf Not Available | Smart Array Logical Volume No DISKDRIVE 5.6.56.32 |
| | 4/8/2003 Hewlett-Packard oem3.inf Not Available |

| | |
|---|--|
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLU ME\4&349D8482&0&0600004000000000 | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B69 |
| Smart Array Logical Volume No DISKDRIVE 5.6.56.32 | OFFSET7E00LENGTH4A2EDEC00 |
| 4/8/2003 Hewlett-Packard oem3.inf Not Available | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| HPQCISS\DISK&VEN_COMPAQ&PROD_LOGICAL_VOLU ME\4&349D8482&0&0700004000000000 | volume.inf Not Available |
| ACPI Thermal Zone Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B6 |
| ACPI\THERMALZONE\THM0 | BOFFSET7E00LENGTHHBB477E00 |
| ACPI Fixed Feature Button Yes SYSTEM 5.2.3790.0 | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| 10/1/2002 (Standard system devices) machine.inf | volume.inf Not Available |
| Not Available ACPI\FIXEDBUTTON\2&DABA3FF&0 | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B6 |
| Logical Disk Manager Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available | AOFFSET7E00LENGTH4E1AEEC00 |
| ROOT\DMIO\0000 | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft | volume.inf Not Available |
| volume.inf Not Available | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B75 |
| STORAGE\VOLUME\1&3735C57B&0&LDM#{C6F7ED6E- D833-4793-BBAC-9DBA179C3FBE} | OFFSET7E00LENGTH270987600 |
| Volume Manager Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| ROOT\FDISK\0000 | volume.inf Not Available |
| Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B74 |
| volume.inf Not Available | OFFSET7E00LENGTH4A2EDEC00 |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B65 | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| OFFSET7E00LENGTH4E1AEEC00 | volume.inf Not Available |
| Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B77 |
| volume.inf Not Available | OFFSET7E00LENGTH4E1AEEC00 |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B64 | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| OFFSET7E00LENGTH270987600 | volume.inf Not Available |
| Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B76 |
| volume.inf Not Available | OFFSET7E00LENGTH270987600 |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B67 | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| OFFSET7E00LENGTH4A2EDEC00 | volume.inf Not Available |
| Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B71 |
| volume.inf Not Available | OFFSET7E00LENGTH4A2EDEC00 |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B66 | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| OFFSET7E00LENGTH4E1AEEC00 | volume.inf Not Available |
| Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B7 |
| volume.inf Not Available | DOFFSET7E00LENGTH4E1AEEC00 |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B61 | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| OFFSET7E00LENGTH270987600 | volume.inf Not Available |
| Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B7 |
| volume.inf Not Available | EOFFSET7E00LENGTH4E1AEEC00 |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B60 | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| OFFSET7E00LENGTH4A2EDEC00 | volume.inf Not Available |
| Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B79 |
| volume.inf Not Available | OFFSET7E00LENGTH270987600 |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B62 | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| OFFSET7E00LENGTH4E1AEEC00 | volume.inf Not Available |
| Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B78 |
| volume.inf Not Available | OFFSET7E00LENGTH4A2EDEC00 |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B6 | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| DOFFSET7E00LENGTH270987600 | volume.inf Not Available |
| Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B7 |
| volume.inf Not Available | AOFFSET7E00LENGTH4E1AEEC00 |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B6 | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| COFFSET7E00LENGTH4A2EDEC00 | volume.inf Not Available |
| Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B45 |
| volume.inf Not Available | OFFSET7E00LENGTH270987600 |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B6 | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| FOFFSET7E00LENGTH4E1AEEC00 | volume.inf Not Available |
| Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B44 |
| volume.inf Not Available | OFFSET7E00LENGTH4A2EDEC00 |
| STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B6 | Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft |
| EOFFSET7E00LENGTH270987600 | volume.inf Not Available |
| Generic volume Yes VOLUME 5.2.3790.0 10/1/2002 Microsoft | STORAGE\VOLUME\1&30A96598&0&SIGNATURE3FE3B46 |
| volume.inf Not Available | OFFSET7E00LENGTH4E1AEEC00 |

Legacy Audio Drivers Yes MEDIA 5.2.3790.0 10/1/2002 (Standard system devices) wave.inf Not Available
 ROOT\MEDIA\MS_MMDRV
 Media Control Devices Yes MEDIA 5.2.3790.0 10/1/2002 (Standard system devices) wave.inf Not Available
 Available ROOT\MEDIA\MS_MMMCI
 Legacy Video Capture Devices Yes MEDIA 5.2.3790.0 10/1/2002 (Standard system devices) wave.inf Not Available
 Available ROOT\MEDIA\MS_MMVCD
 Video Codecs Yes MEDIA 5.2.3790.0 10/1/2002 (Standard system devices) wave.inf Not Available
 ROOT\MEDIA\MS_MMVID
 WAN Miniport (L2TP) Yes NET 5.2.3790.0 10/1/2002 Microsoft netrasa.inf Not Available
 ROOT\MS_L2TPMINIPORT\0000
 WAN Miniport (IP) Yes NET 5.2.3790.0 10/1/2002 Microsoft netrasa.inf Not Available
 ROOT\MS_NDISWANIP\0000
 WAN Miniport (PPPOE) Yes NET 5.2.3790.0 10/1/2002 Microsoft netrasa.inf Not Available
 ROOT\MS_PPPOEMINIPORT\0000
 WAN Miniport (PPTP) Yes NET 5.2.3790.0 10/1/2002 Microsoft netrasa.inf Not Available
 ROOT\MS_PPTPMINIPORT\0000
 Direct Parallel Yes NET 5.2.3790.0 10/1/2002 Microsoft netrasa.inf Not Available
 ROOT\MS_PTMINIPORT\0000
 Terminal Server Device Redirector Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available
 ROOT\RDPDR\0000
 Terminal Server Keyboard Driver Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available
 ROOT\RDP_KBD\0000
 Terminal Server Mouse Driver Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available
 ROOT\RDP_MOUSE\0000
 Plug and Play Software Device Enumerator Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available
 ROOT\SYSTEM\0000
 Microcode Update Device Yes SYSTEM 5.2.3790.0 10/1/2002 (Standard system devices) machine.inf Not Available
 ROOT\SYSTEM\0001

[Environment Variables]

| Variable | Value | User Name |
|------------------------|--|-----------|
| ComSpec | %SystemRoot%\system32\cmd.exe | <SYSTEM> |
| Path | %SystemRoot%\system32;%SystemRoot%;%SystemRoot%\System32\Wbem;C:\Program Files\Microsoft SQL Server\80\Tools\BINN\<SYSTEM> | |
| windir | %SystemRoot% | <SYSTEM> |
| OS | Windows_NT | <SYSTEM> |
| PROCESSOR_ARCHITECTURE | x86 | <SYSTEM> |
| PROCESSOR_LEVEL | 15 | <SYSTEM> |
| PROCESSOR_IDENTIFIER | x86 Family 15 Model 2 Stepping 2, GenuineIntel | <SYSTEM> |
| PROCESSOR_REVISION | 0202 | <SYSTEM> |
| NUMBER_OF_PROCESSORS | 8 | <SYSTEM> |
| ClusterLog | C:\WINDOWS\Cluster\cluster.log | <SYSTEM> |
| PATHEXT | .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH | <SYSTEM> |
| TEMP | %SystemRoot%\TEMP | <SYSTEM> |

| Path | Permissions | Owner | Group |
|------|-----------------------------------|------------------------------|-------|
| TMP | %SystemRoot%\TEMP | <SYSTEM> | |
| TEMP | %USERPROFILE%\Local Settings\Temp | NT AUTHORITY\SYSTEM | |
| TEMP | %USERPROFILE%\Local Settings\Temp | NT AUTHORITY\SYSTEM | |
| TEMP | %USERPROFILE%\Local Settings\Temp | NT AUTHORITY\LOCAL SERVICE | |
| TEMP | %USERPROFILE%\Local Settings\Temp | NT AUTHORITY\LOCAL SERVICE | |
| TEMP | %USERPROFILE%\Local Settings\Temp | NT AUTHORITY\NETWORK SERVICE | |
| TEMP | %USERPROFILE%\Local Settings\Temp | NT AUTHORITY\NETWORK SERVICE | |
| TEMP | %USERPROFILE%\Local Settings\Temp | MINI\Administrator | |
| TEMP | %USERPROFILE%\Local Settings\Temp | MINI\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 |
|---------------|---------------|------|--------------------|------|
| Name | | | | |
| Not Available | \\inforb\dpol | Disk | Current Connection | |
| | MINI\dpol | | | |

[Running Tasks]

| Name | Path | Process ID | Priority | Min Working Set | Max |
|---------------|------------------------------------|-------------------|------------------------------------|--------------------|---------------|
| Working Set | Start Time | Version | Size | File Date | |
| system | idle process | Not Available | 0 | 0 | Not Available |
| Available | Not Available | Not Available | Not Available | Not Available | Not Available |
| system | Not Available | 4 | 8 | 0 | 1413120 |
| smss.exe | Not Available | 476 | 11 | 204800 | 1413120 |
| | 5/9/2003 12:35 AM | Not Available | | Not Available | |
| csrss.exe | Not Available | 524 | 13 | Not Available | Not Available |
| | 5/9/2003 12:35 AM | Not Available | | Not Available | |
| winlogon.exe | c:\windows\system32\winlogon.exe | | | 548 | |
| | 13 | 204800 | 1413120 | 5/9/2003 12:36 AM | |
| bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | | | 536.50 KB (549,376 | |
| services.exe | c:\windows\system32\services.exe | | | 592 | |
| | 9 | 204800 | 1413120 | 5/9/2003 12:36 AM | |
| bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | | | 102.00 KB (104,448 | |
| lsass.exe | c:\windows\system32\lsass.exe | | | 604 | 9 |
| | 1413120 | 5/9/2003 12:36 AM | 5.2.3790.0 (srv03_rtm.030324-2048) | | 204800 |
| svchost.exe | c:\windows\system32\svchost.exe | | | 756 | |
| | 8 | 204800 | 1413120 | 5/9/2003 12:36 AM | |
| bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | | | 13.00 KB (13,312 | |
| svchost.exe | c:\windows\system32\svchost.exe | | | 824 | |
| | 8 | 204800 | 1413120 | 5/9/2003 12:36 AM | |
| bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | | | 13.00 KB (13,312 | |
| svchost.exe | Not Available | | | 968 | 8 |
| Available | Not Available | | | 5/9/2003 12:36 AM | Not Available |
| Not Available | Not Available | | | Not Available | |

| | | | | | | | |
|--------------|--|-------------------|---------------|---------------|----------|--------------------------------------|-------------------------------|
| svchost.exe | Not Available | 1020 | 8 | Not Available | winlogon | 5.2.3790.0 (srv03_rtm.030324-2048) | 536.50 KB (549,376 bytes) |
| svchost.exe | Not Available | 5/9/2003 12:36 AM | Not Available | Not Available | ntdll | 5.2.3790.0 (srv03_rtm.030324-2048) | 722.50 KB (739,840 bytes) |
| svchost.exe | c:\windows\system32\svchost.exe | 1032 | | | kernel32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 965.00 KB (988,160 bytes) |
| spoolsv.exe | c:\windows\system32\spoolsv.exe | 1244 | | | msvcrt | 7.0.3790.0 (srv03_rtm.030324-2048) | 319.50 KB (327,168 bytes) |
| svchost.exe | c:\windows\system32\svchost.exe | 1276 | | | advapi32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 559.50 KB (572,928 bytes) |
| svchost.exe | Not Available | 1312 | 8 | Not Available | rpcrt4 | 5.2.3790.0 (srv03_rtm.030324-2048) | 643.50 KB (658,944 bytes) |
| sysdown.exe | c:\windows\system32\sysdown.exe | 1348 | | | user32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 562.00 KB (575,488 bytes) |
| dfssvc.exe | c:\windows\system32\dfssvc.exe | 1632 | 8 | 204800 | gdi32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 263.00 KB (269,312 bytes) |
| wmiprvse.exe | Not Available | 1740 | 8 | Not Available | userenv | 5.2.3790.0 (srv03_rtm.030324-2048) | 732.50 KB (750,080 bytes) |
| explorer.exe | c:\windows\explorer.exe | 1960 | 8 | 204800 | nddeapi | 5.2.3790.0 (srv03_rtm.030324-2048) | 16.00 KB (16,384 bytes) |
| cmd.exe | c:\windows\system32\cmd.exe | 1332 | 8 | 204800 | crypt32 | 5.131.3790.0 (srv03_rtm.030324-2048) | 598.00 KB (612,352 bytes) |
| sqlservr.exe | c:\program files\microsoft sql server\mssql\binn\sqlservr.exe | 1604 | 13 | 204800 | msasn1 | 5.2.3790.0 (srv03_rtm.030324-2048) | 58.00 KB (59,392 bytes) |
| csrss.exe | Not Available | 1836 | 13 | Not Available | secur32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 63.00 KB (64,512 bytes) |
| winlogon.exe | c:\windows\system32\winlogon.exe | 1944 | | | winsta | 5.2.3790.0 (srv03_rtm.030324-2048) | 51.00 KB (52,224 bytes) |
| rdpclip.exe | c:\windows\system32\rdpclip.exe | 1780 | 8 | 204800 | netapi32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 317.00 KB (324,608 bytes) |
| explorer.exe | c:\windows\explorer.exe | 1888 | 8 | 204800 | profmap | 5.2.3790.0 (srv03_rtm.030324-2048) | 22.00 KB (22,528 bytes) |
| cmd.exe | c:\windows\system32\cmd.exe | 1452 | 8 | 204800 | regapi | 5.2.3790.0 (srv03_rtm.030324-2048) | 48.50 KB (49,664 bytes) |
| msinfo32.exe | c:\program files\common files\microsoft shared\msinfo\msinfo32.exe | 2900 | 8 | 204800 | ws2_32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 87.50 KB (89,600 bytes) |
| wmiprvse.exe | Not Available | 2944 | 8 | Not Available | ws2help | 5.2.3790.0 (srv03_rtm.030324-2048) | 19.50 KB (19,968 bytes) |
| | | | | | psapi | 5.2.3790.0 (srv03_rtm.030324-2048) | 21.50 KB (22,016 bytes) |
| | | | | | version | 5.2.3790.0 (srv03_rtm.030324-2048) | 17.00 KB (17,408 bytes) |
| | | | | | setupapi | 5.2.3790.0 (srv03_rtm.030324-2048) | 1,014.50 KB (1,038,848 bytes) |
| | | | | | msgina | 5.2.3790.0 (srv03_rtm.030324-2048) | 1.14 MB (1,191,936 bytes) |

