



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



First Edition

Submitted for Review

January 12, 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

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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.

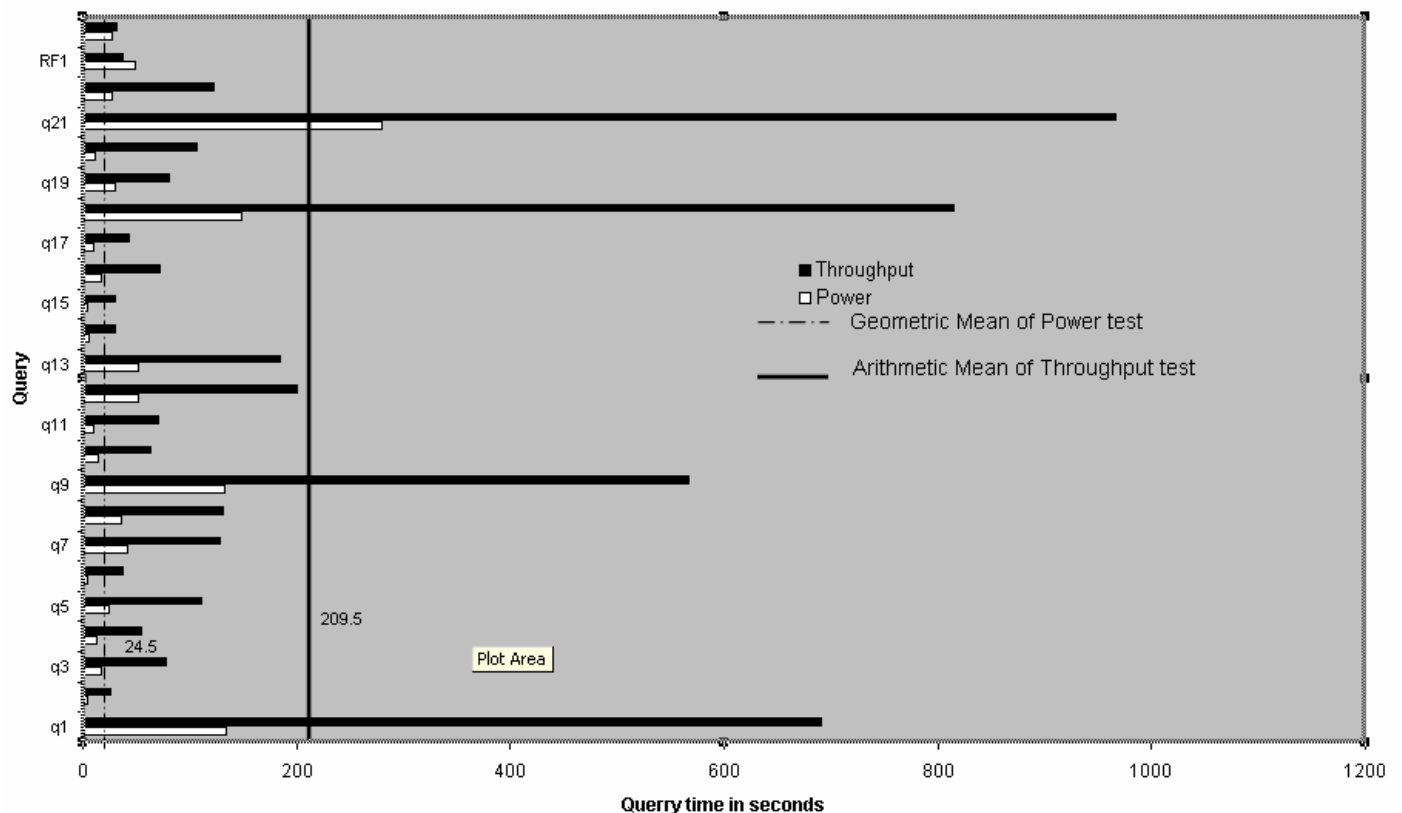
Hardware	Software	Total System Cost
Dell PowerEdge 6800 with Quad Dual-Core Intel® Xeon™ 7040/ 3.0GHz Dell PowerVault 220R Storage Enclosures	Microsoft Windows Server 2003 Enterprise x64 Edition™ SQL Server 2005 Enterprise (x64) Edition™	\$169,952

TPC-H Power@100GB	TPC-H Throughput@100GB	<u>QphH@100GB</u>	\$/QphH@100GB
14,675.1	7,807.6	10,704.1	\$15.88

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: January 12, 2006
Total System Cost \$169,952 USD	TPC-H Composite Query per Hour 10,704.1 QphH@100GB	Price/Performance \$15.88 USD/ QphH@100GB
Database Size 100GB	Database Manager SQL Server 2005 Enterprise (x64) Edition™ and Partitioning	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 1:34:15	Total Disk/Database Size 40.66	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) : 64GB RAM
Disk Drives: 112 – 36GB 15k HDD & 8 – 73GB 10k HDD

