



TPC Benchmark™ H
Full Disclosure Report
DELL PowerEdge 6800/Dual-Core Intel® Xeon™
7040/3.0GHz 2x2MB L2 Cache
Using
Microsoft Windows Server 2003 Enterprise x64 Edition™
and SQL Server 2005 Enterprise (x64) Edition™



Second Edition

Submitted for Review

March 28, 2006

Dell Computer Corp PowerEdge 6800 Server with Microsoft Windows Server 2003 Enterprise x64 Edition and SQL Server 2005 Enterprise (x64) Edition

First Printing - January 2006

Second Printing - March 2006

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Abstract

This report document the methodology and results of the TPC Benchmark H test conducted on a PowerEdge 6800 Server using Microsoft SQL Server 2005 Enterprise (x64) Edition in conformance with the requirements of the TPC-H Benchmark Specification. The operating system used for the benchmark was Windows Server 2003 Enterprise (x64) Edition. The application was written in C and compiled using the Visual Studio Professional Edition compiler.

Hardware	Software	Total System Cost
Dell PowerEdge 6800 with Quad Dual-Core Intel® Xeon™ 7040/ 3.0GHz Dell PowerVault 220R Storage Enclosures	Microsoft Windows Server 2003 Enterprise x64 Edition™ SQL Server 2005 Enterprise (x64) Edition™	\$71,758

TPC-H Power@100GB	TPC-H Throughput@100GB	<u>QphH@100GB</u>	\$/QphH@100GB
11,423.9	6,768.5	8,793.3	\$8.17

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

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



DELL
PowerEdge 6800
with SQL Server 2005
Enterprise (x64) Edition™

TPC-H Revision 2.3.0
 Report Date: Jan 12, 2006
 Revision Date: Mar 28, 2006

Total System Cost
\$71,758 USD

TPC-H Composite Query per Hour
8,793.3 QphH@100GB

Price/Performance
\$8.17 USD/ QphH@100GB

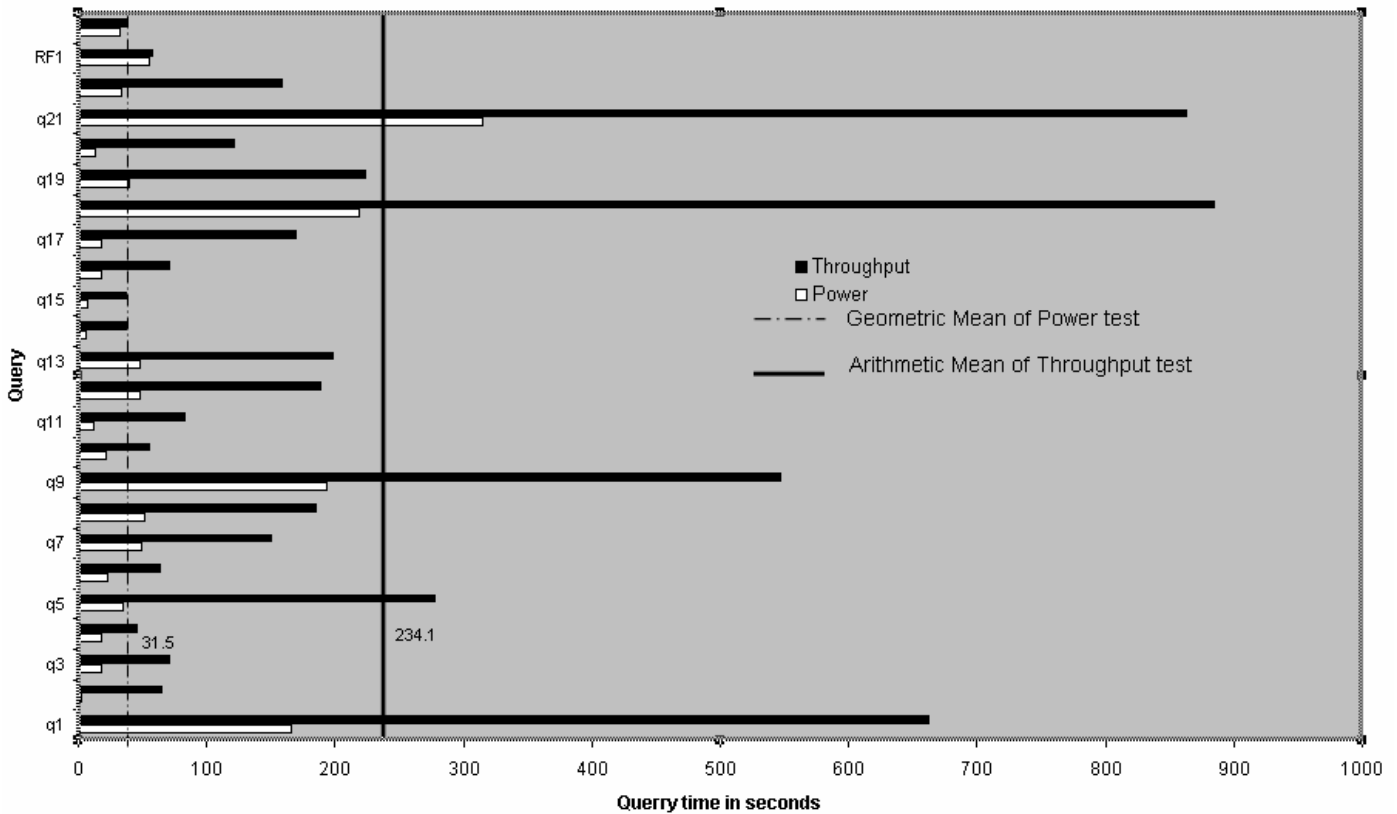
Database Size
100GB

Database Manager
 SQL Server 2005 Enterprise (x64) Edition™

Operating System
 Microsoft Windows Server 2003 Enterprise x64 Edition™

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

Availability Date
January 12, 2006



Database Load Time
 1:34:06

Total Disk/Database Size
 33.9

Load Includes Backup
 Y

RAID (Base tables only)
 N

RAID (Base tables and auxiliary data structures)
 N

RAID (Everything)
 N

System Configuration : 1 node
Processors (per node) : 4x Dual-Core Intel® Xeon™ 7040/3.0GHz 2x2MB L2 Cache
Memory: (per node) : 32GB RAM
Disk Drives: 84 – 36GB 15k HDD & 8 – 73GB 10k HDD
Copyright 2006 Dell Computer Corporation

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

Dell		PowerEdge PE6800			TPC-H REV 2.3 EXECUTIVE SUMMARY		
		Server			Report Date: 12-January-06		
					Revision Date: 28-March-06		
Description	Part Number	Third Party		Unit Price	Qty	Extended Price	3 yr. Maint. Price
Server Hardware		Brand	Pricing				
Dell PowerEdge 6800 3.0GHz Dual Core XEON wr/2+2MB	222-1046			\$4,094.00	1	\$4,094.00	\$300.00
L2 cache, 667MHZ FSB, 2 onboard Gigabit NICs							
3.0GHZ/2+2MB,Dual Core XEON,QUAD PROC	311-5643			\$10,497.00	1	\$10,497.00	
32GB,DDR2,400MHZ(16X2GB),2R	311-4662			\$6,358.00	1	\$6,358.00	
PERC4e/Di 256MB	341-1903			\$299.00	1	\$299.00	
PERC4eDC,128MB,2-EXT CHN	341-1642			\$799.00	3	\$2,397.00	
73GB U320M SCSI 10K RPM Hard Drive (OS+LOG)	341-1287			\$299.00	8	\$2,392.00	
Dell E773,17 in Gray (16.0 VIS)	320-2907			\$159.00	1	\$159.00	
					Subtotal	\$26,196.00	\$300.00
PowerVault Disk Subsystem							
PV220S, U3	220-4476			\$2,255.00	6	\$13,530.00	\$2,406.00
ZEMM,U320,PV22XS,SINGLE	340-9324			\$399.00	6	\$2,394.00	
600W,PWR SPLY,PV22XS	310-0677			\$0.00	6	\$0.00	
600W,PWR SPLY,PV22XS	310-0683			\$89.00	6	\$534.00	
SCSI Cables	310-0679			\$99.00	6	\$594.00	
36GB U320M SCSI 15K RPM Hard Drive *	340-9371			\$249.00	84	\$20,916.00	
RACK-111/24U/Dell	A0213544			\$479.95	1	\$479.95	
					Subtotal	\$38,447.95	\$2,406.00
Server Software							
SQL Server 2005 Enterprise x64 Edition **	810-04793	Microsoft	1	\$8,487.00	1	\$8,487.00	
SQL Server 2005 Client Licence **	359-01911	Microsoft	1	156	25	\$3,900.00	
Windows Server 2003 Enterprise x64 Server **	P72-00274	Microsoft	1	\$2,334.00	1	\$2,334.00	
Visual C++ Standard Edition **	254-00170	Microsoft	1	\$109.00	1	\$109.00	
Visual Basic 2003 Standard	046-00856	Microsoft	1	\$109.00	1	\$109.00	
Professional Support (1 Incident)		Microsoft	1	\$245.00	1		\$245.00
					Subtotal	\$14,939.00	\$245.00
All components from Dell are discounted 16% based on total dollar volume of this configuration.				Other Discounts (16%)		\$10,775.99	
					Total	\$68,807	\$2,951
Notes: * Maint. included in PowerVault 220 disk pod					Three-Year Cost of Ownership:		\$71,758 USD
** All Microsoft maintenance is covered by the maintenance costs of Microsoft SQL Server							
Pricing: 1 = Microsoft, all others are Dell					QphH@100G	8,793.3	
Pricing may be verified by calling 1-800-BUY-DELL and referencing quote # 283836068							
as a complex quote.							
Audited by Lorna Livingtree, Performance Metrics Inc.					\$ / QphH@100G:	\$8.17 USD	
Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components. Individually negotiated discounts are not permitted. Special prices based on assumptions about past or future purchases are not permitted. All discounts reflect standard pricing policies for the listed components. For complete details, see the pricing sections of the TPC benchmark specifications. If you find that the stated prices are not available according to these items, please inform the TPC at pricing@tpc.org.							



DELL
PowerEdge 6800
w/ SQL Server 2005
Enterprise (x64) Edition™

TPC-H Revision 2.3.0

Report Date: **Jan 12, 2006**

Revision Date: **Mar 28, 2006**

Numerical Quantities Summary

Measurement Results:

Database Scale Factor	100
Total Data Storage/Database Size	33.9
Start of Database Load	2005-12-12 08:42:27
End of Database Load	2005-12-12 10:16:33
Database Load Time	1:34:06
Query Streams for Throughput Test	5
TPC-H Power	11423.9
TPC-H Throughput	6768.5
TPC-H Composite Query-per-Hour Metric (QphH@300GB)	8793.3
Total System Price Over 3 Years	\$71,758
TPC-H Price Performance Metric (\$/QphH@300GB)	\$8.17

Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 5851 seconds

Duration of stream execution:

	Seed	Start Date/Time	End Date/Time	Duration
Stream00	1212101633	2005-12-12 13:36:32	2005-12-12 13:59:05	00:22:33
Stream01	1212101634	2005-12-12 13:59:39	2005-12-12 15:22:56	01:23:17
Stream02	1212101635	2005-12-12 13:59:39	2005-12-12 15:27:38	01:28:00
Stream03	1212101636	2005-12-12 13:59:39	2005-12-12 15:29:00	01:29:22
Stream04	1212101637	2005-12-12 13:59:39	2005-12-12 15:24:43	01:25:04
Stream05	1212101638	2005-12-12 13:59:39	2005-12-12 15:23:12	01:23:33
Refresh00		12/12/05 13:35:37	12/12/05 13:36:32	0:00:55
		12/12/05 13:59:05	12/12/05 13:59:38	0:00:32
Refresh01		12/12/05 13:59:39	12/12/05 15:30:39	1:31:01
Refresh02		12/12/05 15:30:40	12/12/05 15:32:23	0:01:42
Refresh03		12/12/05 15:32:24	12/12/05 15:33:59	0:01:36
Refresh04		12/12/05 15:34:01	12/12/05 15:35:35	0:01:34
Refresh05		12/12/05 15:35:37	12/12/05 15:37:09	0:01:32



Numerical Quantities Summary

Timing Intervals in Seconds:

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Stream00	165.7	2.9	18.4	18.0	34.3	22.7	49.8	52.0
Stream01	671.6	42.1	85.3	54.9	127.7	34.3	243.8	211.2
Stream02	632.0	48.4	93.8	35.4	192.3	84.1	111.4	197.5
Stream03	654.1	71.5	16.9	45.8	838.6	43.2	157.8	209.5
Stream04	637.4	61.7	94.6	47.4	154.2	101.7	115.3	168.1
Stream05	713.3	101.5	65.2	46.9	74.2	52.8	125.6	137.4
Min Qi	671.6	42.1	65.2	46.9	74.2	34.3	125.6	137.4
Max Qi	713.3	101.5	94.6	54.9	838.6	101.7	243.8	211.2
Avg Qi	692.45	71.8	75.25	50.9	100.95	43.55	184.7	174.3
Query	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Stream00	193.2	21.5	11.9	48.1	46.0	5.6	7.0	17.5
Stream01	424.5	54.3	99.1	177.6	281.4	28.7	29.3	71.0
Stream02	476.8	67.5	99.3	288.7	176.9	64.7	30.7	93.4
Stream03	595.2	58.8	66.7	55.8	89.7	27.3	25.3	21.6
Stream04	598.0	57.4	89.0	231.6	213.4	28.1	42.7	79.4
Stream05	642.3	36.1	60.7	188.8	227.9	34.5	26.5	87.6
Min Qi	424.5	36.1	60.7	177.6	227.9	28.7	26.5	71
Max Qi	642.3	67.5	99.3	288.7	281.4	64.7	42.7	93.4
Avg Qi	533.4	45.2	79.9	183.2	254.65	31.6	27.9	79.3
Query	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream00	17.5	219.0	39.7	13.2	314.8	34.2	54.7	32.3
Stream01	56.0	938.1	137.8	122.0	945.6	161.3	5421.2	39.0
Stream02	333.1	810.3	502.8	94.1	678.4	167.9	64.9	36.7
Stream03	87.5	999.0	110.2	102.4	952.3	132.1	58.2	36.7
Stream04	234.1	813.4	209.0	151.0	791.7	184.8	56.8	36.7
Stream05	139.2	862.9	159.3	136.0	945.1	148.9	49.5	40.5
Min Qi	56	862.9	137.8	122	945.1	148.9	49.5	39
Max Qi	333.1	999	502.8	151	952.3	184.8	5421.2	40.5
Avg Qi	97.6	900.5	148.55	129	945.35	155.05	2735.35	39.75

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General Items

Test Sponsor

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

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

Parameter Settings

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

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

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

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

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

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

Configuration Items

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

- *Number and type of processors*
- *Size of allocated memory, and any specific mapping/partitioning of memory in the test.*
- *Number and type of disk units (and controllers, if applicable).*
- *Number of channels or bus connections to disk units, including their protocol type.*
- *Number of LAN (e.g. Ethernet) Connections, including routers, workstations, terminals, etc., that were physically used in the test or are incorporated into the pricing structure.*

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

The System Under Test (SUT), 2x DELL PowerEdge 6800 Servers, depicted in the next diagram consists of:

- 4 - Dual-Core Intel® Xeon™ 7040/3.0GHz 2x2MB L2 Cache.
- 32GB RAM.
- 3 - DELL PERC4e-DC RAID Controllers, each with 128MB RAM of cache.
- 6 - DELL PowerVault 220R.
- 84 – 36GB,U320 15k SCSI
- 8 – 73GB 10k HDD.

Per *Clause 7.1.1*:

Specifically excluded from the priced system calculation are:

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

Measured and Priced Configuration

The measured and priced configurations are the same.

PE6800

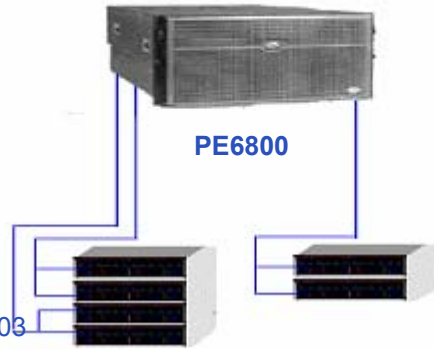
4xDual-Core Intel Xeon 7040/
3.0GHz 2x2MB L2 cache
32 GB DDR
3xPERC4E-DC Controllers
8x73GB, U320, 15K SCSI

DBMS

SQL Server 2005 Enterprise
(x64) Edition

OS

Microsoft Windows Server 2003
Enterprise x64 Edition



Storage

6xPV220S
84x36GB, 15K, U320 SCSI

8xPV220S

Measured Configuration

PE6800

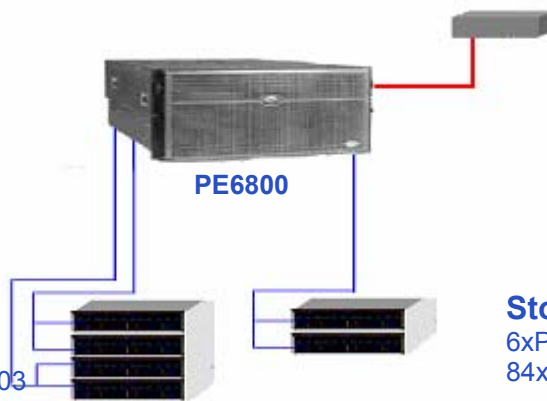
4xDual-Core Intel Xeon 7040/
3.0GHz 2x2MB L2 cache
32 GB DDR
3xPERC4E-DC Controllers
8x73GB, U320, 15K SCSI

DBMS

SQL Server 2005 Enterprise
(x64) Edition

OS

Microsoft Windows Server 2003
Enterprise x64 Edition



Client: PE SC 1420

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

Storage

6xPV220S
84x36GB, 15K, U320 SCSI

8xPV220S

Clause 1: Logical Database Design

Table Definitions

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

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

Physical Organization of Database

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

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

Horizontal Partitioning

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

Horizontal partitioning was not used in this benchmark.

Replication

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

Replication was not used for this benchmark.

Clause 2: Queries and Update Functions

Query Language

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

SQL was the query language used to implement all queries.

Random Number Generation

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

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

Substitution Parameters Generation

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

QGEN version 2.3.0 was used to generate the substitution parameters.

Query Text and Output Data from Database

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

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

Query Substitution Parameters and Seeds Used

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

Appendix E contains the seed and query substitution parameters.

Isolation Level

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

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

Refresh Function Source Code

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

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

Clause 3: Database System Properties

Atomicity

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

Atomicity of Completed Transaction

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

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

Aborted Transaction

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

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

Consistency

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

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

Consistency Test

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

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

Isolation

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

Read-Write Conflict with Commit

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

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

Read-Write Conflict with Rollback

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

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

Write-Write Conflict with Commit

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

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

Write-Write Conflict with Rollback

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

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

Concurrent Read and Write Transactions on Different Tables

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

The following steps were performed:

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

Update Transactions during Continuous Read-Only Query Stream

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

The following steps were performed:

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

Durability

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

Failure of a Durable Medium

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

The database logs were stored on a RAID-10.

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

During the test, one disk from the DELL PV220 enclosure containing re-do log files was removed. As all re-do log files resided on RAID 10 volumes, the test continued uninterrupted. Next, a data drive was removed and a checkpoint submitted. Errors followed and the test was halted. The transaction log was backup up and the system rebooted replacing the failed drive. The database was restored from data and log backups. Post scripts confirmed success.

System Crash

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

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

Memory Failure

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

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

Appendix C contains source code for all transactions.

Clause 4: Scaling and Database Population

Initial Cardinality of Tables

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

Initial number of rows

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

Distribution of Tables and Logs Across Media

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

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

- 3 x DELL PERC4E-DC Disk Controllers
- 6 x PowerVault 22XS Disk Enclosures
- 84x 36GB,U320, 15k rpm, SCSI disk drives
- 8 x 73GB 10k rpm disk drives

6 logical volumes were configured each spanning 14 physical drives across both SCSI channels of the controller in a RAID0 formation. The server had 8 73GB SCSI disks onboard for both the OS and database logs.

Each logical volume had 2 raw and 1 NTFS partitions except for volume1, which had 2 raw and 2 NTFS partitions. Each logical volume had 2 database filegroups on raw partitions and an NTFS partition for flat file and database backup storage. Volume1 had an additional NTFS partition for flat file storage.

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

**Appendix A
Distribution of Storage**

Windows 2003 Disk Administration			DELL PERC4E-DC Configuration			
Disk 0 474.13 GB			Controller # 0			
Partition			Slot# 1	Channels		
1	2	3	SCSI ID	A	B	
G: Lineitem_fg RAW 47.75 GB	N: General_fg RAW 23 GB	T: backup NTFS 402.38 GB	0	A0-1		
			1	A0-2		
			2	A0-3		
			3	A0-4		
			4	A0-5		
			5	A0-6		
			8	A0-7		
			9	A0-8		
			10	A0-9		
			11	A0-10		
			12	A0-11		
			13	A0-12		
			14	A0-13		
			15	A0-14		

Windows 2003 Disk Administration			DELL PERC4E-DC Configuration			
Disk 1 474.13 GB			Controller # 0			
Partition			Slot# 1	Channels		
1	2	3	SCSI ID	A	B	
H: Lineitem_fg RAW 47.75 GB	O: General_fg RAW 23 GB	U: backup NTFS 402.38 GB	0		B0-1	
			1		B0-2	
			2		B0-3	
			3		B0-4	
			4		B0-5	
			5		B0-6	
			8		B0-7	
			9		B0-8	
			10		B0-9	
			11		B0-10	
			12		B0-11	
			13		B0-12	
			14		B0-13	
			15		BO-14	

Windows 2003 Disk Administration

DELL PERC4E-DC Configuration

Disk 2 272.96 GB			Controller # 1						
Partition			Onboard		Channels				
1	2	3		SCSI ID	A	B			
C: OS NTFS 40 GB	E: LOG NTFS 45 GB			0	A0-1				
				1	A0-2				
				2	A0-3				
				3	A0-4				
				4			B0-5		
				5			B0-6		
				8			B0-7		
				9			B0-8		
				10					
				11					
				12					
				13					
				14					
				15					

Windows 2003 Disk Administration			DELL PERC4E-DC Configuration					
Disk 3 474.13 GB			Controller # 2					
Partition			Slot# 2		Channels			
1	2	3		SCSI ID	A	B		
I: Lineitem_fg RAW 47.75 GB	P: General_fg RAW 23 GB	Y: RF files NTFS 2 GB		0	A0-1			
				1	A0-2			
				2	A0-3			
				3	A0-4			
				4	A0-5			
				5	A0-6			
				8	A0-7			
				9	A0-8			
				10	A0-9			
				11	A0-10			
				12	A0-11			
				13	A0-12			
				14	A0-13			
				15	A0-14			

Windows 2003 Disk Administration			DELL PERC4E-DC Configuration					
Disk 4 474.13 GB			Controller # 2					

Appendix A

Partition			Slot# 1		Channels			
1	2	3		SCSI ID	A	B		
J: Lineitem_fg RAW 47.75 GB	Q: General_fg RAW 23 GB	F: Flat files NTFS 402.38 GB		0		B0-1		
				1		B0-2		
				2		B0-3		
				3		B0-4		
				4		B0-5		
				5		B0-6		
				8		B0-7		
				9		B0-8		
				10		B0-9		
				11		B0-10		
				12		B0-11		
				13		B0-12		
				14		B0-13		
				15		BO-14		

Windows 2003 Disk Administration			DELL PERC4E-DC Configuration					
Disk 5 474.13 GB			Controller # 3					
Partition			Slot# 3		Channels			
1	2	3		SCSI ID	A	B		
K: Lineitem_fg RAW 47.75 GB	R: General_fg RAW 23 GB	X: Temp db NTFS 402.38 GB		0	A0-1			
				1	A0-2			
				2	A0-3			
				3	A0-4			
				4	A0-5			
				5	A0-6			
				8	A0-7			
				9	A0-8			
				10	A0-9			
				11	A0-10			
				12	A0-11			
				13	A0-12			
				14	A0-13			
				15	AO-14			

Windows 2003 Disk Administration			DELL PERC4E-DC Configuration					
Disk 6 474.13 GB			Controller # 3					

Partition			Slot# 3		Channels			
1	2	3		SCSI ID	A	B		
L: Lineitem_fg RAW 47.75 GB	S: General_fg RAW 23 GB	Z: backup NTFS 402.38 GB		0		B0-1		
				1		B0-2		
				2		B0-3		
				3		B0-4		
				4		B0-5		
				5		B0-6		
				8		B0-7		
				9		B0-8		
				10		B0-9		
				11		B0-10		
				12		B0-11		
				13		B0-12		
				14		B0-13		
				15		BO-14		

Partitioning and Replication

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

The database was not replicated.
Partitioning was not used in this benchmark.

Appendix A

RAID Implementations

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

RAID 10 was used for logs and OS.

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

DBGEN Version and Modifications

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

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

Database Load time

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

Database load time was 1 hour 34 minutes 6 seconds.

Data Storage Ratio

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

Data Storage Ratio

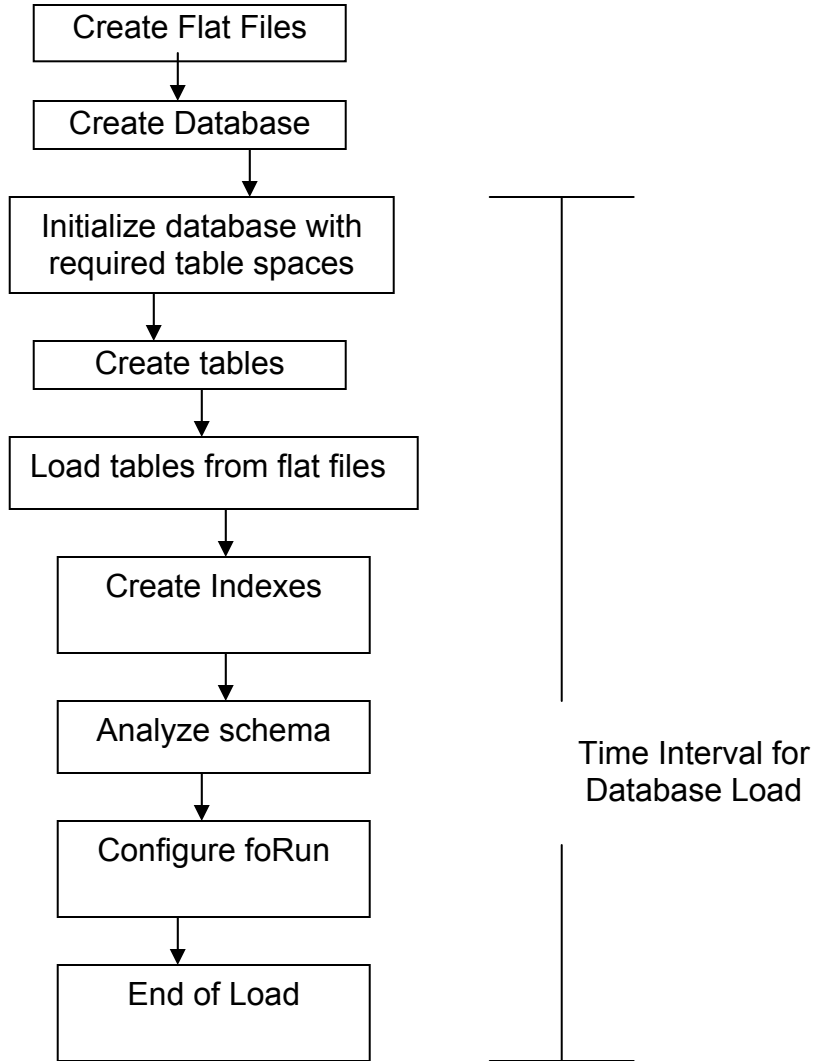
Disk Type	Number of Disks	Space per Disk	Subtotal Disk Space	Total Disk Storage	Data Storage Ratio
36GB 15k	84	33.87GB	2845.08GB		
73GB 15k	8	68.24GB	272.96GB		
				3118.04GB	33.9

Database Load Mechanism Details and Illustration

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

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

Database Load Process



Clause 5: Performance Metrics and Execution Rules

Steps in the Power Test

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

The following steps were used to implement the power test:

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

Timing Intervals

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

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

Number of Streams for the Throughput Test

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

Five streams were used for the throughput test.

Start/Finish Time of Each Query Stream

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

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

Total Elapsed Time

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

The total elapsed time of the throughput test was 5851 seconds.

Start/Finish Time for Refresh Functions

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

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

Timing Intervals for Each Query and Each Update

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

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

Performance Metrics

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

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

Reproducibility Method

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

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

Percentage Differences in Benchmark Executions

Run	QppH@100GB	QthH@100GB	QphH@100GB
1	11986.2	6840.8	9055.1
2	11423.9	6768.5	8793.3
Percent Difference	0.95%	0.99%	0.97%

System Activity Between Run1 and Run2

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

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

Clause 6: SUT and Driver Implementation

Driver

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

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

For each power-test run:

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

Implementation Specific Layer (ISL)

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

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

Profile-Directed Optimization

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

Profile-directed optimization was not used.

Clause 7: Pricing

Hardware and Software Used in the Priced System

A detailed list of hardware and software used in the priced system must be reported. Each item must have vendor part number, description, and release/revision level, and either general availability status or committed delivery date. If package-pricing is used, contents of the package must be disclosed. Pricing source(s) and effective date(s) of price(s) must also be reported.

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

Total Three Year Price

The total 3-year price of the entire configuration must be reported including: hardware, software, and maintenance charges. Separate component pricing is recommended. The basis of all discounts used must be disclosed.

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

Availability Date

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

All Dell components are available at the time of publication.

Clause 8: Auditor-Related Items

Auditor's Report

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

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

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

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

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



December 16, 2005

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

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

Platform: PowerEdge 6800
Database Manager: Microsoft SQL Server 2005 Enterprise Edition
Operating System: Windows Server 2003 Enterprise Edition

CPU's	Memory	Total Disks	Qpph@ 100GB	QthH@100GB	QphH@100GB
4 Intel Xeon @ 3.0 Ghz	32 GB	84 @ 36 GB 8 @ 73GB	11,423.9	6,768.5	8,793.3

In my opinion, these performance results were produced in compliance with the TPC requirements for the benchmark. The following attributes of the benchmark were given special attention:

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

Appendix A

- The performance metrics were correctly computed and reported.
- The repeatability of the measurement was verified.
- The ACID properties were successfully demonstrated and verified.
- The system pricing was checked for major components and maintenance.
- The executive summary pages of the FDR were verified for accuracy.

Auditor's Notes:

None.

Sincerely,

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

Lorna Livingtree
Auditor

Appendix A: Tunable Parameters

Appendix A

Server Configuration Parameters

Microsoft Windows 2003 Server Parameters

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

Microsoft SQL Server 2005 Startup Parameters

Microsoft SQL Server was started with the following command line options

```
sqlservr -c -x -E -T834 -T1204
```

Microsoft SQL Server 2005 Configuration Parameters

name	minimum	maximum			
config_value	run_value				
-----	-----				
Ad Hoc Distributed Queries		0	1	0	0
0					
affinity I/O mask	-2147483648	2147483647			
0	0				
affinity mask	-2147483648	2147483647			
65535	65535				
affinity64 I/O mask	-2147483648	2147483647			
0	0				
affinity64 mask	-2147483648	2147483647			
0	0				
Agent XPs	0	1	0	0	
allow updates	0	1	1	1	
awe enabled	0	1	1	1	
blocked process threshold	0	86400		0	
0					
c2 audit mode	0	1	0	0	
clr enabled	0	1	0	0	
cost threshold for parallelism	0	32767		0	
0					
cross db ownership chaining	0	1		0	
0					
cursor threshold	-1	2147483647		-1	
-1					
Database Mail XPs	0	1		0	
0					
default full-text language	0	2147483647			
1033	1033				
default language	0	9999		0	
0					
default trace enabled	0	1		1	
1					

disallow results from triggers	0	1	0		
0					
fill factor (%)	0	100		0	0
ft crawl bandwidth (max)	0	32767		100	
100					
ft crawl bandwidth (min)	0	32767		0	
0					
ft notify bandwidth (max)	0	32767		100	
100					
ft notify bandwidth (min)	0	32767		0	
0					
in-doubt xact resolution	0	2		0	
0					
index create memory (KB)	704	2147483647			
0	0				
lightweight pooling	0	1		1	
1					
locks	5000	2147483647		0	
0					
max degree of parallelism	0	64		0	
0					
max full-text crawl range	0	256		4	
4					
max server memory (MB)	16	2147483647			
30720	30720				
max text repl size (B)	0	2147483647			
65536	65536				
max worker threads	128	32767		1024	
1024					
media retention	0	365		0	
0					
min memory per query (KB)	512	2147483647			
512	512				
min server memory (MB)	0	2147483647			
28672	28672				
nested triggers	0	1		1	1
network packet size (B)	512	32767			
32767	32767				
Ole Automation Procedures	0	1		0	
0					
open objects	0	2147483647		0	
0					
PH timeout (s)	1	3600		60	
60					
precompute rank	0	1		0	
0					
priority boost	0	1		1	1
query governor cost limit	0	2147483647			
0	0				
query wait (s)	-1	2147483647		2147483647	
2147483647	2147483647				
recovery interval (min)	0	32767		32767	
32767					
remote access	0	1		1	1
remote admin connections	0	1		0	
0					
remote login timeout (s)	0	2147483647			
20	20				

Appendix A

```

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

```

```

BIOS Version/Date Dell Computer Corporation X23, 8/12/2005
SMBIOS Version 2.3
Windows Directory C:\WINDOWS
System Directory C:\WINDOWS\system32
Boot Device \Device\HarddiskVolume19
Locale United States
Hardware Abstraction Layer Version = "5.2.3790.1830
(srv03_sp1_rtm.050324-1447)"
User Name Not Available
Time Zone Central Standard Time
Total Physical Memory 32,763.05 MB
Available Physical Memory 726.64 MB
Total Virtual Memory 33.11 GB
Available Virtual Memory 2.50 GB
Page File Space 2.03 GB
Page File C:\pagefile.sys

```

[Hardware Resources]

[Conflicts/Sharing]

```

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

Memory Address 0xD9100000-0xD91FFFFFF PCI standard PCI-to-
PCI bridge
Memory Address 0xD9100000-0xD91FFFFFF PCI standard PCI-to-
PCI bridge

IRQ 16 Intel(R) 82801EB USB Universal Host Controller - 24D2
IRQ 16 Radeon 7000 / RADEON VE Family (Microsoft Corporation)

Memory Address 0xD9200000-0xD92FFFFFF PCI standard PCI-to-
PCI bridge
Memory Address 0xD9200000-0xD92FFFFFF PCI standard PCI-to-
PCI bridge

Memory Address 0xD0000000-0xFEBFFFFFF PCI bus
Memory Address 0xD0000000-0xFEBFFFFFF Radeon 7000 /
RADEON VE Family (Microsoft Corporation)

IRQ 18 DELL PERC 4e/DC RAID Controller
IRQ 18 DELL PERC 4e/DC RAID Controller
IRQ 18 DELL PERC 4e/DC RAID Controller
IRQ 18 Intel(R) 82801EB USB Universal Host Controller - 24D7

```

```

Memory Address 0xA0000-0xBFFFF PCI bus
Memory Address 0xA0000-0xBFFFF Radeon 7000 / RADEON VE
Family (Microsoft Corporation)

Memory Address 0xD9000000-0xD90FFFFFF PCI standard PCI-to-
PCI bridge
Memory Address 0xD9000000-0xD90FFFFFF PCI standard PCI-to-
PCI bridge

Memory Address 0xD9300000-0xD93FFFFFF PCI standard PCI-to-
PCI bridge
Memory Address 0xD9300000-0xD93FFFFFF PCI standard PCI-to-
PCI bridge

I/O Port 0x0000D000-0x0000DFFF PCI standard PCI-to-PCI bridge
I/O Port 0x0000D000-0x0000DFFF Intel(R) 6700PXH PCI Express-
to-PCI Bridge B - 032A

```

[DMA]

```

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

```

System Information

System Information report written at: 12/14/05 04:28:00

System Name: PE6800

[System Summary]

```

Item Value
OS Name Microsoft(R) Windows(R) Server 2003 Enterprise x64 Edition
Version 5.2.3790 Service Pack 1 Build 3790
Other OS Description Not Available
OS Manufacturer Microsoft Corporation
Activation Status Activation Pending (10 days remaining)
System Name PE6800
System Manufacturer Dell Computer Corporation
System Model PowerEdge 6800
System Type x64-based PC
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz
Processor EM64T Family 15 Model 4 Stepping 8 GenuineIntel ~2993 Mhz

```

Appendix A

[Forced Hardware]

Device PNP Device ID

[I/O]

Resource	Device	Status
0x00000000-0x00000CF7	PCI bus	OK
0x00000000-0x00000CF7	Direct memory access controller	OK
0x00000D00-0x0000FFFF	PCI bus	OK
0x0000E000-0x0000EFFF	PCI standard PCI-to-PCI bridge	OK
0x0000D000-0x0000DFFF	PCI standard PCI-to-PCI bridge	OK
0x0000D000-0x0000DFFF	Intel(R) 6700PXH PCI Express-to-PCI Bridge B - 032A	OK
0x0000BCE0-0x0000BCFF	Intel(R) 82801EB USB Universal Host Controller - 24D2	OK
0x0000BCC0-0x0000BCDF	Intel(R) 82801EB USB Universal Host Controller - 24D4	OK
0x0000BCA0-0x0000BCBF	Intel(R) 82801EB USB Universal Host Controller - 24D7	OK
0x0000CC00-0x0000CCFF	Radeon 7000 / RADEON VE Family (Microsoft Corporation)	OK
0x000003B0-0x000003BB	Radeon 7000 / RADEON VE Family (Microsoft Corporation)	OK
0x000003C0-0x000003DF	Radeon 7000 / RADEON VE Family (Microsoft Corporation)	OK
0x00000080-0x0000009F	Direct memory access controller	OK
0x000000C0-0x000000DF	Direct memory access controller	OK
0x000000F0-0x000000FF	Numeric data processor	OK
0x00000020-0x0000003F	Programmable interrupt controller	OK
0x000000A0-0x000000BF	Programmable interrupt controller	OK
0x000004D0-0x000004D1	Programmable interrupt controller	OK
0x00000061-0x00000061	System speaker	OK
0x00000070-0x0000007F	System CMOS/real time clock	OK
0x00000040-0x0000005F	System timer	OK
0x000003F0-0x000003F5	Standard floppy disk controller	OK
0x000003F7-0x000003F7	Standard floppy disk controller	OK
0x000003F8-0x000003FF	Communications Port (COM1)	OK
0x00000800-0x0000087F	System board	OK
0x00000880-0x000008BF	System board	OK
0x000008C0-0x000008DF	System board	OK
0x00000C00-0x00000C1F	System board	OK
0x00000C10-0x00000C1F	System board	OK
0x00000CA0-0x00000CAF	System board	OK
0x00000C20-0x00000C3F	System board	OK
0x00000E00-0x00000E7F	System board	OK
0x00000060-0x00000060	System board	OK
0x00000064-0x00000064	System board	OK
0x0000FC00-0x0000FC0F	Intel(R) 82801EB Ultra ATA Storage Controllers - 24DB	OK
0x000001F0-0x000001F7	Primary IDE Channel	OK
0x000003F6-0x000003F6	Primary IDE Channel	OK
0x00000170-0x00000177	Secondary IDE Channel	OK
0x00000376-0x00000376	Secondary IDE Channel	OK