| | | | | | | | | | |
|-----------------|--------------------------------------|---------------------------|-----------------------|---|-----------------|--|---------------------------|-----------------------|---------------------------------------|
| shsvcs bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 121.50 KB (124,416 bytes) | Microsoft Corporation | c:\windows\system32\shsvcs.dll | clbcatq bytes) | 2001.12.4720.0 (srv03_rtm.030324-2048) | 481.00 KB (492,544 bytes) | Microsoft Corporation | c:\windows\system32\clbcatq.dll |
| shlwapi bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 281.00 KB (287,744 bytes) | Microsoft Corporation | c:\windows\system32\shlwapi.dll | oleaut32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 486.00 KB (497,664 bytes) | Microsoft Corporation | c:\windows\system32\oleaut32.dll |
| sfc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 4.50 KB (4,608 bytes) | Microsoft Corporation | c:\windows\system32\sfc.dll | comres bytes) | 2001.12.4720.0 (srv03_rtm.030324-2048) | 778.00 KB (796,672 bytes) | Microsoft Corporation | c:\windows\system32\comres.dll |
| sfc_os bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 133.00 KB (136,192 bytes) | Microsoft Corporation | c:\windows\system32\sfc_os.dll | csoui bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 305.00 KB (312,320 bytes) | Microsoft Corporation | c:\windows\system32\csoui.dll |
| wintrust bytes) | 5.131.3790.0 (srv03_rtm.030324-2048) | 161.50 KB (165,376 bytes) | Microsoft Corporation | c:\windows\system32\wintrust.dll | ntmarta bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 114.00 KB (116,736 bytes) | Microsoft Corporation | c:\windows\system32\ntmarta.dll |
| ole32 bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 1.13 MB (1,187,328 bytes) | Microsoft Corporation | c:\windows\system32\ole32.dll | wbemprox bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 17.50 KB (17,920 bytes) | Microsoft Corporation | c:\windows\system32\wbem\wbemprox.dll |
| imagehlp bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 142.50 KB (145,920 bytes) | Microsoft Corporation | c:\windows\system32\imagehlp.dll | wbemcomn | 5.2.3790.0 (srv03_rtm.030324-2048) | 211.50 KB (216,576 bytes) | Microsoft Corporation | c:\windows\system32\wbem\wbemcomn.dll |
| comctl32 | 6.0 (srv03_rtm.030324-2048) | 907.00 KB (928,768 bytes) | Microsoft Corporation | c:\windows\winsxs\x86_microsoft.windows.common-controls_6595b64144ccf1df_6.0.100.0_x-ww_8417450b\comctl32.dll | wbemsvc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 42.50 KB (43,520 bytes) | Microsoft Corporation | c:\windows\system32\wbem\wbemsvc.dll |
| winscard bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 98.50 KB (100,864 bytes) | Microsoft Corporation | c:\windows\system32\winscard.dll | fastprox bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 443.00 KB (453,632 bytes) | Microsoft Corporation | c:\windows\system32\wbem\fastprox.dll |
| wtsapi32 bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 17.50 KB (17,920 bytes) | Microsoft Corporation | c:\windows\system32\wtsapi32.dll | msvcp60 | 6.05.2144.0 | 388.00 KB (397,312 bytes) | Microsoft Corporation | c:\windows\system32\msvcp60.dll |
| sxs bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 733.00 KB (750,592 bytes) | Microsoft Corporation | c:\windows\system32\sxs.dll | ntdsapi bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 76.00 KB (77,824 bytes) | Microsoft Corporation | c:\windows\system32\ntdsapi.dll |
| winmm bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 166.00 KB (169,984 bytes) | Microsoft Corporation | c:\windows\system32\winmm.dll | dnsapi bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 147.50 KB (151,040 bytes) | Microsoft Corporation | c:\windows\system32\dnsapi.dll |
| shell32 bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 7.79 MB (8,166,400 bytes) | Microsoft Corporation | c:\windows\system32\shell32.dll | services bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 102.00 KB (104,448 bytes) | Microsoft Corporation | c:\windows\system32\services.exe |
| wldap32 bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 158.00 KB (161,792 bytes) | Microsoft Corporation | c:\windows\system32\wldap32.dll | scesrv bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 316.50 KB (324,096 bytes) | Microsoft Corporation | c:\windows\system32\scesrv.dll |
| rsaenh bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 176.83 KB (181,072 bytes) | Microsoft Corporation | c:\windows\system32\rsaenh.dll | authz bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 67.00 KB (68,608 bytes) | Microsoft Corporation | c:\windows\system32\authz.dll |
| csd.dll bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 99.00 KB (101,376 bytes) | Microsoft Corporation | c:\windows\system32\csd.dll | umpnpgm bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 121.50 KB (124,416 bytes) | Microsoft Corporation | c:\windows\system32\umpnpgm.dll |
| wlnotify bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 87.50 KB (89,600 bytes) | Microsoft Corporation | c:\windows\system32\wlnotify.dll | ncobjapi bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 34.50 KB (35,328 bytes) | Microsoft Corporation | c:\windows\system32\ncobjapi.dll |
| winspool bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 140.00 KB (143,360 bytes) | Microsoft Corporation | c:\windows\system32\winspool.drv | eventlog bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 60.50 KB (61,952 bytes) | Microsoft Corporation | c:\windows\system32\eventlog.dll |
| mpr bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 56.00 KB (57,344 bytes) | Microsoft Corporation | c:\windows\system32\mpr.dll | lsass bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 13.00 KB (13,312 bytes) | Microsoft Corporation | c:\windows\system32\lsass.exe |
| comctl32 | 5.82 (srv03_rtm.030324-2048) | 561.00 KB (574,464 bytes) | Microsoft Corporation | c:\windows\winsxs\x86_microsoft.windows.common-controls_6595b64144ccf1df_5.82.0.0_x-ww_8a69ba05\comctl32.dll | lsasrv bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 780.50 KB (799,232 bytes) | Microsoft Corporation | c:\windows\system32\lsasrv.dll |
| uxtheme bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 196.00 KB (200,704 bytes) | Microsoft Corporation | c:\windows\system32\uxtheme.dll | samsrv bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 452.00 KB (462,848 bytes) | Microsoft Corporation | c:\windows\system32\samsrv.dll |
| samlib bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 49.00 KB (50,176 bytes) | Microsoft Corporation | c:\windows\system32\samlib.dll | cryptdll bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 34.00 KB (34,816 bytes) | Microsoft Corporation | c:\windows\system32\cryptdll.dll |
| | | | | | msprivs bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 46.50 KB (47,616 bytes) | Microsoft Corporation | c:\windows\system32\msprivs.dll |

| | | | | | |
|-----------------|--|---------------------|-----------------|---|---------------------|
| kerberos bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\kerberos.dll | 332.50 KB (340,480) | rpccs bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\rpccs.dll | 276.50 KB (283,136) |
| msv1_0 bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\msv1_0.dll | 127.00 KB (130,048) | termsrv bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 5/2/2003 3:43 PM Microsoft Corporation c:\windows\system32\termsrv.dll | 216.50 KB (221,696) |
| netlogon bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\netlogon.dll | 409.00 KB (418,816) | icaapi bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 5/2/2003 3:43 PM Microsoft Corporation c:\windows\system32\icaapi.dll | 10.50 KB (10,752) |
| w32time bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\w32time.dll | 216.00 KB (221,184) | mstlsapi bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\mstlsapi.dll | 104.50 KB (107,008) |
| iphlpapi bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\iphlpapi.dll | 82.50 KB (84,480) | activeds bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\activeds.dll | 189.00 KB (193,536) |
| schannel bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\schannel.dll | 149.50 KB (153,088) | adslrpc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\adslrpc.dll | 142.50 KB (145,920) |
| wdigest bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\wdigest.dll | 61.00 KB (62,464) | credui bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\credui.dll | 159.00 KB (162,816) |
| rassfm bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\rassfm.dll | 20.50 KB (20,992) | atl | 3.05.2283 83.00 KB (84,992 bytes) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\atl.dll | |
| kdcsvc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\kdcsvc.dll | 221.00 KB (226,304) | rdpwsx bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 5/2/2003 3:43 PM Microsoft Corporation c:\windows\system32\rdpwsx.dll | 80.13 KB (82,056) |
| ntdsa bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\ntdsa.dll | 1.45 MB (1,520,640) | wzcsvc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 6:15 AM Microsoft Corporation c:\windows\system32\wzcsvc.dll | 272.50 KB (279,040) |
| ntdsatq bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\ntdsatq.dll | 32.00 KB (32,768) | rtutils bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\rtutils.dll | 32.00 KB (32,768) |
| mswsock bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\mswsock.dll | 254.00 KB (260,096) | wmi bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\wmi.dll | 6.50 KB (6,656) |
| esent bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\esent.dll | 1.01 MB (1,056,256) | dhcpcsvc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\dhcpcsvc.dll | 101.50 KB (103,936) |
| scecli bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\scecli.dll | 179.50 KB (183,808) | rastls bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\rastls.dll | 155.00 KB (158,720) |
| wshtcpip bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\wshtcpip.dll | 18.00 KB (18,432) | cryptui bytes) | 5.131.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\cryptui.dll | 473.50 KB (484,864) |
| ipsecsvc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\ipsecsvc.dll | 162.50 KB (166,400) | mprapi bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\mprapi.dll | 81.00 KB (82,944) |
| oakley bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\oakley.dll | 325.50 KB (333,312) | rasapi32 bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\rasapi32.dll | 227.50 KB (232,960) |
| winipsec bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\winipsec.dll | 34.50 KB (35,328) | rasman bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\rasman.dll | 56.50 KB (57,856) |
| pstorsvc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\pstorsvc.dll | 24.00 KB (24,576) | tapi32 bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\tapi32.dll | 175.00 KB (179,200) |
| psbase bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\psbase.dll | 81.00 KB (82,944) | raschap bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\raschap.dll | 106.00 KB (108,544) |
| dssenh bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\dssenh.dll | 131.33 KB (134,480) | schedsvc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 5/2/2003 3:47 PM Microsoft Corporation c:\windows\system32\schedsvc.dll | 176.00 KB (180,224) |
| wlbsctrl bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\wlbsctrl.dll | 78.00 KB (79,872) | msidle bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\msidle.dll | 5.50 KB (5,632) |
| svchost bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\svchost.exe | 13.00 KB (13,312) | wkssvc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) 3/25/2003 12:00 AM Microsoft Corporation c:\windows\system32\wkssvc.dll | 125.00 KB (128,000) |

| | | | | | |
|--|--|--------------------|------------------------|--|--|
| wiarpc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 30.00 KB (30,720 | reprdrvfs bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 165.00 KB (168,960 |
| | 3/25/2003 12:00 AM Microsoft Corporation | | | 5/2/2003 3:43 PM Microsoft Corporation | |
| | c:\windows\system32\wiarpc.dll | | | c:\windows\system32\wbem\reprdrvfs.dll | |
| cryptsvc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 51.00 KB (52,224 | wmioprsvd bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 405.50 KB (415,232 |
| | 3/25/2003 12:00 AM Microsoft Corporation | | | 5/2/2003 3:43 PM Microsoft Corporation | |
| | c:\windows\system32\cryptsvc.dll | | | c:\windows\system32\wbem\wmioprsvd.dll | |
| certcli bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 228.00 KB (233,472 | wbemess bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 256.50 KB (262,656 |
| | 3/25/2003 12:00 AM Microsoft Corporation | | | 5/2/2003 3:43 PM Microsoft Corporation | |
| | c:\windows\system32\certcli.dll | | | c:\windows\system32\wbem\wbemess.dll | |
| vssapi bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 528.00 KB (540,672 | ncprov bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 43.00 KB (44,032 |
| | 3/25/2003 12:00 AM Microsoft Corporation | | | 5/2/2003 3:43 PM Microsoft Corporation | |
| | c:\windows\system32\vssapi.dll | | | c:\windows\system32\wbem\ncprov.dll | |
| dmserver bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 24.00 KB (24,576 | netman bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 209.00 KB (214,016 |
| | 3/25/2003 12:00 AM Microsoft Corporation | | | 3/25/2003 12:00 AM Microsoft Corporation | |
| | c:\windows\system32\dmserver.dll | | | c:\windows\system32\netman.dll | |
| es bytes) | 2001.12.4720.0 (srv03_rtm.030324-2048) | 221.50 KB (226,816 | wzcsapi bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 24.50 KB (25,088 |
| | 3/25/2003 12:00 AM Microsoft Corporation | | | 3/25/2003 6:15 AM Microsoft Corporation | |
| | c:\windows\system32\es.dll | | | c:\windows\system32\wzcsapi.dll | |
| pchsvc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 31.50 KB (32,256 | netshell bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 1.67 MB (1,747,456 |
| | 5/2/2003 3:47 PM Microsoft Corporation | | | 3/25/2003 12:00 AM Microsoft Corporation | |
| | c:\windows\pchealth\helpctr\binaries\pchsvc.dll | | | c:\windows\system32\netshell.dll | |
| srvsvc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 89.00 KB (91,136 | clusapi bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 56.00 KB (57,344 |
| | 3/25/2003 12:00 AM Microsoft Corporation | | | 3/25/2003 12:00 AM Microsoft Corporation | |
| | c:\windows\system32\srvsvc.dll | | | c:\windows\system32\clusapi.dll | |
| seclogon bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 16.50 KB (16,896 | hnetcfg bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 243.50 KB (249,344 |
| | 3/25/2003 12:00 AM Microsoft Corporation | | | 3/25/2003 12:00 AM Microsoft Corporation | |
| | c:\windows\system32\seclogon.dll | | | c:\windows\system32\hnetcfg.dll | |
| trkwks bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 85.00 KB (87,040 | rasdlg bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 642.00 KB (657,408 |
| | 3/25/2003 12:00 AM Microsoft Corporation | | | 3/25/2003 12:00 AM Microsoft Corporation | |
| | c:\windows\system32\trkwks.dll | | | c:\windows\system32\rasdlg.dll | |
| wmisvc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 131.00 KB (134,144 | rasadhlp bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 6.50 KB (6,656 |
| | 5/2/2003 3:43 PM Microsoft Corporation | | | 3/25/2003 12:00 AM Microsoft Corporation | |
| | c:\windows\system32\wbem\wmisvc.dll | | | c:\windows\system32\rasadhlp.dll | |
| wuauerv bytes) | 5.4.3790.0 (srv03_rtm.030324-2048) | 10.50 KB (10,752 | xactsrv bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 86.50 KB (88,576 |
| | 5/2/2003 3:43 PM Microsoft Corporation | | | 3/25/2003 12:00 AM Microsoft Corporation | |
| | c:\windows\system32\wuauerv.dll | | | c:\windows\system32\xactsrv.dll | |
| wuaueng bytes) | 5.4.3790.0 (srv03_rtm.030324-2048) | 188.50 KB (193,024 | ntlsapi bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 8.00 KB (8,192 |
| | 5/2/2003 3:43 PM Microsoft Corporation | | | 3/25/2003 12:00 AM Microsoft Corporation | |
| | c:\windows\system32\wuaueng.dll | | | c:\windows\system32\ntlsapi.dll | |
| advpack bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 93.50 KB (95,744 | spoolsv bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 55.00 KB (56,320 |
| | 3/25/2003 12:00 AM Microsoft Corporation | | | 3/25/2003 12:00 AM Microsoft Corporation | |
| | c:\windows\system32\advpack.dll | | | c:\windows\system32\spoolsv.exe | |
| wininet bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 609.00 KB (623,616 | spoolss bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 79.00 KB (80,896 |
| | 3/25/2003 12:00 AM Microsoft Corporation | | | 3/25/2003 12:00 AM Microsoft Corporation | |
| | c:\windows\system32\wininet.dll | | | c:\windows\system32\spoolss.dll | |
| sens bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 35.50 KB (36,352 | localspl bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 304.50 KB (311,808 |
| | 3/25/2003 12:00 AM Microsoft Corporation | | | 3/25/2003 12:00 AM Microsoft Corporation | |
| | c:\windows\system32\sens.dll | | | c:\windows\system32\localspl.dll | |
| comsvcs bytes) | 2001.12.4720.0 (srv03_rtm.030324-2048) | 1.14 MB (1,199,616 | cnbjmon (46,592 bytes) | 5.2.3680.0 (Lab03_dev(skatar).020509-1043) | 45.50 KB |
| | 5/2/2003 3:43 PM Microsoft Corporation | | | 3/24/2003 7:48 PM Microsoft Corporation | |
| | c:\windows\system32\comsvcs.dll | | | c:\windows\system32\cnbjmon.dll | |
| browser bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 70.50 KB (72,192 | pjlmon bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 15.00 KB (15,360 |
| | 3/25/2003 12:00 AM Microsoft Corporation | | | 3/24/2003 7:49 PM Microsoft Corporation | |
| | c:\windows\system32\browser.dll | | | c:\windows\system32\pjlmon.dll | |
| netrap bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 11.50 KB (11,776 | tcpmon bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 44.00 KB (45,056 |
| | 3/25/2003 12:00 AM Microsoft Corporation | | | 3/25/2003 12:00 AM Microsoft Corporation | |
| | c:\windows\system32\netrap.dll | | | c:\windows\system32\tcpmon.dll | |
| winhttp bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 327.50 KB (335,360 | mgmtapi bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 14.00 KB (14,336 |
| | 5/2/2003 10:34 AM Microsoft Corporation | | | 3/25/2003 12:00 AM Microsoft Corporation | |
| | c:\windows\winsxs\x86_microsoft.windows.winhttp_6595b64144 | | | c:\windows\system32\mgmtapi.dll | |
| ccf1df_5.1.0.0_x-ww_e0651936\winhttp.dll | | | | snmpapi bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) |
| wbemcore bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 457.00 KB (467,968 | | | 17.50 KB (17,920 |
| | 5/2/2003 3:43 PM Microsoft Corporation | | | | 3/25/2003 12:00 AM Microsoft Corporation |
| | c:\windows\system32\wbem\wbemcore.dll | | | | c:\windows\system32\snmpapi.dll |
| esscli bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 235.50 KB (241,152 | wsnmp32 bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 39.50 KB (40,448 |
| | 5/2/2003 3:43 PM Microsoft Corporation | | | | 3/25/2003 12:00 AM Microsoft Corporation |
| | c:\windows\system32\wbem\esscli.dll | | | | c:\windows\system32\wsnmp32.dll |
| wmiutils bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 90.50 KB (92,672 | usbmon bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 17.00 KB (17,408 |
| | 5/2/2003 3:43 PM Microsoft Corporation | | | | 3/25/2003 12:00 AM Microsoft Corporation |
| | c:\windows\system32\wbem\wmiutils.dll | | | | c:\windows\system32\usbmon.dll |