"Database Size includes only raw data (e.g., no temp, index, redundant storage space, etc.)."
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Dell		PowerEdge PE6800			TPC-H REV 2.3 EXECUTIVE SUMMARY PAGE 2 OF 2		
		Server			Report Date: 12-January-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 w/2+2MB	222-1046			\$6,584.00	1	\$6,584.00	\$300.00
L2 cache, 800MHZ FSB, 2 onboard Gigabit NICs							
3.0GHZ/2+2MB,Dual Core XEON,QUAD PROC	311-5643			\$10,897.00	1	\$10,897.00	
64GB,DDR2,400MHZ(16X4GB),2R	311-5706			\$107,199.00	1	\$107,199.00	
PERC4eDC,128MB,2-EXT CHN	341-1642			\$799.00	4	\$3,196.00	
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	\$130,427.00	\$300.00
PowerVault Disk Subsystem							
PV220S, U3	220-4476			\$2,156.00	8	\$17,248.00	\$3,208.00
ZEMM,U320,PV22XS,SINGLE	340-9324			\$399.00	8	\$3,192.00	
600W,PWR SPLY,PV22XS	310-0677			\$0.00	8	\$0.00	
600W,PWR SPLY,PV22XS	310-0683			\$89.00	8	\$712.00	
SCSI Cables	310-0679			\$99.00	8	\$792.00	
36GB U320M SCSI 15K RPM Hard Drive *	340-9371			\$249.00	112	\$27,888.00	
RACK-111/24U/Dell	A0213544			\$479.95	1	\$479.95	
					Subtotal	\$50,311.95	\$3,208.00
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%)		\$29,479.51	
				Total		\$166,198	\$3,753
Notes: * Maint. included in PowerVault 220 disk pod			Three-Year Cost of Ownership			\$169,952	USD
** All Microsoft maintenance is covered by the maintenance costs of Microsoft SQL Server							
Pricing: 1 = Microsoft, all others are Dell			QphH@100G			10,703.70	
Pricing may be verified by calling 1-800-BUY-DELL and refeencing quote # 267803220							
as a complex quote.							
Audited by Lorna Livingtree, Performance Metrics Inc.			\$ / QphH@100G:			\$15.88	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:
January 12, 2006

Numerical Quantities Summary

Measurement Results:

Database Scale Factor	100
Total Data Storage/Database Size	40.66
Start of Database Load	11/23/2005 07:20:34
End of Database Load	11/23/2005 08:54:48
Database Load Time	1:34:15
Query Streams for Throughput Test	5
TPC-H Power	14,675.1
TPC-H Throughput	7,807.6
TPC-H Composite Query-per-Hour Metric (QphH@300GB)	10,704.1
Total System Price Over 3 Years	\$169,952
TPC-H Price Performance Metric (\$/QphH@300GB)	\$15.88

Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 5072 seconds

Duration of stream execution:

	Seed	Start Date/Time	End Date/Time	Duration
Stream00	1123085448	2005-11-23 12:03:24	2005-11-23 12:21:07	00:17:43
Stream01	1123085449	2005-11-23 12:21:35	2005-11-23 13:37:50	1:16:14
Stream02	1123085450	2005-11-23 12:21:36	2005-11-23 13:40:14	1:18:39
Stream03	1123085451	2005-11-23 12:21:36	2005-11-23 13:35:18	1:13:42
Stream04	1123085452	2005-11-23 12:21:36	2005-11-23 13:39:14	1:17:38
Stream05	1123085453	2005-11-23 12:21:36	2005-11-23 13:39:29	1:17:53
Refresh00		2005-11-23 12:02:35	2005-11-23 12:03:24	0:00:49
		2005-11-23 12:21:07	2005-11-23 12:21:35	0:00:27
Refresh01		2005-11-23 12:31:35	2005-11-23 13:41:29	1:19:54
Refresh02		2005-11-23 13:41:30	2005-11-23 13:42:37	0:01:07
Refresh03		2005-11-23 13:42:39	2005-11-23 13:43:48	0:01:10
Refresh04		2005-11-23 13:43:50	2005-11-23 13:44:58	0:01:08
Refresh05		2005-11-23 13:44:59	2005-11-23 13:46:08	0:01:08



Numerical Quantities Summary

Timing Intervals in Seconds:

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Stream00	134.1	4.3	16.7	13.4	24.7	4.6	41.3	36.5
Stream01	683.8	15.2	88.7	49.9	111.4	27.8	126.0	131.3
Stream02	707.8	47.6	65.6	52.2	93.1	20.5	97.4	122.9
Stream03	652.4	17.6	81.3	71.4	136.3	47.8	183.5	174.4
Stream04	692.5	17.9	75.8	50.2	110.6	58.0	119.4	117.4
Stream05	720.0	29.7	81.0	50.8	100.6	31.1	118.9	113.0
Min Qi	683.8	15.2	81	49.9	100.6	27.8	118.9	113
Max Qi	720	47.6	88.7	71.4	136.3	58	183.5	174.4
Avg Qi	701.9	22.45	84.85	50.35	106	29.45	122.45	122.1
Query	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Stream00	132.8	15.0	9.5	52.3	42.1	5.6	4.8	16.9
Stream01	429.7	44.0	96.5	209.3	164.4	22.9	28.7	71.1
Stream02	599.3	87.4	60.5	200.9	145.0	33.6	30.1	69.3
Stream03	607.9	61.0	50.8	214.1	173.0	39.0	25.3	71.7
Stream04	749.5	67.0	65.6	150.4	200.3	25.3	32.8	68.6
Stream05	445.4	59.2	79.4	230.2	237.7	27.1	32.1	77.5
Min Qi	429.7	44	79.4	209.3	164.4	22.9	28.7	71.1
Max Qi	749.5	87.4	96.5	230.2	237.7	39	32.8	77.5
Avg Qi	437.55	51.6	87.95	219.75	201.05	25	30.4	74.3
Query	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream00	10.5	148.8	30.3	11.0	279.9	27.4	49.1	27.5
Stream01	38.6	709.7	57.4	246.0	1106.5	115.5	4763.3	30.2
Stream02	60.2	1141.2	91.1	131.8	741.4	119.8	35.2	31.4
Stream03	44.4	745.5	43.1	54.5	788.1	139.3	38.1	31.1
Stream04	29.7	725.5	68.8	44.7	1090.2	98.0	36.0	31.2
Stream05	42.5	752.1	140.0	59.5	1104.7	140.3	35.8	31.8
Min Qi	38.6	709.7	57.4	59.5	1104.7	115.5	35.8	30.2
Max Qi	60.2	1141.2	140	246	1106.5	140.3	4763.3	31.8
Avg Qi	40.55	730.9	98.7	152.75	1105.6	127.9	2399.55	31

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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.
- 64GB RAM.
- 4 - DELL PERC4e-DC RAID Controllers, each with 128MB RAM of cache.
- 8 - DELL PowerVault 22XS.
- 112 – 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

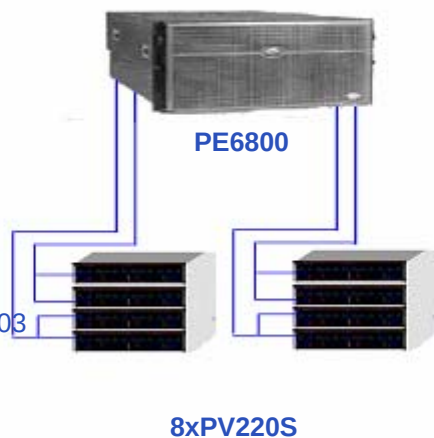
4xDual-Core Intel Xeon 7040/
3.0GHz 2x2MB L2 cache
64 GB DDR
4xPERC4E-DC Controllers
8x73GB, U320, 15K SCSI

DBMS

SQL Server 2005 Enterprise
(x64) Edition

OS

Microsoft Windows Server 2003
Enterprise x64 Edition



Storage

8xPV220S
112x36GB, 15K, U320 SCSI

Measured Configuration

PE6800

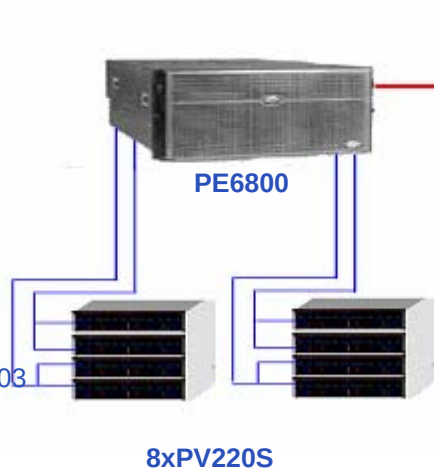
4xDual-Core Intel Xeon 7040/
3.0GHz 2x2MB L2 cache
64 GB DDR
4xPERC4E-DC Controllers
8x73GB, U320, 15K SCSI

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

8xPV220S
56x36GB, 15K, U320 SCSI

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 used for all base and index tables except NATION and REGION. The details of this partitioning can be understood by examining the syntax of the table and index definition statements in Appendix B. Similar partitioning was used in the qualification database.

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:

- 4 x DELL PERC4E-DC Disk Controllers
- 8 x PowerVault 22XS Disk Enclosures
- 112x 36GB,U320, 15k rpm, SCSI disk drives
- 8 x 73GB 10k rpm disk drives

8 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 partions and an NTFS partion for flat file and database backup storage. Volume1 had an additional NTFS partion for rf flat file storage.

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

Distribution of Storage

Windows 2003 Disk Administration			DELL 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	AO-14			

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

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		

Windows 2003 Disk Administration			DELL PERC4E-DC Configuration					
Disk 7 474.13 GB			Controller # 4					
Partition			Slot# 4		Channels			
1	2	3		SCSI ID	A	B		
B: Lineitem_fg RAW 47.75 GB	V: General_fg RAW 23 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 8 474.13 GB			Controller # 4					
Partition			Slot# 4		Channels			

1	2	3		SCSI ID	A	B		
M: Lineitem_fg RAW 47.75 GB	W: General_fg RAW 23 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.

Horizontal partitioning was used for base tables except NATION and REGION.