[IRQs]

Resource	Device	Status
IRQ 9	Microsoft ACPI-Compliant System	OK
IRQ 18	DELL PERC 4e/DC RAID Controller	OK
IRQ 18	DELL PERC 4e/DC RAID Controller	OK
IRQ 18	DELL PERC 4e/DC RAID Controller	OK
IRQ 18	Intel(R) 82801EB USB Universal Host Controller - 24D7	OK
IRQ 64	Broadcom NetXtreme Gigabit Ethernet	OK
IRQ 110	DELL PERC 4e/Di RAID Controller	OK
IRQ 16	Intel(R) 82801EB USB Universal Host Controller - 24D2	OK

IRQ 16	Radeon 7000 / RADEON VE Family (Microsoft Corporation)	OK
IRQ 19	Intel(R) 82801EB USB Universal Host Controller - 24D4	OK
IRQ 23	Intel(R) 82801EB USB2 Enhanced Host Controller - 24DD	OK
IRQ 13	Numeric data processor	OK
IRQ 8	System CMOS/real time clock	OK
IRQ 0	System timer	OK
IRQ 6	Standard floppy disk controller	OK
IRQ 4	Communications Port (COM1)	OK
IRQ 14	Primary IDE Channel	OK
IRQ 15	Secondary IDE Channel	OK

[Memory]

Resource	Device	Status
0xA0000-0xBFFFF	PCI bus	OK
0xA0000-0xBFFFF	Radeon 7000 / RADEON VE Family (Microsoft Corporation)	OK
0xD0000000-0xFEBFFFFF	PCI bus	OK
0xD0000000-0xFEBFFFFF	Radeon 7000 / RADEON VE Family (Microsoft Corporation)	OK
0xDFE00000-0xDFEFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD8000000-0xD8FFFFFF	PCI standard PCI-to-PCI bridge	OK
0xDFB00000-0xDFDFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD9300000-0xD93FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD9300000-0xD93FFFFF	PCI standard PCI-to-PCI bridge	OK
0xDFC00000-0xDFDFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD93F0000-0xD93FFFFF	DELL PERC 4e/DC RAID Controller	OK
0xDFCC0000-0xDFCFFFFF	DELL PERC 4e/DC RAID Controller	OK
0xDF800000-0xDFAFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD9200000-0xD92FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD9200000-0xD92FFFFF	PCI standard PCI-to-PCI bridge	OK
0xDF900000-0xDFAFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD92F0000-0xD92FFFFF	DELL PERC 4e/DC RAID Controller	OK
0xDF9C0000-0xDF9FFFFF	DELL PERC 4e/DC RAID Controller	OK
0xDF500000-0xDF7FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD9100000-0xD91FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD9100000-0xD91FFFFF	PCI standard PCI-to-PCI bridge	OK
0xDF600000-0xDF7FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD91F0000-0xD91FFFFF	DELL PERC 4e/DC RAID Controller	OK
0xDF6C0000-0xDF6FFFFF	DELL PERC 4e/DC RAID Controller	OK
0xDF200000-0xDF4FFFFF	PCI standard PCI-to-PCI bridge	OK
0xDF300000-0xDF4FFFFF	Intel(R) 6700PXH PCI Express-to-PCI Bridge B - 032A	OK
0xDF3F0000-0xDF3FFFFF	Broadcom NetXtreme Gigabit Ethernet	OK
0xDEF00000-0xDF1FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD9000000-0xD90FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD9000000-0xD90FFFFF	PCI standard PCI-to-PCI bridge	OK
0xDF000000-0xDF1FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD90F0000-0xD90FFFFF	DELL PERC 4e/Di RAID Controller	OK
0xDF0C0000-0xDF0FFFFF	DELL PERC 4e/Di RAID Controller	OK
0xDFDF0000-0xDFDF03FF	Intel(R) 82801EB USB2 Enhanced Host Controller - 24DD	OK
0xDED00000-0xDEDFFFFF	Radeon 7000 / RADEON VE Family (Microsoft Corporation)	OK
0xFEBFFC00-0xFEBFFFFF	Intel(R) 82801EB Ultra ATA Storage Controllers - 24DB	OK
0xE0000000-0xEFFFFFFF	Motherboard resources	OK
0xFE60C000-0xFE60FCFF	Motherboard resources	OK
0xFED00000-0xFED003FF	High precision event timer	OK

[Components]

Appendix A

[Sound Device]

Item Value

[Display]

Item Value

Name Radeon 7000 / RADEON VE Family (Microsoft Corporation)
 PNP Device ID PCI\VEN_1002&DEV_5159&SUBSYS_016F1028&REV_00\4&1F7DBC9F&0&00F0
 Adapter Type ATI display adapter (0x5159), ATI Technologies Inc. compatible
 Adapter Description Radeon 7000 / RADEON VE Family (Microsoft Corporation)
 Adapter RAM 16.00 MB (16,777,216 bytes)
 Installed Drivers ati2dvag.dll
 Driver Version 6.14.10.6509
 INF File atiixpag.inf (ati2mtag_RV100 section)
 Color Planes 1
 Color Table Entries 4294967296
 Resolution 1024 x 768 x 85 hertz
 Bits/Pixel 32
 Memory Address 0xD0000000-0xFEBFFFFFFF
 I/O Port 0x0000CC00-0x0000CCFF
 Memory Address 0xDEDF0000-0xDEDFFFFF
 IRQ Channel IRQ 16
 I/O Port 0x000003B0-0x000003BB
 I/O Port 0x000003C0-0x000003DF
 Memory Address 0xA0000-0xBF000
 Driver c:\windows\system32\drivers\ati2mtag.sys (6.14.10.6509, 1.39 MB (1,452,544 bytes), 11/22/2005 10:17 PM)

[Infrared]

Item Value

[Input]

[Keyboard]

Item Value

Description USB Human Interface Device
 Name Enhanced (101- or 102-key)
 Layout 00000409
 PNP Device ID USB\VID_0518&PID_0001&MI_00\6&111E0DBA&0&0000
 Number of Function Keys 12
 Driver c:\windows\system32\drivers\hidusb.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 18.50 KB (18,944 bytes), 3/25/2005 6:00 AM)
 Description USB Human Interface Device
 Name Enhanced (101- or 102-key)
 Layout 00000409
 PNP Device ID USB\VID_0518&PID_0001&MI_00\6&111E0DBA&0&0000
 Number of Function Keys 12
 Driver c:\windows\system32\drivers\hidusb.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 18.50 KB (18,944 bytes), 3/25/2005 6:00 AM)

[Pointing Device]

Item Value

Hardware Type HID-compliant mouse
 Number of Buttons 3
 Status OK
 PNP Device ID HID\VID_0518&PID_0001&MI_01&COL01\7&35583EE6&0&0000
 Power Management Supported No
 Double Click Threshold 6

[Multimedia]

[Audio Codecs]

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

[Video Codecs]

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

[CD-ROM]

Item	Value
Drive	D:
Description	CD-ROM Drive
Media Loaded	No
Media Type	CD-ROM
Name	SAMSUNG CD-ROM SN-124
Manufacturer	(Standard CD-ROM drives)
Status	OK
Transfer Rate	Not Available
SCSI Target ID	0
PNP Device ID	IDE\CDROMSAMSUNG_CD-ROM_SN-124_N103_5&31A9A455&0&0.0.0
Driver	c:\windows\system32\drivers\cdrom.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 75.50 KB (77,312 bytes), 3/25/2005 6:00 AM)

Appendix A

Handedness Right Handed Operation
Driver c:\windows\system32\drivers\mouhid.sys (5.2.3790.1830
(srv03_sp1_rtm.050324-1447), 19.00 KB (19,456 bytes), 3/24/2005 11:21
AM)

Hardware Type HID-compliant mouse
Number of Buttons 3
Status OK
PNP Device ID
HID\VID_0518&PID_0001&MI_01&COL01\7&11BB4CBB&0&
0000

Power Management Supported No
Double Click Threshold 6
Handedness Right Handed Operation
Driver c:\windows\system32\drivers\mouhid.sys (5.2.3790.1830
(srv03_sp1_rtm.050324-1447), 19.00 KB (19,456 bytes), 3/24/2005 11:21
AM)

[Modem]

Item Value

[Network]

[Adapter]

Item Value
Name [00000001] Broadcom NetXtreme Gigabit Ethernet
Adapter Type Ethernet 802.3
Product Type Broadcom NetXtreme Gigabit Ethernet
Installed Yes
PNP Device ID
PCI\VEN_14E4&DEV_1648&SUBSYS_016F1028&REV_10\5&
3BFB1AC&0&100230
Last Reset 12/12/2005 1:29 PM
Index 1
Service Name b57nd
IP Address 192.2.2.68
IP Subnet 255.255.255.0
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 00:12:3F:FF:2B:91
Memory Address 0xDF3F0000-0xDF3FFFFF
IRQ Channel IRQ 64
Driver c:\windows\system32\drivers\b57amd64.sys (7.98.0.0 built by:
WinDDK, 187.00 KB (191,488 bytes), 11/22/2005 10:17 PM)

Name [00000002] Broadcom NetXtreme Gigabit Ethernet
Adapter Type Not Available
Product Type Broadcom NetXtreme Gigabit Ethernet
Installed Yes
PNP Device ID
PCI\VEN_14E4&DEV_1648&SUBSYS_016F1028&REV_10\5&
3BFB1AC&0&110230
Last Reset 12/12/2005 1:29 PM
Index 2
Service Name b57nd
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled Yes
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Driver c:\windows\system32\drivers\b57amd64.sys (7.98.0.0 built by:
WinDDK, 187.00 KB (191,488 bytes), 11/22/2005 10:17 PM)

Name [00000003] RAS Async Adapter
Adapter Type Not Available
Product Type RAS Async Adapter
Installed Yes
PNP Device ID Not Available
Last Reset 12/12/2005 1:29 PM
Index 3
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 [00000004] WAN Miniport (L2TP)
Adapter Type Not Available
Product Type WAN Miniport (L2TP)
Installed Yes
PNP Device ID ROOT\MS_L2TPMINIPOINT\0000
Last Reset 12/12/2005 1:29 PM
Index 4
Service Name Rasl2tp
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Driver c:\windows\system32\drivers\rasl2tp.sys (5.2.3790.1830
(srv03_sp1_rtm.050324-1447), 132.00 KB (135,168 bytes), 3/25/2005 6:00
AM)

Name [00000005] 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 12/12/2005 1:29 PM
Index 5
Service Name PptpMiniport
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address 50:50:54:50:30:30
Driver c:\windows\system32\drivers\raspptp.sys (5.2.3790.1830
(srv03_sp1_rtm.050324-1447), 117.50 KB (120,320 bytes), 3/25/2005 6:00
AM)

Name [00000006] 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 12/12/2005 1:29 PM
Index 6
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

Appendix A

Driver c:\windows\system32\drivers\raspppoe.sys (5.2.3790.1830
(srv03_sp1_rtm.050324-1447), 67.50 KB (69,120 bytes), 3/25/2005 6:00 AM)

Name [00000007] Direct Parallel
Adapter Type Not Available
Product Type Direct Parallel
Installed Yes
PNP Device ID ROOT\MS_PTMINIIMPORT\0000
Last Reset 12/12/2005 1:29 PM
Index 7

Service Name Raspti
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Driver c:\windows\system32\drivers\raspti.sys (5.2.3790.1830
(srv03_sp1_rtm.050324-1447), 30.50 KB (31,232 bytes), 3/25/2005 6:00 AM)

Name [00000008] WAN Miniport (IP)
Adapter Type Not Available
Product Type WAN Miniport (IP)
Installed Yes
PNP Device ID ROOT\MS_NDISWANIP\0000
Last Reset 12/12/2005 1:29 PM
Index 8

Service Name NdisWan
IP Address Not Available
IP Subnet Not Available
Default IP Gateway Not Available
DHCP Enabled No
DHCP Server Not Available
DHCP Lease Expires Not Available
DHCP Lease Obtained Not Available
MAC Address Not Available
Driver c:\windows\system32\drivers\ndiswan.sys (5.2.3790.1830
(srv03_sp1_rtm.050324-1447), 157.50 KB (161,280 bytes), 3/25/2005 6:00 AM)

[Protocol]

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

Name	MSAFD Tcpip [UDP/IP]
Connectionless Service	Yes
Guarantees Delivery	No
Guarantees Sequencing	No
Maximum Address Size	16 bytes
Maximum Message Size	63.93 KB (65,467 bytes)
Message Oriented	Yes
Minimum Address Size	16 bytes
Pseudo Stream Oriented	No
Supports Broadcasting	Yes

Supports Connect Data	No
Supports Disconnect Data	No
Supports Encryption	No
Supports Expedited Data	No
Supports Graceful Closing	No
Supports Guaranteed Bandwidth	No
Supports Multicasting	Yes

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

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

[WinSock]

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

[Ports]

[Serial]

Item	Value
Name	Communications Port (COM1)
Status	OK
PNP Device ID	ACPI\PNP0501\1
Maximum Input Buffer Size	0
Maximum Output Buffer Size	No
Settable Baud Rate	Yes
Settable Data Bits	Yes
Settable Flow Control	Yes
Settable Parity	Yes
Settable Parity Check	Yes
Settable Stop Bits	Yes
Settable RLSD	Yes
Supports RLSD	Yes
Supports 16 Bit Mode	No
Supports Special Characters	No

Appendix A

Baud Rate 9600
 Bits/Byte 8
 Stop Bits 1
 Parity None
 Busy No
 Abort Read/Write on Error No
 Binary Mode Enabled Yes
 Continue Xmit on XOff No
 CTS Outflow Control No
 Discard NULL Bytes No
 DSR Outflow Control 0
 DSR Sensitivity 0
 DTR Flow Control Type Enable
 EOF Character 0
 Error Replace Character 0
 Error Replacement Enabled No
 Event Character 0
 Parity Check Enabled No
 RTS Flow Control Type Enable
 XOff Character 19
 XOffXmit Threshold 512
 XOn Character 17
 XOnXmit Threshold 2048
 XOnXOff InFlow Control 0
 XOnXOff OutFlow Control 0
 I/O Port 0x000003F8-0x000003FF
 IRQ Channel IRQ 4
 Driver c:\windows\system32\drivers\serial.sys (5.2.3790.1830
 (srv03_sp1_rtm.050324-1447), 118.50 KB (121,344 bytes), 3/25/2005 6:00
 AM)

[Parallel]

Item Value

[Storage]

[Drives]

Item Value

Drive A:
 Description 3 1/2 Inch Floppy Drive

Drive C:
 Description Local Fixed Disk
 Compressed No
 File System NTFS
 Size 40.00 GB (42,952,376,320 bytes)
 Free Space 27.17 GB (29,169,520,640 bytes)
 Volume Name
 Volume Serial Number A47EB4DD

Drive D:
 Description CD-ROM Disc

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

Drive F:
 Description Local Fixed Disk
 Compressed No
 File System NTFS
 Size 379.87 GB (407,883,350,016 bytes)
 Free Space 267.81 GB (287,560,564,736 bytes)
 Volume Name

Volume Serial Number 502143AB

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

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

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

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

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

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

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

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

Appendix A

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

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

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

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

Drive T:
 Description Local Fixed Disk
 Compressed No
 File System NTFS
 Size 377.86 GB (405,728,329,728 bytes)
 Free Space 236.37 GB (253,798,514,688 bytes)
 Volume Name
 Volume Serial Number C4022086

Drive U:
 Description Local Fixed Disk
 Compressed No
 File System NTFS
 Size 379.87 GB (407,883,350,016 bytes)
 Free Space 238.35 GB (255,926,534,144 bytes)
 Volume Name
 Volume Serial Number 60C6D6F0

Drive X:
 Description Local Fixed Disk
 Compressed No
 File System NTFS
 Size 379.87 GB (407,883,350,016 bytes)
 Free Space 343.25 GB (368,565,092,352 bytes)
 Volume Name
 Volume Serial Number 5049C626

Drive Y:
 Description Local Fixed Disk
 Compressed No
 File System NTFS
 Size 2.01 GB (2,155,020,288 bytes)
 Free Space 259.63 MB (272,236,544 bytes)
 Volume Name
 Volume Serial Number CCA0257

Drive Z:
 Description Local Fixed Disk
 Compressed No
 File System NTFS
 Size 379.87 GB (407,883,350,016 bytes)
 Free Space 266.99 GB (286,676,025,344 bytes)
 Volume Name
 Volume Serial Number E851D486

[Disks]

Item	Value
Description	Disk drive
Manufacturer	(Standard disk drives)
Model	PERC LD 0 PERCRAID SCSI Disk Device
Bytes/Sector	512
Media Loaded	Yes
Media Type	Fixed hard disk
Partitions	3
SCSI Bus	3
SCSI Logical Unit	0
SCSI Port	5
SCSI Target ID	0
Sectors/Track	63
Size	474.14 GB (509,103,705,600 bytes)
Total Cylinders	61,895
Total Sectors	994,343,175
Total Tracks	15,783,225
Tracks/Cylinder	255
Partition Disk #5, Partition #0	
Partition Size	63.50 GB (68,187,538,944 bytes)
Partition Starting Offset	32,256 bytes
Partition Disk #5, Partition #1	
Partition Size	30.76 GB (33,024,499,200 bytes)
Partition Starting Offset	68,187,571,200 bytes
Partition Disk #5, Partition #2	
Partition Size	379.87 GB (407,883,409,920 bytes)
Partition Starting Offset	101,212,070,400 bytes

Description	Value
Description	Disk drive
Manufacturer	(Standard disk drives)
Model	PERC LD 0 PERCRAID SCSI Disk Device
Bytes/Sector	512
Media Loaded	Yes
Media Type	Fixed hard disk
Partitions	2
SCSI Bus	3
SCSI Logical Unit	0
SCSI Port	3
SCSI Target ID	0
Sectors/Track	63
Size	272.96 GB (293,091,402,240 bytes)
Total Cylinders	35,633
Total Sectors	572,444,145
Total Tracks	9,086,415
Tracks/Cylinder	255
Partition Disk #2, Partition #0	
Partition Size	40.00 GB (42,952,379,904 bytes)
Partition Starting Offset	32,256 bytes
Partition Disk #2, Partition #1	
Partition Size	45.00 GB (48,323,520,000 bytes)
Partition Starting Offset	42,952,412,160 bytes

Description	Value
Description	Disk drive
Manufacturer	(Standard disk drives)
Model	PERC LD 0 PERCRAID SCSI Disk Device
Bytes/Sector	512
Media Loaded	Yes
Media Type	Fixed hard disk
Partitions	3
SCSI Bus	3
SCSI Logical Unit	0
SCSI Port	4

Appendix A

SCSI Target ID 0
 Sectors/Track 63
 Size 474.14 GB (509,103,705,600 bytes)
 Total Cylinders 61,895
 Total Sectors 994,343,175
 Total Tracks 15,783,225
 Tracks/Cylinder 255
 Partition Disk #3, Partition #0
 Partition Size 63.50 GB (68,187,538,944 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #3, Partition #1
 Partition Size 30.76 GB (33,024,499,200 bytes)
 Partition Starting Offset 68,187,571,200 bytes
 Partition Disk #3, Partition #2
 Partition Size 2.01 GB (2,155,023,360 bytes)
 Partition Starting Offset 101,212,070,400 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model PERC LD 0 PERCRAID SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 3
 SCSI Bus 3
 SCSI Logical Unit 0
 SCSI Port 2
 SCSI Target ID 0
 Sectors/Track 63
 Size 474.14 GB (509,103,705,600 bytes)
 Total Cylinders 61,895
 Total Sectors 994,343,175
 Total Tracks 15,783,225
 Tracks/Cylinder 255

Partition Disk #0, Partition #0
 Partition Size 63.50 GB (68,187,538,944 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #0, Partition #1
 Partition Size 32.76 GB (35,179,522,560 bytes)
 Partition Starting Offset 68,187,571,200 bytes
 Partition Disk #0, Partition #2
 Partition Size 377.86 GB (405,728,386,560 bytes)
 Partition Starting Offset 103,367,093,760 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model PERC LD 1 PERCRAID SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 3
 SCSI Bus 3
 SCSI Logical Unit 0
 SCSI Port 5
 SCSI Target ID 1
 Sectors/Track 63
 Size 474.14 GB (509,103,705,600 bytes)
 Total Cylinders 61,895
 Total Sectors 994,343,175
 Total Tracks 15,783,225
 Tracks/Cylinder 255

Partition Disk #6, Partition #0
 Partition Size 63.50 GB (68,187,538,944 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #6, Partition #1
 Partition Size 30.76 GB (33,024,499,200 bytes)
 Partition Starting Offset 68,187,571,200 bytes
 Partition Disk #6, Partition #2
 Partition Size 379.87 GB (407,883,409,920 bytes)
 Partition Starting Offset 101,212,070,400 bytes

Description Disk drive
 Manufacturer (Standard disk drives)

Model PERC LD 1 PERCRAID SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 3
 SCSI Bus 3
 SCSI Logical Unit 0
 SCSI Port 4
 SCSI Target ID 1
 Sectors/Track 63
 Size 474.14 GB (509,103,705,600 bytes)
 Total Cylinders 61,895
 Total Sectors 994,343,175
 Total Tracks 15,783,225
 Tracks/Cylinder 255
 Partition Disk #4, Partition #0
 Partition Size 63.50 GB (68,187,538,944 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #4, Partition #1
 Partition Size 30.76 GB (33,024,499,200 bytes)
 Partition Starting Offset 68,187,571,200 bytes
 Partition Disk #4, Partition #2
 Partition Size 379.87 GB (407,883,409,920 bytes)
 Partition Starting Offset 101,212,070,400 bytes

Description Disk drive
 Manufacturer (Standard disk drives)
 Model PERC LD 1 PERCRAID SCSI Disk Device
 Bytes/Sector 512
 Media Loaded Yes
 Media Type Fixed hard disk
 Partitions 3
 SCSI Bus 3
 SCSI Logical Unit 0
 SCSI Port 2
 SCSI Target ID 1
 Sectors/Track 63
 Size 474.14 GB (509,103,705,600 bytes)
 Total Cylinders 61,895
 Total Sectors 994,343,175
 Total Tracks 15,783,225
 Tracks/Cylinder 255
 Partition Disk #1, Partition #0
 Partition Size 63.50 GB (68,187,538,944 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #1, Partition #1
 Partition Size 30.76 GB (33,024,499,200 bytes)
 Partition Starting Offset 68,187,571,200 bytes
 Partition Disk #1, Partition #2
 Partition Size 379.87 GB (407,883,409,920 bytes)
 Partition Starting Offset 101,212,070,400 bytes

[SCSI]

Item	Value
Name	DELL PERC 4e/DC RAID Controller
Manufacturer	DELL
Status	OK
PNP Device ID	PCI\VEN_1000&DEV_0408&SUBSYS_00021028&REV_07\5&230D0D0F&0&700010
Memory Address	0xD93F0000-0xD93FFFFF
Memory Address	0xDFCC0000-0xDFCFFFFF
IRQ Channel	IRQ 18
Driver	c:\windows\system32\drivers\mraid35x.sys (6.46.3.64 built by: WinDDK, 36.00 KB (36,864 bytes), 11/22/2005 10:01 PM)
Name	DELL PERC 4e/DC RAID Controller
Manufacturer	DELL
Status	OK
PNP Device ID	PCI\VEN_1000&DEV_0408&SUBSYS_00021028&REV_07\5&266C47C5&0&700020

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Memory Address 0xD92F0000-0xD92FFFFF
 Memory Address 0xDF9C0000-0xDF9FFFFF
 IRQ Channel IRQ 18
 Driver c:\windows\system32\drivers\mraid35x.sys (6.46.3.64 built by:
 WinDDK, 36.00 KB (36,864 bytes), 11/22/2005 10:01 PM)

Name DELL PERC 4e/DC RAID Controller
 Manufacturer DELL
 Status OK
 PNP Device ID
 PCI\VEN_1000&DEV_0408&SUBSYS_00021028&REV_07\5&
 6E1FF5D&0&700028
 Memory Address 0xD91F0000-0xD91FFFFF
 Memory Address 0xDF6C0000-0xDF6FFFFF
 IRQ Channel IRQ 18
 Driver c:\windows\system32\drivers\mraid35x.sys (6.46.3.64 built by:
 WinDDK, 36.00 KB (36,864 bytes), 11/22/2005 10:01 PM)

Name DELL PERC 4e/Di RAID Controller
 Manufacturer DELL
 Status OK
 PNP Device ID
 PCI\VEN_1028&DEV_0013&SUBSYS_016F1028&REV_06\5&
 18D0E4AD&0&700038
 Memory Address 0xD90F0000-0xD90FFFFF
 Memory Address 0xDF0C0000-0xDF0FFFFF
 IRQ Channel IRQ 110
 Driver c:\windows\system32\drivers\mraid35x.sys (6.46.3.64 built by:
 WinDDK, 36.00 KB (36,864 bytes), 11/22/2005 10:01 PM)

[IDE]

Item Value
 Name Intel(R) 82801EB Ultra ATA Storage Controllers - 24DB
 Manufacturer Intel
 Status OK
 PNP Device ID
 PCI\VEN_8086&DEV_24DB&SUBSYS_016F1028&REV_02\3
 &13C0B0C5&0&F9
 I/O Port 0x0000FC00-0x0000FC0F
 Memory Address 0xFEBFFC00-0xFEBFFFFF
 Driver c:\windows\system32\drivers\intelide.sys (5.2.3790.1830
 (srv03_sp1_rtm.050324-1447), 9.00 KB (9,216 bytes), 11/22/2005 10:16 PM)

Name Primary IDE Channel
 Manufacturer (Standard IDE ATA/ATAPI controllers)
 Status OK
 PNP Device ID PCI\IDE\IDECHANNEL\4&16A8F7F1&0&0
 I/O Port 0x000001F0-0x000001F7
 I/O Port 0x000003F6-0x000003F6
 IRQ Channel IRQ 14
 Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.1830
 (srv03_sp1_rtm.050324-1447), 145.00 KB (148,480 bytes), 3/25/2005 6:00
 AM)

Name Secondary IDE Channel
 Manufacturer (Standard IDE ATA/ATAPI controllers)
 Status OK
 PNP Device ID PCI\IDE\IDECHANNEL\4&16A8F7F1&0&1
 I/O Port 0x00000170-0x00000177
 I/O Port 0x00000376-0x00000376
 IRQ Channel IRQ 15
 Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.1830
 (srv03_sp1_rtm.050324-1447), 145.00 KB (148,480 bytes), 3/25/2005 6:00
 AM)

[Printing]

Name	Driver	Port Name	Server Name
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[Problem Devices]

Device	PNP Device ID	Error Code
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Broadcom NetXtreme Gigabit Ethernet #2
 PCI\VEN_14E4&DEV_1648&SUBSYS_016F1028&REV_10\5&
 3BFB1AC&0&110230 This device is disabled.

[USB]

Device PNP Device ID
 Intel(R) 82801EB USB Universal Host Controller - 24D2
 PCI\VEN_8086&DEV_24D2&SUBSYS_016F1028&REV_02\3&
 13C0B0C5&0&E8
 Intel(R) 82801EB USB Universal Host Controller - 24D4
 PCI\VEN_8086&DEV_24D4&SUBSYS_016F1028&REV_02\3&
 13C0B0C5&0&E9
 Intel(R) 82801EB USB Universal Host Controller - 24D7
 PCI\VEN_8086&DEV_24D7&SUBSYS_016F1028&REV_02\3&
 13C0B0C5&0&EA
 Intel(R) 82801EB USB2 Enhanced Host Controller - 24DD
 PCI\VEN_8086&DEV_24DD&SUBSYS_016F1028&REV_02\3
 &13C0B0C5&0&EF

[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		
	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
afd	AFD	c:\windows\system32\drivers\afd.sys	Kernel		
Driver	Yes	System	Running	OK	Normal
	Yes				No
aic78u2	aic78u2	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No
aic78xx	aic78xx	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No
aliide	AliIde	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No
amdide	AmdIde	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No
arc	arc	Not Available	Kernel Driver	No	No
	Disabled	Stopped	OK	Normal	No
asynccmac	RAS Asynchronous Media Driver		Kernel Driver		
	c:\windows\system32\drivers\asynccmac.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
ati2mtag	ati2mtag	c:\windows\system32\drivers\ati2mtag.sys	Kernel		
Driver	Yes	Manual	Running	OK	Ignore
	Yes				No
atmarpc	ATM ARP Client Protocol		Kernel Driver		
	c:\windows\system32\drivers\atmarpc.sys		Kernel Driver		
	No	Manual	Stopped	OK	Normal
	No				No

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audstub	Audio Stub Driver	c:\windows\system32\drivers\audstub.sys	Yes	Boot	Running	OK	Normal	No
	Kernel Driver	Yes	Manual	Running	OK			
	Normal	No	Yes					
b57nd	Broadcom NetXtreme Gigabit Ethernet		gpc	Generic Packet Classifier				
	c:\windows\system32\drivers\b57amd64.sys	Kernel Driver	Yes	Manual	Running	OK	Kernel Driver	Normal
	Yes	Manual	Running	OK	Normal	No		
	Yes							
beep	Beep	c:\windows\system32\drivers\beep.sys	Kernel					
Driver	Yes	System	Running	OK	Normal	No	Kernel Driver	Ignore
	Yes							
cdac15ba	CdaC15BA	c:\windows\system32\drivers\cdac15ba.sys	hpciss	hpciss	Not Available	Kernel Driver	No	
	Kernel Driver	Yes	Auto	Running	OK			
	Normal	No	Yes					
cdad10ba	CdaD10BA	c:\windows\system32\drivers\cdad10ba.sys	http	HTTP	c:\windows\system32\drivers\http.sys	Kernel		
	Kernel Driver	Yes	Auto	Running	OK			
	Normal	No	Yes					
cdfs	Cdfs	c:\windows\system32\drivers\cdfs.sys	i2omgmt	i2omgmt	Not Available	Kernel Driver	No	
System Driver	Yes	Disabled	Running	OK	Normal	No	No	
	No	Yes						
cdrom	CD-ROM Driver	c:\windows\system32\drivers\cdrom.sys	i8042prt	i8042prt	c:\windows\system32\drivers\i8042prt.sys	Kernel		
	Kernel Driver	Yes	System	Running	OK			
	Normal	No	Yes					
changer	Changer	Not Available		Kernel Driver	No			
	System	Stopped	OK	Ignore	No	No		
clusdisk	Cluster Disk Driver	c:\windows\system32\drivers\clusdisk.sys	imapi	CD-Burning Filter Driver				
	Kernel Driver	No	Disabled	Stopped	OK			
	Normal	No	No					
cmdide	CmdIde	Not Available		Kernel Driver	No			
	Disabled	Stopped	OK	Normal	No	No		
cpqciissm	cpqciissm	Not Available		Kernel Driver	No			
	Disabled	Stopped	OK	Normal	No	No		
credisk	CRC Disk Filter Driver							
	c:\windows\system32\drivers\credisk.sys	Kernel Driver	Yes	Boot	Running	OK	Normal	No
	Yes							
dfsdriver	DfsDriver	c:\windows\system32\drivers\dfs.sys						
System Driver	Yes	Boot	Running	OK	Normal			
	No	Yes						
disk	Disk Driver	c:\windows\system32\drivers\disk.sys						
	Kernel Driver	Yes	Boot	Running	OK			
	Normal	No	Yes					
dmboot	dmboot	c:\windows\system32\drivers\dmboot.sys						
Driver	No	Disabled	Stopped	OK	Normal	No		
	No							
dmio	Logical Disk Manager Driver							
	c:\windows\system32\drivers\dmio.sys	Kernel Driver	Yes	Boot	Running	OK	Normal	No
	Yes							
dmload	dmload	c:\windows\system32\drivers\dmload.sys						
Driver	Yes	Boot	Running	OK	Normal	No		
	Yes							
dpti2o	dpti2o	Not Available		Kernel Driver	No			
	Disabled	Stopped	OK	Normal	No	No		
elxstor	elxstor	Not Available		Kernel Driver	No			
	Disabled	Stopped	OK	Normal	No	No		
fastfat	Fastfat	c:\windows\system32\drivers\fastfat.sys						
System Driver	Yes	Disabled	Running	OK	Normal			
	No	Yes						
fdc	Floppy Disk Controller Driver							
	c:\windows\system32\drivers\fdc.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
	Yes							
fips	Fips	c:\windows\system32\drivers\fips.sys						
Driver	Yes	System	Running	OK	Normal	No		
	Yes							
flpydisk	Floppy Disk Driver	c:\windows\system32\drivers\flpydisk.sys						
	Kernel Driver	Yes	Manual	Running	OK			
	Normal	No	Yes					
fltmgr	FltMgr	c:\windows\system32\drivers\fltmgr.sys						
System Driver	Yes	Boot	Running	OK	Normal			
	No	Yes						
ftdisk	Volume Manager Driver							
	c:\windows\system32\drivers\ftdisk.sys	Kernel Driver	Yes	System	Running	OK	Ignore	No
			Yes					

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modem Driver	Modem No	c:\windows\system32\drivers\modem.sys	Kernel No	pci	PCI Bus Driver Kernel Driver	c:\windows\system32\drivers\pci.sys	Kernel No
	Manual Stopped OK Ignore No				Critical No Yes	Yes Boot Running OK	
mouclass	Mouse Class Driver	c:\windows\system32\drivers\mouclass.sys	Kernel Driver	pciide Driver	PCIIde	c:\windows\system32\drivers\pciide.sys	Kernel No
	Normal No Yes		Yes System Running OK		Yes Boot Running OK	Normal No	
mouhid	Mouse HID Driver	c:\windows\system32\drivers\mouhid.sys	Kernel Driver	pemcia Driver	Pemcia	c:\windows\system32\drivers\pemcia.sys	Kernel No
	Ignore No Yes		Yes Manual Running OK		No Disabled Stopped OK	Normal No	
mountmgr	Mount Point Manager	c:\windows\system32\drivers\mountmgr.sys	Kernel Driver	pdcomp	PDCOMP	Not Available	Kernel Driver No
	Kernel Driver		Yes Boot Running OK		Manual Stopped OK	Ignore No No	
	Normal No Yes			pdframe	PDFRAME	Not Available	Kernel Driver
mraid35x Driver	mraid35x	c:\windows\system32\drivers\mraid35x.sys	Kernel Driver		No Manual Stopped OK	Ignore No	
	Yes Boot Running OK Normal No			pdreli	PDRELI	Not Available	Kernel Driver No
mrxdav	WebDav Client Redirector	c:\windows\system32\drivers\mrxdav.sys	File System Driver		Manual Stopped OK	Ignore No No	
	No Manual Stopped OK Normal No			pdframe	PDRFRAME	Not Available	Kernel Driver
					No Manual Stopped OK	Ignore No	
mrxsmb System Driver	MRXSMB	c:\windows\system32\drivers\mrxsmb.sys	File System Driver	pptpminiport	WAN Miniport (PPTP)		Kernel Driver Normal No
	No Yes		Yes System Running OK Normal		c:\windows\system32\drivers\raspptp.sys	Kernel Driver Normal No	
					Yes Manual Running OK		
msfs System Driver	Msfs	c:\windows\system32\drivers\msfs.sys	File System Driver	ptilink	Direct Parallel Link Driver		Kernel Driver Normal No
	No Yes		Yes System Running OK Normal		c:\windows\system32\drivers\ptilink.sys	Kernel Driver Normal No	
mssmbios	Microsoft System Management BIOS Driver	c:\windows\system32\drivers\mssmbios.sys	Kernel Driver		Yes Manual Running OK		
	Yes Manual Running OK Normal No			ql2300	ql2300	Not Available	Kernel Driver No
					Disabled Stopped OK	Normal No No	
mup System Driver	Mup	c:\windows\system32\drivers\mup.sys	File System Driver	rasacd	Remote Access Auto Connection Driver		Kernel Driver Normal No
	No Yes		Yes Boot Running OK Normal		c:\windows\system32\drivers\rasacd.sys	Kernel Driver Normal No	
ndis	NDIS System Driver	c:\windows\system32\drivers\ndis.sys	Kernel Driver		Yes System Running OK		
	Kernel Driver		Yes Boot Running OK	rasl2tp	WAN Miniport (L2TP)		Kernel Driver Normal No
	Normal No Yes				c:\windows\system32\drivers\rasl2tp.sys	Kernel Driver Normal No	
ndistapi	Remote Access NDIS TAPI Driver	c:\windows\system32\drivers\ndistapi.sys	Kernel Driver		Yes Manual Running OK		
	Yes Manual Running OK Normal No			raspppoe	Remote Access PPPOE Driver		Kernel Driver Normal No
					c:\windows\system32\drivers\raspppoe.sys	Kernel Driver Normal No	
ndisuio	NDIS Usermode I/O Protocol	c:\windows\system32\drivers\ndisuio.sys	Kernel Driver		Yes Manual Running OK		
	No Manual Stopped OK Normal No			raspti	Direct Parallel	c:\windows\system32\drivers\raspti.sys	Kernel Driver Normal No
					Kernel Driver	Yes Manual Running OK	
ndiswan	Remote Access NDIS WAN Driver	c:\windows\system32\drivers\ndiswan.sys	Kernel Driver		Normal No Yes		
	Yes Manual Running OK Normal No			rdbss System Driver	Rdbss	c:\windows\system32\drivers\rdbss.sys	File System Driver Normal
					No Yes	Yes System Running OK	
ndproxy	NDIS Proxy	c:\windows\system32\drivers\ndproxy.sys	Kernel Driver	rdpcedd Driver	RDPDCC	c:\windows\system32\drivers\rdpcedd.sys	Kernel Driver Ignore No
	Normal No Yes		Yes Manual Running OK		Yes System Running OK		
netbios	NetBIOS Interface	c:\windows\system32\drivers\netbios.sys	File System Driver	rdpdr	Terminal Server Device Redirector Driver		Kernel Driver Normal No
	Normal No Yes		Yes System Running OK		c:\windows\system32\drivers\rdpdr.sys	Kernel Driver Normal No	
netbt	NetBios over Tcpip	c:\windows\system32\drivers\netbt.sys	Kernel Driver		Yes Manual Running OK		
	Normal No Yes		Yes System Running OK	rdpwd Driver	RDPWD	c:\windows\system32\drivers\rdpwd.sys	Kernel Driver Ignore No
nfrd960	nfrd960	Not Available	Kernel Driver		Yes Manual Running OK		
	Disabled Stopped OK Normal No			redbook	Digital CD Audio Playback Filter Driver		Kernel Driver Normal No
					c:\windows\system32\drivers\redbook.sys	Kernel Driver Normal No	
npfs System Driver	Npfs	c:\windows\system32\drivers\npfs.sys	File System Driver		Yes System Running OK		
	No Yes		Yes System Running OK Normal	secdrv	Security Driver	c:\windows\system32\drivers\secdrv.sys	Kernel Driver Normal No
					Kernel Driver	Yes Auto Running OK	
ntfs System Driver	Ntfs	c:\windows\system32\drivers\ntfs.sys	File System Driver		Normal No Yes		
	No Yes		Yes Disabled Running OK Normal	serenum	Serenum Filter Driver	c:\windows\system32\drivers\serenum.sys	Kernel Driver Normal No
					Kernel Driver	Yes Manual Running OK	
null Driver	Null	c:\windows\system32\drivers\null.sys	Kernel Driver		Normal No Yes		
	Yes System Running OK Normal No			serial	Serial port driver	c:\windows\system32\drivers\serial.sys	Kernel Driver Ignore No
					Kernel Driver	Yes System Running OK	
parport Driver	Parport	c:\windows\system32\drivers\parport.sys	Kernel Driver		Ignore No Yes		
	No Manual Stopped OK Ignore No			sfloppy Driver	Sfloppy	c:\windows\system32\drivers\sfloppy.sys	Kernel Driver No
					No System Stopped OK	Ignore No	
partmgr	Partition Manager	c:\windows\system32\drivers\partmgr.sys	Kernel Driver		No		
	Kernel Driver		Yes Boot Running OK				
	Normal No Yes						