| | | | | | |
|-------------------------------|--|---------------------------|--------------------|-----------------------------|---|
| winnr bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 15.00 KB (15,360 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\winnr.dll |
| wshqos bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 23.00 KB (23,552 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\wshqos.dll |
| win32spl bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 94.50 KB (96,768 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\win32spl.dll |
| inetpp bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 71.50 KB (73,216 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\inetpp.dll |
| icmp bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 4.50 KB (4,608 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\icmp.dll |
| ersvc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 22.00 KB (22,528 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\ersvc.dll |
| sysdown 4:09 PM | 5.27.2195.0 | 34.77 KB (35,600 bytes) | 5/2/2003 | Compaq Computer Corporation | c:\windows\system32\sysdown.exe |
| dfssvc bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 130.50 KB (133,632 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\dfssvc.exe |
| resutils bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 59.00 KB (60,416 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\resutils.dll |
| mfc42u | 6.05.3014.0 | 960.00 KB (983,040 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\mfc42u.dll |
| wsock32 bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 22.00 KB (22,528 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\wsock32.dll |
| explorer (1,032,704 bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 1,008.50 KB | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\explorer.exe |
| browseui bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 1.01 MB (1,057,280 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\browseui.dll |
| shdocvw bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 1.33 MB (1,393,664 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\shdocvw.dll |
| apphelp bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 122.00 KB (124,928 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\apphelp.dll |
| themeui bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 360.50 KB (369,152 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\themeui.dll |
| msimg32 bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 4.50 KB (4,608 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\msimg32.dll |
| linkinfo bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 16.50 KB (16,896 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\linkinfo.dll |
| ntshrui bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 136.00 KB (139,264 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\ntshrui.dll |
| webcheck bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 261.50 KB (267,776 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\webcheck.dll |
| stobject bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 117.50 KB (120,320 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\stobject.dll |
| batmeter bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 28.50 KB (29,184 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\batmeter.dll |
| powrprof bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 14.50 KB (14,848 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\powrprof.dll |
| printui bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 536.50 KB (549,376 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\printui.dll |
| cfgmgr32 bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 17.50 KB (17,920 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\cfgmgr32.dll |
| urlmon bytes) | 6.00.3790.0 (srv03_rtm.030324-2048) | 501.50 KB (513,536 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\urlmon.dll |
| drprov bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 12.50 KB (12,800 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\drprov.dll |
| ntlanman bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 41.00 KB (41,984 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\ntlanman.dll |
| netui0 bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 75.50 KB (77,312 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\netui0.dll |
| netui1 bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 184.00 KB (188,416 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\netui1.dll |
| davclnt bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 23.50 KB (24,064 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\davclnt.dll |
| cmd bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 374.00 KB (382,976 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\cmd.exe |
| sqlservr 3:59 PM | 2000.080.0761.00 | 7.11 MB (7,450,664 bytes) | 5/2/2003 | Microsoft Corporation | c:\program files\microsoft sql server\mssql\binn\sqlservr.exe |
| opends60 3:59 PM | 2000.080.0194.00 | 24.06 KB (24,639 bytes) | 5/2/2003 | Microsoft Corporation | c:\program files\microsoft sql server\mssql\binn\opends60.dll |
| ums 3:59 PM | 2000.080.0760.00 | 52.55 KB (53,808 bytes) | 5/2/2003 | Microsoft Corporation | c:\program files\microsoft sql server\mssql\binn\ums.dll |
| sqlsort 3:59 PM | 2000.080.0760.00 | 576.56 KB (590,396 bytes) | 5/2/2003 | Microsoft Corporation | c:\program files\microsoft sql server\mssql\binn\sqlsort.dll |
| msvcirt bytes) | 7.0.3790.0 (srv03_rtm.030324-2048) | 50.00 KB (51,200 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\msvcirt.dll |
| sqllevn70 3:59 PM | 2000.080.0760.00 | 28.00 KB (28,672 bytes) | 5/2/2003 | Microsoft Corporation | c:\program files\microsoft sql server\mssql\binn\resources\1033\sqllevn70.rll |
| xolehlp bytes) | 2001.12.4720.0 (srv03_rtm.030324-2048) | 8.50 KB (8,704 bytes) | 5/2/2003 3:43 PM | Microsoft Corporation | c:\windows\system32\xolehlp.dll |
| msdtcprx bytes) | 2001.12.4720.0 (srv03_rtm.030324-2048) | 427.50 KB (437,760 bytes) | 5/2/2003 3:43 PM | Microsoft Corporation | c:\windows\system32\msdtcprx.dll |
| mtxclu bytes) | 2001.12.4720.0 (srv03_rtm.030324-2048) | 74.50 KB (76,288 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\mtxclu.dll |
| ssnmpn70 3:59 PM | 2000.080.0534.00 | 24.56 KB (25,148 bytes) | 5/2/2003 | Microsoft Corporation | c:\program files\microsoft sql server\mssql\binn\ssnmpn70.dll |
| ssnetlib 3:59 PM | 2000.080.0760.00 | 80.56 KB (82,492 bytes) | 5/2/2003 | Microsoft Corporation | c:\program files\microsoft sql server\mssql\binn\ssnetlib.dll |
| security bytes) | 5.2.3790.0 (srv03_rtm.030324-2048) | 5.50 KB (5,632 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\security.dll |
| ssmslpcn 3:59 PM | 2000.080.0760.00 | 28.56 KB (29,244 bytes) | 5/2/2003 | Microsoft Corporation | c:\program files\microsoft sql server\mssql\binn\ssmslpcn.dll |
| sqloledb bytes) | 2000.085.1022.00 (srv03_rtm.030324-2048) | 536.00 KB (548,864 bytes) | 5/2/2003 3:47 PM | Microsoft Corporation | c:\program files\common files\system\ole db\sqloledb.dll |

| | | | | | |
|--------------|--|---------------------------|--------------------|---|---|
| msdart | 2.80.1022.0 (srv03_rtm.030324-2048) | 164.00 KB (167,936 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\msdart.dll |
| comdlg32 | 6.00.3790.0 (srv03_rtm.030324-2048) | 261.00 KB (267,264 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\comdlg32.dll |
| msdatl3 | 2.80.1022.0 (srv03_rtm.030324-2048) | 96.00 KB (98,304 bytes) | 5/2/2003 3:47 PM | Microsoft Corporation | c:\program files\common files\system\ole db\msdatl3.dll |
| oledb32 | 2.80.1022.0 (srv03_rtm.030324-2048) | 500.00 KB (512,000 bytes) | 5/2/2003 3:47 PM | Microsoft Corporation | c:\program files\common files\system\ole db\oledb32.dll |
| oledb32r | 2.80.1022.0 (srv03_rtm.030324-2048) | 68.00 KB (69,632 bytes) | 5/2/2003 3:47 PM | Microsoft Corporation | c:\program files\common files\system\ole db\oledb32r.dll |
| impprov | 2000.080.0760.00 | 100.58 KB (102,992 bytes) | 5/2/2003 3:59 PM | Microsoft Corporation | c:\program files\microsoft sql server\80\com\impprov.dll |
| sqlresld | 2000.080.0382.00 | 28.56 KB (29,248 bytes) | 5/2/2003 3:59 PM | Microsoft Corporation | c:\program files\microsoft sql server\80\com\sqlresld.dll |
| xpstar | 2000.080.0760.00 | 280.56 KB (287,296 bytes) | 5/2/2003 3:59 PM | Microsoft Corporation | c:\program files\microsoft sql server\mssql\bin\xpstar.dll |
| sqlsvc | 2000.080.0760.00 | 92.56 KB (94,784 bytes) | 5/2/2003 4:00 PM | Microsoft Corporation | c:\program files\microsoft sql server\mssql\bin\sqlsvc.dll |
| odbc32 | 3.525.1022.0 (srv03_rtm.030324-2048) | 232.00 KB (237,568 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\odbc32.dll |
| odbcbcpc | 2000.085.1022.00 (srv03_rtm.030324-2048) | 24.00 KB (24,576 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\odbcbcpc.dll |
| w95scm | 2000.080.0760.00 | 48.56 KB (49,728 bytes) | 5/2/2003 4:00 PM | Microsoft Corporation | c:\program files\microsoft sql server\mssql\bin\w95scm.dll |
| sqlunirl | 2000.080.0728.00 | 176.56 KB (180,800 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\sqlunirl.dll |
| shfolder | 6.00.3790.0 (srv03_rtm.030324-2048) | 23.00 KB (23,552 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\shfolder.dll |
| odbcint | 3.525.1022.0 (srv03_rtm.030324-2048) | 92.00 KB (94,208 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\odbcint.dll |
| sqlsvc | 2000.080.0194.00 | 24.00 KB (24,576 bytes) | 5/2/2003 4:00 PM | Microsoft Corporation | c:\program files\microsoft sql server\mssql\bin\resources\1033\sqlsvc.rll |
| xpstar | 2000.080.0760.00 | 36.00 KB (36,864 bytes) | 5/2/2003 3:59 PM | Microsoft Corporation | c:\program files\microsoft sql server\mssql\bin\resources\1033\xpstar.rll |
| rdpsnd | 5.2.3790.0 (srv03_rtm.030324-2048) | 18.00 KB (18,432 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\rdpsnd.dll |
| scredir | 5.2.3790.0 (srv03_rtm.030324-2048) | 27.00 KB (27,648 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\scredir.dll |
| msacm32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 21.00 KB (21,504 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\msacm32.drv |
| msacm32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 67.50 KB (69,120 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\msacm32.dll |
| imaadp32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 15.50 KB (15,872 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\imaadp32.acm |
| msadp32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 14.50 KB (14,848 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\msadp32.acm |
| msg711 | 5.2.3790.0 (srv03_rtm.030324-2048) | 10.00 KB (10,240 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\msg711.acm |
| msgsm32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 20.50 KB (20,992 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\msgsm32.acm |
| tssoft32 | 1.01 | 9.50 KB (9,728 bytes) | 3/25/2003 12:00 AM | DSP GROUP, INC. | c:\windows\system32\tssoft32.acm |
| tsd32 | 1.03 | 16.50 KB (16,896 bytes) | 3/25/2003 12:00 AM | DSP GROUP, INC. | c:\windows\system32\tsd32.dll |
| msg723 | 4.4.4000 | 116.00 KB (118,784 bytes) | 5/2/2003 3:47 PM | Microsoft Corporation | c:\windows\system32\msg723.acm |
| msaud32 | 8.00.00.4487 | 288.00 KB (294,912 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\msaud32.acm |
| sl_anet | 3.02 | 84.00 KB (86,016 bytes) | 3/25/2003 12:00 AM | Sipro Lab Telecom Inc. | c:\windows\system32\sl_anet.acm |
| l3codeca | 1, 9, 0, 0305 | 284.00 KB (290,816 bytes) | 3/25/2003 12:00 AM | Fraunhofer Institut Integrierte Schaltungen | c:\windows\system32\l3codeca.acm |
| IIS | 5.2.3790.0 (srv03_rtm.030324-2048) | 53.00 KB (54,272 bytes) | 5/2/2003 3:43 PM | Microsoft Corporation | c:\windows\system32\rdpclip.exe |
| rdpclip | 5.2.3790.0 (srv03_rtm.030324-2048) | 95.00 KB (97,280 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\actxprxy.dll |
| actxprxy | 6.00.3790.0 (srv03_rtm.030324-2048) | 62.00 KB (63,488 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\browsecl.dll |
| browsecl | 6.00.3790.0 (srv03_rtm.030324-2048) | 588.50 KB (602,624 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\shdoclc.dll |
| shdoclc | 6.00.3790.0 (srv03_rtm.030324-2048) | 316.00 KB (323,584 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\zipfldr.dll |
| zipfldr | 6.00.3790.0 (srv03_rtm.030324-2048) | 52.00 KB (53,248 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\sendmail.dll |
| sendmail | 6.00.3790.0 (srv03_rtm.030324-2048) | 88.00 KB (90,112 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\mydocs.dll |
| mydocs | 6.00.3790.0 (srv03_rtm.030324-2048) | 66.50 KB (68,096 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\twext.dll |
| twext | 5.2.3790.0 (srv03_rtm.030324-2048) | 40.50 KB (41,472 bytes) | 5/2/2003 3:47 PM | Microsoft Corporation | c:\program files\common files\microsoft shared\msinfo\msinfo32.exe |
| msinfo32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 358.50 KB (367,104 bytes) | 5/2/2003 3:47 PM | Microsoft Corporation | c:\windows\pchealth\helpctr\binaries\msinfo.dll |
| riched32 | 5.2.3790.0 (srv03_rtm.030324-2048) | 3.50 KB (3,584 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\riched32.dll |
| riched20 | 5.31.23.1218 | 406.00 KB (415,744 bytes) | 3/25/2003 12:00 AM | Microsoft Corporation | c:\windows\system32\riched20.dll |
| [Services] | | | | | |
| Display Name | Name | State | Start Mode | Service Type | |
| Path | Error Control | | Start Name | Tag ID | |