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 15 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

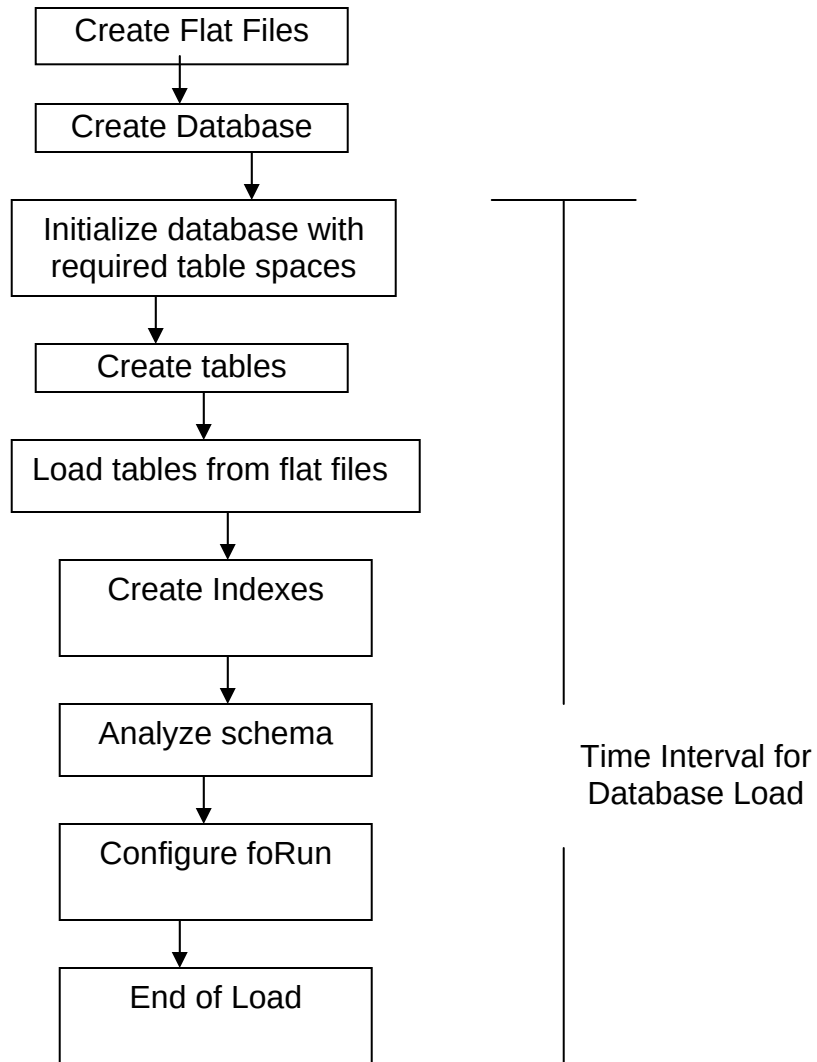
Disk Type	Number of Disks	Space per Disk	Subtotal Disk Space	Total Disk Storage	Data Storage Ratio
36GB 15k	112	33.87GB	3793.44GB		
73GB 15k	8	68.24GB	272.96GB		
				4066.4GB	40.66

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 5072.4 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	14751.7	7922.9	10810.9
2	14675.1	7807.6	10704.1
Percent Difference	0.99%	0.99%	0.99%

System Activity Between Run1 and Run2

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

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

Clause 6: SUT and Driver Implementation

Driver

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

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

For each power-test run:

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

Implementation Specific Layer (ISL)

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

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

Profile-Directed Optimization

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

Profile-directed optimization was not used.

Clause 7: Pricing

Hardware and Software Used in the Priced System

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

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

Total Three Year Price

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

A detailed price sheet of all the hardware and software used in this configuration, including the 3-year maintenance cost, and total price, is included in the executive summary at the beginning of this document. This purchase qualifies for a 16% discount from Dell 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	64 GB	112 @ 36 GB 8 @ 73GB	14,675.1	7,807.6	10,704.1

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

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

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

Auditor's Notes:

None.

Sincerely,

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

Lorna Livingtree
Auditor

Appendix A: Tunable Parameters

Server Configuration Parameters

Microsoft Windows 2003 Server Parameters

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

Microsoft SQL Server 2005 Startup Parameters

Microsoft SQL Server was started with the following command line options

sqlservr -c -x -E -T834 -T1204

Microsoft SQL Server 2005 Configuration Parameters

name	minimum	maximum		
config_value	run_value			

Ad Hoc Distributed Queries		0	1	0
0				
affinity I/O mask	-2147483648	2147483647		
0	0			
affinity mask	-2147483648	2147483647		
65535	65535			
affinity64 I/O mask	-2147483648	2147483647		
0	0			
affinity64 mask	-2147483648	2147483647		
0	0			
Agent XPs	0	1	0	0
allow updates	0	1	1	1
awe enabled	0	1	1	1
blocked process threshold	0	86400		0
0				
c2 audit mode	0	1	0	0
clr enabled	0	1	0	0
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
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		
63488	63488			
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		
61440	61440			
nested triggers	0	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
query governor cost limit	0	2147483647		
0	0			
query wait (s)	-1	2147483647		
2147483647	2147483647			
recovery interval (min)	0	32767		32767
32767				