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simbad	Simbad	Not Available	Kernel Driver	No	wdica	WDICA	Not Available	Kernel Driver	No
	Disabled	Stopped	OK	Normal		Manual	Stopped	OK	Ignore
srv	Srv	c:\windows\system32\drivers\srv.sys	File		wlbs	Network Load Balancing			
System Driver	No	No	Manual	Stopped	OK	Normal			
swenum	Software Bus Driver	c:\windows\system32\drivers\swenum.sys	Kernel Driver	Yes	Manual	Running	OK		
	Normal	No	Yes						
symc8xx	symc8xx	Not Available	Kernel Driver	No					
	Disabled	Stopped	OK	Normal	No	No			
symmpi	symmpi	Not Available	Kernel Driver	No					
	Disabled	Stopped	OK	Normal	No	No			
sym_hi	sym_hi	Not Available	Kernel Driver	No					
	Disabled	Stopped	OK	Normal	No	No			
sym_u3	sym_u3	Not Available	Kernel Driver	No					
	Disabled	Stopped	OK	Normal	No	No			
tcpip	TCP/IP Protocol Driver								
	c:\windows\system32\drivers\tcpip.sys		Kernel Driver						
	Yes	System	Running	OK	Normal	No			
	Yes								
tdpipe	TDDPIPE	c:\windows\system32\drivers\tdpipe.sys	Kernel						
Driver	No	Manual	Stopped	OK	Ignore	No			
	No								
tdtcp	TDTCP	c:\windows\system32\drivers\tdtcp.sys	Kernel						
Driver	Yes	Manual	Running	OK	Ignore	No			
	Yes								
termdd	Terminal Device Driver								
	c:\windows\system32\drivers\termdd.sys		Kernel Driver						
	Yes	System	Running	OK	Normal	No			
	Yes								
toside	TosIde	Not Available	Kernel Driver	No					
	Disabled	Stopped	OK	Normal	No	No			
udfs	Udfs	c:\windows\system32\drivers\udfs.sys	File						
System Driver	No	Disabled	Stopped	OK	Normal				
	No	No							
ultra	ultra	Not Available	Kernel Driver	No					
	Disabled	Stopped	OK	Normal	No	No			
update	Microcode Update Driver								
	c:\windows\system32\drivers\update.sys		Kernel Driver						
	Yes	Manual	Running	OK	Normal	No			
	Yes								
usbccgp	Microsoft USB Generic Parent Driver								
	c:\windows\system32\drivers\usbccgp.sys		Kernel Driver						
	Yes	Manual	Running	OK	Normal	No			
	Yes								
usbhci	Microsoft USB 2.0 Enhanced Host Controller Miniport Driver								
	c:\windows\system32\drivers\usbhci.sys		Kernel Driver						
	Yes	Manual	Running	OK	Normal	No			
	Yes								
usbhub	USB2 Enabled Hub	c:\windows\system32\drivers\usbhub.sys	Kernel Driver	Yes	Manual	Running	OK		
	Normal	No	Yes						
usbstor	USB Mass Storage Driver								
	c:\windows\system32\drivers\usbstor.sys		Kernel Driver						
	No	Manual	Stopped	OK	Normal	No			
	No								
usbuhci	Microsoft USB Universal Host Controller Miniport Driver								
	c:\windows\system32\drivers\usbuhci.sys		Kernel Driver						
	Yes	Manual	Running	OK	Normal	No			
	Yes								
vgasave	VGA Display Controller.								
	c:\windows\system32\drivers\vga.sys		Kernel Driver						
	Yes	System	Running	OK	Ignore	No			
	Yes								
viaide	Vialde	Not Available	Kernel Driver	No					
	Disabled	Stopped	OK	Normal	No	No			
volsnap	Storage volumes	c:\windows\system32\drivers\volsnap.sys	Kernel Driver	Yes	Boot	Running	OK		
	Normal	No	Yes						
wanarp	Remote Access IP ARP Driver								
	c:\windows\system32\drivers\wanarp.sys		Kernel Driver						
	Yes	Manual	Running	OK	Normal	No			
	Yes								
[Signed Drivers]									
	Device Name	Signed	Device Class	Driver Version					
	Driver Date	Manufacturer	INF Name	Driver					
	Name	Device ID							
	Microsoft	System Management BIOS Driver	Yes	SYSTEM					
	5.2.3790.1830	10/1/2002 (Standard system devices)							
	machine.inf	Not Available							
	ROOTSYSTEM\0002								
	Microcode Update Device	Yes	SYSTEM	5.2.3790.1830					
	10/1/2002 (Standard system devices)	machine.inf							
	Not Available	ROOTSYSTEM\0001							
	Plug and Play Software Device Enumerator	Yes	SYSTEM						
	5.2.3790.1830	10/1/2002 (Standard system devices)							
	machine.inf	Not Available							
	ROOTSYSTEM\0000								
	Terminal Server Mouse Driver	Yes	SYSTEM	5.2.3790.1830					
	10/1/2002 (Standard system devices)	machine.inf							
	Not Available	ROOTRDP_MOU\0000							
	Terminal Server Keyboard Driver	Yes	SYSTEM						
	5.2.3790.1830	10/1/2002 (Standard system devices)							
	machine.inf	Not Available							
	ROOTRDP_KBD\0000								
	Terminal Server Device Redirector	Yes	SYSTEM						
	5.2.3790.1830	10/1/2002 (Standard system devices)							
	machine.inf	Not Available							
	ROOTRDPDR\0000								
	Direct Parallel	Yes	NET	5.2.3790.1830					
	10/1/2002								
	Microsoft	netrasa.inf	Not Available						
	ROOTMS_PTMINIPORT\0000								
	WAN Miniport (PPTP)	Yes	NET	5.2.3790.1830					
	10/1/2002	Microsoft	netrasa.inf	Not Available					
	ROOTMS_PPTPMINIPORT\0000								
	WAN Miniport (PPPOE)	Yes	NET	5.2.3790.1830					
	10/1/2002	Microsoft	netrasa.inf	Not Available					
	ROOTMS_PPPOEMINIPORT\0000								
	WAN Miniport (IP)	Yes	NET	5.2.3790.1830					
	10/1/2002	Microsoft	netrasa.inf	Not Available					
	ROOTMS_NDISWANIP\0000								
	WAN Miniport (L2TP)	Yes	NET	5.2.3790.1830					
	10/1/2002	Microsoft	netrasa.inf	Not Available					
	ROOTMS_L2TPMINIPORT\0000								
	Video Codecs	Yes	MEDIA	5.2.3790.1830					
	10/1/2002	(Standard system devices)	wave.inf	Not Available					
	ROOTMEDIA\MS_MMVID								
	Legacy Video Capture Devices	Yes	MEDIA	5.2.3790.1830					
	10/1/2002 (Standard system devices)	wave.inf	Not						
	Available	ROOTMEDIA\MS_MMVCD							
	Media Control Devices	Yes	MEDIA	5.2.3790.1830					
	10/1/2002 (Standard system devices)	wave.inf	Not						
	Available	ROOTMEDIA\MS_MMMCI							
	Legacy Audio Drivers	Yes	MEDIA	5.2.3790.1830					
	10/1/2002	(Standard system devices)	wave.inf	Not Available					
	ROOTMEDIA\MS_MMDRV								
	Audio Codecs	Yes	MEDIA	5.2.3790.1830					
	10/1/2002	(Standard system devices)	wave.inf	Not Available					
	ROOTMEDIA\MS_MMACM								
	Remote Access IP ARP Driver	Not Available	LEGACYDRIVER						
	Not Available	Not Available	Not Available						
	Not Available	Not Available	Not Available						
	ROOTLEGACY_WANARP\0000								
	volsnap	Not Available	LEGACYDRIVER	Not Available					
	Not Available	Not Available	Not Available						
	Not Available	Not Available	Not Available						
	ROOTLEGACY_VOLSNAP\0000								
	VGA Display Controller.	Not Available	LEGACYDRIVER						
	Not Available	Not Available	Not Available						

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	Not Available	Not Available	Fips	Not Available	LEGACYDRIVER	Not Available
	ROOTLEGACY_VGASAVE\0000			Not Available	Not Available	Not Available
TDTCP	Not Available	LEGACYDRIVER	Not Available	Not Available	ROOTLEGACY_FIPS\0000	
	Not Available	Not Available	dmload	Not Available	LEGACYDRIVER	Not Available
	Not Available	ROOTLEGACY_TDTCP\0000		Not Available	Not Available	Not Available
TCP/IP Protocol Driver	Not Available	LEGACYDRIVER		Not Available	ROOTLEGACY_DMLOAD\0000	
	Not Available	Not Available	dmboot	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available		Not Available	Not Available	Not Available
	ROOTLEGACY_TCPIP\0000			Not Available	ROOTLEGACY_DMBOOT\0000	
Security Driver	Not Available	LEGACYDRIVER		CRC Disk Filter Driver	Not Available	LEGACYDRIVER
Available	Not Available	Not Available		Not Available	Not Available	Not Available
	Not Available	ROOTLEGACY_SECDRV\0000		Not Available	Not Available	
RDPWD	Not Available	LEGACYDRIVER		ROOTLEGACY_CRCDISK\0000		
	Not Available	Not Available		CdaD10BA	Not Available	LEGACYDRIVER
	Not Available	ROOTLEGACY_RDPWD\0000		Available	Not Available	Not Available
RDP added	Not Available	LEGACYDRIVER		Not Available	ROOTLEGACY_CDAD10BA\0000	
	Not Available	Not Available		CdaC15BA	Not Available	LEGACYDRIVER
	Not Available	ROOTLEGACY_RDP added\0000		Available	Not Available	Not Available
Remote Access Auto Connection Driver	Not Available			Not Available	ROOTLEGACY_CDAC15BA\0000	
	LEGACYDRIVER	Not Available		Beep	Not Available	LEGACYDRIVER
	Not Available	Not Available			Not Available	Not Available
	ROOTLEGACY_RASACD\0000				Not Available	ROOTLEGACY_BEEP\0000
PCIIde	Not Available	LEGACYDRIVER		AFD	Not Available	LEGACYDRIVER
	Not Available	Not Available			Not Available	Not Available
	Not Available	ROOTLEGACY_PCIIDE\0000			Not Available	ROOTLEGACY_AFD\0000
Partition Manager	Not Available	LEGACYDRIVER		Generic volume	Yes	VOLUME 5.2.3790.1830
Available	Not Available	Not Available			Microsoft	volume.inf\Not Available
	Not Available	ROOTLEGACY_PARTMGR\0000			STORAGE\	VOLUME\1&30A96598&0&SIGNATUREEF00EF00
Null	Not Available	LEGACYDRIVER			OFFSETA0029CC00LENGTHB404E6600	
	Not Available	Not Available		Generic volume	Yes	VOLUME 5.2.3790.1830
	Not Available	ROOTLEGACY_NULL\0000			Microsoft	volume.inf\Not Available
NetBios over Tcpip	Not Available	LEGACYDRIVER			STORAGE\	VOLUME\1&30A96598&0&SIGNATUREEF00EF00
Available	Not Available	Not Available			OFFSET7E00LENGTHA00294E00	
	Not Available	ROOTLEGACY_NETBT\0000		Generic volume	Yes	VOLUME 5.2.3790.1830
NDProxy	Not Available	LEGACYDRIVER			Microsoft	volume.inf\Not Available
	Not Available	Not Available			STORAGE\	VOLUME\1&30A96598&0&SIGNATURE58913C5
	Not Available	ROOTLEGACY_NDPROXY\0000			DOFFSET1790B5A200LENGTH5EF7BEEA00	
NDIS Usermode I/O Protocol	Not Available	LEGACYDRIVER		Generic volume	Yes	VOLUME 5.2.3790.1830
	Not Available	Not Available			Microsoft	volume.inf\Not Available
	Not Available	ROOTLEGACY_NDISUIO\0000			STORAGE\	VOLUME\1&30A96598&0&SIGNATURE58913C5
Remote Access NDIS TAPI Driver	Not Available				DOFFSETFE04BC400LENGTH7B069DE00	
	LEGACYDRIVER	Not Available		Generic volume	Yes	VOLUME 5.2.3790.1830
	Not Available	Not Available			Microsoft	volume.inf\Not Available
	ROOTLEGACY_NDISTAPI\0000				STORAGE\	VOLUME\1&30A96598&0&SIGNATURE58913C5
NDIS System Driver	Not Available	LEGACYDRIVER			DOFFSET7E00LENGTHFE04B4600	
Available	Not Available	Not Available		Generic volume	Yes	VOLUME 5.2.3790.1830
	Not Available	ROOTLEGACY_NDIS\0000			Microsoft	volume.inf\Not Available
mountmgr	Not Available	LEGACYDRIVER			STORAGE\	VOLUME\1&30A96598&0&SIGNATURE58913C5E
	Not Available	Not Available			OFFSET1790B5A200LENGTH5EF7BEEA00	
	Not Available	ROOTLEGACY_MOUNTMGR\0000		Generic volume	Yes	VOLUME 5.2.3790.1830
mmdd	Not Available	LEGACYDRIVER			Microsoft	volume.inf\Not Available
	Not Available	Not Available			STORAGE\	VOLUME\1&30A96598&0&SIGNATURE58913C5E
	Not Available	ROOTLEGACY_MN added\0000			OFFSETFE04BC400LENGTH7B069DE00	
ksecdd	Not Available	LEGACYDRIVER		Generic volume	Yes	VOLUME 5.2.3790.1830
	Not Available	Not Available			Microsoft	volume.inf\Not Available
	Not Available	ROOTLEGACY_KSECDD\0000			STORAGE\	VOLUME\1&30A96598&0&SIGNATURE58913C5E
IPSEC driver	Not Available	LEGACYDRIVER			OFFSET7E00LENGTHFE04B4600	
Available	Not Available	Not Available		Generic volume	Yes	VOLUME 5.2.3790.1830
	Not Available	ROOTLEGACY_IPSEC\0000			Microsoft	volume.inf\Not Available
IP Network Address Translator	Not Available	LEGACYDRIVER			STORAGE\	VOLUME\1&30A96598&0&SIGNATURE66F437B8
	Not Available	Not Available			OFFSET1790B5A200LENGTH5EF7BEEA00	
	Not Available	ROOTLEGACY_IPNAT\0000		Generic volume	Yes	VOLUME 5.2.3790.1830
HTTP	Not Available	LEGACYDRIVER			Microsoft	volume.inf\Not Available
	Not Available	Not Available			STORAGE\	VOLUME\1&30A96598&0&SIGNATURE66F437B8
	Not Available	ROOTLEGACY_HTTP\0000			OFFSETFE04BC400LENGTH7B069DE00	
Generic Packet Classifier	Not Available	LEGACYDRIVER		Generic volume	Yes	VOLUME 5.2.3790.1830
	Not Available	Not Available			Microsoft	volume.inf\Not Available
	Not Available	ROOTLEGACY_GPC\0000			STORAGE\	VOLUME\1&30A96598&0&SIGNATURE66F437B8
	Not Available	Not Available			OFFSET7E00LENGTHFE04B4600	
	Not Available	Not Available		Generic volume	Yes	VOLUME 5.2.3790.1830
	Not Available	Not Available			Microsoft	volume.inf\Not Available
	Not Available	Not Available			STORAGE\	VOLUME\1&30A96598&0&SIGNATURE66F437B9
	Not Available	Not Available			OFFSET1790B5A200LENGTH80730C00	

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Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002	Floppy disk drive	Yes	FLOPPYDISK	5.2.3790.1830
Microsoft volume.inf	Not Available			10/1/2002 (Standard floppy disk drives)			flpydisk.inf
STORAGE\VOLUME\1&30A96598&0&SIGNATURE66F437B9				Not Available			
OFFSETFE04BC400LENGTH7B069DE00				FDC\GENERIC_FLOPPY_DRIVE\5&14BBD7CB&0&0			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002	Standard floppy disk controller	Yes	FDC	5.2.3790.1830
Microsoft volume.inf	Not Available			10/1/2002 (Standard floppy disk controllers)			fdc.inf
STORAGE\VOLUME\1&30A96598&0&SIGNATURE66F437B9				Not Available		ACPI\PNP0700\4&26DD0F47&0	
OFFSET7E00LENGTHFE04B4600				System timer	Yes	SYSTEM	5.2.3790.1830
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002	(Standard system devices)		machine.inf	Not
Microsoft volume.inf	Not Available			Available		ACPI\PNP0100\4&26DD0F47&0	
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB52C4B0				System CMOS/real time clock	Yes	SYSTEM	5.2.3790.1830
10FFSET1790B5A200LENGTH5EF7BEEA00				10/1/2002 (Standard system devices)		machine.inf	
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002	Not Available		ACPI\PNP0B00\4&26DD0F47&0	
Microsoft volume.inf	Not Available			System speaker	Yes	SYSTEM	5.2.3790.1830
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB52C4B0				(Standard system devices)		machine.inf	Not
10FFSETFE04BC400LENGTH7B069DE00				Available		ACPI\PNP0800\4&26DD0F47&0	
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002	Programmable interrupt controller	Yes	SYSTEM	
Microsoft volume.inf	Not Available			5.2.3790.1830		10/1/2002 (Standard system devices)	
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB52C4B0				machine.inf		Not Available	
10FFSET7E00LENGTHFE04B4600				ACPI\PNP0000\4&26DD0F47&0			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002	Numeric data processor	Yes	SYSTEM	5.2.3790.1830
Microsoft volume.inf	Not Available			10/1/2002 (Standard system devices)		machine.inf	
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB52C4B0				Not Available		ACPI\PNP0C04\4&26DD0F47&0	
00FFSET181128AE00LENGTH5E774BDE00				Direct memory access controller	Yes	SYSTEM	5.2.3790.1830
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002	10/1/2002 (Standard system devices)		machine.inf	
Microsoft volume.inf	Not Available			Not Available		ACPI\PNP0200\4&26DD0F47&0	
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB52C4B0				Intel(R) 82801EB LPC Interface Controller - 24D0	Yes	SYSTEM	
00FFSETFE04BC400LENGTHH830DCEA00				5.2.3790.1830		10/1/2002 Intel	machine.inf
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002	Not Available			
Microsoft volume.inf	Not Available			PCI\VEN_8086&DEV_24D0&SUBSYS_00000000&REV_02\3&13C0B0C5&0&F8			
STORAGE\VOLUME\1&30A96598&0&SIGNATUREB52C4B0				Default Monitor	Yes	MONITOR	5.2.3790.1830
00FFSET7E00LENGTHFE04B4600				10/1/2002 (Standard monitor types)		monitor.inf	
Volume Manager	Yes	SYSTEM 5.2.3790.1830	10/1/2002	Not Available			
(Standard system devices)		machine.inf	Not	DISPLAY\DEFAULT_MONITOR\5&199D9B00&0&10000000&1A&00			
Available		ROOT\FTDISK\0000		Radeon 7000 / RADEON VE Family (Microsoft Corporation)	Yes		
Logical Disk Manager	Yes	SYSTEM 5.2.3790.1830	10/1/2002	DISPLAY 6.14.10.6508		12/3/2004 ATI Technologies	
(Standard system devices)		machine.inf	Not	Inc.		atiixpag.inf	Not Available
Available		ROOT\DMIO\0000		PCI\VEN_1002&DEV_5159&SUBSYS_016F1028&REV_00\4&1F7DBC9F&0&00F0			
ACPI Fixed Feature Button	Yes	SYSTEM 5.2.3790.1830		Intel(R) 82801 PCI Bridge - 244E	Yes	SYSTEM	
10/1/2002 (Standard system devices)		machine.inf		5.2.3790.1830		10/1/2002 Intel	machine.inf
Not Available		ACPI\FIXEDBUTTON\2&DABA3FF&0		Not Available			
High precision event timer	Yes	SYSTEM 5.2.3790.1830		PCI\VEN_8086&DEV_244E&SUBSYS_00000000&REV_C2\3&13C0B0C5&0&F0			
10/1/2002 (Standard system devices)		machine.inf		Generic USB Hub	Yes	USB	5.2.3790.1830
Not Available		ACPI\PNP0103\0		(Generic USB Hub)		usb.inf	Not Available
Motherboard resources	Yes	SYSTEM 5.2.3790.1830		USB\VID_413C&PID_A001\5&227234D6&0&3			
10/1/2002 (Standard system devices)		machine.inf		USB Root Hub	Yes	USB	5.2.3790.1830
Not Available		ACPI\PNP0C02\1		(Standard USB Host Controller)		usbport.inf	Not Available
Motherboard resources	Yes	SYSTEM 5.2.3790.1830		USB\ROOT_HUB20\4&36AC53BE&0			
10/1/2002 (Standard system devices)		machine.inf		Intel(R) 82801EB USB2 Enhanced Host Controller - 24DD	Yes		
Not Available		ACPI\PNP0C02\0		USB	5.2.3790.1830	10/1/2002 Intel	usbport.inf
Secondary IDE Channel	Yes	HDC 5.2.3790.1830		Not Available			
10/1/2002 (Standard IDE ATA/ATAPI controllers)		mshdc.inf		PCI\VEN_8086&DEV_24DD&SUBSYS_016F1028&REV_02\3&13C0B0C5&0&EF			
Not Available		PCI\IDE\IDECHANNEL\4&16A8F7F1&0&1		HID-compliant consumer control device	Yes	HIDCLASS	
CD-ROM Drive	Yes	CDROM 5.2.3790.1830	10/1/2002	5.2.3790.1830		10/1/2002 Microsoft	hidserv.inf
(Standard CD-ROM drives)		cdrom.inf	Not Available	Available			
IDE\CDROMSAMSUNG_CD-ROM_SN-				HID\VID_0518&PID_0001&MI_01&COL03\7&11BB4CBB&0&0002			
124_____N103_____5&31A9A455&0&0.0.0				HID-compliant device	Yes	HIDCLASS	5.2.3790.1830
Primary IDE Channel	Yes	HDC 5.2.3790.1830	10/1/2002	10/1/2002 (Standard system devices)		input.inf	Not
(Standard IDE ATA/ATAPI controllers)		mshdc.inf	Not	Available			
Available		PCI\IDE\IDECHANNEL\4&16A8F7F1&0&0		HID\VID_0518&PID_0001&MI_01&COL02\7&11BB4CBB&0&0001			
Intel(R) 82801EB Ultra ATA Storage Controllers - 24DB	Yes			HID-compliant mouse	Yes	MOUSE	5.2.3790.1830
HDC	5.2.3790.1830	10/1/2002 Intel	mshdc.inf	Microsoft		msmouse.inf	Not Available
Not Available				HID\VID_0518&PID_0001&MI_01&COL01\7&11BB4CBB&0&0000			
PCI\VEN_8086&DEV_24DB&SUBSYS_016F1028&REV_02\3&13C0B0C5&0&F9				USB Human Interface Device	Yes	HIDCLASS	
System board	Yes	SYSTEM 5.2.3790.1830	10/1/2002	5.2.3790.1830		10/1/2002 (Standard system devices)	
(Standard system devices)		machine.inf	Not				
Available		ACPI\PNP0C01\4&26DD0F47&0					
Communications Port	Yes	PORTS 5.2.3790.1830	10/1/2002				
(Standard port types)		msports.inf	Not Available				
ACPI\PNP0501\1							

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input.inf	Not Available				Not Available
HID Keyboard Device	Yes	KEYBOARD			PCI\VEN_8086&DEV_261D&SUBSYS_00000000&REV_00\3&13C0B0C5&0&9E
5.2.3790.1830	10/1/2002	(Standard keyboards)			PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
keyboard.inf	Not Available				10/1/2002 (Standard system devices) machine.inf
HID\VID_0518&PID_0001&MI_00\7&121BF107&0&0000					Not Available
USB Human Interface Device	Yes	HIDCLASS			PCI\VEN_8086&DEV_261C&SUBSYS_00000000&REV_00\3&13C0B0C5&0&9D
5.2.3790.1830	10/1/2002	(Standard system devices)			PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
input.inf	Not Available				10/1/2002 (Standard system devices) machine.inf
USB\VID_0518&PID_0001&MI_00\6&39FF271C&0&0000					Not Available
USB Composite Device	Yes	USB	5.2.3790.1830		PCI\VEN_8086&DEV_261B&SUBSYS_00000000&REV_00\3&13C0B0C5&0&9C
10/1/2002	(Standard USB Host Controller)	usb.inf	Not Available		PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
Available	USB\VID_0518&PID_0001\5&12282430&0&2				10/1/2002 (Standard system devices) machine.inf
HID-compliant consumer control device	Yes	HIDCLASS			Not Available
5.2.3790.1830	10/1/2002	Microsoft hidserv.inf	Not Available		PCI\VEN_8086&DEV_261A&SUBSYS_00000000&REV_00\3&13C0B0C5&0&9B
Available	HID\VID_0518&PID_0001&MI_01&COL03\7&35583EE6&0&0				PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
002					10/1/2002 (Standard system devices) machine.inf
HID-compliant device	Yes	HIDCLASS	5.2.3790.1830		Not Available
10/1/2002	(Standard system devices)	input.inf	Not Available		PCI\VEN_8086&DEV_2619&SUBSYS_00000000&REV_00\3&13C0B0C5&0&9A
Available	HID\VID_0518&PID_0001&MI_01&COL02\7&35583EE6&0&0				PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
001					10/1/2002 (Standard system devices) machine.inf
HID-compliant mouse	Yes	MOUSE	5.2.3790.1830	10/1/2002	Not Available
Microsoft	msmouse.inf	Not Available			PCI\VEN_8086&DEV_2618&SUBSYS_00000000&REV_00\3&13C0B0C5&0&99
Available	HID\VID_0518&PID_0001&MI_01&COL01\7&35583EE6&0&0				PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
000					10/1/2002 (Standard system devices) machine.inf
USB Human Interface Device	Yes	HIDCLASS			Not Available
5.2.3790.1830	10/1/2002	(Standard system devices)			PCI\VEN_8086&DEV_2617&SUBSYS_00000000&REV_00\3&13C0B0C5&0&98
input.inf	Not Available				PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
USB\VID_0518&PID_0001&MI_01\6&111E0DBA&0&0001					10/1/2002 (Standard system devices) machine.inf
HID Keyboard Device	Yes	KEYBOARD			Not Available
5.2.3790.1830	10/1/2002	(Standard keyboards)			PCI\VEN_8086&DEV_2615&SUBSYS_00000000&REV_00\3&13C0B0C5&0&8A
keyboard.inf	Not Available				PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
HID\VID_0518&PID_0001&MI_00\7&11810124&0&0000					10/1/2002 (Standard system devices) machine.inf
USB Human Interface Device	Yes	HIDCLASS			Not Available
5.2.3790.1830	10/1/2002	(Standard system devices)			PCI\VEN_8086&DEV_2614&SUBSYS_00000000&REV_00\3&13C0B0C5&0&89
input.inf	Not Available				PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
USB\VID_0518&PID_0001&MI_00\6&111E0DBA&0&0000					10/1/2002 (Standard system devices) machine.inf
USB Composite Device	Yes	USB	5.2.3790.1830		Not Available
10/1/2002	(Standard USB Host Controller)	usb.inf	Not Available		PCI\VEN_8086&DEV_2613&SUBSYS_00000000&REV_00\3&13C0B0C5&0&88
Available	USB\VID_0518&PID_0001\5&12282430&0&1				PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
USB Root Hub	Yes	USB	5.2.3790.1830	10/1/2002	10/1/2002 (Standard system devices) machine.inf
(Standard USB Host Controller)	usbport.inf	Not Available			Not Available
USB\ROOT_HUB\4&56E8D8E&0					PCI\VEN_8086&DEV_2612&SUBSYS_00000000&REV_00\3&13C0B0C5&0&87
Intel(R) 82801EB USB Universal Host Controller - 24D7	Yes				PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
USB	5.2.3790.1830	10/1/2002	Intel	usbport.inf	10/1/2002 (Standard system devices) machine.inf
Not Available					Not Available
PCI\VEN_8086&DEV_24D7&SUBSYS_016F1028&REV_02\3&13C0B0C5&0&EA					PCI\VEN_8086&DEV_2611&SUBSYS_00000000&REV_00\3&13C0B0C5&0&81
USB Root Hub	Yes	USB	5.2.3790.1830	10/1/2002	PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
(Standard USB Host Controller)	usbport.inf	Not Available			10/1/2002 (Standard system devices) machine.inf
USB\ROOT_HUB\4&2978E436&0					Not Available
Intel(R) 82801EB USB Universal Host Controller - 24D4	Yes				PCI\VEN_8086&DEV_2610&SUBSYS_00000000&REV_00\3&13C0B0C5&0&80
USB	5.2.3790.1830	10/1/2002	Intel	usbport.inf	PCI standard RAM Controller Yes SYSTEM 5.2.3790.1830
Not Available					10/1/2002 (Standard system devices) machine.inf
PCI\VEN_8086&DEV_24D4&SUBSYS_016F1028&REV_02\3&13C0B0C5&0&E9					Not Available
USB Root Hub	Yes	USB	5.2.3790.1830	10/1/2002	PCI\VEN_8086&DEV_2627&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&7F
(Standard USB Host Controller)	usbport.inf	Not Available			PCI standard RAM Controller Yes SYSTEM 5.2.3790.1830
USB\ROOT_HUB\4&39104496&0					10/1/2002 (Standard system devices) machine.inf
Intel(R) 82801EB USB Universal Host Controller - 24D2	Yes				Not Available
USB	5.2.3790.1830	10/1/2002	Intel	usbport.inf	PCI\VEN_8086&DEV_2626&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&7E
Not Available					
PCI\VEN_8086&DEV_24D2&SUBSYS_016F1028&REV_02\3&13C0B0C5&0&E8					
PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830		
10/1/2002	(Standard system devices)	machine.inf			
Not Available					
PCI\VEN_8086&DEV_261E&SUBSYS_00000000&REV_00\3&13C0B0C5&0&9F					
PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830		
10/1/2002	(Standard system devices)	machine.inf			

Appendix A

PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830		Intel(R) 6700PXH PCI Express-to-PCI Bridge A - 0329	Yes	SYSTEM	5.2.3790.1830	10/1/2002	Intel	machine.inf		
13C0B0C5&0&4B													
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830		PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830					
13C0B0C5&0&4A													
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830		PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830					
13C0B0C5&0&49													
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830		Disk drive	Yes	DISKDRIVE	5.2.3790.1830	10/1/2002				
13C0B0C5&0&48													
PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830		Disk drive	Yes	DISKDRIVE	5.2.3790.1830	10/1/2002				
13C0B0C5&0&40													
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830		RAID Virtual Device	Yes	SYSTEM	6.46.3.64	1/4/2005	DELL			
35432062&0&0238													
Disk drive	Yes	DISKDRIVE	5.2.3790.1830	10/1/2002									
13C0B0C5&0&30													
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830		DELL PV22XS Backplane	Yes	SYSTEM	5.2.3790.1830					
35432062&0&0238													
Disk drive	Yes	DISKDRIVE	5.2.3790.1830	10/1/2002									
13C0B0C5&0&30													
RAID Virtual Device	Yes	SYSTEM	6.46.3.64	1/4/2005	DELL								
35432062&0&0238													
PE 1x5 Backplane	Yes	SYSTEM	5.2.3790.1830	10/1/2002									
13C0B0C5&0&30													
RAID Virtual Device	Yes	SYSTEM	6.46.3.64	1/4/2005	DELL								
35432062&0&0238													
PE 1x5 Backplane	Yes	SYSTEM	5.2.3790.1830	10/1/2002									
13C0B0C5&0&30													
DELL PERC 4e/Di RAID Controller	Yes	SCSIADAPTER	6.46.3.64	1/4/2005	DELL	oem1.inf	Not Available						
18D0E4AD&0&700038													
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830										
35432062&0&0038													
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830										
13C0B0C5&0&38													
Broadcom NetXtreme Gigabit Ethernet	Yes	NET	7.98.0.0										
3BFB1AC&0&110230													
Broadcom NetXtreme Gigabit Ethernet	Yes	NET	7.98.0.0										
3BFB1AC&0&100230													
Intel(R) 6700PXH PCI Express-to-PCI Bridge B - 032A	Yes	SYSTEM	5.2.3790.1830	10/1/2002	Intel	machine.inf	Not Available						
2BB21864&0&0230													