| | | | | | | | | | |
|--|--|---------------------------|-------------|---------------|--|---|---------------|---------------|---------------|
| Remote Access Auto Connection Manager | RasAuto | Stopped | Manual | | Telephony TapiSrv | Stopped | Manual | Share Process | |
| Share Process | c:\windows\system32\svchost.exe -k | | | | c:\windows\system32\svchost.exe -k tapisrv | Normal | | | |
| netsvcs | Normal | LocalSystem | 0 | | LocalSystem | 0 | | | |
| Remote Access Connection Manager | RasMan | Stopped | Manual | | Terminal Services | TermService | Running | Manual | Share |
| Share Process | c:\windows\system32\svchost.exe -k | | | | Process | c:\windows\system32\svchost.exe -k termsvcs | Normal | | |
| netsvcs | Normal | LocalSystem | 0 | | LocalSystem | 0 | | | |
| Remote Desktop Help Session Manager | RDSessMgr | Stopped | | | Themes | Themes | Stopped | Disabled | Share Process |
| Manual | Own Process | | | | c:\windows\system32\svchost.exe -k netsvcs | Normal | | | |
| c:\windows\system32\sessmgr.exe | | Normal | | | LocalSystem | 0 | | | |
| LocalSystem | 0 | | | | Telnet | TlntSvr | Stopped | Disabled | Own Process |
| Routing and Remote Access | RemoteAccess | Stopped | Disabled | | c:\windows\system32\tlntsvr.exe | Normal | NT | | |
| Share Process | c:\windows\system32\svchost.exe -k | | | | AUTHORITY\LocalService | 0 | | | |
| netsvcs | Normal | LocalSystem | 0 | | Distributed Link Tracking Server | TrkSvr | Stopped | Disabled | Share |
| Remote Registry | RemoteRegistry | Running | Auto | Share | Process | c:\windows\system32\svchost.exe -k netsvcs | Normal | | |
| Process | c:\windows\system32\svchost.exe -k regsvc | Normal | NT | | LocalSystem | 0 | | | |
| AUTHORITY\LocalService | 0 | | | | Distributed Link Tracking Client | TrkWks | Running | Auto | Share |
| Remote Procedure Call (RPC) Locator | RpcLocator | Stopped | | | Process | c:\windows\system32\svchost.exe -k netsvcs | Normal | | |
| Manual | Own Process | | | | LocalSystem | 0 | | | |
| c:\windows\system32\locator.exe | Normal | NT | | | Terminal Services Session Directory | Tssdis | Stopped | Disabled | |
| AUTHORITY\NetworkService | 0 | | | | Own Process | c:\windows\system32\tssdis.exe | Normal | | |
| Remote Procedure Call (RPC) | RpcSs | Running | Auto | Share | LocalSystem | 0 | | | |
| Process | c:\windows\system32\svchost -k rpsvc | Normal | | | Upload Manager | uploadmgr | Stopped | Manual | Share Process |
| LocalSystem | 0 | | | | c:\windows\system32\svchost.exe -k netsvcs | Normal | | | |
| Resultant Set of Policy Provider | RSOPProv | Stopped | Manual | Share | LocalSystem | 0 | | | |
| Process | c:\windows\system32\rsopprov.exe | Normal | | | Uninterruptible Power Supply | UPS | Stopped | Manual | Own |
| LocalSystem | 0 | | | | Process | c:\windows\system32\ups.exe | Normal | NT | |
| Special Administration Console Helper | sacsvr | Stopped | Manual | | AUTHORITY\LocalService | 0 | | | |
| Share Process | c:\windows\system32\svchost.exe -k | | | | Virtual Disk Service | vds | Stopped | Manual | Own Process |
| netsvcs | Normal | LocalSystem | 0 | | c:\windows\system32\vds.exe | Normal | LocalSystem | | |
| Security Accounts Manager | SamSs | Running | Auto | Share | 0 | | | | |
| Process | c:\windows\system32\lsass.exe | Normal | LocalSystem | | Volume Shadow Copy | VSS | Stopped | Manual | Own |
| 0 | | | | | Process | c:\windows\system32\vssvc.exe | Normal | LocalSystem | |
| Smart Card | SCardSvr | Stopped | Manual | Share Process | 0 | | | | |
| c:\windows\system32\scardsvr.exe | | Ignore | NT | | Windows Time | W32Time | Running | Auto | Share Process |
| AUTHORITY\LocalService | 0 | | | | c:\windows\system32\svchost.exe -k netsvcs | Normal | | | |
| Task Scheduler | Schedule | Running | Auto | Share Process | LocalSystem | 0 | | | |
| c:\windows\system32\svchost.exe -k netsvcs | Normal | | | | WebClient | WebClient | Stopped | Disabled | Share Process |
| LocalSystem | 0 | | | | c:\windows\system32\svchost.exe -k localservice | Normal | | | |
| Secondary Logon | seclogon | Running | Auto | Share Process | NT AUTHORITY\LocalService | 0 | | | |
| c:\windows\system32\svchost.exe -k netsvcs | Ignore | | | | WinHTTP | Web Proxy Auto-Discovery Service | | | |
| LocalSystem | 0 | | | | WinHttpAutoProxySvc | Stopped | Manual | Share | |
| System Event Notification | SENS | Running | Auto | Share | Process | c:\windows\system32\svchost.exe -k localservice | Normal | | |
| Process | c:\windows\system32\svchost.exe -k netsvcs | Normal | | | NT AUTHORITY\LocalService | 0 | | | |
| LocalSystem | 0 | | | | Windows Management Instrumentation | winmgmt | Running | Auto | |
| Internet Connection Firewall (ICF) / Internet Connection Sharing (ICS) | SharedAccess | Stopped | Disabled | Share Process | Share Process | c:\windows\system32\svchost.exe -k | | | |
| c:\windows\system32\svchost.exe -k netsvcs | Normal | | | | netsvcs | Ignore | LocalSystem | 0 | |
| LocalSystem | 0 | | | | Portable Media Serial Number Service | WmdmPmSN | Stopped | | |
| Shell Hardware Detection | ShellHWDetection | Running | Auto | | Manual | Share Process | | | |
| Share Process | c:\windows\system32\svchost.exe -k | | | | c:\windows\system32\svchost.exe -k netsvcs | Normal | | | |
| netsvcs | Ignore | LocalSystem | 0 | | LocalSystem | 0 | | | |
| Print Spooler | Spooler | Running | Auto | Own Process | Windows Management Instrumentation Driver Extensions | | | | Wmi |
| c:\windows\system32\spoolsv.exe | | Normal | | | Stopped | Manual | Share Process | | |
| LocalSystem | 0 | | | | c:\windows\system32\svchost.exe -k netsvcs | Normal | | | |
| SQLSERVERAGENT | SQLSERVERAGENT | Stopped | | | LocalSystem | 0 | | | |
| Manual | Own Process | | | | WMI Performance Adapter | WmiApSrv | Stopped | Manual | |
| c:\progra~1\micros~1\mssql\bin\sqlagent.exe | | Normal | | | Own Process | c:\windows\system32\wbem\wmiapsrv.exe | | | |
| LocalSystem | 0 | | | | Normal | LocalSystem | 0 | | |
| Windows Image Acquisition (WIA) | stisvc | Stopped | Disabled | | Automatic Updates | wuauerv | Running | Auto | Share Process |
| Share Process | c:\windows\system32\svchost.exe -k | | | | c:\windows\system32\svchost.exe -k netsvcs | Normal | | | |
| imgsvc | Normal | NT AUTHORITY\LocalService | 0 | | LocalSystem | 0 | | | |
| Microsoft Software Shadow Copy Provider | swprv | Stopped | Manual | | Wireless Configuration | WZCSVC | Running | Auto | Share |
| Own Process | c:\windows\system32\svchost.exe -k swprv | | | | Process | c:\windows\system32\svchost.exe -k netsvcs | Normal | | |
| Normal | LocalSystem | 0 | | | LocalSystem | 0 | | | |
| HP ProLiant System Shutdown Service | sysdown | Running | Auto | | [Program Groups] | | | | |
| Own Process | c:\windows\system32\sysdown.exe | | | | Group Name | Name | User Name | | |
| Normal | LocalSystem | 0 | | | Accessories | Default User:Accessories | Default User | | |
| Performance Logs and Alerts | SysmonLog | Stopped | Manual | | | | | | |
| Own Process | c:\windows\system32\smlogsvc.exe | | | | | | | | |
| Normal | NT Authority\NetworkService | 0 | | | | | | | |

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

Accessories\Accessibility
 MINI\Administrator:Accessories\Accessibility
 MINI\Administrator
 Accessories\Entertainment
 MINI\Administrator:Accessories\Entertainment
 MINI\Administrator
 Administrative Tools MINI\Administrator:Administrative Tools
 MINI\Administrator
 Startup MINI\Administrator:Startup MINI\Administrator

[Startup Programs]

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

[OLE Registration]

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

[Windows Error Reporting]

| Time | Type | Details |
|------------------|------------------|---|
| 5/4/2003 1:51 PM | Application Hang | Hanging application mmc.exe,
version 5.2.3790.0, 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 | 6.0.3790.0 |
| Build | 63790 |
| Application Path | C:\Program Files\Internet Explorer |
| Language | English (United States) |
| Active Printer | Not Available |

| | |
|-----------------|----------|
| Cipher Strength | 128-bit |
| Content Advisor | Disabled |
| IEAK Install | No |

[File Versions]

| File | Version | Size | Date | Path | Company |
|---------------|----------------|---------------|---------------|------------------------------------|-----------------------|
| actxprxy.dll | 6.0.3790.0 | 95 KB | 3/25/2003 | C:\WINDOWS\system32 | Microsoft Corporation |
| advpack.dll | 6.0.3790.0 | 94 KB | 3/25/2003 | C:\WINDOWS\system32 | Microsoft Corporation |
| asctrls.ocx | 6.0.3790.0 | 90 KB | 3/25/2003 | C:\WINDOWS\system32 | Microsoft Corporation |
| browseic.dll | 6.0.3790.0 | 62 KB | 3/25/2003 | C:\WINDOWS\system32 | Microsoft Corporation |
| browseui.dll | 6.0.3790.0 | 1,033 KB | 3/25/2003 | C:\WINDOWS\system32 | Microsoft Corporation |
| cdfview.dll | 6.0.3790.0 | 144 KB | 3/25/2003 | C:\WINDOWS\system32 | Microsoft Corporation |
| comctl32.dll | 5.82.3790.0 | 561 KB | 3/25/2003 | C:\WINDOWS\system32 | Microsoft Corporation |
| dxtrans.dll | 6.3.3790.0 | 198 KB | 3/25/2003 | C:\WINDOWS\system32 | Microsoft Corporation |
| dxtmsft.dll | 6.3.3790.0 | 344 KB | 3/25/2003 | C:\WINDOWS\system32 | Microsoft Corporation |
| iecont.dll | <File Missing> | Not Available | Not Available | Not Available | Not Available |
| iecontlc.dll | <File Missing> | Not Available | Not Available | Not Available | Not Available |
| iedkcs32.dll | 16.0.3790.0 | 300 KB | 3/25/2003 | C:\WINDOWS\system32 | Microsoft Corporation |
| iepeers.dll | 6.0.3790.0 | 230 KB | 3/25/2003 | C:\WINDOWS\system32 | Microsoft Corporation |
| iesetup.dll | 6.0.3790.0 | 59 KB | 3/25/2003 | C:\WINDOWS\system32 | Microsoft Corporation |
| ieuinit.inf | Not Available | 20 KB | 3/25/2003 | C:\WINDOWS\system32 | Not Available |
| ieexplore.exe | 6.0.3790.0 | 90 KB | 3/25/2003 | C:\Program Files\Internet Explorer | Microsoft Corporation |
| imgutil.dll | 5.2.3790.0 | 35 KB | 3/25/2003 | C:\WINDOWS\system32 | Microsoft Corporation |

inetcp.cpl 6.0.3790.0 303 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

inetplc.dll 6.0.3790.0 109 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

inseng.dll 6.0.3790.0 72 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

mlang.dll 6.0.3790.0 570 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

msencode.dll 2002.10.4.0 112 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Not Available

mshta.exe 6.0.3790.0 26 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

mshtml.dll 6.0.3790.0 2,848 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

mshtml.tlb 6.0.3790.0 1,319 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

mshtmlmed.dll 6.0.3790.0 444 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

mshtmlr.dll 6.0.3790.0 55 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

msident.dll 6.0.3790.0 47 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

msidntld.dll 6.0.3790.0 15 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

msieftp.dll 6.0.3790.0 230 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

msrating.dll 6.0.3790.0 132 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

mstime.dll 6.0.3790.0 491 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

occache.dll 6.0.3790.0 89 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

proctexe.ocx 6.3.3790.0 78 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Intel Corporation

sendmail.dll 6.0.3790.0 52 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

shdoclc.dll 6.0.3790.0 589 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

shdocvw.dll 6.0.3790.0 1,361 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

shfolder.dll 6.0.3790.0 23 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

shlwapi.dll 6.0.3790.0 281 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

tdc.ocx 1.3.0.3130 58 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

url.dll 6.0.3790.0 36 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

urlmon.dll 6.0.3790.0 502 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

webcheck.dll 6.0.3790.0 262 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

wininet.dll 6.0.3790.0 609 KB 3/25/2003 1:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation

[Connectivity]

| Item | Value |
|-----------------------|------------|
| Connection Preference | Never dial |

LAN Settings

| | |
|---------------------|---------------|
| AutoConfigProxy | Not Available |
| AutoProxyDetectMode | Disabled |
| AutoConfigURL | |
| Proxy | Disabled |
| ProxyServer | |
| ProxyOverride | |

[Cache]

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

| Item | Value |
|---------------------------------|--|
| Page Refresh Type | Automatic |
| Temporary Internet Files Folder | C:\Documents and Settings\NetworkService\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 | Medium-low |
| Trusted sites | Medium |
| Internet | High |
| Restricted sites | High |