remote access	0	1	1	1
remote admin connections		0	1	0
0				
remote login timeout (s)	0	2147483647		
20	20			
remote proc trans	0	1	0	
0				
remote query timeout (s)	0	2147483647		
600	600			
Replication XPs	0	1	0	
0				
scan for startup procs	0	1	0	
0				
server trigger recursion	0	1	1	
1				
set working set size	0	1	0	
0				
show advanced options	0	1	1	
1				
SMO and DMO XPs	0	1	1	
1				
SQL Mail XPs	0	1	0	
0				
transform noise words	0	1	0	
0				
two digit year cutoff	1753	9999	2049	
2049				
user connections	0	32767	0	
0				
user options	0	32767	0	
0				
Web Assistant Procedures	0	1	0	
0				
xp_cmdshell	0	1	0	0

System Information

System Information report written at: 11/24/05 00:56:21
 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 (30 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
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\HarddiskVolume23
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	65,531.05 MB
Available Physical Memory	96.18 MB
Total Virtual Memory	64.41 GB
Available Virtual Memory	1.77 GB
Page File Space	2.00 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 0xD8000000-0xD80FFFFF	PCI standard PCI-to-PCI bridge
Memory Address 0xD8000000-0xD80FFFFF	PCI standard PCI-to-PCI bridge
Memory Address 0xD8100000-0xD81FFFFF	PCI standard PCI-to-PCI bridge
Memory Address 0xD8100000-0xD81FFFFF	PCI standard PCI-to-PCI bridge
Memory Address 0xD8200000-0xD82FFFFF	PCI standard PCI-to-PCI bridge
Memory Address 0xD8200000-0xD82FFFFF	PCI standard PCI-to-PCI bridge

I/O Port 0x0000E000-0x0000EFFF	PCI standard PCI-to-PCI bridge
I/O Port 0x0000E000-0x0000EFFF	Intel(R) 6700PXH PCI Express-to-PCI Bridge B - 032A

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

Memory Address 0xD8400000-0xD84FFFFF	PCI standard PCI-to-PCI bridge
Memory Address 0xD8400000-0xD84FFFFF	PCI standard PCI-to-PCI bridge

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	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 0xD8300000-0xD83FFFFF	PCI standard PCI-to-PCI bridge
--------------------------------------	--------------------------------

Memory Address 0xD8300000-0xD83FFFFF PCI standard PCI-to-PCI bridge

[DMA]

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

[Forced Hardware]

Device	PNP Device ID
--------	---------------

[I/O]

Resource	Device	Status
0x00000000-0x00000CF7	PCI bus	OK
0x00000000-0x00000CF7	Direct memory access controller	OK
0x00000D00-0x0000FFFF	PCI bus	OK
0x0000E000-0x0000EFFF	PCI standard PCI-to-PCI bridge	OK
0x0000E000-0x0000EFFF	Intel(R) 6700PXH PCI Express-to-PCI Bridge B - 032A	OK
0x0000CCE0-0x0000CCFF	Intel(R) 82801EB USB Universal Host Controller - 24D2	OK
0x0000CCC0-0x0000CCDF	Intel(R) 82801EB USB Universal Host Controller - 24D4	OK
0x0000CCA0-0x0000CCBF	Intel(R) 82801EB USB Universal Host Controller - 24D7	OK
0x0000DC00-0x0000DCFF	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
0x000000E0-0x000000E7	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	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
0x80000000-0xFEBFFFFF	PCI bus	OK
0xDFC00000-0xDFEFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD8400000-0xD84FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD8400000-0xD84FFFFF	PCI standard PCI-to-PCI bridge	OK
0xDFD00000-0xDFEFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD84F0000-0xD84FFFFF	DELL PERC 4e/DC RAID Controller	OK
0xDFDC0000-0xDFDFFFFF	DELL PERC 4e/DC RAID Controller	OK
0xDF900000-0xDFBFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD8300000-0xD83FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD8300000-0xD83FFFFF	PCI standard PCI-to-PCI bridge	OK
0xDFA00000-0xDFBFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD83F0000-0xD83FFFFF	DELL PERC 4e/DC RAID Controller	OK
0xDFAC0000-0xDFAFFFFF	DELL PERC 4e/DC RAID Controller	OK
0xDF600000-0xDF8FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD8200000-0xD82FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD8200000-0xD82FFFFF	PCI standard PCI-to-PCI bridge	OK
0xDF700000-0xDF8FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD82F0000-0xD82FFFFF	DELL PERC 4e/DC RAID Controller	OK
0xDF7C0000-0xDF7FFFFF	DELL PERC 4e/DC RAID Controller	OK
0xDF300000-0xDF5FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD8100000-0xD81FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD8100000-0xD81FFFFF	PCI standard PCI-to-PCI bridge	OK
0xDF400000-0xDF5FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD81F0000-0xD81FFFFF	DELL PERC 4e/DC RAID Controller	OK
0xDF4C0000-0xDF4FFFFF	DELL PERC 4e/DC RAID Controller	OK
0xDF000000-0xDF2FFFFF	PCI standard PCI-to-PCI bridge	OK
0xDF100000-0xDF2FFFFF	Intel(R) 6700PXH PCI Express-to-PCI Bridge B - 032A	OK
0xDF1F0000-0xDF1FFFFF	Broadcom NetXtreme Gigabit Ethernet	OK
0xDE000000-0xDEFFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD8000000-0xD80FFFFF	PCI standard PCI-to-PCI bridge	OK
0xD8000000-0xD80FFFFF	PCI standard PCI-to-PCI bridge	OK
0xDEE00000-0xDEFFFFFF	PCI standard PCI-to-PCI bridge	OK
0xD80F0000-0xD80FFFFF	DELL PERC 4e/Di RAID Controller	OK