Appendix A

SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.17\6&3484200D&0&060				Intel Processor	Yes	PROCESSOR	5.2.3790.1830
DELL PERC 4e/DC RAID Controller	Yes	SCSIADAPTER		10/1/2002 Intel	Not Available	cpu.inf	Not Available
6.46.3.64 1/4/2005 DELL oem1.inf	Not Available			ACPI\GENUINEINTEL_-EM64T_FAMILY_15_MODEL_4\15			
PCI\VEN_1000&DEV_0408&SUBSYS_00021028&REV_07\5&266C47C5&0&700020				Intel Processor	Yes	PROCESSOR	5.2.3790.1830
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	10/1/2002 Intel	Not Available	cpu.inf	Not Available
10/1/2002 (Standard system devices)		machine.inf		ACPI\GENUINEINTEL_-EM64T_FAMILY_15_MODEL_4\14			
Not Available				Intel Processor	Yes	PROCESSOR	5.2.3790.1830
PCI\VEN_8086&DEV_0330&SUBSYS_00000000&REV_07\4&190119FF&0&0020				10/1/2002 Intel	Not Available	cpu.inf	Not Available
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	ACPI\GENUINEINTEL_-EM64T_FAMILY_15_MODEL_4\13			
10/1/2002 (Standard system devices)		machine.inf		Intel Processor	Yes	PROCESSOR	5.2.3790.1830
Not Available				10/1/2002 Intel	Not Available	cpu.inf	Not Available
PCI\VEN_8086&DEV_2604&SUBSYS_00000000&REV_00\3&13C0B0C5&0&20				ACPI\GENUINEINTEL_-EM64T_FAMILY_15_MODEL_4\11			
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	Intel Processor	Yes	PROCESSOR	5.2.3790.1830
10/1/2002 (Standard system devices)		machine.inf		10/1/2002 Intel	Not Available	cpu.inf	Not Available
Not Available				ACPI\GENUINEINTEL_-EM64T_FAMILY_15_MODEL_4\10			
PCI\VEN_8086&DEV_2603&SUBSYS_00000000&REV_00\3&13C0B0C5&0&18				Intel Processor	Yes	PROCESSOR	5.2.3790.1830
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	10/1/2002 Intel	Not Available	cpu.inf	Not Available
10/1/2002 (Standard system devices)		machine.inf		ACPI\GENUINEINTEL_-EM64T_FAMILY_15_MODEL_4\9			
Not Available				Intel Processor	Yes	PROCESSOR	5.2.3790.1830
PCI\VEN_8086&DEV_0332&SUBSYS_00000000&REV_07\4&6501B9A&0&0210				10/1/2002 Intel	Not Available	cpu.inf	Not Available
Disk drive	Yes	DISKDRIVE	5.2.3790.1830	ACPI\GENUINEINTEL_-EM64T_FAMILY_15_MODEL_4\7			
(Standard disk drives)		disk.inf	10/1/2002	Intel Processor	Yes	PROCESSOR	5.2.3790.1830
Not Available				10/1/2002 Intel	Not Available	cpu.inf	Not Available
SCSI\DISK&VEN_PERC&PROD_LD_1_PERCRAID&REV_\6&C41C090&0&310				ACPI\GENUINEINTEL_-EM64T_FAMILY_15_MODEL_4\6			
Disk drive	Yes	DISKDRIVE	5.2.3790.1830	Intel Processor	Yes	PROCESSOR	5.2.3790.1830
(Standard disk drives)		disk.inf	10/1/2002	10/1/2002 Intel	Not Available	cpu.inf	Not Available
Not Available				ACPI\GENUINEINTEL_-EM64T_FAMILY_15_MODEL_4\5			
SCSI\DISK&VEN_PERC&PROD_LD_0_PERCRAID&REV_\6&C41C090&0&300				Intel Processor	Yes	PROCESSOR	5.2.3790.1830
RAID Virtual Device	Yes	SYSTEM	6.46.3.64	10/1/2002 Intel	Not Available	cpu.inf	Not Available
1/4/2005 DELL oem0.inf	Not Available			ACPI\GENUINEINTEL_-EM64T_FAMILY_15_MODEL_4\4			
SCSI\OTHER&VEN_RAID&PROD_DUMMYDEVICE&REV_0000\6&C41C090&0&2390				Intel Processor	Yes	PROCESSOR	5.2.3790.1830
DELL PV22XS Backplane	Yes	SYSTEM	5.2.3790.1830	10/1/2002 Intel	Not Available	cpu.inf	Not Available
10/1/2002 Dell scsidev.inf	Not Available			ACPI\GENUINEINTEL_-EM64T_FAMILY_15_MODEL_4\3			
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.17\6&C41C090&0&160				Intel Processor	Yes	PROCESSOR	5.2.3790.1830
DELL PV22XS Backplane	Yes	SYSTEM	5.2.3790.1830	10/1/2002 Intel	Not Available	cpu.inf	Not Available
10/1/2002 Dell scsidev.inf	Not Available			ACPI\GENUINEINTEL_-EM64T_FAMILY_15_MODEL_4\2			
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.17\6&C41C090&0&060				Intel Processor	Yes	PROCESSOR	5.2.3790.1830
DELL PERC 4e/DC RAID Controller	Yes	SCSIADAPTER		10/1/2002 Intel	Not Available	cpu.inf	Not Available
6.46.3.64 1/4/2005 DELL oem1.inf	Not Available			ACPI\GENUINEINTEL_-EM64T_FAMILY_15_MODEL_4\0			
PCI\VEN_1000&DEV_0408&SUBSYS_00021028&REV_07\5&230D0D0F&0&700010				Microsoft ACPI-Compliant System	Yes	SYSTEM	
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	5.2.3790.1830	10/1/2002	Microsoft acpi.inf	Not Available
10/1/2002 (Standard system devices)		machine.inf		Available	ACPI_HAL\PNP0C08\0		
Not Available				ACPI Multiprocessor x64-based PC	Yes	COMPUTER	
PCI\VEN_8086&DEV_0330&SUBSYS_00000000&REV_07\4&6501B9A&0&0010				5.2.3790.1830	10/1/2002 (Standard computers)	hal.inf	
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	Not Available	ROOT\ACPI_HAL\0000		
10/1/2002 (Standard system devices)		machine.inf		Not Available	Not Available	Not Available	Not Available
Not Available				Available	Not Available	Not Available	Not Available
PCI\VEN_8086&DEV_2602&SUBSYS_00000000&REV_00\3&13C0B0C5&0&10				Not Available	Not Available	HTREE\ROOT\0	
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	[Environment Variables]			
10/1/2002 (Standard system devices)		machine.inf		Variable	Value	User Name	
Not Available				ClusterLog	C:\WINDOWS\Cluster\cluster.log		
PCI\VEN_8086&DEV_2601&SUBSYS_00000000&REV_00\3&13C0B0C5&0&08					<SYSTEM>		
PCI standard host CPU bridge	Yes	SYSTEM	5.2.3790.1830	ComSpec	%SystemRoot%\system32\cmd.exe		<SYSTEM>
10/1/2002 (Standard system devices)		machine.inf		FP_NO_HOST_CHECK	NO		<SYSTEM>
Not Available				NUMBER_OF_PROCESSORS	16		<SYSTEM>
PCI\VEN_8086&DEV_2600&SUBSYS_00000000&REV_00\3&13C0B0C5&0&00				OS	Windows_NT		<SYSTEM>
PCI bus	Yes	SYSTEM	5.2.3790.1830	Path	%SystemRoot%\system32;%SystemRoot%;%SystemRoot%\System32\Wbem;C:\Program Files (x86)\Microsoft SQL Server\80\Tools\Binn\C:\Program Files\Microsoft SQL Server\90\Tools\bin\C:\Program Files (x86)\Microsoft SQL Server\90\Tools\bin\C:\Program Files (x86)\Microsoft SQL		
system devices)		machine.inf	10/1/2002 (Standard system devices)				
Not Available							
ACPI\PNP0A03\1							

Appendix A

Server\90\DTS\Binn\C:\Program Files (x86)\Microsoft SQL
 Server\90\Tools\Binn\VSShell\Common7\IDE\C:\Program Files\Microsoft
 SQL Server\MSSQL.1\MSSQL\Binn. <SYSTEM>
 PATHEXT

.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH
 <SYSTEM>

PROCESSOR_ARCHITECTURE AMD64 <SYSTEM>
 PROCESSOR_IDENTIFIER EM64T Family 15 Model 4 Stepping 8,
 GenuineIntel <SYSTEM>
 PROCESSOR_LEVEL 15 <SYSTEM>
 PROCESSOR_REVISION 0408 <SYSTEM>
 TEMP %SystemRoot%\TEMP <SYSTEM>
 TMP %SystemRoot%\TEMP <SYSTEM>
 windir %SystemRoot% <SYSTEM>
 TEMP %USERPROFILE%\Local Settings\Temp NT
 AUTHORITY\SYSTEM
 TMP %USERPROFILE%\Local Settings\Temp NT
 AUTHORITY\SYSTEM
 TEMP %USERPROFILE%\Local Settings\Temp NT
 AUTHORITY\NETWORK SERVICE
 TMP %USERPROFILE%\Local Settings\Temp NT
 AUTHORITY\NETWORK SERVICE
 TEMP %USERPROFILE%\Local Settings\Temp
 PE6800\Administrator
 TMP %USERPROFILE%\Local Settings\Temp
 PE6800\Administrator

[Print Jobs]

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

[Network Connections]

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

[Running Tasks]

Name	Path	Process ID	Priority	Min Working Set	Max
Working Set				File Date	
system idle process		Not Available		0	Not
Available	Not Available	Not Available		Not Available	
system	Not Available	4	8	0	1413120
	Not Available	Not Available		Not Available	
smss.exe	Not Available	404	11	204800	1413120
	12/12/2005 1:29 PM	Not Available		Not Available	
	Not Available				
csrss.exe	Not Available	544	13	Not Available	
	Not Available	12/12/2005 1:29 PM		Not Available	
	Not Available				
winlogon.exe	c:\windows\system32\winlogon.exe			600	
	13	204800	1413120	12/12/2005 1:29 PM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			901.00 KB	
	(922,624 bytes)	3/25/2005 6:00 AM			
services.exe	c:\windows\system32\services.exe			660	
	9	204800	1413120	12/12/2005 1:29 PM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			216.50 KB	
	(221,696 bytes)	3/25/2005 6:00 AM			
lsass.exe	c:\windows\system32\lsass.exe			204800	
	1413120	12/12/2005 1:29 PM	5.2.3790.1830		
	(srv03_sp1_rtm.050324-1447)			14.00 KB (14,336 bytes)	
	6:00 AM			3/25/2005	
svchost.exe	c:\windows\system32\svchost.exe			860	
	8	204800	1413120	12/12/2005 1:29 PM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			24.50 KB	
	(25,088 bytes)	3/25/2005 6:00 AM			

svchost.exe	Not Available	960	8	Not	
Available	Not Available	12/12/2005 1:30 PM		Not Available	
	Not Available	Not Available			
svchost.exe	Not Available	1016	8	Not	
Available	Not Available	12/12/2005 1:30 PM		Not Available	
	Not Available	Not Available			
svchost.exe	c:\windows\system32\svchost.exe			1080	
	8	204800	1413120	12/12/2005 1:30 PM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			24.50 KB	
	(25,088 bytes)	3/25/2005 6:00 AM			
msdtc.exe	Not Available	1228	8	Not Available	
	Not Available	12/12/2005 1:30 PM		Not Available	
	Not Available	Not Available			
inetinfo.exe	c:\windows\system32\inetrv\inetinfo.exe			1540	
	8	204800	1413120	12/12/2005 1:30 PM	
	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)			17.50 KB	
	(17,920 bytes)	11/23/2005 4:43 AM			
svchost.exe	c:\windows\system32\svchost.exe			1792	
	8	204800	1413120	12/12/2005 1:30 PM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			24.50 KB	
	(25,088 bytes)	3/25/2005 6:00 AM			
svchost.exe	c:\windows\system32\svchost.exe			344	
	8	204800	1413120	12/12/2005 1:30 PM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			24.50 KB	
	(25,088 bytes)	3/25/2005 6:00 AM			
csrss.exe	Not Available	552	13	Not Available	
	Not Available	12/12/2005 1:33 PM		Not Available	
	Not Available	Not Available			
winlogon.exe	c:\windows\system32\winlogon.exe			588	
	13	204800	1413120	12/12/2005 1:33 PM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			901.00 KB	
	(922,624 bytes)	3/25/2005 6:00 AM			
rdpclip.exe	c:\windows\system32\rdpclip.exe			1192	
	1413120	12/12/2005 1:34 PM	5.2.3790.1830		
	(srv03_sp1_rtm.050324-1447)			99.00 KB (101,376 bytes)	
	11/23/2005 4:25 AM				
explorer.exe	c:\windows\explorer.exe			1628	
	204800	1413120	12/12/2005 1:34 PM	6.00.3790.1830	
	(srv03_sp1_rtm.050324-1447)			1.30 MB (1,364,480 bytes)	
	6:00 AM			3/25/2005	
cmd.exe	c:\windows\system32\cmd.exe			1348	
	1413120	12/12/2005 1:34 PM	5.2.3790.1830		
	(srv03_sp1_rtm.050324-1447)			538.50 KB (551,424 bytes)	
	6:00 AM			3/25/2005	
sqlservr.exe	c:\program files\microsoft sql				
	server\mssql.1\mssql\bin\sqlservr.exe			248	
	1413120	12/12/2005 1:34 PM	2005.090.1399.00	13	
	(39,379,672 bytes)	10/14/2005 3:37 PM			
wmiprvse.exe	Not Available	1988	8	Not	
Available	Not Available	12/12/2005 1:34 PM		Not Available	
	Not Available	Not Available			
logon.scr	Not Available	2872	4	Not Available	
	Not Available	12/12/2005 1:40 PM		Not Available	
	Not Available	Not Available			
wpaaln.exe	c:\windows\system32\wpaaln.exe			2992	
	8	204800	1413120	12/13/2005 1:36 PM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			33.50 KB	
	(34,304 bytes)	3/25/2005 6:00 AM			
helpctr.exe	c:\windows\pchealth\helpctr\binaries\helpctr.exe			512	
	8	204800	1413120	12/14/2005 4:26 AM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			1.30 MB	
	(1,363,456 bytes)	11/23/2005 4:26 AM			
helpsvc.exe	c:\windows\pchealth\helpctr\binaries\helpsvc.exe				
	2172	8	204800	1413120	12/14/2005 4:26 AM
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)			1.52 MB	
	(1,591,296 bytes)	11/23/2005 4:26 AM			
wmiprvse.exe	Not Available	2440	8	Not	
Available	Not Available	12/14/2005 4:26 AM		Not Available	
	Not Available	Not Available			

[Loaded Modules]

Name	Version	Size	File Date	Manufacturer	Path
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Appendix A

winlogon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	901.00 KB	shlwapi	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	606.50 KB
(922,624 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(621,056 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\winlogon.exe			c:\windows\system32\shlwapi.dll	
ntdll	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.20 MB	sfc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.00 KB
(1,257,472 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(6,144 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ntdll.dll			c:\windows\system32\sfc.dll	
kernel32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.43 MB	sfc_os	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	183.50 KB
(1,500,160 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(187,904 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\kernel32.dll			c:\windows\system32\sfc_os.dll	
advapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.00 MB	wintrust	5.131.3790.1830 (srv03_sp1_rtm.050324-1447)	297.50 KB
(1,051,136 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(304,640 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\advapi32.dll			c:\windows\system32\wintrust.dll	
rpert4	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.63 MB	imagehlp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	57.50 KB
(1,714,176 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(58,880 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\rpert4.dll			c:\windows\system32\imagehlp.dll	
crypt32	5.131.3790.1830 (srv03_sp1_rtm.050324-1447)	1.36 MB	ole32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.43 MB
(1,428,992 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(2,543,616 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\crypt32.dll			c:\windows\system32\ole32.dll	
msasn1	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	152.50 KB	comctl32	6.0 (srv03_sp1_rtm.050324-1447)	1.51 MB (1,584,128 bytes)
(156,160 bytes)	3/25/2005 6:00 AM Microsoft Corporation			11/22/2005 10:06 PM Microsoft Corporation	
	c:\windows\system32\msasn1.dll			c:\windows\winsxs\amd64_microsoft.windows.common-controls_6595b64144ccf1df_6.0.3790.1830_x-ww_aced72af\comctl32.dll	
msvcrt	7.0.3790.1830 (srv03_sp1_rtm.050324-1447)	508.00 KB	winscard	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	230.00 KB
(520,192 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(235,520 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msvcrt.dll			c:\windows\system32\winscard.dll	
user32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.04 MB	wtsapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	29.00 KB
(1,085,952 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(29,696 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\user32.dll			c:\windows\system32\wtsapi32.dll	
gdi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	592.00 KB	winmm	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	303.50 KB
(606,208 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(310,784 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\gdi32.dll			c:\windows\system32\winmm.dll	
nddeapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	25.00 KB	shell32	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	10.01 MB
(25,600 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(10,492,416 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\nddeapi.dll			c:\windows\system32\shell32.dll	
profmap	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.00 KB	sxs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.91 MB
(36,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(2,003,968 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\profmap.dll			c:\windows\system32\sxs.dll	
netapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	589.00 KB	rsaenh	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	241.96 KB
(603,136 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(247,768 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\netapi32.dll			c:\windows\system32\rsaenh.dll	
userenv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.02 MB	wldap32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	390.00 KB
(1,069,056 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(399,360 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\userenv.dll			c:\windows\system32\wldap32.dll	
psapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	29.00 KB	csdll	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	151.50 KB
(29,696 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(155,136 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\psapi.dll			c:\windows\system32\csdll.dll	
regapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	108.50 KB	dimsntfy	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	28.00 KB
(111,104 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(28,672 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\regapi.dll			c:\windows\system32\dimsntfy.dll	
secur32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	120.00 KB	wlnotify	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	148.00 KB
(122,880 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(151,552 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\secur32.dll			c:\windows\system32\wlnotify.dll	
setupapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.45 MB	mpr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	115.00 KB
(1,523,200 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(117,760 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\setupapi.dll			c:\windows\system32\mpr.dll	
version	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	28.00 KB	oleaut32	5.2.3790.1830	1.06 MB (1,116,160 bytes)
(28,672 bytes)	3/25/2005 6:00 AM Microsoft Corporation		6:00 AM Microsoft Corporation		
	c:\windows\system32\version.dll			c:\windows\system32\oleaut32.dll	
winsta	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	89.00 KB	winspool	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	247.00 KB
(91,136 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(252,928 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\winsta.dll			c:\windows\system32\winspool.drv	
ws2_32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	176.50 KB	comctl32	5.82 (srv03_sp1_rtm.050324-1447)	934.50 KB (956,928 bytes)
(180,736 bytes)	3/25/2005 6:00 AM Microsoft Corporation			11/22/2005 10:06 PM Microsoft Corporation	
	c:\windows\system32\ws2_32.dll			c:\windows\winsxs\amd64_microsoft.windows.common-controls_6595b64144ccf1df_5.82.3790.1830_x-ww_4d792d2a\comctl32.dll	
ws2help	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.50 KB	uxtheme	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	494.50 KB
(31,232 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(506,368 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ws2help.dll			c:\windows\system32\uxtheme.dll	
msgina	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.14 MB	mprapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	154.50 KB
(1,193,472 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(158,208 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msgina.dll			c:\windows\system32\mprapi.dll	
shsvcs	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	193.50 KB			
(198,144 bytes)	3/25/2005 6:00 AM Microsoft Corporation				
	c:\windows\system32\shsvcs.dll				

Appendix A

activeds	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	348.50 KB	samsrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.01 MB
(356,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(1,059,328 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\activeds.dll			c:\windows\system32\samsrv.dll	
adslsdp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	240.50 KB	cryptdll	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	47.00 KB
(246,272 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(48,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\adslsdp.dll			c:\windows\system32\cryptdll.dll	
credui	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	202.00 KB	msprivs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	47.50 KB
(206,848 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(48,640 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\credui.dll			c:\windows\system32\msprivs.dll	
atl	3.05.2284 96.50 KB (98,816 bytes)	3/25/2005 6:00 AM	kerberos	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	698.00 KB
Microsoft Corporation			(714,752 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\atl.dll			c:\windows\system32\kerberos.dll	
rtutils	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	66.00 KB	msv1_0	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	253.00 KB
(67,584 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(259,072 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\rtutils.dll			c:\windows\system32\msv1_0.dll	
samlib	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	69.00 KB	iphlpapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	177.00 KB
(70,656 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(181,248 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\samlib.dll			c:\windows\system32\iphlpapi.dll	
clbcatq	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	865.00 KB	netlogon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	666.00 KB
(885,760 bytes)	11/23/2005 4:24 AM Microsoft Corporation		(681,984 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\clbcatq.dll			c:\windows\system32\netlogon.dll	
comres	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	779.50 KB	w32time	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	400.50 KB
(798,208 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(410,112 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\comres.dll			c:\windows\system32\w32time.dll	
wbemprox	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	38.00 KB	schannel	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	248.00 KB
(38,912 bytes)	11/23/2005 4:24 AM Microsoft Corporation		(253,952 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wbem\wbemprox.dll			c:\windows\system32\schannel.dll	
wbemcomn	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	524.00 KB	wdigest	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	130.50 KB
(536,576 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(133,632 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wbem\wbemcomn.dll			c:\windows\system32\wdigest.dll	
xpsp2res	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.77 MB	rassfm	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.00 KB
(2,899,456 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(36,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\xpsp2res.dll			c:\windows\system32\rassfm.dll	
wbemsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	58.00 KB	kdcsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	409.00 KB
(59,392 bytes)	11/23/2005 4:24 AM Microsoft Corporation		(418,816 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wbem\wbemsvc.dll			c:\windows\system32\kdcsvc.dll	
fastprox	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	866.50 KB	ntdsa	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.81 MB
(887,296 bytes)	11/23/2005 4:24 AM Microsoft Corporation		(2,948,096 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wbem\fastprox.dll			c:\windows\system32\ntdsa.dll	
msvcp60	7.0.3790.1830 (srv03_sp1_rtm.050324-1447)	919.50 KB	esent	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.26 MB
(941,568 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(2,366,976 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msvcp60.dll			c:\windows\system32\esent.dll	
ntdsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	127.50 KB	ntdsatq	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	51.00 KB
(130,560 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(52,224 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ntdsapi.dll			c:\windows\system32\ntdsatq.dll	
dnsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	297.50 KB	msocket	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	478.00 KB
(304,640 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(489,472 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\dnsapi.dll			c:\windows\system32\msocket.dll	
services	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	216.50 KB	scecli	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	308.00 KB
(221,696 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(315,392 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\services.exe			c:\windows\system32\scecli.dll	
ncobjapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	80.00 KB	ws03res	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	794.00 KB
(81,920 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(813,056 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ncobjapi.dll			c:\windows\system32\ws03res.dll	
scsvr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	594.50 KB	ipsecsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	358.50 KB
(608,768 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(367,104 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\scsvr.dll			c:\windows\system32\ipsecsvc.dll	
authz	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	167.00 KB	oakley	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	372.50 KB
(171,008 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(381,440 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\authz.dll			c:\windows\system32\oakley.dll	
umpnpgmr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	205.00 KB	windows	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	52.50 KB
(209,920 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(53,760 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\umpnpgmr.dll			c:\windows\system32\windows.dll	
eventlog	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	127.00 KB	hnetcfg	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	561.00 KB
(130,048 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(574,464 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\eventlog.dll			c:\windows\system32\hnetcfg.dll	
lsass	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	14.00 KB	wshtcpip	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	29.00 KB
(14,336 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(29,696 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\lsass.exe			c:\windows\system32\wshtcpip.dll	
lsasrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.50 MB	dssenh	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	226.96 KB
(1,568,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(232,408 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\lsasrv.dll			c:\windows\system32\dssenh.dll	

Appendix A

wlbsctrl	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	137.50 KB	rasman	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	95.50 KB
(140,800 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(97,792 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wlbsctrl.dll			c:\windows\system32\rasman.dll	
w3ssl	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	21.00 KB	tapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	332.50 KB
(21,504 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(340,480 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\w3ssl.dll			c:\windows\system32\tapi32.dll	
strmfilt	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	131.50 KB	wininet	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	1.13 MB
(134,656 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(1,186,304 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\strmfilt.dll			c:\windows\system32\wininet.dll	
httpapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.50 KB	wzcsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	49.00 KB
(37,376 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(50,176 bytes)	3/24/2005 11:35 AM Microsoft Corporation	
	c:\windows\system32\httpapi.dll			c:\windows\system32\wzcsapi.dll	
svchost	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB	wzcsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	492.00 KB
(25,088 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(503,808 bytes)	3/24/2005 11:35 AM Microsoft Corporation	
	c:\windows\system32\svchost.exe			c:\windows\system32\wzcsvc.dll	
rpsess	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	672.00 KB	wmi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	5.50 KB
(688,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(5,632 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\rpsess.dll			c:\windows\system32\wmi.dll	
ntmarta	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	222.50 KB	dhcpcsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	219.00 KB
(227,840 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(224,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ntmarta.dll			c:\windows\system32\dhcpcsvc.dll	
wkssvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	221.00 KB	wmisvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	227.00 KB
(226,304 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(232,448 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\wkssvc.dll			c:\windows\system32\wbem\wmisvc.dll	
aelupsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.50 KB	wbemcore	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.24 MB
(32,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(1,299,968 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\aelupsvc.dll			c:\windows\system32\wbem\wbemcore.dll	
apphelp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	241.00 KB	esscli	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	626.50 KB
(246,784 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(641,536 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\apphelp.dll			c:\windows\system32\wbem\esscli.dll	
cryptsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	114.00 KB	wmiutils	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	171.00 KB
(116,736 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(175,104 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\cryptsvc.dll			c:\windows\system32\wbem\wmiutils.dll	
certcli	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	372.00 KB	repdrvfs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	353.50 KB
(380,928 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(361,984 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\certcli.dll			c:\windows\system32\wbem\repdrvfs.dll	
vssapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.26 MB	wmiprvsd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	743.00 KB
(1,320,960 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(760,832 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\vssapi.dll			c:\windows\system32\wbem\wmiprvsd.dll	
es	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	357.00 KB	wbemess	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	532.50 KB
(365,568 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(545,280 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\es.dll			c:\windows\system32\wbem\wbemess.dll	
hidserv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB	rasdlg	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	859.50 KB
(24,576 bytes)	11/22/2005 10:18 PM Microsoft Corporation		(880,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\hidserv.dll			c:\windows\system32\rasdlg.dll	
hid	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	33.00 KB	rasadhlp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	12.00 KB
(33,792 bytes)	3/24/2005 11:18 AM Microsoft Corporation		(12,288 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\hid.dll			c:\windows\system32\rasadhlp.dll	
dmserver	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.50 KB	ncprov	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	73.00 KB
(37,376 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(74,752 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\dmserver.dll			c:\windows\system32\wbem\ncprov.dll	
sens	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	63.50 KB	pchsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	76.00 KB
(65,024 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(77,824 bytes)	11/23/2005 4:26 AM Microsoft Corporation	
	c:\windows\system32\sens.dll			c:\windows\pchealth\helpctr\binaries\pchsvc.dll	
trkwks	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	177.50 KB	inetinfo	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	17.50 KB
(181,760 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(17,920 bytes)	11/23/2005 4:43 AM Microsoft Corporation	
	c:\windows\system32\trkwks.dll			c:\windows\system32\inetrv\inetinfo.exe	
comsvcs	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	2.06 MB	iisutil	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	316.50 KB
(2,156,544 bytes)	11/23/2005 4:24 AM Microsoft Corporation		(324,096 bytes)	11/23/2005 4:43 AM Microsoft Corporation	
	c:\windows\system32\comsvcs.dll			c:\windows\system32\inetrv\iisutil.dll	
netman	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	457.00 KB	rpref	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	4.50 KB
(467,968 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(4,608 bytes)	11/23/2005 4:43 AM Microsoft Corporation	
	c:\windows\system32\netman.dll			c:\windows\system32\inetrv\rpref.dll	
netshell	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.32 MB	iisrtl	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	225.00 KB
(2,437,120 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(230,400 bytes)	11/23/2005 4:43 AM Microsoft Corporation	
	c:\windows\system32\netshell.dll			c:\windows\system32\iisrtl.dll	
clusapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	127.00 KB	iisadmin	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	30.00 KB
(130,048 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(30,720 bytes)	11/23/2005 4:43 AM Microsoft Corporation	
	c:\windows\system32\clusapi.dll			c:\windows\system32\inetrv\iisadmin.dll	
rasapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	410.00 KB	coadmin	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	100.50 KB
(419,840 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(102,912 bytes)	11/23/2005 4:43 AM Microsoft Corporation	
	c:\windows\system32\rasapi32.dll			c:\windows\system32\inetrv\coadmin.dll	

Appendix A

admwprox 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) (67,584 bytes)	11/23/2005 4:43 AM	Microsoft Corporation	c:\windows\system32\admwprox.dll	66.00 KB	msgsm32 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (35,328 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\msgsm32.acm	34.50 KB
iisefg 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) (1,298,432 bytes)	11/23/2005 4:43 AM	Microsoft Corporation	c:\windows\system32\inetsrv\iisefg.dll	1.24 MB	tssoft32 1.01 13.50 KB (13,824 bytes)	3/25/2005 6:00 AM	DSP GROUP, INC.	c:\windows\system32\tssoft32.acm	
metadata 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) (350,208 bytes)	11/23/2005 4:43 AM	Microsoft Corporation	c:\windows\system32\inetsrv\metadata.dll	342.00 KB	tsd32 1.03 24.50 KB (25,088 bytes)	3/25/2005 6:00 AM	DSP GROUP, INC.	c:\windows\system32\tsd32.dll	
msxml3 8.70.1104.0 2.04 MB (2,141,184 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\msxml3.dll		rdpclip 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (101,376 bytes)	11/23/2005 4:25 AM	Microsoft Corporation	c:\windows\system32\rdpclip.exe	99.00 KB
svcxext 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) (61,952 bytes)	11/23/2005 4:43 AM	Microsoft Corporation	c:\windows\system32\inetsrv\svcxext.dll	60.50 KB	wsock32 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (25,088 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\wsock32.dll	24.50 KB
security 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (6,144 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\security.dll	6.00 KB	urlmon 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) (1,074,176 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\urlmon.dll	1.02 MB
iismap 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) (99,328 bytes)	11/23/2005 4:43 AM	Microsoft Corporation	c:\windows\system32\iismap.dll	97.00 KB	explorer 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) (1,364,480 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\explorer.exe	1.30 MB
wamreg 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) (80,384 bytes)	11/23/2005 4:44 AM	Microsoft Corporation	c:\windows\system32\inetsrv\wamreg.dll	78.50 KB	browseui 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) (1,601,536 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\browseui.dll	1.53 MB
iisw3adm 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) (312,320 bytes)	11/23/2005 4:44 AM	Microsoft Corporation	c:\windows\system32\inetsrv\iisw3adm.dll	305.00 KB	shdocvw 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) (2,416,128 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\shdocvw.dll	2.30 MB
w3cache 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) (28,160 bytes)	11/23/2005 4:44 AM	Microsoft Corporation	c:\windows\system32\inetsrv\w3cache.dll	27.50 KB	cryptui 5.131.3790.1830 (srv03_sp1_rtm.050324-1447) (722,432 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\cryptui.dll	705.50 KB
w3tp 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) (16,384 bytes)	11/23/2005 4:44 AM	Microsoft Corporation	c:\windows\system32\inetsrv\w3tp.dll	16.00 KB	themeui 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) (543,232 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\themeui.dll	530.50 KB
lonsint 6.0.3790.1830 (srv03_sp1_rtm.050324-1447) (17,920 bytes)	11/23/2005 4:43 AM	Microsoft Corporation	c:\windows\system32\inetsrv\lonsint.dll	17.50 KB	msimg32 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (6,656 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\msimg32.dll	6.50 KB
termsrv 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (363,008 bytes)	11/23/2005 4:25 AM	Microsoft Corporation	c:\windows\system32\termsrv.dll	354.50 KB	linkinfo 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (30,720 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\linkinfo.dll	30.00 KB
icaapi 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (28,160 bytes)	11/23/2005 4:25 AM	Microsoft Corporation	c:\windows\system32\icaapi.dll	27.50 KB	ntshui 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) (188,416 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\ntshui.dll	184.00 KB
mstlsapi 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (191,488 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\mstlsapi.dll	187.00 KB	webcheck 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) (449,536 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\webcheck.dll	439.00 KB
rdpwsx 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (174,216 bytes)	11/23/2005 4:25 AM	Microsoft Corporation	c:\windows\system32\rdpwsx.dll	170.13 KB	stobject 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (145,920 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\stobject.dll	142.50 KB
rdpsnd 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (25,600 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\rdpsnd.dll	25.00 KB	batmeter 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) (42,496 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\batmeter.dll	41.50 KB
scredir 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (39,424 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\scredir.dll	38.50 KB	powrprof 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) (33,280 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\powrprof.dll	32.50 KB
csui 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (451,584 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\csui.dll	441.00 KB	drprov 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (24,576 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\drprov.dll	24.00 KB
msacm32 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (31,744 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\msacm32.drv	31.00 KB	ntlanman 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (73,216 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\ntlanman.dll	71.50 KB
msacm32 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (114,688 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\msacm32.dll	112.00 KB	netui0 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (133,120 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\netui0.dll	130.00 KB
imaadp32 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (24,576 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\imaadp32.acm	24.00 KB	netui1 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (346,624 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\netui1.dll	338.50 KB
msadp32 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (24,064 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\msadp32.acm	23.50 KB	davclnt 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (38,912 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\davclnt.dll	38.00 KB
msg711 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) (13,824 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\msg711.acm	13.50 KB	shdoclc 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) (603,648 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\shdoclc.dll	589.50 KB
					browseui 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) (64,512 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	c:\windows\system32\browseui.dll	63.00 KB

Appendix A

duser	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	445.00 KB	helpctr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.30 MB
(455,680 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\duser.dll	(1,363,456 bytes)	11/23/2005 4:26 AM Microsoft Corporation	c:\windows\pchealth\helpctr\binaries\helpctr.exe
mydocs	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	101.00 KB	hcappres	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	7.50 KB
(103,424 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\mydocs.dll	(7,680 bytes)	11/23/2005 4:26 AM Microsoft Corporation	c:\windows\pchealth\helpctr\binaries\hcappres.dll
zipfldr	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	449.50 KB	itss	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	208.00 KB
(460,288 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\zipfldr.dll	(212,992 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\itss.dll
actxprxy	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	220.50 KB	pchshell	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	155.00 KB
(225,792 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\actxprxy.dll	(158,720 bytes)	11/23/2005 4:26 AM Microsoft Corporation	c:\windows\pchealth\helpctr\binaries\pchshell.dll
sendmail	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	64.00 KB	mlang	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	686.00 KB
(65,536 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\sendmail.dll	(702,464 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\mlang.dll
cmd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	538.50 KB	mshtml	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	5.65 MB
(551,424 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\cmd.exe	(5,928,448 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\mshtml.dll
sqlservr	2005.090.1399.00 37.56 MB (39,379,672 bytes)	10/14/2005 3:37 PM Microsoft Corporation	msls31	3.10.349.0 357.00 KB (365,568 bytes)	3/25/2005 6:00 AM Microsoft Corporation
files\microsoft sql server\mssql.1\mssql\bin\sqlservr.exe		c:\program	Microsoft Corporation	c:\windows\system32\msls31.dll	
msvcr80	8.00.50727.42 803.50 KB (822,784 bytes)	9/23/2005 12:26 AM Microsoft Corporation	msimtf	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	380.50 KB
c:\windows\winsxs\amd64_microsoft.vc80.crt_1fc8b3b9a1e18e3b_8.0.50727.42_x-ww_3fea50ad\msvcr80.dll			(389,632 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\msimtf.dll
msvcp80	8.00.50727.42 1.05 MB (1,097,728 bytes)	9/23/2005 12:28 AM Microsoft Corporation	msctf	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	617.50 KB
c:\windows\winsxs\amd64_microsoft.vc80.crt_1fc8b3b9a1e18e3b_8.0.50727.42_x-ww_3fea50ad\msvcp80.dll			(632,320 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\msctf.dll
opends60	2005.090.1399.00 22.21 KB (22,744 bytes)	10/14/2005 3:31 PM Microsoft Corporation	jscrip	5.6.0.8827 974.50 KB (997,888 bytes)	3/25/2005 6:00 AM Microsoft Corporation
files\microsoft sql server\mssql.1\mssql\bin\opends60.dll		c:\program	Microsoft Corporation	c:\windows\system32\jscrip.dll	
instapi	2005.090.1399.00 40.71 KB (41,688 bytes)	10/14/2005 3:23 PM Microsoft Corporation	imm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	208.00 KB
files\microsoft sql server\90\shared\instapi.dll		c:\program	(212,992 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\imm32.dll
sqllevn70	2005.090.1399.00 1.57 MB (1,642,712 bytes)	10/14/2005 3:32 PM Microsoft Corporation	mshtml	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	905.50 KB
files\microsoft sql server\mssql.1\mssql\bin\resources\1033\sqllevn70.rll			(927,232 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\mshtml.dll
sqlqs	2005.090.1399.00 15.71 KB (16,088 bytes)	10/14/2005 3:35 PM Microsoft Corporation	vbscript	5.6.0.8827 646.50 KB (662,016 bytes)	3/25/2005 6:00 AM Microsoft Corporation
files\microsoft sql server\mssql.1\mssql\bin\sqlqs.dll		c:\program	Microsoft Corporation	c:\windows\system32\vbscript.dll	
mscoree	2.0.50727.42 (RTM.050727-4200)	441.00 KB (451,584 bytes)	9/23/2005 12:37 AM Microsoft Corporation	msinfo	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
c:\windows\system32\mscoree.dll			(651,264 bytes)	11/23/2005 4:26 AM Microsoft Corporation	c:\windows\pchealth\helpctr\binaries\msinfo.dll
xolehlp	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	10.50 KB	mfc42u	6.50.9146.0 1.39 MB (1,462,272 bytes)	3/25/2005 6:00 AM Microsoft Corporation
(10,752 bytes)	11/23/2005 4:24 AM Microsoft Corporation	c:\windows\system32\xolehlp.dll	riched32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	7.00 KB
msdtcprx	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	805.50 KB	(7,168 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\riched32.dll
(824,832 bytes)	11/23/2005 4:24 AM Microsoft Corporation	c:\windows\system32\msdtcprx.dll	riched20	5.31.23.1224 1.10 MB (1,157,120 bytes)	3/25/2005 6:00 AM Microsoft Corporation
mtxclu	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	141.50 KB	(1,591,296 bytes)	11/23/2005 4:26 AM Microsoft Corporation	c:\windows\system32\riched20.dll
(144,896 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\mtxclu.dll	helpsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.52 MB
resutils	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	98.50 KB	(1,591,296 bytes)	11/23/2005 4:26 AM Microsoft Corporation	c:\windows\pchealth\helpctr\binaries\helpsvc.exe
(100,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\resutils.dll			
winnr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.00 KB	[Services]		
(30,720 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\winnr.dll	Display Name	Name	State
sqlncli	2005.090.1399.00 3.01 MB (3,152,144 bytes)	10/14/2005 3:37 PM Microsoft Corporation	Path	Error Control	Start Mode
c:\windows\system32\sqlncli.dll			Application Experience Lookup Service	Share Process	Service Type
comdlg32	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	446.50 KB	Auto	0	Running
(457,216 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\comdlg32.dll	c:\windows\system32\svchost.exe -k netsvcs	Normal	
sqlnclir	2005.090.1399.00 201.21 KB (206,040 bytes)	10/14/2005 3:31 PM Microsoft Corporation	LocalSystem	0	
c:\windows\system32\sqlnclir.rll			Alerter	Stopped	Disabled
wpabaln	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	33.50 KB	(34,304 bytes)	3/25/2005 6:00 AM Microsoft Corporation	c:\windows\system32\svchost.exe -k localservice
c:\windows\system32\wpabaln.exe			Application Layer Gateway Service	ALG	Stopped
			Own Process	c:\windows\system32\alg.exe	Manual
			NT AUTHORITY\LocalService	0	Normal
			Application Management	AppMgmt	Stopped
			Process	c:\windows\system32\svchost.exe -k netsvcs	Manual
			LocalSystem	0	Share
			ASP.NET State Service	aspnet_state	Stopped
			Own Process		Manual
			c:\windows\microsoft.net\framework64\v2.0.50727\aspnet_state.ex		
			e	Normal	NT AUTHORITY\NetworkService
				0	