A.8 Server Registry Parameters

Windows Registry Editor Version 5.00

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session  
Manager\I/O System]  
"CountOperations"=dword:00000000
```

Appendix B: Database Build Scripts

B.1 CreateDatabase.sql

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

Create Database tpch100g on
Primary (name=tpch100g,
filename='c:\dev\tpch100g.mdf',size=10mb,filegrowth=0),
FileGroup tpch100g

(name=tpch100g1,filename='c:\dev\tpch_1\',size=19950mb,filegrowth=0),

(name=tpch100g2,filename='c:\dev\tpch_2\',size=19950mb,filegrowth=0),

(name=tpch100g3,filename='c:\dev\tpch_3\',size=19950mb,filegrowth=0),

(name=tpch100g4,filename='c:\dev\tpch_4\',size=19950mb,filegrowth=0),

(name=tpch100g5,filename='c:\dev\tpch_5\',size=19950mb,filegrowth=0),

(name=tpch100g6,filename='c:\dev\tpch_6\',size=19950mb,filegrowth=0),

(name=tpch100g7,filename='c:\dev\tpch_7\',size=19950mb,filegrowth=0),

(name=tpch100g8,filename='c:\dev\tpch_8\',size=19950mb,filegrowth=0),

(name=tpch100g9,filename='c:\dev\tpch_9\',size=19950mb,filegrowth=0),

(name=tpch100g10,filename='c:\dev\tpch_10\',size=19950mb,filegrowth=0
),
(name=tpch100g11,filename='c:\dev\tpch_11\',size=5450mb,filegrowth=0)
,
(name=tpch100g12,filename='c:\dev\tpch_12\',size=5450mb,filegrowth=0)

Log on
      (name=tpch100gLog,filename='c:\dev\tpchlog\',size=11000mb,filegrowth=0)

Alter Database tpch100g Add FileGroup LoadFg

Alter Database tpch100g Add File
      (name=LoadFg1,
filename='c:\dev\load_1\load.ldf',size=18900mb,filegrowth=0),
      (name=LoadFg2,
filename='c:\dev\load_2\load.ldf',size=18900mb,filegrowth=0),
      (name=LoadFg3,
filename='c:\dev\load_3\load.ldf',size=18900mb,filegrowth=0),
      (name=LoadFg4,
filename='c:\dev\load_4\load.ldf',size=18900mb,filegrowth=0),
      (name=LoadFg5,
filename='c:\dev\load_5\load.ldf',size=18900mb,filegrowth=0),
      (name=LoadFg6,
filename='c:\dev\load_6\load.ldf',size=18900mb,filegrowth=0),
      (name=LoadFg7,
filename='c:\dev\load_7\load.ldf',size=18900mb,filegrowth=0),
      (name=LoadFg8,
filename='c:\dev\load_8\load.ldf',size=18900mb,filegrowth=0),
      (name=LoadFg9,
filename='c:\dev\load_9\load.ldf',size=18900mb,filegrowth=0),
      (name=LoadFg10,
filename='c:\dev\load_10\load.ldf',size=18900mb,filegrowth=0)

to FileGroup LoadFg
```

B.2 CreateTables.sql

```
-- CreateTables
-- Uses filegroups

--
-- BASE TABLES
--

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

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

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

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

create table ORDERS
      (O_ORDERKEY     int          not null,
      O_CUSTKEY       int          not null,
      O_ORDERSTATUS   char(1)     not null,
      O_TOTALPRICE    money       not null,
      O_ORDERDATE     smalldatetime not null,
      O_ORDERPRIORITY char(15)   not null,
      O_CLERK         char(15)   not null,
      O_SHIPPRIORITY  int          not null,
      O_COMMENT      varchar(79)  not null)
on LoadFg

create table LINEITEM
      (L_ORDERKEY     int          not null,
```

```

L_PARTKEY      int          not null,
L_SUPPKEY      int          not null,
L_LINENUMBER  int          not null,
L_QUANTITY     money       not null,
L_EXTENDEDPRICE money     not null,
L_DISCOUNT   money       not null,
L_TAX          money       not null,
L_RETURNFLAG  char(1)     not null,
L_LINESTATUS  char(1)     not null,
L_SHIPDATE    smalldatetime not null,
L_COMMITDATE  smalldatetime not null,
L_RECEIPTDATE smalldatetime not null,
L_SHIPINSTRUCT char(25)  not null,
L_SHIPMODE    char(10)   not null,
L_COMMENT     varchar(44)  not null)
on LoadFg

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 LoadFg

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

```

B.3 CreateCUSTOMERIndexes.sql

```

create unique clustered index C_KEY_CLUIDX
on CUSTOMER(C_CUSTKEY)
with SORT_IN_TEMPDB
on tpch100g
create index C_NATION_KEYIDX
on CUSTOMER (C_NATIONKEY)
with SORT_IN_TEMPDB
on tpch100g

```

B.4 CreateLINEITEMIndexes.sql

```

create clustered index L_SHIPDATE_CLUIDX
on LINEITEM(L_SHIPDATE)
with fillfactor=95, SORT_IN_TEMPDB
on tpch100g

create index L_PARTKEY_SUPPKEY_IDX
on LINEITEM (L_PARTKEY,L_SUPPKEY)
with fillfactor=95, SORT_IN_TEMPDB
on tpch100g

create index L_ORDERKEY_IDX
on LINEITEM (L_ORDERKEY)
with fillfactor=95, SORT_IN_TEMPDB
on tpch100g

```

B.5 CreateNATIONIndexes.sql

```

create unique clustered index N_KEY_CLUIDX
on NATION(N_NATIONKEY)
on tpch100g
create index N_REGIONKEY_IDX
on NATION (N_REGIONKEY)
on tpch100g

```

B.6 CreateORDERSIndexes.sql

```

create clustered index O_ORDERDATE_CLUIDX
on ORDERS (O_ORDERDATE)
with fillfactor=95, SORT_IN_TEMPDB
on tpch100g

create index O_CUSTKEY_IDX
on ORDERS (O_CUSTKEY)
with fillfactor=95, SORT_IN_TEMPDB
on tpch100g

create unique index O_KEY_IDX
on ORDERS(O_ORDERKEY)
with fillfactor=95, SORT_IN_TEMPDB
on tpch100g

```

B.7 CreatePARTIndexes.sql

```

create unique clustered index P_KEY_CLUIDX
on PART(P_PARTKEY)
with SORT_IN_TEMPDB
on tpch100g

```

B.8 CreatePARTSUPPIndexes.sql

```

create unique clustered index PS_KEY_CLUIDX
on PARTSUPP(PS_PARTKEY,PS_SUPPKEY)
with SORT_IN_TEMPDB
on tpch100g
create index PS_SUPPKEY_IDX
on PARTSUPP (PS_SUPPKEY)
with SORT_IN_TEMPDB
on tpch100g

```

B.9 CreateREGIONIndexes.sql

```

create unique clustered index R_KEY_CLUIDX
on REGION(R_REGIONKEY)
on tpch100g

```

B.10 createSUPPLIERindexes.sql

```

create unique clustered index S_SUPPKEY_CLUIDX
on SUPPLIER (S_SUPPKEY)
with SORT_IN_TEMPDB
on tpch100g
create index S_NATION_KEYIDX
on SUPPLIER (S_NATIONKEY)
with SORT_IN_TEMPDB
on tpch100g

```

B.11 Backup.sql

```

backup database tpch100g to
disk='c:\dev\load_1\test.bak',
disk='c:\dev\load_2\test.bak',
disk='c:\dev\load_3\test.bak',
disk='c:\dev\load_4\test.bak',

```

```
disk='c:\dev\load_5\test.bak',
disk='c:\dev\load_6\test.bak',
disk='c:\dev\load_7\test.bak',
disk='c:\dev\load_8\test.bak',
disk='c:\dev\load_9\test.bak',
disk='c:\dev\load_10\test.bak'
with init,stats=10
```

B.12 Restore.sql

```
restore database tpch100g from
disk='c:\dev\load_1\test.bak',
disk='c:\dev\load_2\test.bak',
disk='c:\dev\load_3\test.bak',
disk='c:\dev\load_4\test.bak',
disk='c:\dev\load_5\test.bak',
disk='c:\dev\load_6\test.bak',
disk='c:\dev\load_7\test.bak',
disk='c:\dev\load_8\test.bak',
disk='c:\dev\load_9\test.bak',
disk='c:\dev\load_10\test.bak'
with stats=1, replace
```

B.13 MoveTemp.sql

```
alter database tempdb modify file
(name=tempdev,filename='c:\dev\tempdev\',size=15MB)
alter database tempdb modify file
(name=templog,filename='c:\dev\templog\',size=20MB)
```

B.14 AddTemp.sql

```
alter database tempdb modify file
(name=tempdev, filename='c:\dev\tempdev\',size=9950mb,filegrowth=0)
alter database tempdb modify file
(name=templog, filename='c:\dev\templog\',size=5556mb,filegrowth=0)
alter database tempdb add file
(name=tempdev2,
filename='c:\dev\tempdev_2\',size=9950mb,filegrowth=0),
(name=tempdev3,
filename='c:\dev\tempdev_3\',size=9950mb,filegrowth=0),
(name=tempdev4,
filename='c:\dev\tempdev_4\',size=9950mb,filegrowth=0),
(name=tempdev5,
filename='c:\dev\tempdev_5\',size=9950mb,filegrowth=0),
(name=tempdev6,
filename='c:\dev\tempdev_6\',size=9950mb,filegrowth=0),
(name=tempdev7,
filename='c:\dev\tempdev_7\',size=9950mb,filegrowth=0),
(name=tempdev8,
filename='c:\dev\tempdev_8\',size=9950mb,filegrowth=0),
(name=tempdev9,
filename='c:\dev\tempdev_9\',size=9950mb,filegrowth=0),
(name=tempdev10,
filename='c:\dev\tempdev_10\',size=9950mb,filegrowth=0),
(name=tempdev11,
filename='c:\dev\tempdev_11\',size=2950mb,filegrowth=0),
(name=tempdev12,
filename='c:\dev\tempdev_12\',size=2950mb,filegrowth=0)
```

B.15 DelLoadFg.sql

```
alter database tpch100g remove file LoadFg1
alter database tpch100g remove file LoadFg2
alter database tpch100g remove file LoadFg3
alter database tpch100g remove file LoadFg4
alter database tpch100g remove file LoadFg5
alter database tpch100g remove file LoadFg6
alter database tpch100g remove file LoadFg7
alter database tpch100g remove file LoadFg8
alter database tpch100g remove file LoadFg9
alter database tpch100g remove file LoadFg10
alter database tpch100g remove filegroup LoadFg
```

Appendix C: Query Text and Output

C.1 Qualification Queries and Output

Qualification Query 1

```

SELECT
L_RETURNFLAG
,L_LINESTATUS
,SUM(L_QUANTITY) AS SUM_QTY
,SUM(L_EXTENDEDPRI) AS SUM_BASE_PRICE
,SUM(L_EXTENDEDPRI*(1-L_DISCOUNT)) AS SUM_DISC_PRICE
,SUM(L_EXTENDEDPRI*(1-L_DISCOUNT)*(1+L_TAX)) AS
SUM_CHARGE
,AVG(L_QUANTITY) AS AVG_QTY
,AVG(L_EXTENDEDPRI) AS AVG_PRICE
,AVG(L_DISCOUNT) AS AVG_DISC
,COUNT(*) AS COUNT_ORDER
FROM
LINEITEM
WHERE
L_SHIPDATE <= DATEADD(dd, -90, cast('1998/12/01' as smalldatetime))
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      37734107.0000  56586554400.7300
53758257134.8700  55909065224.7041      25.5220
38273.1297      .0499  1478493
N      F      991417.0000    1487504710.3800
1413082168.0541  1469649223.2395      25.5164      38284.4677
.0500  38854
N      O      74476040.0000  111701729697.7400
106118230307.6056  110367043876.2372      25.5022
38249.1179      .0499  2920374
R      F      37719753.0000  56568041380.9000
53741292684.6040  55889619121.7027      25.5057
38250.8546      .0500  1478870

```

(4 rows affected)

Qualification Query 2

```

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
-----
-----
9938.5300 Supplier#000005359 UNITED KINGDOM
185358 Manufacturer#4 QKuHYh,vZGiwu2FWEJoLDx04
33-429-790-6131 blithely silent pinto beans are furiously. slyly final deposits
acros
9937.8400 Supplier#000005969 ROMANIA
108438 Manufacturer#1
ANDENSOSmk,miq23Xfb5RWt6dvUcvt6Qa 29-520-692-3537
carefully slow deposits use furiously. slyly ironic platelets above the ironic
9936.2200 Supplier#000005250 UNITED KINGDOM
249 Manufacturer#4 B3rq0xbSEim4Mpy2RH J 33-320-
228-2957 blithely special packages are. stealthily express deposits across the
closely final instructi
9923.7700 Supplier#000002324 GERMANY
29821 Manufacturer#4 y3OD9UywSTok 17-779-
299-1839 quickly express packages breach quiet pinto beans. requ
9871.2200 Supplier#000006373 GERMANY
43868 Manufacturer#5 J8fcXWsTqM 17-813-485-
8637 never silent deposits integrate furiously blit
9870.7800 Supplier#000001286 GERMANY
81285 Manufacturer#2
YKA,E2fjVd7eUrzp2Ef8j1QxGo2DFnosaTEH 17-516-924-4574 final
theodolites cajole slyly special,
9870.7800 Supplier#000001286 GERMANY
181285 Manufacturer#4
YKA,E2fjVd7eUrzp2Ef8j1QxGo2DFnosaTEH 17-516-924-4574 final
theodolites cajole slyly special,
..... Additional rows deleted .....