0xDEEC0000-0xDEFFFFFF	DELL PERC 4e/Di RAID Controller	OK
0xDFF00000-0xDFF003FF	Intel(R) 82801EB USB2 Enhanced Host Controller - 24DD	OK
0xD0000000-0xD7FFFFFF	Radeon 7000 / RADEON VE Family	OK
(Microsoft Corporation)		
0xDEBF0000-0xDEBFFFFFF	Radeon 7000 / RADEON VE Family	OK
(Microsoft Corporation)		
0xFEBFFC00-0xFEBFFFFFF	Intel(R) 82801EB Ultra ATA Storage Controllers - 24DB	OK
0xE0000000-0xEFFFFFFF	Motherboard resources	OK
0xFE60C000-0xFE60CFFF	Motherboard resources	OK
0xFED00000-0xFED003FF	High precision event timer	OK

[Components]

[Multimedia]

[Audio Codecs]

CODEC	Manufacturer	Description	Status	File
	Version	Size	Creation Date	
c:\windows\system32\msg711.acm	Microsoft Corporation			
OK	C:\WINDOWS\system32\MSG711.ACM			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)		13.50 KB		
(13,824 bytes)	3/25/2005 6:00 AM			
c:\windows\system32\imaadp32.acm	Microsoft Corporation			
OK	C:\WINDOWS\system32\IMAADP32.ACM			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)		24.00 KB		
(24,576 bytes)	3/25/2005 6:00 AM			
c:\windows\system32\msadp32.acm	Microsoft Corporation			
OK	C:\WINDOWS\system32\MSADP32.ACM			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)		23.50 KB		
(24,064 bytes)	3/25/2005 6:00 AM			
c:\windows\system32\msgsm32.acm	Microsoft Corporation			
OK	C:\WINDOWS\system32\MSGSM32.ACM			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)		34.50 KB		
(35,328 bytes)	3/25/2005 6:00 AM			
c:\windows\system32\tssoft32.acm	DSP GROUP, INC.			
OK	C:\WINDOWS\system32\TSOFT32.ACM	1.01		
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\msvidc32.dll	Microsoft Corporation			
OK	C:\WINDOWS\system32\MSVIDC32.DLL			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)		43.00 KB		
(44,032 bytes)	3/25/2005 6:00 AM			
c:\windows\system32\msyuv.dll	Microsoft Corporation			
OK	C:\WINDOWS\system32\MSYUV.DLL			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)		21.00 KB		
(21,504 bytes)	3/24/2005 11:21 AM			
c:\windows\system32\tsbyuv.dll	Microsoft Corporation			
OK	C:\WINDOWS\system32\TSBYUV.DLL			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)		12.50 KB		
(12,800 bytes)	3/24/2005 11:34 AM			
c:\windows\system32\msrle32.dll	Microsoft Corporation			
OK	C:\WINDOWS\system32\MSRLE32.DLL			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)		15.50 KB		
(15,872 bytes)	3/25/2005 6:00 AM			
c:\windows\system32\iyuv_32.dll	Microsoft Corporation			
OK	C:\WINDOWS\system32\IYUV_32.DLL			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)		52.50 KB		
(53,760 bytes)	3/24/2005 11:19 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)

[Sound Device]

Item	Value
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[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	0xD0000000-0xD7FFFFFF
I/O Port	0x0000DC00-0x0000DCFF
Memory Address	0xDEBF0000-0xDEBFFFFFF
IRQ Channel	IRQ 16
I/O Port	0x000003B0-0x000003BB
I/O Port	0x000003C0-0x000003DF
Memory Address	0xA0000-0xBFFFF
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
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[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&0
000
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)

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 11/23/2005 11:51 AM
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 0xDF1F0000-0xDF1FFFFF
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 11/23/2005 11:51 AM
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 11/23/2005 11:51 AM
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 11/23/2005 11:51 AM
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 11/23/2005 11:51 AM
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\raspppt.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 11/23/2005 11:51 AM
 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
 Driver c:\windows\system32\drivers\rasppoe.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_PTIMINIPOINT\0000
 Last Reset 11/23/2005 11:51 AM
 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 11/23/2005 11:51 AM
 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\wssock32.dll
Size	24.50 KB (25,088 bytes)
Version	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)

[Ports]

[Serial]