Appendix A

Windows Audio	AudioSrv	Stopped	Disabled	Share Process	IMAPI CD-Burning COM Service	ImapiService	Stopped
c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0		Disabled	Own Process	c:\windows\system32\imapi.exe
Background Intelligent Transfer Service	BITS	Stopped	Manual		Normal	LocalSystem	0
Share Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Intersite Messaging	IsmServ	Stopped
Computer Browser	Browser	Stopped	Manual	Share Process	c:\windows\system32\ismserv.exe	Normal	LocalSystem
c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0		Kerberos Key Distribution Center	kdc	Stopped
Indexing Service	CiSvc	Stopped	Disabled	Share Process	c:\windows\system32\lsass.exe	Normal	LocalSystem
c:\windows\system32\cisvc.exe	Normal	LocalSystem	0		Server	lanmanserver	Stopped
ClipBook	ClipSrv	Stopped	Disabled	Own Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem
c:\windows\system32\clipsrv.exe	Normal	LocalSystem	0		Workstation	lanmanworkstation	Running
.NET Runtime Optimization Service v2.0.50727_X86	clr_optimization_v2.0.50727_32	Stopped	Manual	Own Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem
c:\windows\microsoft.net\framework\v2.0.50727\mscorsvw.exe	Ignore	LocalSystem	0		License Logging	LicenseService	Stopped
.NET Runtime Optimization Service v2.0.50727_x64	clr_optimization_v2.0.50727_64	Stopped	Manual	Own Process	c:\windows\system32\llsdrv.exe	Normal	NT
c:\windows\microsoft.net\framework\v2.0.50727\mscorsvw.exe	Ignore	LocalSystem	0		AUTHORITY\NetworkService	0	
COM+ System Application	COMSysApp	Stopped	Manual		TCP/IP NetBIOS Helper	LmHosts	Stopped
Own Process	c:\windows\system32\dlhhost.exe	Normal	LocalSystem	0	c:\windows\system32\svchost.exe -k localservice	Normal	Share
/processid:{02d4b3f1-fd88-11d1-960d-00805fc79235}	Normal	LocalSystem	0		NT AUTHORITY\LocalService	0	
Cryptographic Services	CryptSvc	Running	Auto	Share Process	Messenger	Messenger	Stopped
c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0		c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem
DCOM Server Process Launcher	DcomLaunch	Running	Auto		NetMeeting Remote Desktop Sharing	mnmsrvc	Stopped
Share Process	c:\windows\system32\svchost.exe -k	Normal	LocalSystem	0	Own Process	c:\windows\system32\mnmsrvc.exe	Normal
dcomlaunch	Normal	LocalSystem	0		Normal	LocalSystem	0
Distributed File System	Dfs	Stopped	Manual	Own Process	Distributed Transaction Coordinator	MSDTC	Running
c:\windows\system32\dfsrv.exe	Normal	LocalSystem	0		Own Process	c:\windows\system32\msdtc.exe	Normal
DHCP Client	Dhcp	Running	Auto	Share Process	NT AUTHORITY\NetworkService	0	
c:\windows\system32\svchost.exe -k networkservice	Normal	NT AUTHORITY\NetworkService	0		Windows Installer	MSIServer	Stopped
Logical Disk Manager Administrative Service	dmadmin	Stopped			c:\windows\system32\msiexec.exe /v	Normal	Share Process
Manual	Share Process	LocalSystem	0		LocalSystem	0	
Logical Disk Managerdmserver	Running	Auto	Share Process		SQL Server (MSSQLSERVER)	MSSQLSERVER	Stopped
c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0		Own Process	"c:\program files\microsoft sql server\mssql.1\mssql\bin\sqlservr.exe" -smssqlserver	Normal
DNS Client	Dnscache	Running	Auto	Share Process	LocalSystem	0	
c:\windows\system32\svchost.exe -k networkservice	Normal	NT AUTHORITY\NetworkService	0		SQL Server Active Directory Helper	MSSQLServerADHelper	Stopped
Error Reporting Service	ERSvc	Stopped	Manual	Share Process	Stopped	Disabled	Own Process
c:\windows\system32\svchost.exe -k winerr	Ignore	LocalSystem	0		files\microsoft sql server\90\shared\sqladhlp90.exe"	Normal	NT
Event Log	Eventlog	Running	Auto	Share Process	AUTHORITY\NetworkService	0	
c:\windows\system32\services.exe	Normal	LocalSystem	0		Network DDE	NetDDE	Stopped
COM+ Event System	EventSystem	Running	Auto	Share Process	c:\windows\system32\netdde.exe	Normal	LocalSystem
c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0		0		
Help and Support	helpsvc	Running	Manual	Share Process	Network DDE DSDM	NetDDEdsdm	Stopped
c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0		Process	c:\windows\system32\netdde.exe	Normal
HID Input Service	HidServ	Running	Auto	Share Process	0		
c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0		Net Logon	Netlogon	Stopped
HTTP SSLHTTPFilter	Running	Manual	Share Process		c:\windows\system32\lsass.exe	Normal	LocalSystem
c:\windows\system32\lsass.exe	Normal	LocalSystem	0		0		
IAS Jet Database Access	IASJet	Stopped	Manual	Share Process	Network Connections	Netman	Running
c:\windows\syswow64\svchost.exe -k iasjet	Normal	LocalSystem	0		c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem
IIS Admin Service	IISADMIN	Running	Auto	Share Process	Normal	LocalSystem	0
c:\windows\system32\inetrv\inetinfo.exe	Normal	LocalSystem	0		File Replication	NtFrs	Stopped
					c:\windows\system32\ntfrs.exe	Ignore	LocalSystem
					0		
					NT LM Security Support Provider	NtLmSsp	Stopped
					Share Process	c:\windows\system32\lsass.exe	Normal
					LocalSystem	0	
					Removable Storage	NtmsSvc	Stopped
					c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem
					0		
					Office Source Engine	ose	Stopped
					"c:\program files (x86)\common files\microsoft shared\source engine\ose.exe"	Normal	LocalSystem
					0		
					Plug and Play	PlugPlay	Running
					c:\windows\system32\services.exe	Auto	Share Process
					LocalSystem	0	Normal

Appendix A

IPSEC Services	PolicyAgent	Running	Auto	Share	Microsoft Software Shadow Copy Provider	swprv	Stopped	Manual
Process	c:\windows\system32\lsass.exe	Normal	LocalSystem	0	Own Process	c:\windows\system32\svchost.exe -k swprv	Normal	LocalSystem
Protected Storage	ProtectedStorage	Stopped	Manual	Share	Performance Logs and Alerts	SysmonLog	Stopped	Auto
Process	c:\windows\system32\lsass.exe	Normal	LocalSystem	0	Own Process	c:\windows\system32\smlogsvc.exe	Normal	NT Authority\NetworkService
Remote Access Auto Connection Manager	RasAuto	Stopped	Manual	Share Process	Telephony	TapiSrv	Stopped	Manual
Share Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Share Process	c:\windows\system32\svchost.exe -k tapisrv	Normal	LocalSystem
Remote Access Connection Manager	RasMan	Stopped	Manual	Share Process	Terminal Services	TermService	Running	Manual
Share Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Process	c:\windows\system32\svchost.exe -k termsvcs	LocalSystem	0
Remote Desktop Help Session Manager	RDSessMgr	Stopped	Manual	Share Process	Themes	Themes	Stopped	Disabled
Manual	Own Process	Normal	LocalSystem	0	Process	c:\windows\system32\svchost.exe -k netsvcs	LocalSystem	0
Routing and Remote Access	RemoteAccess	Stopped	Disabled	Share Process	Telnet	TlntSvr	Stopped	Disabled
Share Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Process	c:\windows\system32\tlntsvr.exe	Normal	NT
Remote Registry	RemoteRegistry	Stopped	Manual	Share	AUTHORITY\LocalService	0	Distributed Link Tracking Server	TrkSvr
Process	c:\windows\system32\svchost.exe -k regsvc	Normal	NT	AUTHORITY\LocalService	0	Process	c:\windows\system32\svchost.exe -k netsvcs	Normal
Remote Procedure Call (RPC) Locator	RpcLocator	Stopped	Manual	Own Process	Distributed Link Tracking Client	TrkWks	Running	Auto
Normal	NT AUTHORITY\NetworkService	0	Process	c:\windows\system32\locator.exe	LocalSystem	0	Process	c:\windows\system32\svchost.exe -k netsvcs
Remote Procedure Call (RPC)	RpcSs	Running	Auto	Share	Terminal Services Session Directory	Tssdis	Stopped	Disabled
Process	c:\windows\system32\svchost.exe -k rpsvc	Normal	NT	AUTHORITY\NetworkService	0	Own Process	c:\windows\system32\tssdis.exe	Normal
Resultant Set of Policy Provider	RSOPProv	Stopped	Manual	Share	Windows User Mode Driver Framework	UMWdf	Stopped	Manual
Process	c:\windows\system32\rsopprov.exe	Normal	LocalSystem	0	Own Process	c:\windows\system32\wdmfr.exe	Normal	NT AUTHORITY\LocalService
Special Administration Console Helper	sacsrv	Stopped	Manual	Share Process	Uninterruptible Power Supply	UPS	Stopped	Manual
Share Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Process	c:\windows\system32\ups.exe	Normal	NT
Security Accounts Manager	SamSs	Running	Auto	Share	AUTHORITY\LocalService	0	Virtual Disk Service	vds
Process	c:\windows\system32\lsass.exe	Normal	LocalSystem	0	Process	c:\windows\system32\vds.exe	Normal	LocalSystem
Smart Card	SCardSvr	Stopped	Manual	Share Process	Volume Shadow Copy	VSS	Stopped	Manual
Process	c:\windows\system32\scardsvr.exe	Ignore	NT	AUTHORITY\LocalService	0	Process	c:\windows\system32\vssvc.exe	Normal
Task Scheduler	Schedule	Stopped	Manual	Share Process	Windows Time	W32Time	Stopped	Manual
Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Process	c:\windows\system32\svchost.exe -k localservice	Normal	NT AUTHORITY\LocalService
Secondary Logon	seclogon	Stopped	Manual	Share Process	World Wide Web Publishing Service	W3SVC	Running	Auto
Process	c:\windows\system32\svchost.exe -k netsvcs	Ignore	LocalSystem	0	Share Process	c:\windows\system32\svchost.exe -k iissvc	Normal	LocalSystem
System Event Notification	SENS	Running	Auto	Share	WebClient	WebClient	Stopped	Share Process
Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Process	c:\windows\system32\svchost.exe -k localservice	Normal	NT AUTHORITY\LocalService
Windows Firewall/Internet Connection Sharing (ICS)	SharedAccess	Stopped	Disabled	Share Process	WinHTTP	Web Proxy Auto-Discovery Service	WinHttpAutoProxySvc	Stopped
Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	Process	c:\windows\system32\svchost.exe -k localservice	Normal	NT AUTHORITY\LocalService
Shell Hardware Detection	ShellHWDetection	Stopped	Disabled	Share Process	Windows Management Instrumentation	wimgmt	Running	Manual
Ignore	LocalSystem	0	Process	c:\windows\system32\svchost.exe -k netsvcs	Share Process	c:\windows\system32\svchost.exe -k netsvcs	Ignore	LocalSystem
Print Spooler	Spooler	Stopped	Manual	Own Process	Portable Media Serial Number Service	WmdmPmSN	Stopped	Manual
Process	c:\windows\system32\spoolsv.exe	Normal	LocalSystem	0	Manual	Share Process	c:\windows\system32\svchost.exe -k netsvcs	Normal
SQL Server Browser	SQLBrowser	Stopped	Disabled	Own	LocalSystem	0	Windows Management Instrumentation Driver Extensions	Wmi
Process	"c:\program files (x86)\microsoft sql server\90\shared\sqlbrowser.exe"	Normal	LocalSystem	0	Stopped	Manual	Share Process	c:\windows\system32\svchost.exe -k netsvcs
SQL Server Agent (MSSQLSERVER)	SQLSERVERAGENT	Stopped	Manual	Own Process	WMI Performance Adapter	WmiApSrv	Stopped	Manual
Process	"c:\program files\microsoft sql server\mssql.1\mssql\bin\sqlagent90.exe" -i mssqlserver	Normal	LocalSystem	0	Own Process	c:\windows\system32\wbem\wmiapsrv.exe	Normal	LocalSystem
SQL Server VSS Writer	SQLWriter	Stopped	Manual	Own	Automatic Updates	wuauerv	Stopped	Manual
Process	"c:\program files\microsoft sql server\90\shared\sqlwriter.exe"	Normal	LocalSystem	0	Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem
Windows Image Acquisition (WIA)	stisvc	Stopped	Disabled	Share Process	Wireless Configuration	WZCSVC	Stopped	Manual
Share Process	c:\windows\system32\svchost.exe -k imgsvc	Normal	NT AUTHORITY\LocalService	0	Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem

Appendix A

Network Provisioning Service xmlprov Stopped Manual Share
 Process c:\windows\system32\svchost.exe -k netsvcs Normal
 LocalSystem 0

Bitmap Image mspaint.exe

[Windows Error Reporting]

[Program Groups]

Time Type Details

Group Name	Name	User Name	Default User
Accessories	Default User:Accessories		Default User
Accessories\Accessibility	Default User:Accessories\Accessibility		Default User
Accessories\Entertainment	Default User:Accessories\Entertainment		Default User
Startup	Default User:Startup		Default User
Accessories	All Users:Accessories		All Users
Accessories\Accessibility	All Users:Accessories\Accessibility		All Users
Accessories\Communications	All Users:Accessories\Communications		All Users
Accessories\Entertainment	All Users:Accessories\Entertainment		All Users
Accessories\System Tools	All Users:Accessories\System Tools		All Users
Administrative Tools	All Users:Administrative Tools		All Users
Microsoft SQL Server 2005	All Users:Microsoft SQL Server 2005		All Users
Microsoft SQL Server 2005\Analysis Services		All Users:Microsoft	
SQL Server 2005\Analysis Services		All Users	
Microsoft SQL Server 2005\Configuration Tools		All Users:Microsoft	
SQL Server 2005\Configuration Tools		All Users	
Microsoft SQL Server 2005\Performance Tools		All Users:Microsoft	
SQL Server 2005\Performance Tools		All Users	
Startup	All Users:Startup		All Users
Accessories	NT AUTHORITY\SYSTEM:Accessories		NT AUTHORITY\SYSTEM
Accessories\Accessibility	NT AUTHORITY\SYSTEM:Accessories\Accessibility		NT AUTHORITY\SYSTEM
Accessories\Entertainment	NT AUTHORITY\SYSTEM:Accessories\Entertainment		NT AUTHORITY\SYSTEM
Startup	NT AUTHORITY\SYSTEM:Startup		NT AUTHORITY\SYSTEM
Accessories	PE6800\Administrator:Accessories		PE6800\Administrator
Accessories\Accessibility	PE6800\Administrator:Accessories\Accessibility		PE6800\Administrator
Accessories\Entertainment	PE6800\Administrator:Accessories\Entertainment		PE6800\Administrator
Administrative Tools	PE6800\Administrator:Administrative Tools		PE6800\Administrator
Startup	PE6800\Administrator:Startup		PE6800\Administrator

[Internet Settings]

[Internet Explorer]

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

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

[File Versions]

File	Version	Size	Date	Path	Company
actxprxy.dll	6.0.3790.1830	221 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
actxprxy.dll	6.0.3790.1830	221 KB	3/25/2005 6:00:00 AM	.	Microsoft Corporation
advpack.dll	6.0.3790.1830	146 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
advpack.dll	6.0.3790.1830	146 KB	3/25/2005 6:00:00 AM	.	Microsoft Corporation
asctrls.ocx	6.0.3790.1830	147 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
asctrls.ocx	6.0.3790.1830	147 KB	3/25/2005 6:00:00 AM	.	Microsoft Corporation
browsecl.dll	6.0.3790.1830	63 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
browsecl.dll	6.0.3790.1830	63 KB	3/25/2005 6:00:00 AM	.	Microsoft Corporation
browseui.dll	6.0.3790.1830	1,564 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
browseui.dll	6.0.3790.1830	1,564 KB	3/25/2005 6:00:00 AM	.	Microsoft Corporation
cdfview.dll	6.0.3790.1830	216 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
cdfview.dll	6.0.3790.1830	216 KB	3/25/2005 6:00:00 AM	.	Microsoft Corporation
comctl32.dll	5.82.3790.1830	935 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
comctl32.dll	5.82.3790.1830	935 KB	3/25/2005 6:00:00 AM	.	Microsoft Corporation
dxtmsft.dll	6.3.3790.1830	320 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
dxtmsft.dll	6.3.3790.1830	320 KB	3/25/2005 6:00:00 AM	.	Microsoft Corporation
dxtmsft.dll	6.3.3790.1830	549 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
dxtmsft.dll	6.3.3790.1830	549 KB	3/25/2005 6:00:00 AM	.	Microsoft Corporation
iecont.dll	<File Missing>	Not Available	Not Available		Not Available
iecont.dll	<File Missing>	Not Available	Not Available		Not Available
iecont.dll	<File Missing>	Not Available	Not Available		Not Available
iecont.dll	<File Missing>	Not Available	Not Available		Not Available
iedkcs32.dll	16.0.3790.1830	417 KB	3/25/2005 6:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iedkcs32.dll	16.0.3790.1830	417 KB	3/25/2005 6:00:00 AM	.	Microsoft Corporation

[Startup Programs]

Program	Command	User Name	Location
desktop	desktop.ini	NT AUTHORITY\SYSTEM	Startup
desktop	desktop.ini	PE6800\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"

Appendix A

iepeers.dll	6.0.3790.1830	361 KB	3/25/2005 6:00:00 AM	mstime.dll	6.0.3790.1830	878 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32		Microsoft Corporation		C:\WINDOWS\system32		Microsoft Corporation
iepeers.dll	6.0.3790.1830	361 KB	3/25/2005 6:00:00 AM	mstime.dll	6.0.3790.1830	878 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation				Microsoft Corporation		
iesetup.dll	6.0.3790.1830	71 KB	3/25/2005 6:00:00 AM	occache.dll	6.0.3790.1830	126 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32		Microsoft Corporation		C:\WINDOWS\system32		Microsoft Corporation
iesetup.dll	6.0.3790.1830	71 KB	3/25/2005 6:00:00 AM	occache.dll	6.0.3790.1830	126 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation				Microsoft Corporation		
ieuinit.inf	Not Available	24 KB	3/25/2005 6:00:00 AM	proctexe.ocx	<File Missing>	Not Available	Not Available
	C:\WINDOWS\system32		Not Available		Available	Not Available	Not Available
ieuinit.inf	Not Available	24 KB	3/25/2005 6:00:00 AM	sendmail.dll	6.0.3790.1830	64 KB	3/25/2005 6:00:00 AM
	Not Available				C:\WINDOWS\system32		Microsoft Corporation
ieexplore.exe	6.0.3790.1830	94 KB	3/25/2005 6:00:00 AM	sendmail.dll	6.0.3790.1830	64 KB	3/25/2005 6:00:00 AM
AM	C:\Program Files\Internet Explorer		Microsoft Corporation		Microsoft Corporation		
imgutil.dll	6.0.3790.1830	61 KB	3/25/2005 6:00:00 AM	shdoclc.dll	6.0.3790.1830	590 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32		Microsoft Corporation		C:\WINDOWS\system32		Microsoft Corporation
imgutil.dll	6.0.3790.1830	61 KB	3/25/2005 6:00:00 AM	shdoclc.dll	6.0.3790.1830	590 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation				Microsoft Corporation		
inetpl.cpl	6.0.3790.1830	428 KB	3/25/2005 6:00:00 AM	shdocvw.dll	6.0.3790.1830	2,360 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32		Microsoft Corporation		C:\WINDOWS\system32		Microsoft Corporation
inetpl.cpl	6.0.3790.1830	428 KB	3/25/2005 6:00:00 AM	shdocvw.dll	6.0.3790.1830	2,360 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation				Microsoft Corporation		
inetplc.dll	6.0.3790.1830	110 KB	3/25/2005 6:00:00 AM	shfolder.dll	6.0.3790.1830	34 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32		Microsoft Corporation		C:\WINDOWS\system32		Microsoft Corporation
inetplc.dll	6.0.3790.1830	110 KB	3/25/2005 6:00:00 AM	shfolder.dll	6.0.3790.1830	34 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation				Microsoft Corporation		
inseng.dll	6.0.3790.1830	147 KB	3/25/2005 6:00:00 AM	shlwapi.dll	6.0.3790.1830	607 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32		Microsoft Corporation		C:\WINDOWS\system32		Microsoft Corporation
inseng.dll	6.0.3790.1830	147 KB	3/25/2005 6:00:00 AM	shlwapi.dll	6.0.3790.1830	607 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation				Microsoft Corporation		
mlang.dll	6.0.3790.1830	686 KB	3/25/2005 6:00:00 AM	tdc.ocx	1.3.0.3130	91 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32		Microsoft Corporation		C:\WINDOWS\system32		Microsoft Corporation
mlang.dll	6.0.3790.1830	686 KB	3/25/2005 6:00:00 AM	tdc.ocx	1.3.0.3130	91 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation				Microsoft Corporation		
msencode.dll	<File Missing>	Not Available	Not Available	url.dll	6.0.3790.1830	40 KB	3/25/2005 6:00:00 AM
Available	Not Available	Not Available			C:\WINDOWS\system32		Microsoft Corporation
mshta.exe	6.0.3790.1830	38 KB	3/25/2005 6:00:00 AM	url.dll	6.0.3790.1830	40 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32		Microsoft Corporation		Microsoft Corporation		
mshta.exe	6.0.3790.1830	38 KB	3/25/2005 6:00:00 AM	urlmon.dll	6.0.3790.1830	1,049 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation				C:\WINDOWS\system32		Microsoft Corporation
mshtml.dll	6.0.3790.1830	5,790 KB	3/25/2005 6:00:00 AM	urlmon.dll	6.0.3790.1830	1,049 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32		Microsoft Corporation		Microsoft Corporation		
mshtml.dll	6.0.3790.1830	5,790 KB	3/25/2005 6:00:00 AM	webcheck.dll	6.0.3790.1830	439 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation				C:\WINDOWS\system32		Microsoft Corporation
mshtml.tlb	6.0.3790.1830	1,320 KB	3/25/2005 6:00:00 AM	webcheck.dll	6.0.3790.1830	439 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32		Microsoft Corporation		Microsoft Corporation		
mshtml.tlb	6.0.3790.1830	1,320 KB	3/25/2005 6:00:00 AM	wininet.dll	6.0.3790.1830	1,159 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation				C:\WINDOWS\system32		Microsoft Corporation
mshtmlmled.dll	6.0.3790.1830	906 KB	3/25/2005 6:00:00 AM	wininet.dll	6.0.3790.1830	1,159 KB	3/25/2005 6:00:00 AM
AM	C:\WINDOWS\system32		Microsoft Corporation		Microsoft Corporation		
mshtmlmled.dll	6.0.3790.1830	906 KB	3/25/2005 6:00:00 AM				
AM	Microsoft Corporation			[Connectivity]			
mshtmlmled.dll	6.0.3790.1830	56 KB	3/25/2005 6:00:00 AM	Item	Value		
AM	C:\WINDOWS\system32		Microsoft Corporation	Connection Preference	Never dial		
mshtmlmled.dll	6.0.3790.1830	56 KB	3/25/2005 6:00:00 AM				
AM	Microsoft Corporation			LAN Settings			
msident.dll	6.0.3790.1830	69 KB	3/25/2005 6:00:00 AM	AutoConfigProxy	wininet.dll		
	C:\WINDOWS\system32		Microsoft Corporation	AutoProxyDetectMode	Disabled		
msident.dll	6.0.3790.1830	69 KB	3/25/2005 6:00:00 AM	AutoConfigURL			
	Microsoft Corporation			Proxy	Disabled		
msidntld.dll	6.0.3790.1830	16 KB	3/25/2005 6:00:00 AM	ProxyServer			
AM	C:\WINDOWS\system32		Microsoft Corporation	ProxyOverride			
msidntld.dll	6.0.3790.1830	16 KB	3/25/2005 6:00:00 AM				
AM	Microsoft Corporation			[Cache]			
msieftp.dll	6.0.3790.1830	369 KB	3/25/2005 6:00:00 AM	[Following are sub-categories of this main category]			
	C:\WINDOWS\system32		Microsoft Corporation	[Summary]			
msieftp.dll	6.0.3790.1830	369 KB	3/25/2005 6:00:00 AM	Item	Value		
	Microsoft Corporation			Page Refresh Type	Automatic		
msrating.dll	6.0.3790.1830	240 KB	3/25/2005 6:00:00 AM				
AM	C:\WINDOWS\system32		Microsoft Corporation				
msrating.dll	6.0.3790.1830	240 KB	3/25/2005 6:00:00 AM				
AM	Microsoft Corporation						

Appendix A

Temporary Internet Files Folder C:\Documents and
Settings\Administrator\Local Settings\Temporary Internet Files
Total Disk Space Not Available
Available Disk Space Not Available
Maximum Cache Size Not Available
Available Cache Size Not Available

[List of Objects]

Program File Status CodeBase
No cached object information available

[Content]

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

Item	Value
Content Advisor	Disabled

[Personal Certificates]

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

[Other People Certificates]

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

[Publishers]

Name
No publisher information available

[Security]

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

Appendix B

Appendix B: Database Build Scripts

Appendix B

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

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

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

```
FILEGROWTH = 0),
(
    NAME          = %DBNAME%_gen_4,
    FILENAME      = "Q:",
    SIZE          = 31304MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_gen_5,
    FILENAME      = "R:",
    SIZE          = 31304MB,
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_gen_6,
    FILENAME      = "S:",
    SIZE          = 31304MB,
    FILEGROWTH    = 0)
LOG ON
(
    NAME          = %DBNAME%_log,
    FILENAME      = "E:",
    SIZE          = 46000MB,
    FILEGROWTH    = 0)
```

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

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

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

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

create table CUSTOMER
(C_CUSTKEY int not null,
 C_MKTSEGMENT char(10) not null,
```

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

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

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

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

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

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

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

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

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

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

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

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

alter table PARTSUPP add constraint
PK_PS_PARTKEY_PS_SUPPKEY primary key
(P_S_PARTKEY, P_S_SUPPKEY)
ON GENERAL_FG

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

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

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

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

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

create clustered index L_SHIPDATE_CLUIDX
on LINEITEM(L_SHIPDATE)
```

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```
with FILLFACTOR=95, SORT_IN_TEMPDB
on GENERAL_FG

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

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

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

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

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

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

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

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

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

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

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

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

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

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

```
-- Drop the LOAD_FG
```

Appendix B

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

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

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

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

sp_addumpdevice 'disk', 'BackupDev1', 'T:\TPCHbackup1'
GO
sp_addumpdevice 'disk', 'BackupDev2', 'U:\TPCHbackup2'
GO
sp_addumpdevice 'disk', 'BackupDev3', 'F:\TPCHbackup3'
GO

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

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

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

restore database tpch from BackupDev1, BackupDev2,
BackupDev3 with replace, stats=1

--
-- Copyright (c) 1999-2000 Intel Corporation
--
-- MoveTemp.sql

alter database tempdb modify file
(name='tempdev',filename='T:\TempdB.mdf')
```

```
alter database tempdb modify file
(name='templog',filename='T:\Templog.ldf')

--
-- Copyright (c) 1999-2000 Intel Corporation
--
-- AddTemp.sql

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

-- Drop the LOAD_FG

ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load1
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load2
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load3
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load4
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load5
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load6
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load7
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load8
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load9
go
```

Appendix B

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load10
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load11
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load12
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load13
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load14
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load15
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load16
go
ALTER DATABASE %DBNAME% REMOVE
FILEGROUP LOAD_FG
go
```

Appendix C: ACID Scripts

Appendix C

```

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

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

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

begin
    begin tran T

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

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

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

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

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

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

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

        commit transaction T

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

    end
go

-- File: ACID_HIST.SQL

```

Appendix C

```

-- Microsoft TPC-H Benchmark Kit Ver. 2.00
-- Copyright Microsoft, 1999
-- Purpose: Creates HISTORY tables for TPC-H ACID tests
--
if exists ( select name from sysobjects where name =
'HISTORY_ACI' )
    drop table HISTORY_ACI

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

GO

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

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

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

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

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

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

go

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

begin
    begin tran T

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

```

Appendix C

```

select @quantity = @ototal 'Total'
L_QUANTITY,
@extprice = end
L_EXTENDEDPRICE,
@pkey = L_PARTKEY, go
@skkey = L_SUPPKEY,
@tax = L_TAX,
@disc = L_DISCOUNT -- File: ACID_VALUES.SQL
from LINEITEM -- Microsoft TPC-H Benchmark Kit Version
where L_ORDERKEY = @o_key and 2.00
L_LINENUMBER = -- Copyright Microsoft, 1999
--
@l_key -- Purpose: This script creates a stored procedure that,
-- when called with the
-- number of desired streams, will populate the
-- acid_values table.
-- The ACID procedures read this table to
-- guarantee random and valid input.
-- This table includes a unique clustered index
-- to guarantee that all values
-- are unique for each stage of the ACI tests.
-- If an attempt is made to insert
-- a value that currently exists in the table, the
-- insert errors out and
-- the values are recalculated and another
-- insert is attempted.
--
-- The first 10 rows, seq_num, are for
-- atomicity and isolation. The remaining
-- x * 200 rows are for consistency and
-- durability, where x is the number of streams desired.
--
if exists ( select name from sysobjects where name =
'tpch_acid_values' )
drop procedure tpch_acid_values
go
create proc tpch_acid_values @num_streams int
as
declare @acid_test char(25),
@rand_o_key int,
@rand_l_key int,
@rand_deltatinyint,
@rand_part_key int,
@rand_supp_key int,
@cnt int,
@multiplier int,
@counter int,
@found_one tinyint,
@cons_rows int
-- set initial values for loop controls
select @found_one = 0,
@counter = 1,
@cnt = 0,
@cons_rows = @num_streams * 200
select @rprice 'RPrice',
@quantity 'Quantity',
@tax 'Tax',
@disc 'Discount',
@extprice 'Extended Price',
@new_extprice = @extprice +
@cost,
@new_ototal = @ototal +
ROUND((ROUND((@extprice * (1 - @disc)),2,1) * (1 +
@tax)),2,1),
@rprice =
ROUND((@extprice/@quantity),2,1),
@cost =
ROUND((@rprice * @delta),2,1),
@new_extprice = @extprice +
@cost,
@new_ototal =
ROUND((@new_extprice * (1.0 - @disc)),2,1),
@new_ototal =
ROUND((@new_ototal * (1.0 + @tax)),2,1),
@new_ototal = @ototal +
update LINEITEM
set L_EXTENDEDPRICE =
@new_extprice,
L_QUANTITY = @quantity +
@delta
where L_ORDERKEY = @o_key and
L_LINENUMBER =
@l_key
update ORDERS
set O_TOTALPRICE =
@new_ototal
where O_ORDERKEY = @o_key
insert into HISTORY_ACI values( @pkey,
@skkey,
@o_key,
@l_key,
@delta,
getdate())
commit transaction T

```

Appendix C

```

--      loop to populate table for ACID
while (@counter <= (@cons_rows + 10))
begin
    --      Set ACI test name based on counter
    select @acid_test = case      @counter
        when 1 then 'Atomicity_Commit'
        when 2 then 'Atomicity_Rollback'
        when 3 then 'Isolation 1'
        when 4 then 'Isolation 2'
        when 5 then 'Isolation 3'
        when 6 then 'Isolation 3'
        when 7 then 'Isolation 4'
        when 8 then 'Isolation 4'
        when 9 then 'Isolation 5'
        when 10 then 'Isolation 6'
        else 'Consistency_Durability'
    end

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

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

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

```

```

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

        select
        @cnt = count(*)
        from
        PARTSUPP
        WHERE
        PS_PARTKEY = @rand_part_key
        end
        set
        rowcount @cnt

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

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

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

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

            set rowcount @cnt

            select TOP 1
            @rand_l_key = L_LINENUMBER
            from LINEITEM
            where L_ORDERKEY = @rand_o_key
            set rowcount 0

            select @rand_delta = (RAND()*100)

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

```

Appendix C

```

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

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

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

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

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

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

```

```

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

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

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

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

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

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

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

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

create proc cons_tran @counter int
as

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

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

```

Appendix C

```

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

exec    acid_tran_com  @rand_o_key,
                    @rand_l_key,
                    @rand_delta

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

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

create proc dur_tran  @counter  int

as

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

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

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

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

exec    acid_dur_tran_com  @rand_o_key,
                        @rand_l_key,
                        @rand_delta

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

```

```

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

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

as

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

begin

        begin tran T

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

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

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

```

Appendix C

```

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

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

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

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

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

commit transaction T

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

-- ACID CODE END

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

end

go

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

go

```

Appendix C

```

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

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

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

        commit transaction P

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

end

go

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

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

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

```

```

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

begin
    begin tran T

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

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

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

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

```


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```

                L_LINENUMBER      =
@l_key

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

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

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

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

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

        commit transaction T

-- ACID CODE BEGIN
print " "
print "Timestamp after commit of ACID transaction:"
select convert(char(30), getdate(), 9)
print " "
print "O_TOTALPRICE from Orders Table after commit:"
select  O_TOTALPRICE
from    ORDERS
where   O_ORDERKEY = @o_key

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

print " "
print "Row from HISTORY:"
select  *
from    HISTORY_ACI
where   H_O_KEY = @o_key and
        H_L_KEY = @l_key

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

-- ACID CODE END

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

end

go

-- ACIDQ.SQL
--
-- TPC-H Version 1.01 ACID Query
--
-- Implemented trunc(x,2) as (cast(x*100) as int / 100)
--

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

create proc iso_query          @o_key          int
as

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

```

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```

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

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

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

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

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

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

begin
    begin tran T

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

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

print " "
--      ACID CODE END

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

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

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

```

Appendix C

```

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

update  ORDERS
set     O_TOTALPRICE      =

@new_ototal

where   O_ORDERKEY = @o_key

insert into HISTORY_ACI values( @pkey,
                                @skey,

                                @o_key,

                                @l_key,
                                @delta,

                                getdate())

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

commit transaction T

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

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

end

go

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

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

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

begin

begin tran T

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

```

Appendix C

```

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

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

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

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

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

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

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

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

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

rollback transaction T

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

```

Appendix C

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

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

end

go

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

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

select @rand_o_key = acid_o_key,
       @rand_l_key = acid_l_key,
       @rand_delta = acid_delta
from acid_values
where acid_test='Isolation 1'

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

exec tran_w_com @rand_o_key,
               @rand_l_key,
               @rand_delta

GO

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

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

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

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

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

exec iso_query @rand_o_key
GO

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

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

select @rand_o_key = acid_o_key,
       @rand_l_key = acid_l_key,
       @rand_delta = acid_delta
from acid_values
where acid_test='Isolation 2'

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

exec tran_w_rb @rand_o_key,
              @rand_l_key,
              @rand_delta

GO

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

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

declare @acid_test char(25),
        @rand_o_key int

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

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

exec iso_query @rand_o_key
GO

-- File: ISOL3_1.SQL
```

Appendix C

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

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

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

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

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

GO

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

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

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

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

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

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

```
exec iso34_tran_w_com @rand_o_key,
```

```
@rand_l_key,
@rand_delta
```

GO

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

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

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

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

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

GO

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

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

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

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

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

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

Appendix C

```

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

exec iso34_tran_w_com @rand_o_key,
                    @rand_l_key,
                    @rand_delta

GO

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

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

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

from acid_values
where acid_test='Isolation 5'

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

exec tran_w_com @rand_o_key,
               @rand_l_key,
               @rand_delta

GO

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

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

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

select @rand_part = acid_part,
       @rand_supp = acid_supp

from acid_values
where acid_test='Isolation 5'

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

exec iso5_parts @rand_part,
               @rand_supp

GO

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

```

```

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

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

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

GO

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

```

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

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

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

exec iso6_tran_w_com    @rand_o_key,
                       @rand_l_key,
                       @rand_delta

GO

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

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

```
      L_LINESTATUS
ORDER BY L_RETURNFLAG,
         L_LINESTATUS

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

GO

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

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

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

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

exec tran_w_rb    @rand_o_key,
                 @rand_l_key,
                 @rand_delta

GO

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


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```

and          where  H_O_KEY = acid_o_key          (      o_orderkey
and          H_L_KEY = acid_l_key                int,
and          H_DELTA = acid_delta                money,
)                                                    l_orderkey
int,
money
lineitem_sum
)

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

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

-- File:  DUR_VERIFY1.SQL
-- Microsoft TPC-H Kit Ver. 2.00
-- Copyright Microsoft, 1999
--
-- Durability Verification test 1
-- -----
--
-- Comment: ORDERS.O_TOTALPRICE should equal
LINEITEM sums

print ''
print 'Timestamp for Pre-Failure Durability Verification 1
start:'
select convert(char(30), getdate(),9)
print ''

select count(*) from HISTORY_DUR
GO

if exists ( select name from sysobjects where name =
'temp_dur1_output' )
      drop table temp_dur1_output
GO

CREATE TABLE temp_dur1_output

-- File:  DUR_VERIFY2.SQL

```

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

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

select count(*) from HISTORY_DUR
GO

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

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

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

-- Select data from temporary table...
print ''
print 'Select all rows from temporary table'
print ''
SELECT o_orderkey 'O_OrderKey',
o_totalprice 'O_TotalPrice',
l_orderkey 'L_OrderKey',
```

```
lineitem_sum 'LineItem Sum'
FROM temp_dur2_output

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

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

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

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

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

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

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

exec tran_w_com @rand_o_key,
@rand_l_key,
@rand_delta

GO

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

Appendix C

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

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

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

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

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

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

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

```
WHERE o_totalprice <> lineitem_sum

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

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

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

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

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

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

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

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

```
print ''
```

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

```
print ''
```

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

```
print ''
```

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

```
print ''
```

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

```
print ''
```

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

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

```
print ''
```

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

```
drop table temp_con2_output
```

```
GO
```


Appendix D

Appendix D: Query text and Output

Appendix D

/* TPC_H Query 1 - Pricing Summary Report */

```

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

```

```

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

```

```

A      F      37734107.000000
56586554400.733406 53758257134.871681
55909065222.824005 25.522006 38273.129735
0.049985 1478493
N      F      991417.000000 1487504710.379996
1413082168.054107 1469649223.194385 25.516472
38284.467761 0.050093 38854
N      O      74476040.000000
111701729697.742690 106118230307.602520
110367043872.491560 25.502227 38249.117989
0.049997 2920374
R      F      37719753.000000
56568041380.905540 53741292684.603966
55889619119.832787 25.505794 38250.854626
0.050009 1478870

```

(4 row(s) affected)

-- using default substitutions

/* TPC_H Query 2 - Minimum Cost Supplier */

```

SELECT      TOP 100
           S_ACCTBAL,
           S_NAME,
           N_NAME,
           P_PARTKEY,
           P_MFGR,
           S_ADDRESS,
           S_PHONE,
           S_COMMENT
FROM PART,
SUPPLIER,
PARTSUPP,
NATION,
REGION
WHERE P_PARTKEY = PS_PARTKEY AND
S_SUPPKEY = PS_SUPPKEY AND
P_SIZE = 15 AND
P_TYPE LIKE '%%BRASS' AND
S_NATIONKEY = N_NATIONKEY AND
N_REGIONKEY = R_REGIONKEY AND
R_NAME = 'EUROPE' AND
PS_SUPPLYCOST = ( SELECT
MIN(PS_SUPPLYCOST)
FROM PARTSUPP,
SUPPLIER,
NATION,
REGION
WHERE P_PARTKEY
= PS_PARTKEY AND
S_SUPPKEY
= PS_SUPPKEY AND
S_NATIONKEY
= N_NATIONKEY AND
N_REGIONKEY
= R_REGIONKEY AND
R_NAME
= 'EUROPE'
)
ORDER BY   S_ACCTBAL DESC,
           N_NAME,
           S_NAME,
           P_PARTKEY
S_ACCTBAL S_NAME N_NAME
P_PARTKEY P_MFGR S_ADDRESS
S_PHONE S_COMMENT
-----
-----
-----
9938.530000 Supplier#000005359 UNITED
KINGDOM 185358 Manufacturer#4
QKuHYh,vZGiwu2FWEJoLDx04 33-429-790-
6131 blithely silent pinto beans are furiously. slyly final
deposits across
9937.840000 Supplier#000005969 ROMANIA
108438 Manufacturer#1
ANDENSOSmk,miq23Xfb5RWt6dvUcvt6Qa 29-520-
692-3537 carefully slow deposits use furiously. slyly ironic
platelets above the ironic