```

29-250-925-9690 blithely bold ideas haggle quickly final, regular request
 7914.4500 Supplier#000001013 RUSSIA 125988
 Manufacturer#2 riRcntps4KEDtYScjpMIWeYF6mNnR 32-
 194-698-3365 final, ironic theodolites alongside of the ironic
 7912.9100 Supplier#000004211 GERMANY
 159180 Manufacturer#5 2wQRVovHrm3,v03IKzfTd,1PYsFXQFFOG
 17-266-947-7315 final requests integrate slyly above the silent, even
 7912.9100 Supplier#000004211 GERMANY
 184210 Manufacturer#4 2wQRVovHrm3,v03IKzfTd,1PYsFXQFFOG
 17-266-947-7315 final requests integrate slyly above the silent, even
 7894.5600 Supplier#000007981 GERMANY
 85472 Manufacturer#4 NSJ96vMROAbeXP 17-963-
 404-3760 regular, even theodolites integrate carefully. bold, special
 theodolites are slyly fluffily iron
 7887.0800 Supplier#000009792 GERMANY
 164759 Manufacturer#3 Y28ITVeYriT3kiGdV2K8fSZ
 V2UqT5H1Otz 17-988-938-4296 pending, ironic packages sleep among
 the carefully ironic accounts. quickly final accounts
 7871.5000 Supplier#000007206 RUSSIA 104695
 Manufacturer#1 3w fNCnrVmvJjE95sgWZzvW 32-432-
 452-7731 furiously dogged pinto beans cajole. bold, express notornis until
 the slyly pending
 7852.4500 Supplier#000005864 RUSSIA 8363
 Manufacturer#4 WCNfBPZeSXh3h,c 32-454-883-
 3821 blithely regular deposits
 7850.6600 Supplier#000001518 UNITED KINGDOM
 86501 Manufacturer#1 ONda3YJiHKJOC 33-730-
 383-3892 furiously final accounts wake carefully idle requests. even dolphins
 wake acc
 7843.5200 Supplier#000006683 FRANCE
 11680 Manufacturer#4 2ZJOJGkiv01Y00oCFwUGfviIbhzCdy
 16-464-517-8943 carefully bold accounts doub

(100 rows affected)

Qualification Query 3

```

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 406181.0111 1995-03-05 00:00:00.000 0
3459808 405838.6989 1995-03-04 00:00:00.000 0
492164 390324.0610 1995-02-19 00:00:00.000 0
1188320 384537.9359 1995-03-09 00:00:00.000 0
2435712 378673.0558 1995-02-26 00:00:00.000 0
4878020 378376.7952 1995-03-12 00:00:00.000 0
5521732 375153.9215 1995-03-13 00:00:00.000 0

```

```

2628192 373133.3094 1995-02-22 00:00:00.000 0
993600 371407.4595 1995-03-05 00:00:00.000 0
2300070 367371.1452 1995-03-13 00:00:00.000 0

```

(10 rows affected)

Qualification Query 4

```

SELECT
O_ORDERPRIORITY
,COUNT(*) AS ORDER_COUNT
FROM
ORDERS
WHERE O_ORDERDATE >= '1993-07-01'
AND O_ORDERDATE < DATEADD(mm, 3, cast('1993-07-01' as
smalldatetime))
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 rows affected)

Qualification Query 5

```

SELECT
N_NAME
,SUM(L_EXTENDEDPRICE*(1-L_DISCOUNT)) AS REVENUE
FROM
CUSTOMER
,ORDERS
,LINEITEM
,SUPPLIER
,NATION
,REGION
WHERE
C_CUSTKEY = O_CUSTKEY
AND L_ORDERKEY = O_ORDERKEY
AND L_SUPPKEY = S_SUPPKEY
AND C_NATIONKEY = S_NATIONKEY
AND S_NATIONKEY = N_NATIONKEY
AND N_REGIONKEY = R_REGIONKEY
AND R_NAME = 'ASIA'
AND O_ORDERDATE >= '1994-01-01'
AND O_ORDERDATE < DATEADD(YY, 1, cast('1994-01-01' as
smalldatetime))
GROUP BY
N_NAME
ORDER BY
REVENUE DESC
N_NAME REVENUE
-----
INDONESIA 55502041.1697
VIETNAM 55295086.9967

```

| | |
|-------|---------------|
| CHINA | 53724494.2566 |
| INDIA | 52035512.0002 |
| JAPAN | 45410175.6954 |

(5 rows affected)

Qualification Query 6

```

SELECT
SUM(L_EXTENDEDPRI* L_DISCOUNT) AS REVENUE
FROM
LINEITEM
WHERE
L_SHIPDATE >= '1994-01-01'
AND L_SHIPDATE < dateadd (yy, 1, cast('1994-01-01' as smalldatetime))
AND L_DISCOUNT BETWEEN .06 - 0.01 AND .06 + 0.01
AND L_QUANTITY < 24
REVENUE
-----
123141078.2283

```

(1 row affected)

Qualification Query 7

```

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(Y,Y,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 |
| 54639732.7336 | | |
| FRANCE | GERMANY | 1996 |
| 54633083.3076 | | |
| GERMANY | FRANCE | 1995 |
| 52531746.6697 | | |
| GERMANY | FRANCE | 1996 |
| 52520549.0224 | | |

(4 rows affected)

Qualification Query 8

```

SELECT
O_YEAR
,SUM(CASE WHEN NATION = 'BRAZIL'
THEN VOLUME
ELSE 0
END) / SUM(VOLUME) AS MKT_SHARE
FROM
(
SELECT
DATEPART(Y,Y,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          .0344
1996          .0414

```

(2 rows affected)

Qualification Query 9

```

SELECT
NATION
,O_YEAR
,SUM(AMOUNT) AS SUM_PROFIT
FROM
(
SELECT
N_NAME AS NATION
,DATEPART(Y,Y,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
AND O_ORDERKEY = L_ORDERKEY
AND S_NATIONKEY = N_NATIONKEY
AND P_NAME LIKE '%green%'
)

```

```

AS PROFIT
GROUP BY
NATION
,O_YEAR
ORDER BY
NATION
,O_YEAR DESC

```

| NATION | O_YEAR | SUM_PROFIT |
|-----------|--------|---------------|
| ALGERIA | 1998 | 31342867.2345 |
| ALGERIA | 1997 | 57138193.0233 |
| ALGERIA | 1996 | 56140140.1330 |
| ALGERIA | 1995 | 53051469.6534 |
| ALGERIA | 1994 | 53867582.1286 |
| ALGERIA | 1993 | 54942718.1324 |
| ALGERIA | 1992 | 54628034.7127 |
| ARGENTINA | 1998 | 30211185.7081 |
| ARGENTINA | 1997 | 50805741.7523 |
| ARGENTINA | 1996 | 51923746.5755 |
| ARGENTINA | 1995 | 49298625.7666 |

..... Additional rows deleted

| | | |
|---------|------|---------------|
| VIETNAM | 1996 | 50488161.4100 |
| VIETNAM | 1995 | 49658284.6125 |
| VIETNAM | 1994 | 50596057.2607 |
| VIETNAM | 1993 | 50953919.1519 |
| VIETNAM | 1992 | 49613838.3151 |

(175 rows affected)

Qualification Query 10

```

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, cast('1993-10-01' as
smalldatetime))

```

```

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 734235.2455 632.8700
JAPAN Eioyzzf4pp 22-895-641-3466
requests sleep blithely about the furiously i
143347 Customer#000143347 721002.6948 2557.4700
EGYPT IaReFYv,Kw4 14-742-935-3718
fluffily bold excuses haggle finally after the u
60838 Customer#000060838 679127.3077 2454.7700
BRAZIL 64EaJ5vMAHWJIBOxJklpNc2RjWE 12-913-
494-9813 furiously even pinto beans integrate under the ruthless foxes;
ironic, even dolphins across the slyl
101998 Customer#000101998 637029.5667 3790.8900
UNITED KINGDOM 01c9CILnNtfOQYmZj 33-593-
865-6378 accounts doze blithely! enticing, final deposits sleep blithely
special accounts. slyly express accounts pla
125341 Customer#000125341 633508.0860 4983.5100
GERMANY S29ODD6bceU8QSuueJznkNaK 17-582-
695-5962 quickly express requests wake quickly blithely
25501 Customer#000025501 620269.7849 7725.0400
ETHIOPIA W556MXuoiaYCCZamJL,Rn0B4ACUGdkQ8DZ
15-874-808-6793 quickly special requests sleep evenly among the special
deposits. special deposi
115831 Customer#000115831 596423.8672 5098.1000
FRANCE rFeBbEEyk dl ne7zV5fDrmiq1oK09wV7pxqCglc 16-
715-386-3788 carefully bold excuses sleep alongside of the thinly idle
84223 Customer#000084223 594998.0239 528.6500
UNITED KINGDOM nAVZCs6BaWap rrM27N 2qBnzc5WBauxbA
33-442-824-8191 pending, final ideas haggle final requests. unusual, regular
asymptotes affix according to the even foxes.
54289 Customer#000054289 585603.3918 5583.0200
IRAN vXCxoCsU0Bad5JQI ,oobkZ 20-834-292-
4707 express requests sublute blithely regular requests. regular, even ideas
solve.
39922 Customer#000039922 584878.1134 7321.1100
GERMANY Zgy4s50l2GKN4pLDPBU8m342gIw6R 17-
147-757-8036 even pinto beans haggle. slyly bold accounts inte
6226 Customer#000006226 576783.7606 2230.0900
UNITED KINGDOM 8gPu8,NPGkfyQQ0hcIYUGPIBWc,ybP5g,
33-657-701-3391 quickly final requests against the regular instructions wake
blithely final instructions. pa
922 Customer#000000922 576767.5333 3869.2500
GERMANY Az9RFaut7NkPnc5zSD2PwHgVvr4jRzq 17-
945-916-9648 boldly final requests cajole blith
147946 Customer#000147946 576455.1320 2030.1300
ALGERIA iANyZHjqhy7Ajah0pTrYyhJ 10-886-956-
3143 furiously even accounts are blithely above the furiousl
115640 Customer#000115640 569341.1933 6436.1000
ARGENTINA Vtgfia9ql 7EpHgecU1X 11-411-543-
4901 final instructions are slyly according to the

```

```

73606 Customer#000073606      568656.8578      1785.6700
JAPAN      xuR0TRo5yChDfOCrjkd2ol      22-437-653-
6966 furiously bold orbits about the furiously busy requests wake across the
furiously quiet theodolites. d
110246 Customer#000110246      566842.9815      7763.3500
VIETNAM      7KzflgX MDOq7sOkI      31-943-426-
9837 dolphins sleep blithely among the slyly final
142549 Customer#000142549      563537.2368      5085.9900
INDONESIA      ChqEoK43OysjdHbtKCp6dKqjNyyvi9      19-
955-562-2398 regular, unusual dependencies boost slyly; ironic attainments
nag fluffily into the unusual packages?
146149 Customer#000146149      557254.9865      1791.5500
ROMANIA      s87fvzFQpU      29-744-164-6487
silent, unusual requests detect quickly slyly regul
52528 Customer#000052528      556397.3509      551.7900
ARGENTINA      NFztyTOR10UOJ      11-208-192-
3205 unusual requests detect. slyly dogged theodolites use slyly. deposit
23431 Customer#000023431      554269.5360      3381.8600
ROMANIA      HgiV0phqhala9aydNoIlb      29-915-458-
2654 instructions nag quickly. furiously bold accounts cajol

```

(20 rows affected)

Qualification Query 11

```

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      17538456.8600
166726      16503353.9200
191287      16474801.9700
161758      16101755.5400
34452      15983844.7200
139035      15907078.3400
9403      15451755.6200
154358      15212937.8800
38823      15064802.8600
85606      15053957.1500
33354      14408297.4000
..... Additional rows deleted .....
128820      7892882.7200

```

```

25891      7890511.2000
122819      7888881.0200
154731      7888301.3300
101674      7879324.6000
51968      7879102.2100
72073      7877736.1100
5182      7874521.7300

```

(1048 rows affected)

Qualification Query 12

```

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, cast('1994-01-01' as
smalldatetime))
GROUP BY
L_SHIPMODE
ORDER BY
L_SHIPMODE
L_SHIPMODE HIGH_LINE_COUNT LOW_LINE_COUNT
-----
MAIL      6202      9324
SHIP      6200      9262

```

(2 rows affected)

Qualification Query 13

```

SELECT
C_COUNT
,COUNT(*) AS CUSTDIST
FROM
(
SELECT
C_CUSTKEY
,COUNT(O_ORDERKEY)
FROM
CUSTOMER LEFT OUTER JOIN ORDERS ON
C_CUSTKEY = O_CUSTKEY
AND O_COMMENT NOT LIKE '%special%requests%'
GROUP BY
C_CUSTKEY
) AS C_ORDERS (C_CUSTKEY, C_COUNT)
GROUP BY
C_COUNT
ORDER BY

```

CUSTDIST DESC
 .C_COUNT DESC
 C_COUNT CUSTDIST

```
-----
  0  50004
  9  6641
 10  6566
 11  6058
  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 rows affected)

Qualification Query 14

```
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, cast('1995-09-01' as
smalldatetime))
PROMO_REVENUE
```

```
-----
16.380778626395540
```

(1 row affected)

Qualification Query 15

if exists (select * from sysindexes where name = 'REVENUE0')
 drop view REVENUE0

```
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, cast('1996-01-01' as
smalldatetime))
GROUP BY
L_SUPPKEY
```

```
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 1772627.2087
```

(1 row affected)

Qualification Query 16

```
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 |

..... Additional rows deleted

| | | | |
|----------|------------------------|----|---|
| Brand#35 | MEDIUM ANODIZED TIN | 19 | 3 |
| Brand#51 | SMALL PLATED BRASS | 23 | 3 |
| 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 rows affected)

Qualification Query 17

```
SELECT
SUM(L_EXTENDEDPRISE)/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
```

348406.0542857

(1 row affected)

Qualification Query 18

```
SELECT TOP 100
C_NAME
```

```
,C_CUSTKEY
,O_ORDERKEY
,O_ORDERDATE
,O_TOTALPRICE
,SUM(L_QUANTITY)
FROM
CUSTOMER
,ORDERS
,LINEITEM
WHERE
O_ORDERKEY IN
(
SELECT
L_ORDERKEY
FROM
LINEITEM
GROUP BY
L_ORDERKEY HAVING
SUM(L_QUANTITY) > 300
)
```

```
AND C_CUSTKEY = O_CUSTKEY
AND O_ORDERKEY = L_ORDERKEY
GROUP BY
C_NAME
,C_CUSTKEY
,O_ORDERKEY
,O_ORDERDATE
,O_TOTALPRICE
ORDER BY
O_TOTALPRICE DESC
,O_ORDERDATE
C_NAME C_CUSTKEY O_ORDERKEY O_ORDERDATE
O_TOTALPRICE
```

| | | | |
|--------------------|----------|-------------|-------------------------|
| Customer#000128120 | 128120 | 4722021 | 1994-04-07 00:00:00.000 |
| 544089.0900 | 323.0000 | | |
| Customer#000144617 | 144617 | 3043270 | 1997-02-12 00:00:00.000 |
| 530604.4400 | 317.0000 | | |
| Customer#000013940 | 13940 | 2232932 | 1997-04-13 00:00:00.000 |
| 522720.6100 | 304.0000 | | |
| Customer#000066790 | 66790 | 2199712 | 1996-09-30 00:00:00.000 |
| 515531.8200 | 327.0000 | | |
| Customer#000046435 | 46435 | 4745607 | 1997-07-03 00:00:00.000 |
| 508047.9900 | 309.0000 | | |
| Customer#000015272 | 15272 | 3883783 | 1993-07-28 00:00:00.000 |
| 500241.3300 | 302.0000 | 418161.4900 | 305.0000 |

.... Additional rows deleted

| | | | |
|--------------------|----------|---------|-------------------------|
| Customer#000069904 | 69904 | 1742403 | 1996-10-19 00:00:00.000 |
| 408513.0000 | 305.0000 | | |
| Customer#000017746 | 17746 | 6882 | 1997-04-09 00:00:00.000 |
| 408446.9300 | 303.0000 | | |
| Customer#000013072 | 13072 | 1481925 | 1998-03-15 00:00:00.000 |
| 399195.4700 | 301.0000 | | |
| Customer#000082441 | 82441 | 857959 | 1994-02-07 00:00:00.000 |
| 382579.7400 | 305.0000 | | |
| Customer#000088703 | 88703 | 2995076 | 1994-01-30 00:00:00.000 |
| 363812.1200 | 302.0000 | | |

(57 rows affected)

Qualification Query 19

```
SELECT
SUM(L_EXTENDEDPRISE* (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
-----
3083843.0578

(1 row affected)