Item	Value
Name	Communications Port (COM1)
Status	OK
PNP Device ID	ACPI\PNP0501\1
Maximum Input Buffer Size	0
Maximum Output Buffer Size	No
Settable Baud Rate	Yes
Settable Data Bits	Yes
Settable Flow Control	Yes
Settable Parity	Yes
Settable Parity Check	Yes
Settable Stop Bits	Yes
Settable RLSD	Yes
Supports RLSD	Yes
Supports 16 Bit Mode	No
Supports Special Characters	No
Baud Rate	9600
Bits/Byte	8
Stop Bits	1
Parity	None
Busy	No
Abort Read/Write on Error	No
Binary Mode Enabled	Yes
Continue XMit on XOff	No
CTS Outflow Control	No
Discard NULL Bytes	No
DSR Outflow Control	0
DSR Sensitivity	0
DTR Flow Control Type	Enable
EOF Character	0
Error Replace Character	0
Error Replacement Enabled	No
Event Character	0
Parity Check Enabled	No
RTS Flow Control Type	Enable
XOff Character	19
XOffXMit Threshold	512
XOn Character	17
XOnXMit Threshold	2048
XOnXOff InFlow Control	0
XOnXOff OutFlow Control	0
I/O Port	0x000003F8-0x000003FF
IRQ Channel	IRQ 4
Driver	c:\windows\system32\drivers\serial.sys (5.2.3790.1830 (srv03_sp1_rtm.050324-1447), 118.50 KB (121,344 bytes), 3/25/2005 6:00 AM)

[Parallel]

Item	Value
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[Storage]

[Drives]

Item	Value
Drive	A:
Description	3 1/2 Inch Floppy Drive
Drive	B:
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	C:
Description	Local Fixed Disk

Compressed	No
File System	NTFS
Size	40.00 GB (42,952,376,320 bytes)
Free Space	27.28 GB (29,294,198,784 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	263.38 GB (282,806,059,008 bytes)
Volume Name	
Volume Serial Number	C46B4098

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

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

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

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

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

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

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

Drive 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

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 292.29 GB (313,842,860,032 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 294.27 GB (315,971,141,632 bytes)
 Volume Name
 Volume Serial Number 60C6D6F0

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

Drive W:
 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 X:
 Description Local Fixed Disk
 Compressed No
 File System NTFS
 Size 379.87 GB (407,883,350,016 bytes)
 Free Space 343.26 GB (368,567,779,328 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 315.38 MB (330,694,656 bytes)
 Volume Name
 Volume Serial Number A087C4B1

Drive Z:
 Description Local Fixed Disk
 Compressed No
 File System NTFS
 Size 379.87 GB (407,883,350,016 bytes)
 Free Space 267.25 GB (286,954,749,952 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	2
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 47.75 GB (51,276,363,264 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #0, Partition #1
 Partition Size 23.00 GB (24,700,515,840 bytes)
 Partition Starting Offset 51,276,395,520 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 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 47.75 GB (51,276,363,264 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #5, Partition #1
 Partition Size 23.00 GB (24,700,515,840 bytes)
 Partition Starting Offset 51,276,395,520 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 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 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 6
 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 #7, Partition #0
 Partition Size 47.75 GB (51,276,363,264 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #7, Partition #1
 Partition Size 23.00 GB (24,700,515,840 bytes)
 Partition Starting Offset 51,276,395,520 bytes
 Partition Disk #7, Partition #2
 Partition Size 2.01 GB (2,155,023,360 bytes)
 Partition Starting Offset 75,976,911,360 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 4
 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 47.75 GB (51,276,363,264 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #3, Partition #1
 Partition Size 23.00 GB (24,700,515,840 bytes)
 Partition Starting Offset 51,276,395,520 bytes
 Partition Disk #3, 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 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 47.75 GB (51,276,363,264 bytes)
 Partition Starting Offset 32,256 bytes
 Partition Disk #1, Partition #1
 Partition Size 23.00 GB (24,700,515,840 bytes)
 Partition Starting Offset 51,276,395,520 bytes
 Partition Disk #1, 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 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 47.75 GB (51,276,363,264 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #6, Partition #1
Partition Size 23.00 GB (24,700,515,840 bytes)
Partition Starting Offset 51,276,395,520 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 2
SCSI Bus 3
SCSI Logical Unit 0
SCSI Port 6
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 #8, Partition #0
Partition Size 47.75 GB (51,276,363,264 bytes)
Partition Starting Offset 32,256 bytes
Partition Disk #8, Partition #1
Partition Size 23.00 GB (24,700,515,840 bytes)
Partition Starting Offset 51,276,395,520 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 47.75 GB (51,276,363,264 bytes)
Partition Starting Offset 32,256 bytes

Partition Disk #4, Partition #1
Partition Size 23.00 GB (24,700,515,840 bytes)
Partition Starting Offset 51,276,395,520 bytes
Partition Disk #4, 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&1F90FA0D&0&700008
Memory Address	0xD84F0000-0xD84FFFFF
Memory Address	0xDFDC0000-0xDFDFFFFF
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&230D0D0F&0&700010
Memory Address	0xD83F0000-0xD83FFFFF
Memory Address	0xDFAC0000-0xDFAFFFFF
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
Memory Address	0xD82F0000-0xD82FFFFF
Memory Address	0xDF7C0000-0xDF7FFFFF
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	0xD81F0000-0xD81FFFFF
Memory Address	0xDF4C0000-0xDF4FFFFF
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	0xD80F0000-0xD80FFFFF
Memory Address	0xDEEC0000-0xDEEFFFFF
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
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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