```


Appendix D

9936.220000 Supplier#000005250 UNITED
 KINGDOM 249 Manufacturer#4
 B3rqp0xbSEim4Mpy2RH J 33-320-228-2957
 blithely special packages are. stealthily express deposits
 across the closely final instructi
 9923.770000 Supplier#000002324 GERMANY
 29821 Manufacturer#4 y3OD9UywSTOk
 17-779-299-1839 quickly express packages breach quiet pinto
 beans. requ
 9871.220000 Supplier#000006373 GERMANY
 43868 Manufacturer#5 J8fcXWsTqM
 17-813-485-8637 never silent deposits integrate furiously blit
 9870.780000 Supplier#000001286 GERMANY
 81285 Manufacturer#2
 YKA,E2fjiVd7eUrzp2Ef8j1QxGo2DFnosaTEH 17-516-
 924-4574 final theodolites cajole slyly special,
 9870.780000 Supplier#000001286 GERMANY
 181285 Manufacturer#4
 YKA,E2fjiVd7eUrzp2Ef8j1QxGo2DFnosaTEH 17-516-
 924-4574 final theodolites cajole slyly special,
 9852.520000 Supplier#000008973 RUSSIA
 18972 Manufacturer#2
 t5L67YdBYH6o,Vz24jpDyQ9 32-188-594-7038
 quickly regular instructions wake-- carefully unusual braids
 into the expres

.....Additional Rows Deleted

7914.450000 Supplier#000001013 RUSSIA
 125988 Manufacturer#2
 riRcntps4KEDtYScjpMIWeYF6mNnR 32-194-698-
 3365 final, ironic theodolites alongside of the ironic
 7912.910000 Supplier#000004211 GERMANY
 159180 Manufacturer#5
 2wQRVovHrm3,v03IKzfTd,1PYsFXQFFOG 17-266-
 947-7315 final requests integrate slyly above the silent, even
 7912.910000 Supplier#000004211 GERMANY
 184210 Manufacturer#4
 2wQRVovHrm3,v03IKzfTd,1PYsFXQFFOG 17-266-
 947-7315 final requests integrate slyly above the silent, even
 7894.560000 Supplier#000007981 GERMANY
 85472 Manufacturer#4 NSJ96vMROAbeXP
 17-963-404-3760 regular, even theodolites integrate carefully.
 bold, special theodolites are slyly fluffily iron
 7887.080000 Supplier#000009792 GERMANY
 164759 Manufacturer#3
 Y28ITVeYriT3kIGdV2K8fSZ V2UqT5H1Otz 17-988-
 938-4296 pending, ironic packages sleep among the carefully
 ironic accounts. quickly final accounts
 7871.500000 Supplier#000007206 RUSSIA
 104695 Manufacturer#1 3w
 fNCnrVmvJjE95sgWZzvW 32-432-452-7731
 furiously dogged pinto beans cajole. bold, express notornis
 until the slyly pending
 7852.450000 Supplier#000005864 RUSSIA
 8363 Manufacturer#4 WCNfBPZeSXh3h,c
 32-454-883-3821 blithely regular deposits
 7850.660000 Supplier#000001518 UNITED
 KINGDOM 86501 Manufacturer#1

ONda3YJiHKJOC 33-730-383-3892
 furiously final accounts wake carefully idle requests. even
 dolphins wake acc
 7843.520000 Supplier#000006683 FRANCE
 11680 Manufacturer#4
 2Z0JGkiv01Y00oCFwUGfviIbhzcDy 16-464-517-
 8943 carefully bold accounts doub

(100 row(s) affected)

-- using default substitutions

/* TPC_H Query 3 - Shipping Priority */

```

SELECT      TOP 10
            L_ORDERKEY,
            SUM(L_EXTENDEDPRICE*(1-L_DISCOUNT))
            AS REVENUE,
            O_ORDERDATE,
            O_SHIPPRIORITY
FROM        CUSTOMER,
            ORDERS,
            LINEITEM
WHERE      C_MKTSEGMENT      = 'BUILDING' AND
            C_CUSTKEY      = O_CUSTKEY AND
            L_ORDERKEY      = O_ORDERKEY AND
            O_ORDERDATE      < '1995-03-15' AND
            L_SHIPDATE      > '1995-03-15'
GROUP BY   L_ORDERKEY,
            O_ORDERDATE,
            O_SHIPPRIORITY
ORDER BY   REVENUE DESC,
            O_ORDERDATE
L_ORDERKEY      REVENUE
O_ORDERDATE      O_SHIPPRIORITY
  
```

```

-----
2456423      406181.011100      1995-03-05
00:00:00.000 0
3459808      405838.698900      1995-03-04
00:00:00.000 0
492164      390324.061000      1995-02-19
00:00:00.000 0
1188320      384537.935900      1995-03-09
00:00:00.000 0
2435712      378673.055800      1995-02-26
00:00:00.000 0
4878020      378376.795200      1995-03-12
00:00:00.000 0
5521732      375153.921500      1995-03-13
00:00:00.000 0
2628192      373133.309400      1995-02-22
00:00:00.000 0
993600      371407.459500      1995-03-05
00:00:00.000 0
2300070      367371.145200      1995-03-13
00:00:00.000 0
  
```

(10 row(s) affected)

Appendix D

```
CHINA          53724494.256600
INDIA          52035512.000200
JAPAN         45410175.695400
```

(5 row(s) affected)

-- using default substitutions

/* TPC_H Query 6 - Forecasting Revenue Change */

```
SELECT
      SUM(L_EXTENDEDPRICE*L_DISCOUNT)
      AS REVENUE
FROM LINEITEM
WHERE L_SHIPDATE >= '1994-01-01' AND
      L_SHIPDATE < dateadd (yy, 1, '1994-01-01')
AND
      L_DISCOUNT BETWEEN .06 - 0.01 AND .06 +
      0.01 AND
      L_QUANTITY < 24
REVENUE
-----
123141078.228299
```

(1 row(s) affected)

-- using default substitutions

/* TPC_H Query 7 - Volume Shipping */

```
SELECT      SUPP_NATION,
            CUST_NATION,
            L_YEAR,
            SUM(VOLUME)AS REVENUE
FROM (      SELECT      N1.N_NAME
            AS SUPP_NATION,
                        N2.N_NAME
            AS CUST_NATION,
                        datepart(yy,L_SHIPDATE)
            AS L_YEAR,
                        L_EXTENDEDPRICE*(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
```

-- using default substitutions

/* TPC_H Query 4 - Order Priority Checking */

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

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

(5 row(s) affected)

-- using default substitutions

/* TPC_H Query 5 - Local Supplier Volume */

```
SELECT      N_NAME,
            SUM(L_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,
'1994-01-01')
GROUP BY N_NAME
ORDER BY REVENUE DESC
N_NAME      REVENUE
```

```
-----
INDONESIA     55502041.169700
VIETNAM      55295086.996700
```

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```

        (      (N1.N_NAME =
'FRANCE'    AND N2.N_NAME = 'GERMANY')
            OR
            (N1.N_NAME =
'GERMANY'   AND N2.N_NAME = 'FRANCE')
        ) AND
        L_SHIPDATE BETWEEN
'1995-01-01' AND '1996-12-31'
    ) AS SHIPPING
GROUP BY  SUPP_NATION,
          CUST_NATION,
          L_YEAR
ORDER BY  SUPP_NATION,
          CUST_NATION,
          L_YEAR
SUPP_NATION  CUST_NATION  L_YEAR
REVENUE
-----
FRANCE      GERMANY      1995
54639732.733600
FRANCE      GERMANY      1996
54633083.307600
GERMANY     FRANCE        1995
52531746.669700
GERMANY     FRANCE        1996
52520549.022400

(4 row(s) affected)

-- using default substitutions

/* TPC_H Query 8 - National Market Share */

SELECT      O_YEAR,
            SUM(CASE WHEN NATION =
'BRAZIL'
                THEN VOLUME
                ELSE 0
            END) / SUM(VOLUME) AS
MKT_SHARE
FROM (      SELECT
            datepart(yy,O_ORDERDATE) AS
O_YEAR,
            L_EXTENDEDPRICE * (1-
L_DISCOUNT) AS VOLUME,
            N2.N_NAME
            AS NATION
        FROM PART,
            SUPPLIER,
            LINEITEM,
            ORDERS,
            CUSTOMER,
            NATION N1,
            NATION N2,
            REGION
        WHEREP_PARTKEY = L_PARTKEY
    AND
        (      (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' AND
        P_TYPE = 'ECONOMY
ANODIZED STEEL'
    ) AS ALL_NATIONS
GROUP BY  O_YEAR
ORDER BY  O_YEAR
O_YEAR  MKT_SHARE
-----
1995    0.034436
1996    0.041486

(2 row(s) affected)

-- using default substitutions

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

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

```

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```

S_NATIONKEY =
N_NATIONKEY AND
P_NAME
LIKE
'%%green%%'
)
GROUP BY
ORDER BY
NATION
O_YEAR
DESC
SUM_PROFIT

```

NATION	O_YEAR	DESC	SUM_PROFIT
ALGERIA	1998	31342867.234500	
ALGERIA	1997	57138193.023300	
ALGERIA	1996	56140140.133000	
ALGERIA	1995	53051469.653400	
ALGERIA	1994	53867582.128600	
ALGERIA	1993	54942718.132400	
ALGERIA	1992	54628034.712700	
ARGENTINA	1998	30211185.708100	
ARGENTINA	1997	50805741.752300	
ARGENTINA	1996	51923746.575500	
ARGENTINA	1995	49298625.766600	
ARGENTINA	1994	50835610.109500	
ARGENTINA	1993	51646079.177500	
ARGENTINA	1992	50410314.994800	
BRAZIL	1998	27217924.383200	
BRAZIL	1997	48378669.198900	
BRAZIL	1996	50482870.357200	
BRAZIL	1995	47623383.634900	
BRAZIL	1994	47840165.725600	
BRAZIL	1993	49054694.035100	
BRAZIL	1992	48667639.084200	
CANADA	1998	30379833.768500	
CANADA	1997	50465052.311400	
CANADA	1996	52560501.390400	
CANADA	1995	52375332.809200	
CANADA	1994	52600364.658700	
CANADA	1993	52644504.073500	
CANADA	1992	53932871.697000	
CHINA	1998	31075466.164900	
CHINA	1997	50551874.449900	
CHINA	1996	51039293.875400	
CHINA	1995	49287534.616900	
CHINA	1994	50851090.067400	
CHINA	1993	54229629.833000	
CHINA	1992	52400529.372000	
EGYPT	1998	29054433.385600	
EGYPT	1997	50627611.452400	
EGYPT	1996	49542212.844600	
EGYPT	1995	48311550.320700	
EGYPT	1994	49790644.736000	
EGYPT	1993	48904292.969200	
EGYPT	1992	49434932.619200	
ETHIOPIA	1998	28040717.267400	
ETHIOPIA	1997	47455009.866400	
ETHIOPIA	1996	46491097.572900	
ETHIOPIA	1995	46804449.300900	
ETHIOPIA	1994	48516143.917000	
ETHIOPIA	1993	46551891.562900	

```

ETHIOPIA      1992      44934648.642800
.....Additional Rows Deleted .....
UNITED STATES 1998      25126238.946100
UNITED STATES 1997      50077306.418600
UNITED STATES 1996      48048649.470300
UNITED STATES 1995      48809032.422600
UNITED STATES 1994      49296747.182700
UNITED STATES 1993      48029946.801400
UNITED STATES 1992      48671944.498300
VIETNAM       1998      30442736.059400
VIETNAM       1997      50309179.794200
VIETNAM       1996      50488161.410000
VIETNAM       1995      49658284.612500
VIETNAM       1994      50596057.260700
VIETNAM       1993      50953919.151900
VIETNAM       1992      49613838.315100

```

```

(175 row(s) affected)
-- using default substitutions
/* TPC_H Query 10 - Returned Item Reporting */

```

```

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

```

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C_CUSTKEY	C_NAME	REVENUE	Az9RFaut7NkPnc5zSD2PwHgVwr4jRzq	17-945-916-
C_ACCTBAL	N_NAME	C_ADDRESS	9648 boldly final requests cajole blith	
C_PHONE	C_COMMENT		147946 Customer#000147946	576455.132000
2030.130000	ALGERIA		iANyZHjqhy7Ajah0pTrYyhJ	10-886-956-3143
57040	Customer#000057040	734235.245500	furiously even accounts are blithely above the furiousl	
632.870000	JAPAN	Eioyzzf4pp	115640 Customer#000115640	569341.193300
22-895-641-3466	requests sleep blithely about the furiously i		6436.100000	ARGENTINA
143347	Customer#000143347	721002.694800	7EpHgecU1X	11-411-543-4901 final instructions
2557.470000	EGYPT	1aReFYv,Kw4	are slyly according to the	
14-742-935-3718	fluffily bold excuses haggle finally after the		73606 Customer#000073606	568656.857800
u			1785.670000	JAPAN
60838	Customer#000060838	679127.307700	xuR0Tro5yChDfOCrjkd2ol	22-437-653-6966
2454.770000	BRAZIL		furiously bold orbits about the furiously busy requests wake	
64EaJ5vMAHWJIBOXJklpNc2RJiWE		12-913-494-	across the furiously quiet theodolites. d	
9813	furiously even pinto beans integrate under the ruthless		110246 Customer#000110246	566842.981500
foxes; ironic, even dolphins across the slyl			7763.350000	VIETNAM
101998	Customer#000101998	637029.566700	MDOq7sOkI	31-943-426-9837 dolphins sleep
3790.890000	UNITED KINGDOM		blithely among the slyly final	
01c9CILnTfOQYmZj		33-593-865-6378	142549 Customer#000142549	563537.236800
accounts doze blithely! enticing, final deposits sleep blithely			5085.990000	INDONESIA
special accounts. slyly express accounts pla			ChqEoK43OysjdHbtKCp6dKqjNyvvi9	19-955-562-
125341	Customer#000125341	633508.086000	2398 regular, unusual dependencies boost slyly; ironic	
4983.510000	GERMANY		attainments nag fluffily into the unusual packages?	
S29ODD6bceU8QSuUEJznkNaK		17-582-695-5962	146149 Customer#000146149	557254.986500
quickly express requests wake quickly blithely			1791.550000	ROMANIA
25501	Customer#000025501	620269.784900	29-744-164-6487	silent, unusual requests detect quickly slyly
7725.040000	ETHIOPIA		regul	
W556MXuoiaYCCZamJI,Rn0B4ACUGdkQ8DZ		15-874-	52528 Customer#000052528	556397.350900
808-6793	quickly special requests sleep evenly among the		551.790000	ARGENTINA
special deposits. special deposi			NFztyTOR10UOJ	11-208-192-3205 unusual
115831	Customer#000115831	596423.867200	requests detect. slyly dogged theodolites use slyly. deposit	
5098.100000	FRANCE	rFeBbEEyk dl	23431 Customer#000023431	554269.536000
ne7zV5fDrmiq1oK09wV7pxqCgIc		16-715-386-3788	3381.860000	ROMANIA
carefully bold excuses sleep alongside of the thinly idle			HgiV0phqhafa9aydNoIlb	29-915-458-2654
84223	Customer#000084223	594998.023900	instructions nag quickly. furiously bold accounts cajol	
528.650000	UNITED KINGDOM		(20 row(s) affected)	
nAVZCs6BaWap rrM27N 2qBnze5WBauxbA		33-442-	-- using default substitutions	
824-8191	pending, final ideas haggle final requests. unusual,		/* TPC_H Query 11 - Important Stock Identification */	
regular asymptotes affix according to the even foxes.			SELECT	PS_PARTKEY,
54289	Customer#000054289	585603.391800	SUM(PS_SUPPLYCOST*PS_AVAILQTY)	
5583.020000	IRAN		AS VALUE	
vXCxoCsU0Bad5JQI ,oobkZ		20-834-292-4707	FROM PARTSUPP,	
express requests sublate blithely regular requests. regular,			SUPPLIER,	
even ideas solve.			NATION	
39922	Customer#000039922	584878.113400	WHEREPS_SUPPKEY = S_SUPPKEY AND	
7321.110000	GERMANY		S_NATIONKEY = N_NATIONKEY AND	
Zgy4s50l2GKN4pLDPBU8m342gIw6R		17-147-757-	N_NAME = 'GERMANY'	
8036	even pinto beans haggle. slyly bold accounts inte		GROUP BY PS_PARTKEY	
6226	Customer#000006226	576783.760600	HAVING	
2230.090000	UNITED KINGDOM		SUM(PS_SUPPLYCOST*PS_AVAILQTY) >	
8gPu8,NPGkfyQQ0hcIYUGPIBWc,ybP5g,		33-657-701-	(SELECT	
3391	quickly final requests against the regular instructions		SUM(PS_SUPPLYCOST*PS_AVAILQTY) *	
wake blithely final instructions. pa			0.0001000000	
922	Customer#000000922	576767.533300	FROM PARTSUPP,	
3869.250000	GERMANY			

Appendix D

```

SUPPLIER,
NATION
WHEREPS_SUPPKEY =
S_SUPPKEY AND
N_NATIONKEYAND
N_NAME
= 'GERMANY'
)
ORDER BY VALUE DESC
PS_PARTKEY VALUE
-----
129760 17538456.860000
166726 16503353.920000
191287 16474801.970000
161758 16101755.540000
34452 15983844.720000
139035 15907078.340000
9403 15451755.620000
154358 15212937.880000
38823 15064802.860000
85606 15053957.150000
33354 14408297.400000
154747 14407580.680000
82865 14235489.780000
76094 14094247.040000
222 13937777.740000

.....Additional Rows Deleted .....

71475 7903367.580000
36289 7901946.500000
61739 7900794.000000
52338 7898638.080000
194299 7898421.240000
105235 7897829.940000
77207 7897752.720000
96712 7897575.270000
10157 7897046.250000
171154 7896814.500000
79373 7896186.000000
113808 7893353.880000
27901 7892952.000000
128820 7892882.720000
25891 7890511.200000
122819 7888881.020000
154731 7888301.330000
101674 7879324.600000
51968 7879102.210000
72073 7877736.110000
5182 7874521.730000

```

(1048 row(s) affected)

-- using default substitutions

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

```
SELECT L_SHIPMODE,
```

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```

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
WHEREO_ORDERKEY = L_ORDERKEY
AND
L_SHIPMODE IN ('MAIL','SHIP')
AND
L_COMMITDATE < L_RECEIPTDATE
AND
L_SHIPDATE < L_COMMITDATE
AND
L_RECEIPTDATE >= '1994-01-01'
AND
L_RECEIPTDATE < dateadd(yy, 1, '1994-01-
01')
GROUP BY L_SHIPMODE
ORDER BY L_SHIPMODE
L_SHIPMODE HIGH_LINE_COUNT LOW_LINE_COUNT
-----
MAIL 6202 9324
SHIP 6200 9262

(2 row(s) affected)

-- using default substitutions

/* TPC_H Query 13 - Customer Distribution */

SELECT C_COUNT,
COUNT(*) AS CUSTDIST
FROM ( SELECT C_CUSTKEY,
COUNT(O_ORDERKEY)
FROM CUSTOMER left outer join
ORDERS on
C_CUSTKEY = O_CUSTKEY
AND
O_COMMENT not like
'%%special%%requests%%'
)
GROUP BY C_CUSTKEY
AS C_ORDERS (C_CUSTKEY,
C_COUNT)
GROUP BY C_COUNT
ORDER BY CUSTDIST DESC,
C_COUNT DESC
C_COUNT CUSTDIST
-----

```

Appendix D

```

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

WHERE L_PARTKEY = P_PARTKEY AND
      L_SHIPDATE >= '1995-09-01' AND
      L_SHIPDATE < dateadd(mm, 1, '1995-09-01')
PROMO_REVENUE
-----
16.380779

(1 row(s) affected)

-- using default substitutions

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

CREATE VIEW REVENUE0 (SUPPLIER_NO,
TOTAL_REVENUE)
AS
SELECT L_SUPPKEY,
       SUM(L_EXTENDEDPRICE*(1-L_DISCOUNT))
FROM LINEITEM
WHERE L_SHIPDATE >= '1996-01-01' AND
      L_SHIPDATE < dateadd(mm, 3, '1996-01-01')
GROUP BY L_SUPPKEY
GO

/* TPC_H Query 15 - Top Supplier */

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

DROP VIEW REVENUE0
S_SUPPKEY S_NAME S_ADDRESS
S_PHONE TOTAL_REVENUE
-----
8449 Supplier#000008449 Wp34zim9qYFbVctdW
20-469-856-8873 1772627.208700

(1 row(s) affected)

-- using default substitutions

/* TPC_H Query 14 - Promotion Effect */

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

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

SELECT P_BRAND,
       P_TYPE,
       P_SIZE,

```

Appendix D

```

COUNT(DISTINCT PS_SUPPKEY) AS
SUPPLIER_CNT
FROM PARTSUPP,
PART
WHEREP_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 (
S_SUPPKEY
SELECT
FROM
SUPPLIER
WHERE
S_COMMENT LIKE
'%%Customer%%Complaints%%'
)
GROUP BY P_BRAND,
P_TYPE,
P_SIZE
ORDER BY SUPPLIER_CNTDESC,
P_BRAND,
P_TYPE,
P_SIZE
P_BRAND P_TYPE P_SIZE
SUPPLIER_CNT

```

```

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

```

.....Additional Rows Deleted

```

Brand#55 STANDARD PLATED STEEL 23 4
Brand#55 STANDARD PLATED STEEL 49 4
Brand#55 STANDARD PLATED TIN 9 4
Brand#55 STANDARD PLATED TIN 14 4

```

```

Brand#55 STANDARD PLATED TIN 36 4
Brand#55 STANDARD POLISHED BRASS 3 4
Brand#55 STANDARD POLISHED BRASS 9 4
Brand#55 STANDARD POLISHED BRASS 23 4
Brand#55 STANDARD POLISHED COPPER 3 4
Brand#55 STANDARD POLISHED COPPER 23 4
Brand#55 STANDARD POLISHED COPPER 45 4
Brand#55 STANDARD POLISHED NICKEL 3 4
Brand#55 STANDARD POLISHED NICKEL 23 4
Brand#55 STANDARD POLISHED NICKEL 36 4
Brand#55 STANDARD POLISHED NICKEL 45 4
Brand#55 STANDARD POLISHED NICKEL 49 4
Brand#55 STANDARD POLISHED STEEL 14 4
Brand#55 STANDARD POLISHED STEEL 23 4
Brand#55 STANDARD POLISHED TIN 9 4
Brand#55 STANDARD POLISHED TIN 19 4
Brand#55 STANDARD POLISHED TIN 36 4
Brand#11 SMALL BRUSHED TIN 19 3
Brand#15 LARGE PLATED NICKEL 45 3
Brand#15 LARGE POLISHED NICKEL 9 3
Brand#21 PROMO BURNISHED STEEL 45 3
Brand#22 STANDARD PLATED STEEL 23 3
Brand#25 LARGE PLATED STEEL 19 3
Brand#32 STANDARD ANODIZED COPPER 23 3
Brand#33 SMALL ANODIZED BRASS 9 3
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 row(s) affected)

-- using default substitutions

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

```

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

```

```

AVG_YEARLY
-----
348406.054286

```

(1 row(s) affected)

Appendix D

-- using default substitutions

/* TPC_H Query 18 - Large Volume Customer */

```

SELECT      TOP 100
      C_NAME,
      C_CUSTKEY,
      O_ORDERKEY,
      O_ORDERDATE,
      O_TOTALPRICE,
      SUM(L_QUANTITY)
FROM  CUSTOMER,
      ORDERS,
      LINEITEM
WHERE O_ORDERKEY IN (
      SELECT
      L_ORDERKEY
      FROM
      LINEITEM
      GROUP BY
      L_ORDERKEY HAVING SUM(L_QUANTITY) >
300
) AND
      C_CUSTKEY = O_CUSTKEY AND
      O_ORDERKEY = L_ORDERKEY
GROUP BY  C_NAME,
          C_CUSTKEY,
          O_ORDERKEY,
          O_ORDERDATE,
          O_TOTALPRICE
ORDER BY  O_TOTALPRICE      DESC,
          O_ORDERDATE
C_NAME      C_CUSTKEY  O_ORDERKEY
O_ORDERDATE      O_TOTALPRICE
-----
Customer#000128120      128120      4722021      1994-
04-07 00:00:00.000 544089.090000      323.000000
Customer#000144617      144617      3043270      1997-
02-12 00:00:00.000 530604.440000      317.000000
Customer#000013940      13940      2232932      1997-
04-13 00:00:00.000 522720.610000      304.000000
Customer#000066790      66790      2199712      1996-
09-30 00:00:00.000 515531.820000      327.000000
Customer#000046435      46435      4745607      1997-
07-03 00:00:00.000 508047.990000      309.000000
Customer#000015272      15272      3883783      1993-
07-28 00:00:00.000 500241.330000      302.000000
Customer#000146608      146608      3342468      1994-
06-12 00:00:00.000 499794.580000      303.000000
Customer#000096103      96103      5984582      1992-
03-16 00:00:00.000 494398.790000      312.000000
Customer#000024341      24341      1474818      1992-
11-15 00:00:00.000 491348.260000      302.000000
Customer#000137446      137446      5489475      1997-
05-23 00:00:00.000 487763.250000      311.000000
Customer#000107590      107590      4267751      1994-
11-04 00:00:00.000 485141.380000      301.000000

```

```

Customer#000050008      50008      2366755      1996-
12-09 00:00:00.000 483891.260000      302.000000
Customer#000015619      15619      3767271      1996-
08-07 00:00:00.000 480083.960000      318.000000
Customer#000077260      77260      1436544      1992-
09-12 00:00:00.000 479499.430000      307.000000
Customer#000109379      109379      5746311      1996-
10-10 00:00:00.000 478064.110000      302.000000
Customer#000054602      54602      5832321      1997-
02-09 00:00:00.000 471220.080000      307.000000
Customer#000105995      105995      2096705      1994-
07-03 00:00:00.000 469692.580000      307.000000
Customer#000148885      148885      2942469      1992-
05-31 00:00:00.000 469630.440000      313.000000
Customer#000114586      114586      551136      1993-
05-19 00:00:00.000 469605.590000      308.000000
Customer#000105260      105260      5296167      1996-
09-06 00:00:00.000 469360.570000      303.000000
Customer#000147197      147197      1263015      1997-
02-02 00:00:00.000 467149.670000      320.000000
Customer#000064483      64483      2745894      1996-
07-04 00:00:00.000 466991.350000      304.000000
Customer#000136573      136573      2761378      1996-
05-31 00:00:00.000 461282.730000      301.000000
Customer#000016384      16384      502886      1994-
04-12 00:00:00.000 458378.920000      312.000000
Customer#000117919      117919      2869152      1996-
06-20 00:00:00.000 456815.920000      317.000000
Customer#000012251      12251      735366      1993-
11-24 00:00:00.000 455107.260000      309.000000
Customer#000120098      120098      1971680      1995-
06-14 00:00:00.000 453451.230000      308.000000
Customer#000066098      66098      5007490      1992-
08-07 00:00:00.000 453436.160000      304.000000
Customer#000117076      117076      4290656      1997-
02-05 00:00:00.000 449545.850000      301.000000
Customer#000129379      129379      4720454      1997-
06-07 00:00:00.000 448665.790000      303.000000
Customer#000126865      126865      4702759      1994-
11-07 00:00:00.000 447606.650000      320.000000
Customer#000088876      88876      983201      1993-
12-30 00:00:00.000 446717.460000      304.000000
Customer#000036619      36619      4806726      1995-
01-17 00:00:00.000 446704.090000      328.000000
Customer#000141823      141823      2806245      1996-
12-29 00:00:00.000 446269.120000      310.000000
Customer#000053029      53029      2662214      1993-
08-13 00:00:00.000 446144.490000      302.000000
Customer#000018188      18188      3037414      1995-
01-25 00:00:00.000 443807.220000      308.000000
Customer#000066533      66533      29158      1995-
10-21 00:00:00.000 443576.500000      305.000000
Customer#000037729      37729      4134341      1995-
06-29 00:00:00.000 441082.970000      309.000000
Customer#000003566      3566      2329187      1998-
01-04 00:00:00.000 439803.360000      304.000000
Customer#000045538      45538      4527553      1994-
05-22 00:00:00.000 436275.310000      305.000000

```

Appendix D

Customer#000081581	81581	4739650	1995-		L_SHIPINSTRUCT	= 'DELIVER IN
11-04 00:00:00.000	435405.900000	305.000000		PERSON'		
Customer#000119989	119989	1544643	1997-)		
09-20 00:00:00.000	434568.250000	320.000000		OR		
Customer#000003680	3680	3861123	1998-	(P_PARTKEY	= L_PARTKEY
07-03 00:00:00.000	433525.970000	301.000000				AND
Customer#000113131	113131	967334	1995-		P_BRAND	= 'Brand#23'
12-15 00:00:00.000	432957.750000	301.000000				AND
Customer#000141098	141098	565574	1995-		P_CONTAINER	IN ('MED BAG', 'MED
09-24 00:00:00.000	430986.690000	301.000000			BOX', 'MED PKG', 'MED PACK')	AND
Customer#000093392	93392	5200102	1997-		L_QUANTITY	>= 10
01-22 00:00:00.000	425487.510000	304.000000				AND
Customer#000015631	15631	1845057	1994-		L_QUANTITY	<= 10 + 10
05-12 00:00:00.000	419879.590000	302.000000				AND
Customer#000112987	112987	4439686	1996-		P_SIZE	BETWEEN 1 AND 10
09-17 00:00:00.000	418161.490000	305.000000				AND
Customer#000012599	12599	4259524	1998-		L_SHIPMODE	IN ('AIR', 'AIR REG')
02-12 00:00:00.000	415200.610000	304.000000				AND
Customer#000105410	105410	4478371	1996-		L_SHIPINSTRUCT	= 'DELIVER IN
03-05 00:00:00.000	412754.510000	302.000000		PERSON'		
Customer#000149842	149842	5156581	1994-)		
05-30 00:00:00.000	411329.350000	302.000000		OR		
Customer#000010129	10129	5849444	1994-	(P_PARTKEY	= L_PARTKEY
03-21 00:00:00.000	409129.850000	309.000000				AND
Customer#000069904	69904	1742403	1996-		P_BRAND	= 'Brand#34'
10-19 00:00:00.000	408513.000000	305.000000				AND
Customer#000017746	17746	6882	1997-		P_CONTAINER	IN ('LG CASE', 'LG
04-09 00:00:00.000	408446.930000	303.000000			BOX', 'LG PACK', 'LG PKG')	AND
Customer#000013072	13072	1481925	1998-		L_QUANTITY	>= 20
03-15 00:00:00.000	399195.470000	301.000000				AND
Customer#000082441	82441	857959	1994-		L_QUANTITY	<= 20 + 10
02-07 00:00:00.000	382579.740000	305.000000				AND
Customer#000088703	88703	2995076	1994-		P_SIZE	BETWEEN 1 AND 15
01-30 00:00:00.000	363812.120000	302.000000				AND
					L_SHIPMODE	IN ('AIR', 'AIR REG')
						AND
					L_SHIPINSTRUCT	= 'DELIVER IN

(57 row(s) affected)

-- using default substitutions

/* TPC_H Query 19 - Discounted Revenue */

```

SELECT      SUM(L_EXTENDEDPRICE* (1 -
L_DISCOUNT)) AS REVENUE
FROM LINEITEM,
PART
WHERE(      P_PARTKEY   = L_PARTKEY
            AND
            P_BRAND     = 'Brand#12'
            AND
            P_CONTAINER IN ('SM CASE', 'SM
BOX', 'SM PACK', 'SM PKG')
            AND
            L_QUANTITY >= 1
            AND
            L_QUANTITY <= 1 + 10
            AND
            P_SIZE      BETWEEN 1 AND 5
            AND
            L_SHIPMODE IN ('AIR', 'AIR REG')
            AND

```

```

PERSON'
)
REVENUE
-----
3083843.057800

```

(1 row(s) affected)

-- using default substitutions

/* TPC_H Query 20 - Potential Part Promotion */

```

SELECT      S_NAME,
            S_ADDRESS
FROM SUPPLIER,
NATION
WHERE S_SUPPKEY IN ( SELECT
PS_SUPPKEY
FROM
PARTSUPP

```

Appendix D

```

WHERE
SELECT
PS_PARTKEY in (
P_PARTKEY
FROM PART
WHEREP_NAME like 'forest%%'
) AND
PS_AVAILQTY
> ( SELECT 0.5 *
sum(L_QUANTITY)
FROM LINEITEM
WHEREL_PARTKEY = PS_PARTKEY
AND
L_SUPPKEY = PS_SUPPKEY
AND
L_SHIPDATE >= '1994-01-01'
AND
L_SHIPDATE <
dateadd(yy,1,'1994-01-01')
)
) AND
S_NATIONKEY = N_NATIONKEY AND
N_NAME = 'CANADA'
ORDER BY S_NAME
S_NAME S_ADDRESS
-----
Supplier#000000020 iybAE,RmTymrZVYaFZva2SH,j
Supplier#000000091
YV45D7TtkfdQanOOZ7q9QxkyGUapU1oOWU6q3
Supplier#000001197
YC2Acon6kjY3zj3Fbxs2k4Vdf7X0cd2F
Supplier#000002226 83qOdU2EYRdPQAQhEtn GRZEd
Supplier#00000285 Br7e1nnt1yxrw6ImgpJ7YdhFDjuBf
Supplier#00000378 FfbhyCxWvcPrO8ltp9
Supplier#00000402
i9Sw4DoyMhzhKXCH9By,AYSgmD
Supplier#00000530 0qwCMwobKY
OcmLyfRXlagA8ukENJv,
Supplier#00000688 D
fw5ocppmZpYBBIP1718hCihLDZ5KhKX
Supplier#00000710 f19YPvOyb
QoYwjKC,oPycpGfieBAcwKJo
Supplier#00000736
l6i2nMwVuovfKnuVgaSGK2rDy65DIAFLegiL7
Supplier#00000761
zlSLeIQUj2XrvTTFnv7WAcYZGvvMTx882d4
Supplier#00000884 bmhEShejaS
Supplier#00000887 urEaTejH5POADP2ARrf
Supplier#00000935 ij98czM
2KzWe7dDToxB8sq0UfCdvX

```

```

Supplier#000000975 ,AC e,tBpNwKb5xMUzeohxlRn,
hdZJo73gFQF8y
Supplier#000001263 rQWR6nf8ZhB2TAiIDivo5Io
Supplier#000001399 LmrocnIMSyYOWuANx7
Supplier#000001446 lch9HMNU1R7a0LIybsUodVknk6
Supplier#000001454 TOpingu2TVXIjhiL93h,
Supplier#000001500 wDmF5xLxtQch9ctVu,
Supplier#000001602 uKNWleafaM644
Supplier#000001626 UhxNRzUu1dtFmp0
Supplier#000001682 pXTkGxrTQVyH1Rr
Supplier#000001699 Q9C4rfJ26oijVPqqcVXeRI
Supplier#000001700 7hMICoflY5zLFg
Supplier#000001726 TeRY7TtTH24sEword7yAaSkjx8
Supplier#000001730 Rc8e,1Pybn r6zo0VJIEiD0UD vhk
Supplier#000001746
qWsendlOekQG1aW4uq06uQaCm51se8lirv7 hBRd

```

.....Additional Rows Deleted

```

Supplier#000008972 w2vF6 D5YZO3visPXsqVfLADTK
Supplier#000009032 qK,trB6Sdy4Dz1BRUFNy
Supplier#000009147 rOAuryHxpZ9eOvx
Supplier#000009252 F7cZaPUHwhl
ZKjy3xmAVWC1XdP ue1p5m,i
Supplier#000009278 RqYTzgxj93CLX 0mcYfCENOfD
Supplier#000009327 uoqMdf7e7Gj9dbQ53
Supplier#000009430 igRqmneFt
Supplier#000009567 r4Wfx4c3xsEAjcGj71HHZByornl
D9vrztXlv4
Supplier#000009601 51m637bO,Rw5DnHWFUvLacRx9
Supplier#000009709
rRnCbHYgDgl9PZYnyWKVYSUW0vKg
Supplier#000009753 wLhVEcRmd7PkJF4FBnGK7Z
Supplier#000009796 z,y4Idmr15DOvPUqYG
Supplier#000009799 4wNjXGa4OKWl
Supplier#000009811 E3iuyq7UnZxU7oPZIE2Gu6
Supplier#000009812
APFRMy3lCbgFga53n5t9DxzFPQPgnjrGt32
Supplier#000009862 rJzweWeN58
Supplier#000009868 ROjGgx5gvtkmmUUoeyy7v
Supplier#000009869
ucLqxzrpBTRMewGSM29t0rNTM30g1Tu3Xgg3mKag
Supplier#000009899 7XdpaHrzzr1t,UQFZE
Supplier#000009974
7wJ,J5DKcxSU4Kp1cQLpbcAvB5AsvKT

```

(204 row(s) affected)

-- using default substitutions

/* TPC_H Query 21 - Suppliers Who Kept Orders Waiting */

```

SELECT TOP 100
S_NAME,
COUNT(*) AS NUMWAIT
FROM SUPPLIER,
LINEITEM L1,
ORDERS,
NATION