```

Qualification Query 20

```

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,cast('1994-01-01' as
smalldatetime))
)
)
AND S_NATIONKEY = N_NATIONKEY
AND N_NAME = 'CANADA'
ORDER BY
S_NAME
S_NAME S_ADDRESS
-----
Supplier#000000020 iybAE,RmTymrZVYaFZva2SHj
Supplier#000000091
YV45D7TkfdQanOOZ7q9QxkyGUapU1oOWU6q3
Supplier#000000197 YC2Acon6kjY3zj3Fbxs2k4Vdf7X0cd2F
Supplier#000000226 83qOdU2EYRdPQAQhEtm GRZEd
Supplier#000000285 Br7e1nnt1yxrw6ImgpJ7YdhFDjuBf
Supplier#000000378 FfbhyCxWvcPrO8ltp9
Supplier#000000402 i9Sw4DoyMhzhKXCH9By,AYSgmD
Supplier#000000530 0qwCMwobKY OcmLyfRXlagA8ukENJv,
Supplier#000000688 D fw5ocppmZpYBBIPI718hCihLDZ5KhKX
Supplier#000000710 f19YPvOyb QoYwjKC,oPycpGfieBacwKJo
Supplier#000000736 l6i2nMwVuovfKnuVgaSGK2rDy65DIAFLegil7
Supplier#000000761 zLSLeLQUj2XrvTTFnv7WAcyZGvvMTx882d4
Supplier#000000884 bmhEShejaS

.... Additional rows deleted ...

Supplier#000009812 APFRMy3lCbGfGa53n5t9DxzFPQPgnjrGt32
Supplier#000009862 rJzweWeN58
Supplier#000009868 ROjGgx5gvtkmUUoey7v
Supplier#000009869
ucLqxrzrBTRMewGSM29t0rNTM30g1Tu3Xgg3mKag
Supplier#000009899 7XdPAHrzr1t,UQFZE
Supplier#000009974 7wJ,J5DKcxSU4Kp1cQLpbcAvB5AsvKT

(204 rows affected)

```

Qualification Query 21

```

SELECT TOP 100
S_NAME
,COUNT(*) AS NUMWAIT
FROM
SUPPLIER
,LINEITEM L1
,ORDERS
,NATION
WHERE
S_SUPPKEY = L1.L_SUPPKEY
AND O_ORDERKEY = L1.L_ORDERKEY
AND O_ORDERSTATUS = 'F'
AND L1.L_RECEIPTDATE > L1.L_COMMITDATE
AND EXISTS
(
SELECT
*
FROM
LINEITEM L2
WHERE
L2.L_ORDERKEY = L1.L_ORDERKEY
AND L2.L_SUPPKEY <> L1.L_SUPPKEY
)

```

```

AND NOT EXISTS
(
SELECT
*
FROM
LINEITEM L3
WHERE
L3.L_ORDERKEY = L1.L_ORDERKEY
AND L3.L_SUPPKEY <> L1.L_SUPPKEY
AND L3.L_RECEIPTDATE > L3.L_COMMITDATE
)
AND S_NATIONKEY = N_NATIONKEY
AND N_NAME = 'SAUDI ARABIA'
GROUP BY
S_NAME
ORDER BY
NUMWAIT DESC
,S_NAME
S_NAME          NUMWAIT
-----
Supplier#000002829      20
Supplier#000005808      18
Supplier#000000262      17
Supplier#000000496      17
Supplier#0000002160     17
Supplier#000002301      17
Supplier#000002540      17
Supplier#000003063      17
Supplier#000005178      17

```

... Additional rows deleted

```

Supplier#000000673      12
Supplier#000000762      12
Supplier#000000811      12
Supplier#000000821      12
Supplier#000001337      12
Supplier#000001916      12
Supplier#000001925      12
Supplier#000002039      12
Supplier#000002357      12
Supplier#000002483      12

```

(100 rows affected)

Qualification Query 22

```

SELECT
CNTRYCODE
,COUNT(*) AS NUMCUST
,SUM(C_ACCTBAL) AS TOTACCTBAL
FROM
(
SELECT
SUBSTRING(C_PHONE,1,2) AS CNTRYCODE
,C_ACCTBAL
FROM
CUSTOMER
WHERE
SUBSTRING(C_PHONE,1,2) IN
('13', '31', '23', '29', '30', '18', '17')
AND C_ACCTBAL > (
SELECT
AVG(C_ACCTBAL)
FROM
CUSTOMER
WHERE
C_ACCTBAL > 0.00

```

```

AND SUBSTRING(C_PHONE,1,2) IN
('13', '31', '23', '29', '30', '18', '17')
)
AND NOT EXISTS (
SELECT
*
FROM
ORDERS
WHERE
O_CUSTKEY = C_CUSTKEY
)
) AS CUSTSALE
GROUP BY
CNTRYCODE
ORDER BY
CNTRYCODE
CNTRYCODE NUMCUST  TOTACCTBAL
-----
13          888      6737713.9900
17          861      6460573.7200
18          964      7236687.4000
23          892      6701457.9500
29          948      7158866.6300
30          909      6808436.1300
31          922      6806670.1800

```

(7 rows affected)

Appendix D: Seeds and Query Substitution Parameters

Stream0 Seed : 703235958

| | | | | | | |
|----|------------|--------------|------------|------------|--------|----|
| 14 | 1993-10-01 | | | | | |
| 2 | 32 | NICKEL | ASIA | | | |
| 9 | brown | | | | | |
| 20 | cornsilk | 1994-01-01 | | MOZAMBIQUE | | |
| 6 | 1996-01-01 | | 0.06 | 25 | | |
| 17 | Brand#23 | WRAP PKG | | | | |
| 18 | 313 | | | | | |
| 8 | CHINA | ASIA | STANDARD | POLISHED | NICKEL | |
| 21 | GERMANY | | | | | |
| 13 | pending | packages | | | | |
| 3 | MACHINERY | | 1995-03-19 | | | |
| 22 | 26 | 15 | 34 | 27 | 28 | 10 |
| | 21 | | | | | |
| 16 | Brand#12 | MEDIUM | BRUSHED | | 7 | 10 |
| | 42 | 26 | 28 | 29 | 36 | 16 |
| 4 | 1995-12-01 | | | | | |
| 11 | ALGERIA | 0.0000010000 | | | | |
| 15 | 1997-06-01 | | | | | |
| 1 | 87 | | | | | |
| 10 | 1994-10-01 | | | | | |
| 19 | Brand#51 | Brand#24 | Brand#45 | 8 | 10 | 29 |
| 5 | AFRICA | 1996-01-01 | | | | |
| 7 | JAPAN | CHINA | | | | |
| 12 | AIR | REG AIR | 1997-01-01 | | | |

Stream1 Seed : 703235959

| | | | | | | |
|-------|---------------|--------------|------------|-----------|----|----|
| 14 | 1994-01-01 | | | | | |
| 2 | 19 | TIN | AFRICA | | | |
| 9 | beige | | | | | |
| 20 | navy | 1997-01-01 | | FRANCE | | |
| 6 | 1996-01-01 | | 0.03 | 24 | | |
| 17 | Brand#25 | SM CASE | | | | |
| 18 | 315 | | | | | |
| 8 | IRAN | MIDDLE EAST | STANDARD | BURNISHED | | |
| BRASS | | | | | | |
| 21 | UNITED STATES | | | | | |
| 13 | pending | packages | | | | |
| 3 | BUILDING | | 1995-03-04 | | | |
| 22 | 22 | 26 | 31 | 17 | 15 | 10 |
| | 11 | | | | | |
| 16 | Brand#42 | PROMO | ANODIZED30 | | 31 | 50 |
| | 14 | 19 | 37 | 11 | 8 | |
| 4 | 1993-09-01 | | | | | |
| 11 | JORDAN | 0.0000010000 | | | | |
| 15 | 1995-03-01 | | | | | |
| 1 | 95 | | | | | |
| 10 | 1993-07-01 | | | | | |
| 19 | Brand#14 | Brand#52 | Brand#44 | 3 | 11 | 26 |
| 5 | AMERICA | 1996-01-01 | | | | |
| 7 | EGYPT | IRAN | | | | |
| 12 | REG AIR | RAIL | 1993-01-01 | | | |

Stream2 Seed : 703235960

| | | | | | | |
|----|------------|------------|--------------|---------|---------|-------|
| 14 | 1994-04-01 | | | | | |
| 2 | 7 | COPPER | EUROPE | | | |
| 9 | white | | | | | |
| 20 | azure | 1996-01-01 | | VIETNAM | | |
| 6 | 1997-01-01 | | 0.09 | 24 | | |
| 17 | Brand#22 | SM BAG | | | | |
| 18 | 312 | | | | | |
| 8 | BRAZIL | AMERICA | | PROMO | BRUSHED | BRASS |
| 21 | MOZAMBIQUE | | | | | |
| 13 | pending | packages | | | | |
| 3 | MACHINERY | | 1995-03-21 | | | |
| 22 | 31 | 16 | 23 | 19 | 15 | 26 |
| | 12 | | | | | |
| 16 | Brand#32 | SMALL | PLATED | 4 | 18 | 34 |
| | 10 | 30 | 17 | 27 | 13 | |
| 4 | 1996-04-01 | | | | | |
| 11 | ARGENTINA | | 0.0000010000 | | | |
| 15 | 1997-10-01 | | | | | |
| 1 | 103 | | | | | |
| 10 | 1994-05-01 | | | | | |
| 19 | Brand#11 | Brand#45 | Brand#33 | 8 | 12 | 22 |
| 5 | ASIA | 1997-01-01 | | | | |
| 7 | VIETNAM | BRAZIL | | | | |
| 12 | SHIP | RAIL | 1994-01-01 | | | |

Stream3 Seed : 703235961

| | | | | | | |
|----|-------------|--------------|------------|-------|--------|-------|
| 14 | 1994-07-01 | | | | | |
| 2 | 45 | BRASS | AFRICA | | | |
| 9 | tan | | | | | |
| 20 | lavender | 1994-01-01 | | IRAQ | | |
| 6 | 1997-01-01 | | 0.06 | 25 | | |
| 17 | Brand#24 | SM PKG | | | | |
| 18 | 314 | | | | | |
| 8 | ROMANIA | | EUROPE | PROMO | PLATED | BRASS |
| 21 | INDONESIA | | | | | |
| 13 | pending | requests | | | | |
| 3 | BUILDING | | 1995-03-06 | | | |
| 22 | 10 | 14 | 28 | 17 | 27 | 26 |
| | 24 | | | | | |
| 16 | Brand#12 | LARGE | POLISHED | 7 | 35 | 12 |
| | 2 | 41 | 40 | 28 | 17 | |
| 4 | 1994-01-01 | | | | | |
| 11 | KENYA | 0.0000010000 | | | | |
| 15 | 1995-07-01 | | | | | |
| 1 | 112 | | | | | |
| 10 | 1993-02-01 | | | | | |
| 19 | Brand#13 | Brand#23 | Brand#33 | 3 | 13 | 29 |
| 5 | MIDDLE EAST | 1997-01-01 | | | | |
| 7 | JORDAN | ROMANIA | | | | |
| 12 | FOB | RAIL | 1994-01-01 | | | |

Stream4 Seed : 703235962

| | | | | | | |
|----|------------------|-------------------|----------------------|----|----|----|
| 14 | 1994-11-01 | | | | | |
| 2 | 33 | NICKEL | EUROPE | | | |
| 9 | sky | | | | | |
| 20 | slate | 1993-01-01 | ALGERIA | | | |
| 6 | 1997-01-01 | 0.03 | 24 | | | |
| 17 | Brand#21 | LG CASE | | | | |
| 18 | 312 | | | | | |
| 8 | IRAQ | MIDDLE EAST | PROMO ANODIZED BRASS | | | |
| 21 | ARGENTINA | | | | | |
| 13 | pending requests | | | | | |
| 3 | HOUSEHOLD | 1995-03-23 | | | | |
| 22 | 10 | 21 | 16 | 13 | 19 | 22 |
| | 32 | | | | | |
| 16 | Brand#42 | STANDARD ANODIZED | 40 | 4 | | |
| | 3 | 50 | 23 | 13 | 14 | 9 |
| 4 | 1996-07-01 | | | | | |
| 11 | BRAZIL | 0.0000010000 | | | | |
| 15 | 1993-03-01 | | | | | |
| 1 | 120 | | | | | |
| 10 | 1993-11-01 | | | | | |
| 19 | Brand#25 | Brand#11 | Brand#32 | 9 | 14 | 25 |
| 5 | AFRICA | 1997-01-01 | | | | |
| 7 | ETHIOPIA | IRAQ | | | | |
| 12 | TRUCK | RAIL | 1994-01-01 | | | |

Stream5 Seed : 703235963

| | | | | | | |
|----|------------------|------------------|------------------|----|----|----|
| 14 | 1995-02-01 | | | | | |
| 2 | 21 | TIN | AMERICA | | | |
| 9 | royal | | | | | |
| 20 | firebrick | 1996-01-01 | MOROCCO | | | |
| 6 | 1997-01-01 | 0.09 | 24 | | | |
| 17 | Brand#22 | LG BAG | | | | |
| 18 | 313 | | | | | |
| 8 | CANADA | AMERICA | ECONOMY POLISHED | | | |
| | BRASS | | | | | |
| 21 | CHINA | | | | | |
| 13 | pending requests | | | | | |
| 3 | BUILDING | 1995-03-08 | | | | |
| 22 | 21 | 19 | 30 | 18 | 26 | 22 |
| | 34 | | | | | |
| 16 | Brand#32 | MEDIUM BURNISHED | 50 | 15 | | |
| | 37 | 32 | 30 | 39 | 17 | 26 |
| 4 | 1994-04-01 | | | | | |
| 11 | MOROCCO | 0.0000010000 | | | | |
| 15 | 1995-10-01 | | | | | |
| 1 | 67 | | | | | |
| 10 | 1994-08-01 | | | | | |
| 19 | Brand#22 | Brand#44 | Brand#21 | 4 | 15 | 21 |
| 5 | AMERICA | 1997-01-01 | | | | |
| 7 | RUSSIA | CANADA | | | | |
| 12 | RAIL | TRUCK | 1995-01-01 | | | |