```

Appendix D

```

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 NUMWAIT
-----
Supplier#000002829 20
Supplier#000005808 18
Supplier#000000262 17
Supplier#000000496 17
Supplier#000002160 17
Supplier#000002301 17
Supplier#000002540 17
Supplier#000003063 17
Supplier#000005178 17
Supplier#000008331 17
Supplier#000002005 16
Supplier#000002095 16
Supplier#000005799 16
Supplier#000005842 16
Supplier#000006450 16
Supplier#000006939 16
Supplier#000009200 16
Supplier#000009727 16
Supplier#000000486 15
Supplier#000000565 15
Supplier#000001046 15
Supplier#000001047 15
Supplier#000001161 15

.....Additional Rows Deleted .....
Supplier#000008134 13

Supplier#000008234 13
Supplier#000009435 13
Supplier#000009436 13
Supplier#000009564 13
Supplier#000009896 13
Supplier#000000379 12
Supplier#000000673 12
Supplier#000000762 12
Supplier#000000811 12
Supplier#000000821 12
Supplier#000001337 12
Supplier#000001916 12
Supplier#000001925 12
Supplier#000002039 12
Supplier#000002357 12
Supplier#000002483 12

(100 row(s) affected)

-- using default substitutions

/* TPC_H Query 22 - Global Sales Opportunity */

SELECT C_NTRYCODE,
COUNT(*) AS NUMCUST,
SUM(C_ACCTBAL) AS TOTACCTBAL
FROM (
    SELECT
    SUBSTRING(C_PHONE,1,2) AS
C_NTRYCODE,
C_ACCTBAL
FROM CUSTOMER
WHERE SUBSTRING(C_PHONE,1,2)
IN ('13', '31', '23', '29', '30', '18', '17') AND
C_ACCTBAL >
(
    SELECT AVG(C_ACCTBAL)
FROM CUSTOMER
WHERE C_ACCTBAL > 0.00 AND
SUBSTRING(C_PHONE,1,2) IN
('13', '31', '23', '29', '30', '18', '17')
) AND
NOT EXISTS (
    SELECT *
FROM
ORDERS
WHERE
O_CUSTKEY = C_CUSTKEY
)
) AS CUSTSALE
GROUP BY C_NTRYCODE
ORDER BY C_NTRYCODE
C_NTRYCODE NUMCUST TOTACCTBAL
-----
13 888 6737713.990000
17 861 6460573.720000
18 964 7236687.400000

```

Appendix D

23	892	6701457.950000
29	948	7158866.630000
30	909	6808436.130000
31	922	6806670.180000

(7 row(s) affected)

Appendix E: Seed and Input Parameters

Appendix E

Seed

1212101633

Stream0

1 109
 2 47 BRASS ASIA
 3 MACHINERY 1995-03-15
 4 1995-05-01
 5 AMERICA 1993-01-01
 6 1993-01-01 0.09 25
 7 RUSSIASAUDI ARABIA
 8 SAUDI ARABIAMIDDLE EAST LARGE
 ANODIZED STEEL
 9 maroon
 10 1993-11-01
 11 ROMANIA 0.0000010000
 12 SHIP MAIL 1993-01-01
 13 unusual packages
 14 1993-10-01
 15 1994-09-01
 16 Brand#31 MEDIUM BURNISHED 13
 20 24 50 36 39 40
 14
 17 Brand#12 LG BOX
 18 313
 19 Brand#22 Brand#14 Brand#44
 8 12 20
 20 hot 1993-01-01 MOROCCO
 21 CANADA
 22 25 15 29 12 18 21
 34

Stream1

21 SAUDI ARABIA
 3 BUILDING 1995-03-01
 18 315
 5 ASIA 1993-01-01
 11 GERMANY 0.0000010000
 7 KENYAJAPAN
 6 1993-01-01 0.06 24
 20 salmon 1997-01-01 EGYPT
 17 Brand#14 LG PACK
 12 FOB MAIL 1993-01-01
 16 Brand#11 ECONOMY POLISHED 16
 19 26 7 48 43 1
 33
 15 1997-04-01
 13 unusual packages
 10 1994-08-01
 2 35 TIN AFRICA
 8 JAPAN ASIA MEDIUM POLISHED STEEL

14 1994-01-01
 19 Brand#25 Brand#51 Brand#34
 4 13 27
 9 lawn
 22 14 15 10 17 16 27
 13
 1 117
 4 1993-02-01

Stream2

6 1994-01-01 0.04 24
 17 Brand#11 LG DRUM
 14 1994-04-01
 16 Brand#41 STANDARD BRUSHED 2
 12 5 40 13 21 46
 22
 19 Brand#22 Brand#34 Brand#33
 9 14 23
 10 1993-05-01
 9 hot
 2 23 COPPER ASIA
 15 1995-01-01
 8 EGYPT MIDDLE EAST MEDIUM BURNISHED
 STEEL
 5 EUROPE 1994-01-01
 22 15 23 27 25 12 18
 24
 12 MAIL AIR 1995-01-01
 7 FRANCE EGYPT
 13 unusual packages
 18 312
 1 64
 4 1995-09-01
 20 dark 1995-01-01 ROMANIA
 3 HOUSEHOLD 1995-03-17
 11 SAUDI ARABIA0.0000010000
 21 JORDAN

Stream3

8 VIETNAM ASIA SMALL BRUSHED
 COPPER
 5 MIDDLE EAST 1994-01-01
 4 1993-06-01
 6 1994-01-01 0.09 25
 17 Brand#13 MED BAG
 7 UNITED KINGDOM VIETNAM
 1 72
 18 314
 22 16 13 17 24 20 19
 15
 14 1994-08-01
 9 gainsboro
 10 1994-02-01
 15 1997-08-01
 11 INDIA 0.0000010000

Appendix E

20 orchid 1994-01-01 INDONESIA
 2 11 STEEL AFRICA
 21 ETHIOPIA
 19 Brand#34 Brand#22 Brand#32
 4 15 20
 13 unusual requests
 16 Brand#31 LARGE BURNISHED 31
 37 24 3 1 13 46
 28
 12 TRUCK FOB 1994-01-01
 3 BUILDING 1995-03-03

Stream4

5 AFRICA 1994-01-01
 21 RUSSIA
 14 1994-11-01
 19 Brand#31 Brand#55 Brand#21
 9 16 27
 15 1995-04-01
 17 Brand#15 MED PACK
 12 RAIL FOB 1994-01-01
 6 1994-01-01 0.06 25
 4 1996-01-01
 9 dodger
 8 JORDAN MIDDLE EAST SMALL
 PLATED COPPER
 16 Brand#11 PROMO PLATED 10
 4 45 49 20 46 25
 35
 11 VIETNAM 0.0000010000
 2 48 BRASS EUROPE
 10 1994-12-01
 18 315
 1 80
 13 express requests
 7 MOROCCO JORDAN
 22 34 19 14 32 25 26
 17
 3 HOUSEHOLD 1995-03-19
 20 bisque 1997-01-01 UNITED STATES

Stream5

21 KENYA
 15 1997-11-01
 4 1993-10-01
 6 1994-01-01 0.04 24
 7 GERMANY ETHIOPIA
 16 Brand#41 SMALL BRUSHED 47
 19 42 11 46 30 10
 48
 19 Brand#33 Brand#33 Brand#21
 5 17 23
 18 313
 14 1995-02-01

22 25 11 23 10 28 27
 31
 11 INDONESIA 0.0000010000
 13 express requests
 3 AUTOMOBILE 1995-03-05
 1 88
 2 36 TIN AFRICA
 5 ASIA 1994-01-01
 8 ETHIOPIA AFRICA SMALL
 ANODIZED COPPER
 20 light 1995-01-01 JORDAN
 12 AIR FOB 1995-01-01
 17 Brand#12 MED DRUM
 10 1993-09-01
 9 cornsilk

Appendix F: Benchmark Scripts

Appendix F

```
FROM PARTSUPP WHERE PS_PARTKEY =19763);
```

dbtables.sql

```
set echo on
set numwidth 25
spool rdbtablest
SELECT COUNT(*) FROM LINEITEM;

SELECT * FROM LINEITEM
WHERE L_ORDERKEY IN
( 4, 26598, 148577, 387431, 56704, 517442, 600000)
AND L_LINENUMBER = 1
ORDER BY L_ORDERKEY;

SELECT * FROM REGION;

SELECT COUNT(*) FROM NATION;

SELECT * FROM NATION
WHERE N_NATIONKEY IN (3,10,14,20)
ORDER BY N_NATIONKEY;
SELECT COUNT(*) FROM ORDERS;
SELECT * FROM ORDERS
WHERE O_ORDERKEY IN ( 7, 44065, 287590, 411111,
483876, 599942 )
ORDER BY O_ORDERKEY;

SELECT COUNT(*) FROM PART;

SELECT * FROM PART
WHERE P_PARTKEY IN
(1,984,8743,9028,13876,17899,20000)
ORDER BY P_PARTKEY;

SELECT COUNT(*) FROM PARTSUPP;

SELECT* FROM PARTSUPP
WHERE PS_PARTKEY = 3398
AND PS_SUPPKEY = (SELECT MIN(PS_SUPPKEY)
FROM PARTSUPP WHERE PS_PARTKEY = 3398);

SELECT* FROM PARTSUPP
WHERE PS_PARTKEY =15873
AND PS_SUPPKEY = (SELECT MIN(PS_SUPPKEY)
FROM PARTSUPP WHERE PS_PARTKEY = 15873);

SELECT* FROM PARTSUPP
WHERE PS_PARTKEY = 11394
AND PS_SUPPKEY = (SELECT MIN(PS_SUPPKEY)
FROM PARTSUPP WHERE PS_PARTKEY = 11394);

SELECT* FROM PARTSUPP
WHERE PS_PARTKEY = 6743
AND PS_SUPPKEY = (SELECT MIN(PS_SUPPKEY)
FROM PARTSUPP WHERE PS_PARTKEY = 6743);

SELECT* FROM PARTSUPP
WHERE PS_PARTKEY = 19763
AND PS_SUPPKEY = (SELECT MIN(PS_SUPPKEY)
```

```
SELECT COUNT(*) FROM SUPPLIER;

SELECT * FROM SUPPLIER
WHERE S_SUPPKEY IN (83,265,492,784,901,1000)
ORDER BY S_SUPPKEY;

SELECT COUNT(*) FROM CUSTOMER;

DROP TABLE MINMAX;

CREATE TABLE MINMAX
(TNAME CHAR(15),
KEYMIN INTEGER,
KEYMAX INTEGER);

INSERT INTO MINMAX
SELECT
'LINEITEM_ORD',MIN(L_ORDERKEY),MAX(L_ORDER
KEY)
FROM LINEITEM ;

INSERT INTO MINMAX
SELECT
'LINEITEM_NBR',MIN(L_LINENUMBER),MAX(L_LINE
NUMBER)
FROM LINEITEM;

INSERT INTO MINMAX
SELECT
'ORDERTBL',MIN(O_ORDERKEY),MAX(O_ORDERKEY)
FROM ORDERS;

INSERT INTO MINMAX
SELECT
'CUSTOMER',MIN(C_CUSTKEY),MAX(C_CUSTKEY)
FROM CUSTOMER;

INSERT INTO MINMAX
SELECT 'PART',MIN(P_PARTKEY),MAX(P_PARTKEY)
FROM PART;

INSERT INTO MINMAX
SELECT
'SUPPLIER',MIN(S_SUPPKEY),MAX(S_SUPPKEY)
FROM SUPPLIER;

INSERT INTO MINMAX
SELECT
'PARTSUPP_PART',MIN(PS_PARTKEY),MAX(PS_PART
KEY)
FROM PARTSUPP;

INSERT INTO MINMAX
```

Appendix F

```
SELECT
'PARTSUPP_SUPP',MIN(PS_SUPPKEY),MAX(PS_SUPPK
EY)
FROM PARTSUPP ;
```

```
INSERT INTO MINMAX
SELECT
'NATION',MIN(N_NATIONKEY),MAX(N_NATIONKEY)
FROM NATION;
```

```
INSERT INTO MINMAX
SELECT
'REGION',MIN(R_REGIONKEY),MAX(R_REGIONKEY)
FROM REGION;
```

```
SELECT * FROM MINMAX;
spool off
exit;
```

dbinsert.sql

```
rem
rem
=====
=====+
rem FILENAME
rem   inserts.sql
rem DESCRIPTION
rem   Inserts duplicate rows with new key numbers and
rem   inserts rows with values beyond the TPC-D values.
rem
rem
=====
=====
rem
rem Usage:  sqlplus tpcc/tpcc @insert
rem
```

```
set pagesize 100
set termout on
set echo on
set timing on
spool rdbinsert
```

```
rem
=====
=====
rem Duplicates
rem
=====
=====
```

```
REM get timestamp
```

```
select to_char (sysdate, 'HH24:MI:SS') timestamp from dual;
```

```
drop table temp_part;
create table temp_part as
  select * from part
    where p_partkey = 1;
update temp_part
  set p_partkey = 2147483647;
insert into part
  (select * from temp_part);
select * from part
  where p_partkey = 2147483647
 or p_partkey = 1;
delete from part
  where p_partkey = 2147483647;
drop table temp_part;
commit;
```

```
drop table temp_supplier;
create table temp_supplier as
  select * from supplier
    where s_suppkey = 1;
update temp_supplier
  set s_suppkey = 2147483647;
insert into supplier
  (select * from temp_supplier);
select * from supplier
  where s_suppkey = 2147483647
 or s_suppkey = 1;
delete from supplier
  where s_suppkey = 2147483647;
drop table temp_supplier;
commit;
```

```
drop table temp_partsupp;
create table temp_partsupp as
  select * from partsupp
    where ps_partkey = 1
      and ps_suppkey = 2;
update temp_partsupp
  set ps_partkey = 2147483647,
    ps_suppkey = 2147483647;
insert into partsupp
  (select * from temp_partsupp);
select * from partsupp
  where (ps_partkey = 2147483647
 and ps_suppkey = 2147483647)
 or (ps_partkey = 1
 and ps_suppkey = 2);
delete from partsupp
  where ps_partkey = 2147483647
 and ps_suppkey = 2147483647;
drop table temp_partsupp;
commit;
```

```
drop table temp_customer;
create table temp_customer as
```

Appendix F

```
select * from customer
  where c_custkey = 1;
update temp_customer
  set c_custkey = 2147483647;
insert into customer
  (select * from temp_customer);
select * from customer
  where c_custkey = 2147483647
  or c_custkey = 1;
delete from customer
  where c_custkey = 2147483647;
drop table temp_customer;
commit;

drop table temp_orders;
create table temp_orders as
  select * from orders
  where o_orderkey = (select min(o_orderkey) from
orders);
update temp_orders
  set o_orderkey = 2147483647;
insert into orders
  (select * from temp_orders);
select * from orders
  where o_orderkey = 2147483647
  or o_orderkey = (select min(o_orderkey) from
orders);
delete from orders
  where o_orderkey = 2147483647;
drop table temp_orders;
commit;

drop table temp_lineitem;
create table temp_lineitem as
  select * from lineitem
  where l_orderkey = (select min(o_orderkey) from
orders)
  and l_linenumber = 1;
update temp_lineitem
  set l_orderkey = 2147483647,
  l_partkey = 2147483647,
  l_suppkey = 2147483647,
  l_linenumber = -2147483646;
insert into lineitem
  (select * from temp_lineitem);
select * from lineitem
  where (l_orderkey = 2147483647
  and l_partkey = 2147483647
  and l_suppkey = 2147483647
  and l_linenumber = -2147483646)
  or (l_orderkey = (select min(o_orderkey) from
orders)
  and l_linenumber = 1);
delete from lineitem
  where l_orderkey = 2147483647
  and l_partkey = 2147483647
  and l_suppkey = 2147483647
  and l_linenumber = -2147483646;
drop table temp_lineitem;
```

```
commit;

drop table temp_nation;
create table temp_nation as
  select * from nation
  where n_nationkey = 1;
update temp_nation
  set n_nationkey = 2147483647;
insert into nation
  (select * from temp_nation);
select * from nation
  where n_nationkey = 2147483647
  or n_nationkey = 1;
delete from nation
  where n_nationkey = 2147483647;
drop table temp_nation;
commit;

drop table temp_region;
create table temp_region as
  select * from region
  where r_regionkey = 1;
update temp_region
  set r_regionkey = 2147483647;
insert into region
  (select * from temp_region);
select * from region
  where r_regionkey = 2147483647
  or r_regionkey = 1;
delete from region
  where r_regionkey = 2147483647;
drop table temp_region;
commit;

rem
=====
=====
rem Duplicates finished starting inserts for domain range
rem
=====
=====

REM get timestamp
select to_char (sysdate, 'HH24:MI:SS') timestamp from dual;

insert into supplier
  (s_suppkey, s_name, s_address, s_nationkey,
s_phone,
s_acctbal, s_comment)
values
(2147483647, 'NAME text .....25E',
'Address varchar .....30.....40E',
2147483647, 'This is phone E', 123456789012,
'Supplier comment field is 101 long no E');
select * from supplier
  where s_suppkey = 2147483647;
delete from supplier D
```

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```
where s_suppkey = 2147483647;
rem
=====
=====
insert into part
(p_partkey, p_name, p_mfgr, p_brand, p_type,
 p_size, p_container, p_retailprice, p_comment)
values
(2147483647, 'Pname text .....2.....3.....4....5E',
 'Pmfr text.....2....5E','Pbrand 10E',
 'Ptype varchar.....2....5E', 2147483646,
 'PcontainrE', 123456789012,
 'Part comment field 23E');
select * from part
where p_partkey = 2147483647;
delete from part
where p_partkey = 2147483647;
rem
=====
=====
insert into partsupp
(ps_partkey, ps_suppkey, ps_availqty, ps_supplycost,
 ps_comment)
values
(2147483647, 2147483647, -2147483646,
123456789012,
 'PS comment field is 199 long no E');
select * from partsupp
where ps_partkey = 2147483647
and ps_suppkey = 2147483647;
delete from partsupp
where ps_partkey = 2147483647
and ps_suppkey = 2147483647;
rem
=====
=====
insert into customer
(c_custkey, c_name, c_address, c_nationkey,
 c_phone, c_acctbal, c_mktsegment, c_comment)
values
(2147483647, 'Customer Name goes to 25E',
 'Customer Address goes here..3.....4E',
 2147483647, 'This is phone E', 123456789012,
 'ZMark segE', 'Customer comments fiels is 117 long
no E');
select * from customer
where c_custkey = 2147483647;
delete from customer
where c_custkey = 2147483647;
rem
=====
=====
insert into orders
(o_orderkey, o_custkey, o_orderstatus, o_totalprice,
 o_orderdate, o_orderpriority, o_clerk, o_shippriority,
 o_comment)
values
(2147483647, 2147483647, 'X', 123456789012,
TO_DATE('2005-12-30','YYYY-MM-DD'),
```

```
'Order Priority5E', 'Fixed text 15E', -2147483646,
'Order comments field is 79 no E');
select * from orders
where o_orderkey = 2147483647
and o_custkey = 2147483647;
delete from orders
where o_orderkey = 2147483647
and o_custkey = 2147483647;
rem
=====
=====
insert into lineitem
(l_orderkey, l_partkey, l_suppkey, l_linenummer,
 l_quantity, l_extendedprice, l_discount, l_tax,
 l_returnflag, l_linestatus, l_shipdate, l_commitdate,
 l_receiptdate, l_shipinstruct, l_shipmode,
 l_comment)
values
(2147483647,
2147483647,
2147483647,
-2147483646,
-123456789012,
-123456789012,
-123456789012,
-123456789012,
'Q',
'R',
TO_DATE('2005-12-30','YYYY-MM-DD'),
TO_DATE('2005-12-30','YYYY-MM-DD'),
TO_DATE('2005-12-30','YYYY-MM-DD'),
'Ship by camel .....5E',
'Ship ASAPE',
'Is this really what you wanted? 44 long....E');
select * from lineitem
where l_orderkey = 2147483647
and l_partkey = 2147483647
and l_suppkey = 2147483647
and l_linenummer = -2147483646;
delete from lineitem
where l_orderkey = 2147483647
and l_partkey = 2147483647
and l_suppkey = 2147483647
and l_linenummer = -2147483646;
rem
=====
=====
insert into nation
(n_nationkey, n_name, n_regionkey, n_comment)
values
(2147483647,
'Ze Republic d MakebelievE',
2147483647,
'A nation comment for field size 152 no E');
select * from nation
where n_nationkey = 2147483647
and n_regionkey = 2147483647;
delete from nation
where n_nationkey = 2147483647
```

Appendix F

```
and n_regionkey = 2147483647;
rem
=====
=====
insert into region
  (r_regionkey, r_name, r_comment)
  values
  (2147483647,
   'Ze ends of the earth....E',
   'A reasonable comment would go herE');
select * from region
  where r_regionkey = 2147483647;
delete from region
  where r_regionkey = 2147483647;
rem
=====
=====
REM get timestamp
select to_char (sysdate, 'HH24:MI:SS') timestamp from dual;
rem
=====
=====
rem Done
rem
=====
=====
spool off;
exit;
```

gen_seed.sh

```
#!/bin/ksh

SEED_FILE=$1

#Generate the seed

echo "Setting the random number seed"

PSEED=`date +%m:%d:%H:%M:%S | sed -e 's://g'`

echo "Using ${PSEED} as seed0"

echo ${PSEED} > $SEED_FILE

echo "Done setting the random number seed"
```

runTPCHall.beforeload

```
#!/bin/ksh

. $KIT_DIR/env

ECHO=echo

sqlplus=$ORACLE_HOME/bin/sqlplus

GTIME=${KIT_DIR}/utils/gtime

RUN_ID_FILE=${KIT_DIR}/audit/r_id

if [ ! -f $RUN_ID_FILE ]

then

  echo "0" > $RUN_ID_FILE

fi

RUN_ID=`cat $RUN_ID_FILE`

RUN_ID=`expr $RUN_ID + 1`

echo $RUN_ID > $RUN_ID_FILE

OUT_DIR=${KIT_DIR}/audit/tests/${RUN_ID}

if [ ! -d $OUT_DIR ]

then

  mkdir $OUT_DIR

fi

SCRIPT_LOG_FILE=${OUT_DIR}/main.out
RDB_TABLES=${OUT_DIR}/rdtablest
```

Appendix F

```
FIRST_TEN=${OUT_DIR}/firstten
LD1DBCRE=${OUT_DIR}/Ld1dbcre
LD2SCTSO=${OUT_DIR}/Ld2sctso
LD3DAPOP=${OUT_DIR}/Ld3dapop

2shut abort
2asmshut

echo Start TPC-H Benchmark SEQUENCE NUMBER:
$RUN_ID > $SCRIPT_LOG_FILE
echo >> $SCRIPT_LOG_FILE
echo "Starting a new Oracle log file:
$ORACLE_HOME/rdbms/log/alert_${ORACLE_SID}
.log" >> $SCRIPT_LOG_FILE
echo >> $SCRIPT_LOG_FILE

mv
$ORACLE_HOME/rdbms/log/alert_${ORACLE_SID}.log
$ORACLE_HOME/rdbms/log/alert_${
ORACLE_SID}.log.preAudit.$RUN_ID
touch
$ORACLE_HOME/rdbms/log/alert_${ORACLE_SID}.log

echo "Start: load database `date`" >> $SCRIPT_LOG_FILE
asmstart
build_dg_AUDIT2.sh >> $LD1DBCRE
dbcre_AUDIT2.sh >> $LD1DBCRE
tscre_AUDIT2.sh >> $LD2SCTSO
tshut
asmshut
2asmstart
2start
STIME=`$GTIME`
echo "Start: timed load portion `date`" >>
$SCRIPT_LOG_FILE
dapop_AUDIT2.sh >> $LD3DAPOP
$KIT_DIR/audit/gen_seed.sh $KIT_DIR/audit/seed
echo Generated seed: `cat $KIT_DIR/audit/seed` >>
$SCRIPT_LOG_FILE
2shut
2asmshut
2asmstart
2start
2shut
2asmshut
echo "End: timed load portion `date`" >>
$SCRIPT_LOG_FILE

exit

2asmstart >> $SCRIPT_LOG_FILE
2start >> $SCRIPT_LOG_FILE
ckpnt.sh
echo "Start: dbtables.sql and count.sql" >>
$SCRIPT_LOG_FILE
$sqlplus ${DATABASE_USER} @$KIT_DIR/audit/dbtables
> ${RDB_TABLES} 2>&1
$sqlplus ${DATABASE_USER} @$KIT_DIR/audit/firstten
> ${FIRST_TEN} 2>&1
```

```
echo "End: dbtables.sql and count.sql `date`" >>
$SCRIPT_LOG_FILE

runTPCHpt ${SCALE_FACTOR} 1 ${RUN_ID}

#2shut > $SCRIPT_LOG_FILE
#2start >> $SCRIPT_LOG_FILE
#ckpnt.sh
runTPCHpt ${SCALE_FACTOR} 2 ${RUN_ID}

sleep 600
2shut >> $SCRIPT_LOG_FILE

cp $ORACLE_HOME/rdbms/log/alert_${ORACLE_SID}.log
$OUT_DIR

echo "End TPC-H Benchmark SEQUENCE NUMBER:
$RUN_ID `date`" >> $SCRIPT_LOG_FILE

runTPCHall.afterload
#!/bin/ksh
. $KIT_DIR/env

ECHO=echo

sqlplus=$ORACLE_HOME/bin/sqlplus
GTIME=${KIT_DIR}/utils/gtime

RUN_ID_FILE=${KIT_DIR}/audit/r_id

if [ ! -f $RUN_ID_FILE ]
then
echo "0" > $RUN_ID_FILE
fi

RUN_ID=`cat $RUN_ID_FILE`
#RUN_ID=`expr $RUN_ID + 1`
echo $RUN_ID > $RUN_ID_FILE

OUT_DIR=${KIT_DIR}/audit/tests/${RUN_ID}
if [ ! -d $OUT_DIR ]
then
mkdir $OUT_DIR
fi
SCRIPT_LOG_FILE=${OUT_DIR}/main.out
RDB_TABLES=${OUT_DIR}/rdbtablest
FIRST_TEN=${OUT_DIR}/firstten
LD1DBCRE=${OUT_DIR}/Ld1dbcre
LD2SCTSO=${OUT_DIR}/Ld2sctso
LD3DAPOP=${OUT_DIR}/Ld3dapop

#echo Start TPC-H Benchmark SEQUENCE NUMBER:
$RUN_ID > $SCRIPT_LOG_FILE
```

Appendix F

```
#echo >> $SCRIPT_LOG_FILE
#echo "Starting a new Oracle log file:
$ORACLE_HOME/rdbms/log/alert_${ORACLE_SID}
}.log" >> $SCRIPT_LOG_FILE
#echo >> $SCRIPT_LOG_FILE
#
#mv
$ORACLE_HOME/rdbms/log/alert_${ORACLE_SID}.log
$ORACLE_HOME/rdbms/log/alert_
${ORACLE_SID}.log.preAudit.$RUN_ID
#touch
$ORACLE_HOME/rdbms/log/alert_${ORACLE_SID}.log

#echo "Start: load database `date`" >> $SCRIPT_LOG_FILE
#asmstart
#build_dg_AUDIT2.sh >> $LD1DBCRE
#dbcre_AUDIT2.sh >> $LD1DBCRE
#tscre_AUDIT2.sh >> $LD2SCTSO
#tshut
#asmshut
#2asmstart
#2start
#STIME=`$GTIME`
#echo "Start: timed load portion `date`" >>
$SCRIPT_LOG_FILE
#dapop_AUDIT2.sh >> $LD3DAPOP
#$KIT_DIR/audit/gen_seed.sh $KIT_DIR/audit/seed
#echo Generated seed: `cat $KIT_DIR/audit/seed` >>
$SCRIPT_LOG_FILE
#2shut
#2asmshut
#echo "End: timed load portion `date`" >>
$SCRIPT_LOG_FILE

#2asmstart >> $SCRIPT_LOG_FILE
#2start >> $SCRIPT_LOG_FILE
#ckpnt.sh

#echo "Start: dbtables.sql and count.sql" >>
$SCRIPT_LOG_FILE
#sqlplus ${DATABASE_USER}
@${KIT_DIR}/audit/dbtables > ${RDB_TABLES} 2>&1
#sqlplus ${DATABASE_USER} @${KIT_DIR}/audit/firstten
> ${FIRST_TEN} 2>&1
#echo "End: dbtables.sql and count.sql `date`" >>
$SCRIPT_LOG_FILE

#runTPCHpt ${SCALE_FACTOR} 1 ${RUN_ID}
#2shut >> $SCRIPT_LOG_FILE
#2asmshut >> ${SCRIPT_LOG_FILE}
#exit
2asmstart >> ${SCRIPT_LOG_FILE}
2start >> ${SCRIPT_LOG_FILE}
ckpnt.sh
runTPCHpt ${SCALE_FACTOR} 2 ${RUN_ID}

sleep 600
2shut >> ${SCRIPT_LOG_FILE}
```

```
2asmshut >> ${SCRIPT_LOG_FILE}

cp $ORACLE_HOME/rdbms/log/alert_${ORACLE_SID}.log
$OUT_DIR

echo "End TPC-H Benchmark SEQUENCE NUMBER:
$RUN_ID `date`" >> $SCRIPT_LOG_FILE

runuf1.sh
#!/bin/ksh
#
# $Header: runuf1.sh 25-oct-2001.15:56:04 mpoess Exp $
#
# runuf1.sh
#
# Copyright (c) 1999, 2001, Oracle Corporation. All rights
reserved.
#
# NAME
# runuf1.sh - <one-line expansion of the name>
#
# DESCRIPTION
# runuf1.sh -l [<path name for reports>] -u [<uid/passwd>]
# -p [<program>] <run_id> <scale factor> <pair
number>
# <parallelism>
# USAGE
# To execute UF1.
#
# NOTES
# <other useful comments, qualifications, etc.>
#
# MODIFIED (MM/DD/YY)
# mpoess 10/25/01 - change default directory for update
sets
# mpoess 10/17/01 - add support for external tables
# mpoess 08/15/99 - Creation
# mpoess 08/15/99 - Creation
#
#
. $KIT_DIR/env
O=${ORACLE_HOME}
UPDATE_DIR=${KIT_DIR}/update
SCRIPT_DIR=${UPDATE_DIR}/scripts
UTILS_DIR=${KIT_DIR}/utils
LOG_DIR=${UPDATE_DIR}/log
GTIME=${UTILS_DIR}/gtime
SF=${SCALE_FACTOR}
PAR_HINT=16

LOGPATH=
PASSWD=${DATABASE_USER}

if [ $# -lt 1 ];
then
echo runuf1.sh setnum
exit 1
fi
SETNUM=$1
```


Appendix F

```

i=1
PID=""

# perform the update function 1

START=`$GTIME`

# first create the temp tables

sqlplus /NOLOG << !

connect $PASSWD;
set timing on
set serveroutput on
set echo on

drop directory data_dir;
create directory data_dir as '/ff1/';

drop table temp_l_et;
create table temp_l_et(
  l_orderkey      number ,
  l_partkey       number ,
  l_suppkey       number ,
  l_linenumbers   number ,
  l_quantity      number ,
  l_extendedprice number ,
  l_discount      number ,
  l_tax           number ,
  l_returnflag    char(1) ,
  l_linestatus    char(1) ,
  l_shipdate      date ,
  l_commitdate    date ,
  l_receiptdate   date ,
  l_shipinstruct  char(25) ,
  l_shipmode      char(10) ,
  l_comment       varchar(44)
)
organization external (
type ORACLE_LOADER
default directory data_dir
access parameters
(
  records delimited by newline
  nobadfile
  nologfile
  fields terminated by '|'
  missing field values are null
)
location (
'orders.tbl.u${SETNUM}'
))
reject limit unlimited;
alter table temp_l_et parallel ${PAR_HINT};
alter table temp_o_et parallel ${PAR_HINT};

alter session force parallel dml parallel (degree
${PAR_HINT});
alter session set isolation_level = serializable;
alter session set optimizer_index_cost_adj = 10;

insert into orders (
select
  o_orderdate      ,
  o_orderkey       ,
  o_custkey        ,
  o_orderpriority  ,
  o_shippriority   ,
  o_clerk          ,
  o_orderstatus    ,
  o_totalprice     ,
  o_comment
from temp_o_et);

insert into lineitem (
select
  l_shipdate      ,
  l_orderkey       ,
  l_discount       ,
  l_extendedprice  ,
  l_suppkey        ,
  l_quantity       ,
  l_returnflag     ,
  l_partkey        ,
  l_linestatus     ,
  l_tax            ,
  l_commitdate     ,
  l_receiptdate    ,
  l_shipmode

```

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```
l_linenumber      ,
l_shipinstruct    ,
l_comment
from temp_l_et);
commit;
drop table temp_l_et;
drop table temp_o_et;

exit;
!

END=`$GTIME`

# Done

echo ""
echo "Update Function 1 Set $SETNUM done!"
echo "Elapsed Time is `echo $END - $START | bc`"
echo ""

runuf2.sh
#!/bin/ksh
#
# $Header: runuf2.sh 25-oct-2001.15:56:05 mpoess Exp $
#
# runuf2.sh
#
# Copyright (c) 1999, 2001, Oracle Corporation. All rights
reserved.
#
# NAME
# runuf2.sh - <one-line expansion of the name>
#
# DESCRIPTION
# runuf2.sh [-u <uid/passwd to login>] [-p <program>]
<run_id>
#          <scale factor> <pair number> <parallelism>
# USAGE
# To execute UF2.
#
# NOTES
# <other useful comments, qualifications, etc.>
#
# MODIFIED (MM/DD/YY)
# mpoess 10/25/01 - change default directory for update
sets
# mpoess 10/17/01 - add support for external tables
# mpoess 08/15/99 - Creation
# mpoess 08/15/99 - Creation
#
. $KIT_DIR/env
UPDATE_DIR=${KIT_DIR}/update
SCRIPT_DIR=${UPDATE_DIR}/scripts
UTILS_DIR=${KIT_DIR}/utils
GTIME=${UTILS_DIR}/gtime
LOG_DIR=${UPDATE_DIR}/log
PAR_HINT=16
SF=${SCALE_FACTOR}
```

```
PASSWD=${DATABASE_USER}

if [ $# -lt 1 ]
then
usage
exit 1
fi

SETNUM=$1

i=1
PID=""

START=`$GTIME`
# first create the temp tables

sqlplus /NOLOG << !

connect $PASSWD;
set timing on
set serveroutput on
set echo on

drop directory data_dir;
create directory data_dir as '/ff1/';

drop table temp_okey_et;
drop table temp_okey;

create table temp_okey_et(
    t_orderkey      number
)
organization external (
type ORACLE_LOADER
default directory data_dir
access parameters
(
    records delimited by newline
    nobadfile
    nologfile
    fields terminated by '|'
    missing field values are null
)
location (
'delete.${SETNUM}'))
reject limit unlimited;

alter table temp_okey_et parallel ${PAR_HINT};

create table temp_okey parallel ${PAR_HINT} nologging as
select * from temp_okey
_et;

create unique index i_temp_okey on temp_okey (t_orderkey)
parallel ${PAR_HINT}
nologging compute statistics;

analyze table temp_okey estimate statistics sample 2 percent;
```

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```

alter session force parallel dml parallel ${PAR_HINT};
alter session set isolation_level=serializable;
alter session set optimizer_index_cost_adj = 10;
delete from (select /*+ use_nl(o) */ o.rowid from orders o,
temp_okey t where o.
o_orderkey = t.t_orderkey order by 1);

delete from (select /*+ use_nl(l) */ l.rowid from lineitem
l,temp_okey t where l
.l_orderkey = t.t_orderkey order by 1);

commit;
drop table temp_okey;
drop table temp_okey_et;
exit;
!

END=`$GTIME`

# Done

echo ""
echo "Update Function 2 Set $SETNUM done!"
echo "Elapsed Time is `echo $END - $START | bc`"
echo ""

qexecpl.c
#ifdef RCSID
static char *RCSid =
"$Header: qexecpl.c 17-oct-2001.09:29:47 mpoess Exp $ ";
#endif /* RCSID */

/* Copyright (c) 1999, 2001, Oracle Corporation. All rights
reserved. */

/*

NAME
    qexecpl.c - <one-line expansion of the name>

DESCRIPTION
    SQL Execution Engine, Oracle v8, OCI version

PRIVATE FUNCTION(S)
    <list of static functions defined in .c file - with one-line
descriptions>

MODIFIED (MM/DD/YY)
    mpoess 10/17/01 - add serialization level in SQLinit
    mpoess 02/22/01 - add linux changes
    mpoess 08/05/99 - make compile
    mpoess 11/13/98 - fix pdll statement
    pswong 02/19/97 - migrating to version 8
    pswong 04/02/96 - more polishing
    pswong 03/25/96 - polish up
    pswong 03/06/96 - created

```

*/

```

#include <stdio.h>
#include <string.h>
#include <setjmp.h>
#include <sys/param.h>
#include <errno.h>
#include <math.h>
#include <string.h>
#include <sys/types.h>
#include <time.h>
#include <stdlib.h>

#include "qexecpl.h"

/* Function Prototypes */

extern double gettimeofday();

/* function prototypes from gen.c */

int get_statement();

/* Declare error handling functions */

void sql_error();

/* Other prototypes */

int define_output_variables();
void process_select_list();
void usage();
void SQLinit();
void SQLexec();
void SQLexit();
void *memalloc();
void print_header();
void print_rows();
int OFEN();
void remove_newline();

char logname[UNAME_LEN]; /* username/passwd combo */
char *passwd;

double tr_start = 0.0; /* query start time */
double tr_end = 0.0; /* query end time */

double s_tr_start = 0.0; /* statement start time */
double s_tr_end = 0.0; /* statement end time */

/* For our purpose of timing, we will treat comments as
delimiters */
/* for queries. Thus, we will collect query timings whenever
we */
/* encounter a comment (of course not for the first comment
in a */
/* file). */

int end_flag = 0; /* flag to indicate that we have reached
*/

```

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```

/* the end of a query */

int stmt_cnt = 0; /* Number of statements processed.
*/
int qry_cnt = 0; /* Number of query processed. */

double product = 1.0; /* cumulative product of query times
*/
int rows_ret = 0; /* the number of rows fetched */
int num_sel_list = 0; /* the number of select list item */

long num_to_fetch = -1; /* Number of rows to fetch. -1
means fetch all */

slist slist[MAX_SEL_LIST]; /* Array for describing Select
List */
dlist *dlist[MAX_SEL_LIST]; /* Array of ptrs for Defining
Select List */

char stmt[SQL_LEN]; /* The SQL statement or comment
line. */
char qn[4]; /* Number of the query being executed
*/
char qnp[4]; /* Number of the previous query
executed */
char cmnt[5000]; /* Buffer to save the comment.
*/
#ifdef LINUX
FILE *qtemp; /* fd for query template */
FILE *logfile; /* log and report files */
FILE *rep;
#else
FILE *qtemp = stdin; /* fd for query template */
FILE *logfile = stdout; /* log and report files */
FILE *rep = stdout;
#endif
void *defbuf; /* Buffer pointer for ODEFIN */
int deflen = 0; /* Size of data type for ODEFIN */
int deftype = 1; /* Oracle type number for ODEFIN
*/

int pfmem = PFMEMSIZE; /* Memory to prefetch rows
*/

time_t tim; /* To get wall clock time */

/* OCI handles */

OCIEnv *tpcenv = NULL;
OCIServer *tpcsrv = NULL;
OCIError *errhp = NULL;
OCISvcCtx *tpcsvc = NULL;
OCISession *tpcusr = NULL;
OCISmt *curq = NULL;
OCISmt *cur_dml = NULL;
OCISmt *cur_ddl = NULL;
OCIParm *tpcpar = NULL;

```

```

sword status = OCI_SUCCESS; /* OCI return value */

```

```

/* usage: prints the usage of the program */

```

```

void usage() {

    fprintf(stderr, "\nUsage: qexec username/password [q<path
name for query template file>]\n");
    fprintf(stderr, "          [l<path name for log>] [r<path
name for reports>]\n\n");
    fprintf(stderr, "Options:\n");
    fprintf(stderr, "q<path for query>      : full path name for the
query template file.\n");
    fprintf(stderr, "          (default is stdin)\n");
    fprintf(stderr, "l<path name for log>      : full path name for
log files\n");
    fprintf(stderr, "          (default is stdout)\n");
    fprintf(stderr, "r<path name for reports> : full path name for
reports\n");
    fprintf(stderr, "          (default is stdout)\n");
    exit(-1);
}

```

```

/* type: 0 if environment handle is passed, 1 if error handle is
passwd */

```

```

void sql_error(errhp, status, type)
    OCIError *errhp;
    sword status;
    sword type;
{
    char msg[2048];
    ub4 errcode;
    ub4 msglen;
    int i, j;

    switch(status) {
    case OCI_SUCCESS_WITH_INFO:
        fprintf(stderr, "Error: Statement returned with info.\n");
        if (type)
            (void)
OCIErrorGet(errhp, 1, NULL, (sb4*)&errcode, (text*)msg,
                2048, OCI_HTYPE_ERROR);
        else
            (void)
OCIErrorGet(errhp, 1, NULL, (sb4*)&errcode, (text*)msg,
                2048, OCI_HTYPE_ENV);
        fprintf(stderr, "%s\n", msg);
        break;
    case OCI_ERROR:
        fprintf(stderr, "Error: OCI call error.\n");
        if (type)
            (void)
OCIErrorGet(errhp, 1, NULL, (sb4*)&errcode, (text*)msg,
                2048, OCI_HTYPE_ERROR);
        else
            (void)
OCIErrorGet(errhp, 1, NULL, (sb4*)&errcode, (text*)msg,

```

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```

                2048,OCI_HTYPE_ENV);
    fprintf(stderr,"%s\n",msg);
    break;
case OCI_INVALID_HANDLE:
    fprintf(stderr, "Error: Invalid Handle.\n");
    if (type
        (void)
OCIErrorGet(errhp,1,NULL,(sb4*)&errcode,(text*)msg,
            2048,OCI_HTYPE_ERROR);

        else
            (void)
OCIErrorGet(errhp,1,NULL,(sb4*)&errcode,(text*)msg,
            2048,OCI_HTYPE_ENV);
        fprintf(stderr,"%s\n",msg);
        break;
    }

/* Rollback just in case */

(void) OCITransRollback(tpcsvc,errhp,OCI_DEFAULT);

fprintf(stderr, "Exiting Oracle...\n");
fflush(stderr);

SQLexit();

exit(1);
}

#ifdef LINUX
int main(argc,argv)
#else
void main(argc,argv)
#endif
    int argc;
    char *argv[];
    {

    int i,pos,pos2;
    int retcode; /* Return code for get_statement */
#ifdef LINUX
    logfile=fopen("/dev/stdout","w");
    qtemp=fopen("/dev/stdin","rw");
    rep=fopen("/dev/stdout","w");
#endif
    /* Initialize some variables */

    if ((argc > 5) || (argc < 2)) {
        usage();
    }

/* argv[1] -- User and Password for Database */

strcpy(logname, argv[1]);

/* Process optional parameters */

    argc -= 1;
    argv += 1;

```

```

while(--argc) {
    ++argv;
    switch(argv[0][0]) {
    case 'q':
        if ((qtemp = fopen(++(argv[0]),"r")) == NULL) {
            fprintf(stderr,"Unable to open file '%s'\n", argv[0]);
            fprintf(stderr,"%s: %s\n", argv[0], strerror(errno));
            exit(-1);
        }
        break;
    case 'r':
        if ((rep = fopen(++(argv[0]),"a")) == NULL) {
            fprintf(stderr,"Unable to open file '%s'\n", argv[0]);
            fprintf(stderr,"%s: %s\n", argv[0], strerror(errno));
            exit(-1);
        }
        break;
    case 'l':
        if ((logfile = fopen(++(argv[0]),"a")) == NULL) {
            fprintf(stderr,"Unable to open file '%s'\n", argv[0]);
            fprintf(stderr,"%s: %s\n", argv[0], strerror(errno));
            exit(-1);
        }
        break;
    default:
        fprintf(stderr,"Invalid Option: %c\n", argv[0][0]);
        usage();
        break;
    }
}

/* Do some initialization and establish connection with the
database */

SQLinit();

/* May want to add some triggering mechanism here */

time(&tim);
fprintf(logfile, "Begin Execution at %s\n\n", ctime(&tim));
fprintf(rep, "Begin Executing this Stream at %s\n\n",
ctime(&tim));
/* Get the next statement and start processing it */

while ((retcode = get_statement()) > 0) {

    switch (retcode) {

        /* If this is a comment, skips it */
    case COMMENT:
        /*if (end_flag) {
            end_flag = 0; /* /* reset query end flag */
            /* save the comment so that we can print it out later
on */
            /* strcpy(cmnt, stmt);
            break;
        } */
        if (stmt[3]=='@') {

```

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```

pos=4;
strcpy(qnp,qn);
while (stmt[pos] != ')') {
    pos++;
}
pos2=0;
pos++;
while (stmt[pos] != '!') {
    /*printf ("qn %d %c \n",pos2,stmt[pos]);*/
    qn[pos2]=stmt[pos];
    pos2++;
    pos++;
}
qn[pos2] = 0;
/* printf("found a new query: %s\n",qn); */
}
/* save the comment so that we can print it out later on */
strcat(cmnt, stmt);
break;

/* if this is a set_row_fetch command */
case SET_FETCHROW:
    fprintf(logfile,"Setting the number of rows to fetch to:
%d\n",
        num_to_fetch);
    break;

/* if this is a SQL statement */
case SQL_STMT:

    /* Executes the query */
    SQLexec();

    stmt_cnt++;
    qry_cnt++;
    fflush(rep);
    fflush(logfile);
    /*
    fprintf(logfile,"nStatement Started at %.2fn", s_tr_start);
    fprintf(logfile,"Statement Ended at %.2fn", s_tr_end);

    fprintf(logfile,"Statement Processed in %.2f seconds.\n",
        (s_tr_end - s_tr_start));
    fprintf(rep, "Query %s: Execution Time: %.2f started %.2f
ended %.2fn",
        qn,(s_tr_end - s_tr_start)s_tr_start,s_tr_end);
    fflush(rep);
    fflush(logfile);*/
    break;

/* Should never reach here */
default:
    fprintf(stderr, "Invalid statement type!!\n");
    SQLexit();
    break;
}
}

/* Get Timing for the last query */
tr_end = gettimeofday();

fprintf(logfile,"Query Processed in %.2f
seconds.\n\n",(tr_end - s_tr_start));

/* print comments for this query that we have saved */
/* fprintf(logfile, "%s\n", cmnt); */

/* fprintf(rep, "Query %s : Execution time %.2fn",
qn,(tr_end - s_tr_start));*/
fprintf(rep, "Query %s: Execution Time: %.2f started %.2f
ended %.2fn",
        qn,(tr_end - s_tr_start),s_tr_start,tr_end);

time(&tim);
fprintf(logfile, "\nEnded Executing this Stream at %s\n",
ctime(&tim));
fprintf(logfile, "\nStream Started at %.2fn", tr_start);
fprintf(logfile, "Stream Ended at %.2fn", tr_end);
fprintf(logfile, "Stream Processed in %.2f
seconds\n\n",(tr_end - tr_start));

fprintf(rep, "\nEnded Executing this Stream at %s\n",
ctime(&tim));
fprintf(rep, "\nStream Started at %.2fn", tr_start);
fprintf(rep, "Stream Ended at %.2fn", tr_end);
fprintf(rep, "Stream Processed in %.2f seconds\n\n",
        (tr_end - tr_start));

fprintf(logfile, "\nSQL statements processed: %d\n",
stmt_cnt);
/*fprintf(logfile, "Queries processed: %d\n", qry_cnt);*/

fflush(rep);
fflush(logfile);

/* Close the query template file */

fclose(qtemp);

/* Disconnect from ORACLE. */

SQLexit();
exit(0);
}

/* SQLinit(): Perform initialization tasks. */
/* Logs on to Oracle, opens some files and open a
cursor for */
/* later use. */

void SQLinit() {

    int i;

```

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```

/* preallocate MAX_PREALLOC members of the dlist array
*/
/* initializes others to NULL so that we can determine who
to free later */

for (i=0; i<MAX_SEL_LIST; i++) {
    if (i < MAX_PREALLOC) {
        dlist[i] = (dlttype *) memalloc (sizeof(dlttype));
        dlist[i]->defhdl = NULL;
    }
    /* OCIhalloc(curq,&(dlist[i]-
>defhdl),OCI_HTYPE_DEFINE); */
    }
    else
        dlist[i] = NULL;
    }

/* Connect to ORACLE. Program will call sql_error()
*/
/* if an error occurs in connecting to the default database. */

(void) OCIInitialize(OCI_DEFAULT,(dvoid *)0,0,0,0);

if((status=OCIEnvInit((OCIEnv
**) &tpcenv,OCI_DEFAULT,0,(dvoid **)0)) !=
OCI_SUCCESS)
    sql_error(tpcenv, status, 0);

OCIhalloc(tpcenv,&errhp,OCI_HTYPE_ERROR);
OCIhalloc(tpcenv,&curq,OCI_HTYPE_STMT);
OCIhalloc(tpcenv,&cur_dml,OCI_HTYPE_STMT);
OCIhalloc(tpcenv,&cur_ddl,OCI_HTYPE_STMT);
OCIhalloc(tpcenv,&tpcsvc,OCI_HTYPE_SVCCTX);
OCIhalloc(tpcenv,&tpcsrv,OCI_HTYPE_SERVER);
OCIhalloc(tpcenv,&tpcusr,OCI_HTYPE_SESSION);

/* get username and password */

passwd = strchr(logname, '/');
*passwd = '\0';
passwd++;

if ((status = OCIServerAttach(tpcsrv,errhp,(text
*)0,0,OCI_DEFAULT)) != OCI_SUCCESS)
    sql_error(errhp,status,1);

OCIaset(tpcsvc,OCI_HTYPE_SVCCTX,tpcsrv,0,OCI_ATTR
_SERVER,errhp);

OCIaset(tpcusr,OCI_HTYPE_SESSION,logname,strlen(logna
me),OCI_ATTR_USERNAME,
errhp);

OCIaset(tpcusr,OCI_HTYPE_SESSION,passwd,strlen(passw
d),OCI_ATTR_PASSWORD,
errhp);

if((status = OCISessionBegin(tpcsvc, errhp, tpcusr,
OCI_CRED_RDBMS,
OCI_DEFAULT)) !=
OCI_SUCCESS)
    sql_error(errhp,status,1);

OCIaset(tpcsvc,OCI_HTYPE_SVCCTX,tpcusr,0,OCI_ATTR
_SESSION,errhp);

/*
if ((status=OCILogon((OCIEnv *)tpcenv,(OCIError
*)errhp,(OCISvcCtx *)tpcsvc,
(text *)logname, strlen(logname), (text
*)passwd,
strlen(passwd), (text *) 0, 0)) !=
OCI_SUCCESS)
    sql_error(errhp, status, 1);
*/
printf("\nConnected to ORACLE as user: %s\n\n", logname);
}

/* SQLexec() Executes the SQL statement.
*/
/* Parse the SQL statement. */
/* If DDL or DML statements, execute right away.
*/
/* Else describe and define select list outputs, */
/* execute and fetch results. */

void SQLexec()
{
    int i;
    ub2 stmttyp = OCI_STMT_SELECT; /* default is a
SELECT statement */

    /* Clause 5.3.6.2: QI(i,s) is the time between the first
character */
    /* of this query text is submitted and the first */
    /* character of the next query text is submitted. */

    if (qry_cnt) {
        time(&tim);
        s_tr_end = gettime();
        fprintf(logfile,"Query Processed in %.2f seconds.\n\n",
(s_tr_end - s_tr_start));

        /* print comments for this query that we have saved */
        /* fprintf(logfile, "%s\n", cmnt); */

        /*fprintf(rep, "Query %s : Execution time %.2f\n",
qnp,(s_tr_end - s_tr_start));*/
        fprintf(rep, "Query %s: Execution Time: %.2f started %.2f
ended %.2f\n",
qnp,(s_tr_end - s_tr_start),s_tr_start,s_tr_end);
    }
}

```

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```

/* Let's fflush stuff so that we can see what's going on */
/* Fix for Q15 */
fflush(logfile);
fflush(rep);

strcpy(qnp,qn);

fflush(logfile);
fflush(rep);
}
else
    tr_start = gettime();

s_tr_start = gettime();

/* prepare the statement */

if ((status = OCISstmtPrepare(curq, errhp, (text*) stmt, (ub4)
strlen(stmt),
                                OCI_NTV_SYNTAX,
OCI_DEFAULT)) != OCI_SUCCESS)
    sql_error(errhp,status,1);

/* Prints the query text and comment to the logfile */

fprintf(logfile, "\n%s\n", cmnt);
cmnt[0]=0;
fprintf(logfile, "\n%s\n", stmt);

/* if this is a DDL or DML statement, execute it right away
*/
/* only worries about SELECT statements right now, cannot
*/
/* execute a stored PL/SQL procedure in this version */

OCIaget(curq,OCI_HTYPE_STMT,&stmttyp,NULL,OCI_AT
TR_STMT_TYPE,errhp);

if (stmttyp != OCI_STMT_SELECT) {
    OCIsexec(tpcsvc,curq,errhp,1);
    return;
}

/* otherwise, this is a select statement */
/* Describe and define output variables */

/* first let's execute it to get the select-list definition */

OCIaset(curq, OCI_HTYPE_STMT, &pfmem, 0,
OCI_ATTR_PREFETCH_MEMORY, errhp);

OCIsexec(tpcsvc,curq,errhp,0);

num_sel_list = define_output_variables();

/* Executes the query and fetches the rows */
(void) process_select_list(num_sel_list);

/* Need to get the number of rows fetched first */
/* since the following statments will screw it up */

OCIaget(curq,OCI_HTYPE_STMT,&rows_ret,NULL,OCI_A
TTR_ROW_COUNT,errhp);

/* To control memory usage, let's free up the extra dlist
entries */
/* that we have allocated. */

i=MAX_PREALLOC;
while(dlist[i] != NULL) {
    free(dlist[i]);
    dlist[i++] = NULL;
}

/* reset set_fetchrows */

num_to_fetch = -1;
}

void SQLexit() {

    int i;

    OCILogoff(tpcsvc,errhp);
    OCIhfree(tpcenv,OCI_HTYPE_STMT);
    OCIhfree(tpcsvc,OCI_HTYPE_SVCCTX);
    OCIhfree(tpcsrv,OCI_HTYPE_SERVER);
    OCIhfree(tpcusr,OCI_HTYPE_SESSION);

    /* free all memory */

    for (i=0; i<MAX_SEL_LIST; i++) {
        if (dlist[i] != NULL) {
            free(dlist[i]);
        }
    }

    /* Flush all output */

    fflush(rep);
    fflush(logfile);
}

/* define_output_variables(): Describe and define select-list
items for */
/* a query statement. */
/* Returns the number of select-list items */
/* for this query. */

int define_output_variables()

```


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```

{
    int i;
    int retflag = 0;

    for (i=0; i<MAX_SEL_LIST; i++) {

        slist[i].buflen = MAX_COLNAME_SIZE;

        if (OCIParamGet(curq, OCI_HTYPE_STMT, errhp, (dvoid
**) &tpcpar,
                POS(i)) != OCI_SUCCESS)
            break;

        /* dsize and nullok fields of dlist not used */

        OCIaget(tpcpar, OCI_DTYPE_PARAM, &(slist[i].dbsize),
                NULL, OCI_ATTR_DATA_SIZE, errhp);
        OCIaget(tpcpar, OCI_DTYPE_PARAM, &(slist[i].dbtype),
                NULL, OCI_ATTR_DATA_TYPE, errhp);
        OCIaget(tpcpar, OCI_DTYPE_PARAM, &(slist[i].buf),
                &(slist[i].buflen), OCI_ATTR_NAME, errhp);
        OCIaget(tpcpar, OCI_DTYPE_PARAM,
&(slist[i].precision),
                NULL, OCI_ATTR_PRECISION, errhp);
        OCIaget(tpcpar, OCI_DTYPE_PARAM, &(slist[i].scale),
                NULL, OCI_ATTR_SCALE, errhp);

        /* For formatting purpose, remove trailing blanks in select-
list name. */

        /*
        if (slist[i].buflen < MAX_COLNAME_SIZE)
            (slist[i].buf)[slist[i].buflen] = '\0';
        */
        /* Well, we need to allocate for entries for dlist */

        if (i >= MAX_PREALLOC) {
            dlist[i] = (dtype *) memalloc(sizeof(dtype));
            dlist[i]->defhdl = NULL;
        }

        /* Let's check the sizes and types for this select list item */

        switch (slist[i].dbtype) {

        case OCI_TYPECODE_NUMBER:

            /* The odescr will not give a good estimate to the scale if
            */
            /* no scale was given in the Oracle table definition. */

#ifdef HAVE_SCALE
            if (slist[i].scale != 0) {
                defbuf = (double *) dlist[i]->fbuf;
                deflen = FLT;
                deftype = OCI_TYPECODE_DOUBLE;
                slist[i].dbtype = OCI_TYPECODE_DOUBLE;
            } else {
                defbuf = (int *) dlist[i]->ibuf;
                deflen = INT;
                deftype = OCI_TYPECODE_INTEGER;
                slist[i].dbtype = OCI_TYPECODE_INTEGER;
            }
#else
            defbuf = (double *) dlist[i]->fbuf;
            deflen = FLT;
            deftype = OCI_TYPECODE_FLOAT;
            slist[i].dbtype = OCI_TYPECODE_FLOAT;
#endif /* HAVE_SCALE */

            break;

        default:

            /* default is character string */

            defbuf = (char **) dlist[i]->sbuf;
            deflen = MAX_STR_LEN;
            deftype = SQLT_STR;
            /* deftype = OCI_TYPECODE_CHAR; */
            break;
        }

        /* Define the column */

        if ((status=OCIDefineByPos(curq,&(dlist[i]-
>defhdl),errhp,POS(i),
                defbuf,deflen,deftype,NULL,
                dlist[i]-
>rlen,NULL,OCI_DEFAULT))!=OCI_SUCCESS)
            sql_error(errhp,status,1);
        }
        return i;
    }

    /* process_select_list(): Fetch rows from a query. */

    void process_select_list(num)
        int num; /* number of select list items */
    {
        int i,j;
        int ntf;
        int num_so_far;
        sword stats = OCI_SUCCESS;

        /* Print the headers for the query execution result */

        print_header(num);

        /* See if we need to limit the rows to fetch */

        ntf = (num_to_fetch >= 0) ? num_to_fetch : MAX_ARRAY;

        /* Fetch the rows and print them out */
    }
}

```

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```

if ((ntf > MAX_ARRAY) || (num_to_fetch == -1)) {

    stats = OCISstmtFetch(curq, errhp, MAX_ARRAY,
OCI_FETCH_NEXT, OCI_DEFAULT);

OCIaget(curq,OCI_HTYPE_STMT,&rows_ret,NULL,OCI_A
TTR_ROW_COUNT,errhp);

    print_rows(num,rows_ret);

    /* To avoid 1022 from OFEN */
    /* More rows to fetch... */

    if (stats != OCI_NO_DATA) {
        if (num_to_fetch == -1) {
            while ((stats =
OCIISstmtFetch(curq,errhp,MAX_ARRAY,OCI_FETCH_NEX
T,
OCI_DEFAULT)) ==
OCI_SUCCESS) {
OCIaget(curq,OCI_HTYPE_STMT,&num_so_far,NULL,
OCI_ATTR_ROW_COUNT,errhp);
    print_rows(num,(num_so_far-rows_ret));
    rows_ret = num_so_far;
    }
    /* Print the final rows */
    OCIaget(curq,OCI_HTYPE_STMT,&num_so_far,N
ULL,
OCI_ATTR_ROW_COUNT,errhp);
    print_rows(num,(num_so_far-rows_ret));
    rows_ret = num_so_far;
    } else {
        ntf -= MAX_ARRAY;

        while ((stats = OCISstmtFetch(curq,errhp,
((ntf>MAX_ARRAY)
? MAX_ARRAY:ntf),
OCI_FETCH_NEXT,
OCI_DEFAULT)) ==
OCI_SUCCESS) {
            ntf -= MAX_ARRAY;

OCIaget(curq,OCI_HTYPE_STMT,&num_so_far,NULL,
OCI_ATTR_ROW_COUNT,errhp);
    print_rows(num,(num_so_far-rows_ret));
    rows_ret = num_so_far;
    if (ntf <= 0) break;
    }
    OCIaget(curq,OCI_HTYPE_STMT,&num_so_far,N
ULL,
OCI_ATTR_ROW_COUNT,errhp);
    print_rows(num,(num_so_far-rows_ret));
    rows_ret = num_so_far;
    }
    } else {

```

```

OCIISstmtFetch(curq, errhp, ntf, OCI_FETCH_NEXT,
OCI_DEFAULT);

OCIaget(curq,OCI_HTYPE_STMT,&rows_ret,NULL,OCI_A
TTR_ROW_COUNT,errhp);
    print_rows(num,rows_ret);
    }

    fprintf(logfile, "\n\n%d %s processed.\n", rows_ret,
rows_ret == 1 ? "row" : "rows");
}

int get_statement()
{
    char line[128];
    char *pos, *str;

    /* Reset statement buffer */

    stmt[0] = '\0';

    while (fgets(line, 127, qtemp) != NULL) {

        /* skip blank lines */
        if (line[0] == '\n')
            continue;

        /* remove blanks */

        str = line;

        while (*str == ' ') str++;

        /* Let's get the line together first */

        strcat(stmt, str);

        /* if this is a comment line */
        if ((str[0] == '-') && (str[1] == '-'))
            return COMMENT;

        /* see if this is a set_fetchrows line */
        if (strncmp(str, "set_fetchrows", 13) == 0) {
            pos = strchr(str, ',');
            *pos = '\0';
            pos = strchr(str, '=');
            num_to_fetch = atol(++pos);
            return SET_FETCHROW;
        }

        /* if this is the end of the current statement */
        if ((pos = strchr(stmt, ';')) != NULL) {
            *pos = '\0';
            return SQL_STMT;
        }
    }
}

```

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```

return END_OF_FILE;
}

/* memalloc(): Allocates memory, exit program if we have a
problem. */

void *memalloc(size)
    int size;
{
    void *tmp;

    if ((tmp = (void *) malloc(size)) == NULL) {
        fprintf(stderr, "Error in malloc\n");
        SQLexit();
        return NULL; /* should never reach here */
    } else {
        return tmp;
    }
}

void print_header(nsel)
    int nsel; /* Number of select list items */
{
    int i, diff;
    char colname[MAX_COLNAME_SIZE];
    int len = 0; /* Running column length */
    int cwid = 0;

    fprintf(logfile, "\n");

    for (i=0; i<nsel; i++) {

        /* extract the column name */

        strncpy((char *)colname, (char *)slist[i].buf, slist[i].buflen);
        colname[slist[i].buflen] = '\0';

        /* format the output a little */

        cwid = MAX(slist[i].dbsize, slist[i].buflen);

        /* do a little bit of formatting */

        if (cwid > 80) {
            fprintf(logfile, "\n");
            len = 0;
        } else if ((len += cwid) > 80) {
            fprintf(logfile, "\n");
            len = cwid;
        }
#ifdef FORMAT1
        if ((slist[i].dbtype == INT_TYPE) || (slist[i].dbtype ==
FLT_TYPE))
            fprintf(logfile, "%*s ", cwid, slist[i].buf);
            else /* string type */
                fprintf(logfile, "%*s ", -cwid, slist[i].buf);
#else
            fprintf(logfile, "%*s ", -cwid, colname);
#endif /* FORMAT1 */
        }

        fprintf(logfile, "\n");
    }

void print_rows(ncol, nrow)
    int ncol;
    int nrow;
{
    int i, j;
    int len;
    int diff;
    int cwid;

    for (i=0; i<nrow; i++) {

        len = 0;

        for (j=0; j<ncol; j++) {

            cwid = MAX(slist[j].dbsize, slist[j].buflen);

            /* do a little bit of formatting */

            if (cwid > 80) {
                fprintf(logfile, "\n");
                len = 0;
            } else if ((len += cwid) > 80) {
                fprintf(logfile, "\n");
                len = cwid;
            }

            switch(slist[j].dbtype) {
                case INT_TYPE:
#ifdef HAVE_SCALE
                    fprintf(logfile, "%*ld", cwid, (dlist[j]-
>ibuf)[i]);
                    break;
#endif /* HAVE_SCALE */
                case FLT_TYPE:
#ifdef FORMAT1
                    fprintf(logfile, "%*.2f ", cwid, (dlist[j]->fbuf)[i]);
                #else
                    fprintf(logfile, "%*.2f ", -cwid, (dlist[j]->fbuf)[i]);
                #endif /* FORMAT1 */
                break;
                default:
                    fprintf(logfile, "%*s ", -(cwid), (dlist[j]->sbuf)[i]);
                    break;
            }
        }
    }
    fprintf(logfile, "\n");
}

```

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```

}
}

/* remove_newline(): Remove newline character from str. */

void remove_newline(str)
    char *str;
{
    char *p;

    while ((p = strchr(str, '\n')) != NULL)
        *p = ' ';
}

qexecpl.h
/*
 * $Header: qexecpl.h 13-nov-2001.17:52:35 mpoess Exp $
 */

/* Copyright (c) 1999, 2001, Oracle Corporation. All rights
reserved. */

/* NOTE: See 'header_template.doc' in the 'doc' dve under the
'forms'
    directory for the header file template that includes
instructions.
*/

/*
    NAME
        qexecpl.h

    DESCRIPTION
        SQL statement execution front-end header file.

    PUBLIC FUNCTION(S)
        <list of external functions declared/defined - with one-line
descriptions>

    PRIVATE FUNCTION(S)
        <list of static functions defined in .c file - with one-line
descriptions>

    EXAMPLES
    NOTES
        <other useful comments, qualifications, etc.>

    MODIFIED (MM/DD/YY)
    mpoess 11/13/01 - change DOP to 84 for DML and DDL
    mpoess 02/22/01 - add linux changes
    mpoess 08/05/99 - make compile
    mpoess 07/15/99 - Creation
    mpoess 07/15/99 - Creation

*/

/*
# ifndef S_ORACLE
# include <s.h>
# endif
*/
# ifndef QSTREAMPL_H
# define QSTREAMPL_H

# include <stdio.h>
# include <string.h>
# include <sys/param.h>
# include <sys/types.h>
# include <time.h>
# include <errno.h>
# include <math.h>

# include <oratypes.h>

# include <oratypes.h>

# ifndef OCIDFN
# include <ocidfn.h>
# endif /* OCIDFN */

# ifndef OCI_ORACLE
# include <oci.h>
# endif /* OCI_ORACLE */
/*
# ifdef __STDC__
# include <ociapr.h>
# else
# include <ocikpr.h>
# endif /* __STDC__ */

/* some basic definitions */
# define UNAME_LEN 64
# define MAX_FILE_PATH_LEN 128

# ifndef TRUE
# define TRUE 1
# endif /* TRUE */

# ifndef FALSE
# define FALSE 1
# endif /* FALSE */
# ifndef LINUX
# define MAX(x,y) ((x >= y) ? x : y)
# define MIN(x,y) ((x <= y) ? x : y)
# endif
/* defines and typedefs for parsing */

# define CRT_TBL 1
# define INS_STMT 3
# define SEL_STMT 4
# define UPD_STMT 5
# define DRP_VIEW 7
# define DRP_TBL 8
# define DEL_STMT 9
# define CRT_VIEW 10

```

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```

/* defines and typedefs for query description */

#define MAX_COLNAME_SIZE 32 /* Maximum length of
Column name */
#define MAX_SEL_LIST 16 /* Maximum items on a
select list */

#define END_OF_LIST 1007 /* Error code when we reach
the end of the */
/* select list. */

/* types for describe */

#define CHAR_TYPE 1
#define NUM_TYPE 2
#define INT_TYPE 3
#define FLT_TYPE 4
#define STR_TYPE 5
#define DATE_TYPE 12

#define NUMWIDTH 16 /* Width of the numeric fields
*/

#define POS(i) (i+1) /* The position is 1..n instead */
#define IND(i) (i-1) /* of 0..n-1 as in an array. */

typedef struct des
{
    ub2 dbsize;
    ub4 buflen;
    /* sb2 dsize; */
    sb4 scale;
    /* sb2 nullok; */
    OCITextCode dbtype;
    /* text buf[MAX_COLNAME_SIZE]; */
    text *buf;
    ub1 precision;
} sltype;

/* defines and typedefs for query select list definition */

#define MAX_ARRAY 50 /* Maximum array size for
array fetch */
#define PFMEMSIZE 65536 /* Memory size of prefetch
buffer */

#define MAX_STR_LEN 256 /* Maximum size for string
variables */
#define MAX_PREALLOC 8 /* Maximum number of
preallocated select list */
/* definitions. */

#define INT sizeof(long)
#define STR sizeof(char)
#define FLT sizeof(double)
#define FLTP (double *)
#define INTP (long *)
#define STRP (char **)

typedef struct def
{
    long ibuf[MAX_ARRAY];
    double fbuf[MAX_ARRAY];
    char sbuf[MAX_ARRAY][MAX_STR_LEN];
    ub2 rlen[MAX_ARRAY]; /* return length */
} dltype;

extern int errno;

#define SQL_LEN 2048

#ifndef NULL
#define NULL 0
#endif

#ifndef NULLP
#define NULLP (void *)NULL
#endif /* NULLP */
#ifndef DISCARD
#define DISCARD (void)
#endif

#ifndef sword
#define sword int
#endif

#ifndef ub1
#define ub1 unsigned char
#endif

#define NA -1 /* ANSI SQL NULL */
#define VER7 2
#define NOT_SERIALIZABLE 8177 /* ORA-08177:
transaction not serializable */

#define ADR(object) ((ub1 *)&(object))
#define SIZ(object) ((sword)sizeof(object))
#define SID(sid) ((sid == -1) ? 0 : sid)

/* For get_statement */

#define END_OF_FILE -1
#define COMMENT 1
#define SQL_STMT 2
#define SET_FETCHROW 3

#define OCIhalloc(envh,hndl,htyp) \
    if((status=OCIHandleAlloc((dvoid *)envh,(dvoid **)hndl,htyp,0,(dvoid **)0))! \
    =OCI_SUCCESS) \
        sql_error(envh,status,0); \
    else \
        DISCARD 0

#define OCIhfree(hndl,htyp) \

```

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```
if((status=OCIHandleFree((dvoid *)hndl,htyp)) ==
OCI_SUCCESS) \
    fprintf(stderr, "Error freeing handle of type %d\n", htyp)
```

```
#define OCIaget(hndl,htyp,attp,size,atyp,errh) \
    if((status=OCIAttrGet((dvoid *)hndl,htyp,(dvoid
*)attp,(dvoid *)size,atyp,er
rh)) != OCI_SUCCESS) \
        sql_error(errh,status,1); \
    else \
        DISCARD 0
```

```
#define OCIaset(hndl,htyp,attp,size,atyp,errh) \
    if((status=OCIAttrSet((dvoid *)hndl,htyp,(dvoid
*)attp,size,atyp,errh)) != O
CI_SUCCESS) \
        sql_error(errh,status,1); \
    else \
        DISCARD 0
```

```
#define OCIsexec(svch,stmh,errh,iter) \
```

```
if((status=OCISmtExecute(svch,stmh,errh,iter,0,NULL,NUL
L,OCI_DEFAULT)) != O
CI_SUCCESS) \
        sql_error(errh,status,1); \
    else \
        DISCARD 0
```

```
#define ISOTXT "alter session set isolation_level =
serializable"
#define PDMLTXT "alter session force parallel dml parallel
(degree 84)"
#define PDDLTX "alter session force parallel ddl parallel
(degree 84)"
```

```
#endif /* QSTREAMPL_H */
```

2asmshut

```
#!/bin/ksh
. $FRAME_PATH/env
export ORACLE_SID=$ASM_SID
if [ "$1" = "abort" ]; then
for i in $SECONDARY_NODES
do
ssh $i -n $KIT_DIR/rasmshuta
done
sqlplus << !
connect / as sysdba
shutdown abort
exit
!
else
for i in $SECONDARY_NODES
do
ssh $i -n $KIT_DIR/rasmshut
done
sqlplus << !
```

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```
connect / as sysdba
shutdown immediate
exit
```

!

```
fi
```

2asmstart

```
#!/bin/ksh
. $FRAME_PATH/env
export ORACLE_SID=$ASM_SID
sqlplus /NOLOG << EOF
!date
set timing on
connect / as sysdba
startup pfile=$ORACLE_HOME/dbs/init${ASM_SID}.ora
!date
exit
EOF
```

```
for i in $SECONDARY_NODES
do
ssh $i -n $KIT_DIR/rasmstart
done
```

2shut

```
#!/bin/ksh
. $FRAME_PATH/env

if [ "$1" = "abort" ]; then
for i in $SECONDARY_NODES
do
ssh $i -n /mnt/sdb2/home/oracle/frame/bin/tshut
done
sqlplus << !
connect / as sysdba
shutdown abort
exit
!
else
for i in $SECONDARY_NODES
do
ssh $i -n /mnt/sdb2/home/oracle/frame/bin/tshut abort
done
sqlplus << !
connect / as sysdba
shutdown immediate
exit
!
fi
```

2start

```
#!/bin/ksh

. $FRAME_PATH/env

tstart
```

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```
for i in $SECONDARY_NODES
do
ssh $i -n /mnt/sdb2/home/oracle/frame/bin/tstart
done

tshut
#!/bin/ksh
#
# $Header: tshut.sh 08-aug-99.18:06:22 mpoess Exp $
#
# tshut.sh
#
# Copyright (c) Oracle Corporation 1999. All Rights
Reserved.
#
# NAME
#   tshut.sh
#
# DESCRIPTION
#   shuts down a database
#
# NOTES
#   <other useful comments, qualifications, etc.>
#
# MODIFIED (MM/DD/YY)
#   mpoess 08/08/99 - Creation
#   mpoess 08/08/99 - Creation
#
#!/bin/ksh
```

```
if [ "$1" = "abort" ]; then
sqlplus /NOLOG<< !
connect / as sysdba
shutdown abort
exit
!
else
sqlplus /NOLOG<< !
connect / as sysdba
shutdown
exit
!
fi
```

```
tstart
#!/bin/ksh
#
# $Header: tstart.sh 08-aug-99.18:05:50 mpoess Exp $
#
# tstart.sh
#
# Copyright (c) Oracle Corporation 1999. All Rights
Reserved.
#
# NAME
#   tstart.sh
#
# DESCRIPTION
```

```
#   starts a database with a specific init.ora or uses the
default.
#
# NOTES
#   <other useful comments, qualifications, etc.>
#
# MODIFIED (MM/DD/YY)
#   mpoess 08/08/99 - Creation
#   mpoess 08/08/99 - Creation
#
#!/bin/ksh

DIR=`pwd`
cd $ORACLE_HOME/dbs

if [ "$1" != "" ]; then
  PFILE="pfile=$ORACLE_HOME/dbs/$1.ora"
else

PFILE="pfile=$ORACLE_HOME/dbs/init_${ORACLE_SID}.o
ra"
fi
```

Appendix G: Price Quotations

Appendix G

Appendix G

Microsoft Corporation
 One Microsoft Way
 Redmond, WA 98052-6399

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

Microsoft

March 27, 2006

Dell
 Gene Purdy
 1 Dell Way
 Round Rock, TX 78664

Mr. Purdy:

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

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

Part Number	Description	Unit Price	Quantity	Price
810-04793	SQL Server 2005 Enterprise x64 Edition <i>Server License with 25 CALs</i> <i>Discount Schedule: Open Program - No Level</i> <i>Unit Price reflects a 39% discount from the retail unit price of \$13,969.</i>	\$8,487	1	\$8,487
359-01911	SQL Server 2005 Client License <i>Discount Schedule: Open Program - No Level</i> <i>Unit Price reflects a 4% discount from the retail unit price of \$163.</i>	\$156	25	\$3,900
P72-00274	Windows Server 2003 Enterprise x64 Edition <i>Server License Only - No CALs</i> <i>Discount Schedule: Open Program - No Level</i> <i>Unit Price reflects a 42% discount from the retail unit price of \$3,999.</i>	\$2,334	1	\$2,334
254-00170	Visual C++ Standard Edition <i>No Discounts Applied</i>	\$109	1	\$109
046-00856	Visual Basic 2003 .Net Professional <i>No Discounts Applied</i>	\$109	1	\$109
N/A	Microsoft Problem Resolution Services <i>Professional Support</i> <i>(1 Incident)</i>	\$245	1	\$245

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

Some products may not be currently orderable but will be available through Microsoft's normal distribution channels by November 7, 2005.

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

Appendix G

This quote is valid for the next 90 days.

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

Reference ID: PHgepu0627037710.

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