Appendix E: Refresh Function Source Code

E.1 CreateRF1Proc.sql

```
-- CreateRF1Proc.sql

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
@flatfiledir CHAR(40), @updateset INTEGER, @segment INTEGER,
@scalefactor INTEGER
AS
BEGIN

DECLARE @min_orderkey INTEGER
DECLARE @max_orderkey INTEGER
DECLARE @range INTEGER
DECLARE @max_set INTEGER
DECLARE @SQLstring NVARCHAR(255)
DECLARE @insert_sets INTEGER

set @insert_sets= @scalefactor

--
-- Create the insert tables
--
create table #NEWORDERS (
    O_ORDERKEY int not null,
    O_CUSTKEY int not null,
    O_ORDERSTATUS char(1) not null,
    O_TOTALPRICE money not null,
    O_ORDERDATE smalldatetime not null,
    O_ORDERPRIORITY char(15) not null,
    O_CLERK char(15) not null,
    O_SHIPPRIORITY int not null,
    O_COMMENT varchar(79) not null
)
create table #NEWLINEITEM(
    L_ORDERKEY int not null,
    L_PARTKEY int not null,
    L_SUPPKEY int not null,
    L_LINENUMBER int not null,
    L_QUANTITY money not null,
    L_EXTENDEDPRI money not null,
    L_DISCOUNT money not null,
    L_TAX money not null,
    L_RETURNFLAG char(1) not null,
    L_LINESTATUS char(1) not null,
    L_SHIPDATE smalldatetime not null,
    L_COMMITDATE smalldatetime not null,
    L_RECEIPTDATE smalldatetime not null,
    L_SHIPINSTRUCT char(25) not null,
    L_SHIPMODE char(10) not null,
    L_COMMENT varchar(44) not null
)

create unique clustered index NEWORDERS on #NEWORDERS
(O_ORDERKEY)

create clustered index NEWLINEITEM on #NEWLINEITEM
(L_ORDERKEY)

--
-- Generate an SQL statement inserting the current updateset value into
-- the command. Next execute the statement to bulk load the new lineitem
-- insert values.
--
SET @SQLstring="bulk insert #NEWLINEITEM from "
+ RTRIM(convert(CHAR,@flatfiledir)) + "\Lineitem.tbl.u"
+ RTRIM(Convert(char,@updateset)) + "."
+ RTRIM(convert(char,@segment))
+ " with
(FieldTerminator='|',RowTerminator='\n',order(L_ORDERKEY),codepage='
RAW',TABLOCK)"
EXEC sp_executesql @SQLstring

--
-- Generate an SQL statement inserting the current updateset value into
-- the command. Next execute the statement to bulk load the new order
-- insert values.
--
SET @SQLstring="bulk insert #NEWORDERS from "
+ RTRIM(convert(CHAR,@flatfiledir)) + "\Orders.tbl.u"
+ RTRIM(Convert(char,@updateset)) + "."
+ RTRIM(convert(char,@segment))
+ " with
(FieldTerminator='|',RowTerminator='\n',order(O_ORDERKEY),CODEPA
GE='RAW',TABLOCK)"

EXEC sp_executesql @SQLstring

--
-- Obtain minimum and maximum order key and compute the range of each
-- set to be inserted into the ORDERS and LINEITEM tables.
--
SELECT
@min_orderkey=MIN(O_ORDERKEY),@max_orderkey=MAX(O_ORDE
RKEY) FROM #NEWORDERS
SET @range = (@max_orderkey - @min_orderkey) / @insert_sets

--
-- This handles the case when the max-min/insert_sets is less than 1
--
IF @range = 0
-- BEGIN
SET @range = (@max_orderkey - @min_orderkey) / 1
-- END

--
-- Loop through the order keys only inserting a sets into the
-- ORDERS and LINTeITEM tables
--
SET @max_set = @min_orderkey - 1
WHILE @max_set < @max_orderkey
BEGIN
--
-- Set the range from min_orderkey to max_set
--
SET @max_set = @min_orderkey + @range
if @max_set > @max_orderkey
SET @max_set = @max_orderkey + 1

--
-- Insert into ORDERS and LINEITEM tables
--
```

```

INSERT_TRANS:
begin transaction
insert into ORDERS SELECT * FROM #NEWORDERS
WHERE O_ORDERKEY >= @min_orderkey AND
O_ORDERKEY < @max_set
insert into LINEITEM SELECT * FROM #NEWLINITEM
WHERE L_ORDERKEY >= @min_orderkey AND L_ORDERKEY
< @max_set
commit transaction

--
-- If deadlock victim abort then restart the transaction
--
if (@@error = 1205)
BEGIN
print 'Insert deadlock - restarting RF1 transaction'
rollback transaction
GOTO INSERT_TRANS
END

--
-- Move min_orderkey to start of next insert set
--
SET @min_orderkey = @max_set
END

END

GO

```

E.2 CreateRF2Proc.sql

```

-- CreateRF2Proc.sql

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
@flatfiledir CHAR(40), @updateset INTEGER, @segment INTEGER,
@scalefactor INTEGER
AS
BEGIN

DECLARE @min_orderkey INTEGER
DECLARE @max_orderkey INTEGER
DECLARE @range INTEGER
DECLARE @max_set INTEGER
DECLARE @SQLstring NVARCHAR(255)
DECLARE @delete_sets INTEGER

set @delete_sets=@scalefactor

create table #OLDORDERS (O_ORDERKEY int)
create unique clustered index OLDORDERS
on #OLDORDERS (O_ORDERKEY)
with sorted_data

--
-- Generate an SQL statement inserting the current updateset value into
-- the command. Next execute the statement to bulk load the old order
-- delete values
--
SET @SQLstring="bulk insert #OLDORDERS from ""

```

```

+ RTRIM(convert(CHAR,@flatfiledir)) + "\Delete.u"
+ RTRIM(Convert(char,@updateset)) + "."
+ RTRIM(convert(char,@segment))
+ "" with (order(O_ORDERKEY),codepage='RAW',TABLOCK)"
EXEC sp_executesql @SQLstring

--
-- Obtain minimum and maximum order key and compute the
-- range of each delete set
--
SELECT
@min_orderkey=MIN(O_ORDERKEY),@max_orderkey=MAX(O_ORDE
RKEY) FROM #OLDORDERS
SET @range = (@max_orderkey - @min_orderkey) / @delete_sets

--
-- This handles the case when the max-min/delete_sets is less than 1
--
IF @range = 0
-- BEGIN
SET @range = (@max_orderkey - @min_orderkey) / 1
-- END

--
-- Loop through the order keys only deleting sets from orders
-- and lineitem tables
--
SET @max_set = @min_orderkey - 1
WHILE @max_set < @max_orderkey
BEGIN
--
-- Set the range from min_orderkey to max_set
--
SET @max_set = @min_orderkey + @range
if @max_set > @max_orderkey
SET @max_set = @max_orderkey + 1

--
-- Delete from ORDERS and LINEITEM table
--
DELETE_TRANS:
begin transaction
delete from ORDERS where O_ORDERKEY in
(select * from #OLDORDERS WHERE O_ORDERKEY >=
@min_orderkey AND O_ORDERKEY < @max_set)
delete from LINEITEM where L_ORDERKEY in
(select * from #OLDORDERS WHERE O_ORDERKEY >=
@min_orderkey AND O_ORDERKEY < @max_set)

commit transaction

--
-- If deadlock victim abort then restart the transaction
--
if (@@error = 1205)
BEGIN
print 'Delete deadlock - restarting RF2 transaction'
rollback transaction
GOTO DELETE_TRANS
END

--
-- Move min_orderkey to start of next delete set
--
SET @min_orderkey = @max_set

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=C:
set HOMEDIR=(HP_TPCH_KIT)Setup
set OUTPUTDRIVE=c:
set OUTPUTDIR=(HP_TPCH_KIT)Output
set SCALEFACTOR=100
set DBGEN_SEGMENTS=32
set DBGEN_PARALLELISM=8
set FLATFILEDRIVE=z:
set FLATFILEDIR=Flatfiles\
set FLATFILESUBDIR=
set RF1_PARALLELISM=16
set RF2_PARALLELISM=16
set UPDATEDRIVE=z:
set UPDATEDIR=(UF_Flatfiles
set UPDATE_SETS=18

set DoDBGEN=FALSE
set DoDBCREATE=TRUE
set DoBULKINSERT=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%%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 DBGEN of FlatFiles
for /l %%i in (1,1,%DBGEN_SEGMENTS%) do copy dists.dss
%FLATFILEDRIVE%\%FLATFILEDIR%\%i%\FLATFILESUBDIR%
Copy dists.dss %UPDATEDRIVE%%UPDATEDIR%
for /l %%i in (1,%DBGEN_PARALLELISM%,%DBGEN_SEGMENTS%)
do call :DBGEN_ITERATE %%i

echo Starting DBGEN 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 DBGening sets %FIRST% through %LAST%
for /l %%i in (%FIRST%,1,%LAST%) do start cmd /C Setup DBGEN %%i
semaphore -wait DBGEN -count %DBGEN_PARALLELISM%
goto :EOF

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

```

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

```

```

:BULKINSERT

```

```

if NOT '%DoBULKINSERT%' == 'TRUE' goto :CLEANUP
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

```

```

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),TIMESTAMP 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 :BULKINSERTi %%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% -i%DB%\CreateNATIONIndexes.sql -b
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% -i%DB%\CreateREGIONIndexes.sql -b
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 :CLEANUP

```

```

:BULKINSERTi

```

```

echo Starting bulk inserts for %1
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values (%1 bulk
insert begin',getdate())" -1 300
for /1 %%j in (1,1,%DBGEN_PARALLELISM%) do start cmd /C Setup
BULKINSERTn %1 %%j
semaphore -wait %1 -count %DBGEN_PARALLELISM%
echo Starting create indexes for %1
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values (%1
create index begin',getdate())" -b -1 300
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -i %DB%\Create%1Indexes.sql -o
%OUTPUTPATH%\Create%1Indexes.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -Q"insert into LOADTIMES values (%1
end',getdate())" -b -1 300
if ERRORLEVEL 1 goto :ERROR_EXIT
goto :EOF

```

```

:BULKINSERTn

```

```

for /1 %%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

```

```

: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 -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% -d%DB% -Q"sp_dboption 'tpch100g','torn page
detection',FALSE" -o %OUTPUTPATH%\TornPage.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -d%DB% -i CreateRF1Proc.sql -o
%OUTPUTPATH%\CreateRF1Proc.out -b
if ERRORLEVEL 1 goto :ERROR_EXIT
osql -Usa -P%PW% -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%, '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=C:
set HOMEDIR=\HP_TPC_H_KIT\Run
set OUTPUTDRIVE=C:
set OUTPUTDIR=\HP_TPC_H_KIT\Output
set UPDATEDRIVE=Z:
set UPDATEDIR=\UF_Flatfiles
set UPDATESSET=7
set UPDATESEGMENTS=16
set SEED= 703235958
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' == 'RF2' goto RF2
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
%HOMEDRIVE%%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
osql -E -d%DB% -Q"if exists (select * from sysindexes where name =
'TIMES') drop table TIMES"

```

```
osql -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
osql -E -i ..\Setup\%DB%\Restore.sql -b
osql -E -d%DB% -i ..\Setup\CreateRF1Proc.sql
osql -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
osql -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%
osql -E -d%DB% -Q"insert into TIMES values ('RF1',0,getdate())"
for /l %%i in (1,1,%UPDATESEGMENTS%) do start /abovenormal cmd /C
Run RF1 %UPDATE_SEGMENT% %%i
semaphore -wait RF1 -count %UPDATESEGMENTS%
```

```
rem
rem Execute the PowerRun Queries
rem
```

```
:STREAM0
if NOT '%DoPOWERStream0%' == 'TRUE' goto :STREAM0_DONE
echo Running Stream0
osql -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
osql -E -d%DB% -Q"insert into TIMES values ('RF2',0,getdate())"
for /l %%i in (1,1,%UPDATESEGMENTS%) do start /abovenormal cmd /C
Run RF2 %UPDATE_SEGMENT% %%i
semaphore -wait RF2 -count %UPDATESEGMENTS%
```

```
:POWERDONE
osql -E -d%DB% -Q"insert into TIMES values ('QXX',0,getdate())" -I300
```

```
rem
rem Execute the THROUGHPUT Run
rem
```

```
:THROUGHPUT
if NOT '%DoTHROUGHPUT%' == 'TRUE' goto :DONE
echo Running the Throughput Streams
```

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

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

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

```
:THROUGHPUT_REFRESH
if %1 neq 1 osql -E -d%DB% -Q"insert into TIMES values
('RF1',%1,getdate())"
set /a UPDATE_SEGMENT=%1+%UPDATESET%
for /l %%i in (1,1,%UPDATESEGMENTS%) do start /abovenormal cmd /C
Run RF1 %UPDATE_SEGMENT% %%i
semaphore -wait RF1 -count %UPDATESEGMENTS%
osql -E -d%DB% -Q"insert into TIMES values ('RF2',%1,getdate())"
for /l %%i in (1,1,%UPDATESEGMENTS%) do start /abovenormal cmd /C
Run RF2 %UPDATE_SEGMENT% %%i
semaphore -wait RF2 -count %UPDATESEGMENTS%
osql -E -d%DB% -Q"insert into TIMES values ('RFX',%1,getdate())"
goto :EOF
```

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

```
:DONE
osql -E -d%DB% -iReport.sql -o%OUTPUTPATH%\Report.out -w120
bcp %DB%..TIMES out %OUTPUTPATH%\TIMES.bcp -Usa -P -n
rem ----- Get SQL Configuration
osql -E -Q"sp_configure 'show advanced',1"
osql -E -Q"reconfigure with override"
osql -E -n -s, -w300 -Q"sp_configure" -o%OUTPUTPATH%\configure.out
rem ----- Get SQL Version
```

```

osql -E -n -w300 -e -Q"select @@version" -
o%OUTPUTPATH%\sqlversion.out
osql -E -n -w300 -e -Q"sp_helpdb %DB%" -o%OUTPUTPATH%\db.out
osql -E -n -w300 -e -Q"sp_dboption %DB%" -
o%OUTPUTPATH%\dboption.out
osql -E -n -w300 -e -Q"sp_helpsort" -o%OUTPUTPATH%\sort.out
osql -E -n -w300 -e -d%DB% -ilocking.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
osql -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\I/O 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 Executing RF1s
rem called from RF1 and THROUGHPUT_RF1
rem

:RF1
rem osql -E -1 120 -d%DB% -Q"exec RF1
'%UPDATEDRIVE%%UPDATEDIR%',%2,%3,%SCALEFACTOR%" -o
%OUTPUTPATH%\RF1_%2_%3.out
osql -E -1 120 -d%DB% -Q"exec RF1
'%UPDATEDRIVE%%UPDATEDIR%',%2,%3,100" -o
%OUTPUTPATH%\RF1_%2_%3.out
semaphore -release RF1
goto :EOF

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

:RF2
rem osql -E -1 120 -d%DB% -Q"exec RF2
'%UPDATEDRIVE%%UPDATEDIR%',%2,%3,%SCALEFACTOR%" -o
%OUTPUTPATH%\RF2_%2_%3.out
osql -E -1 120 -d%DB% -Q"exec RF2
'%UPDATEDRIVE%%UPDATEDIR%',%2,%3,100" -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, 2000000000,
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);  
}
```

Appendix G: Price Quotations

August 8, 2003

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 |
|------------------|---|------------|----------|---------|
| 810-00652 | SQL Server 2000 Enterprise Edition <i>Server license only - No CALs</i> <i>Discount Schedule: Open Program - No Level</i> <i>Unit Price reflects a 26% discount from the retail unit price of \$7,499.</i> | \$5,549 | 1 | \$5,549 |
| 359-00532 | SQL Server 2000 Client License <i>Discount Schedule: Open Program - No Level</i> <i>Unit Price reflects a 18% discount from the retail unit price of \$179.</i> | \$146 | 50 | \$7,300 |
| P72-00264 | Windows Server 2003, Enterprise Edition <i>Server license only - No CALs</i> <i>Discount Schedule: Open Program - No Level</i> <i>Unit Price reflects a 40% discount from the retail unit price of \$3,999.</i> | \$2,399 | 1 | \$2,399 |
| 254-00170 | Visual C++ Standard <i>No discounts applied</i> | \$109 | 1 | \$109 |
| PRO-PRORS-16U-01 | Database Server Support Package <i>1 Year Term</i> | \$1,950 | 3 | \$5,850 |

All products are currently orderable through Microsoft's normal distribution channels.

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.