[Problem Devices]

Device PNP Device ID Error Code
 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	
	Disabled	Stopped	OK	Ignore	No
acpi	Microsoft ACPI Driver				
	c:\windows\system32\drivers\acpi.sys			Kernel Driver	

Name	Driver	File	Type	Started	Start Mode
acpiec	ACPIEC	c:\windows\system32\drivers\acpiec.sys	Kernel		
Driver	No	Disabled	Stopped	OK	Normal
	No				No
adpu160m	adpu160m	Not Available	Kernel Driver	No	
	Disabled	Stopped	OK	Normal	No
adpu320	adpu320	Not Available	Kernel Driver	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	
	Disabled	Stopped	OK	Normal	No
aic78xx	aic78xx	Not Available	Kernel Driver	No	
	Disabled	Stopped	OK	Normal	No
aliide	AliIde	Not Available	Kernel Driver	No	
	Disabled	Stopped	OK	Normal	No
amdide	AmdIde	Not Available	Kernel Driver	No	
	Disabled	Stopped	OK	Normal	No
arc	arc	Not Available	Kernel Driver	No	
	Disabled	Stopped	OK	Normal	No
asynccmac	RAS Asynchronous Media Driver				
	c:\windows\system32\drivers\asynccmac.sys		Kernel Driver		
	No	Manual	Stopped	OK	Normal
	No				No
atapi	Standard IDE/ESDI Hard Disk Controller				
	c:\windows\system32\drivers\atapi.sys		Kernel Driver		
	Yes	Boot	Running	OK	Normal
	Yes				No
atdisk	Atdisk	Not Available	Kernel Driver	No	
	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				
	c:\windows\system32\drivers\atmarpc.sys		Kernel Driver		
	No	Manual	Stopped	OK	Normal
	No				No
audstub	Audio Stub Driver	c:\windows\system32\drivers\audstub.sys			
	Kernel Driver	Yes	Manual	Running	OK
	Normal	No	Yes		
b57nd	Broadcom NetXtreme Gigabit Ethernet				
	c:\windows\system32\drivers\b57amd64.sys		Kernel Driver		
	Yes	Manual	Running	OK	Normal
	Yes				No
beep	Beep	c:\windows\system32\drivers\beep.sys	Kernel		
Driver	Yes	System	Running	OK	Normal
	Yes				No
cdac15ba	CdaC15BA	c:\windows\system32\drivers\cdac15ba.sys			
	Kernel Driver	Yes	Auto	Running	OK
	Normal	No	Yes		
cdad10ba	CdaD10BA	c:\windows\system32\drivers\cdad10ba.sys			
	Kernel Driver	Yes	Auto	Running	OK
	Normal	No	Yes		
cdfs	Cdfs	c:\windows\system32\drivers\cdfs.sys	File		
System Driver	Yes	Disabled	Running	OK	Normal
	No	Yes			
cdrom	CD-ROM Driver	c:\windows\system32\drivers\cdrom.sys			
	Kernel Driver	Yes	System	Running	OK
	Normal	No	Yes		
changer	Changer	Not Available	Kernel Driver	No	
	System	Stopped	OK	Ignore	No
clusdisk	Cluster Disk Driver	c:\windows\system32\drivers\clusdisk.sys			
	Kernel Driver	No	Disabled	Stopped	OK
	Normal	No	No		
cmdide	CmdIde	Not Available	Kernel Driver	No	
	Disabled	Stopped	OK	Normal	No
cpqcissm	cpqcissm	Not Available	Kernel Driver	No	
	Disabled	Stopped	OK	Normal	No
crcdisk	CRC Disk Filter Driver				
	c:\windows\system32\drivers\crcdisk.sys		Kernel Driver		

	Yes	Boot	Running	OK	Normal	No
dfsdriver	DfsDriver	c:\windows\system32\drivers\dfs.sys				File
System Driver	Yes	Boot	Running	OK	Normal	
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				Kernel
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				Kernel
Driver	Yes	Boot	Running	OK	Normal	No
	Yes					
dpti2o	dpti2o	Not Available				Kernel Driver
	Disabled	Stopped	OK			Normal
						No
elxstor	elxstor	Not Available				Kernel Driver
	Disabled	Stopped	OK			Normal
						No
fastfat	Fastfat	c:\windows\system32\drivers\fastfat.sys				File
System Driver	No	Disabled	Stopped	OK		Normal
	No					
fdc	Floppy Disk Controller Driver					
	c:\windows\system32\drivers\fdc.sys					Kernel Driver
	Yes	Manual	Running	OK		Normal
	Yes					No
fips	Fips	c:\windows\system32\drivers\fips.sys				Kernel
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				File
System Driver	No	Yes	Boot	Running	OK	Normal
	No					
ftdisk	Volume Manager Driver					
	c:\windows\system32\drivers\ftdisk.sys					Kernel Driver
	Yes	Boot	Running	OK		Normal
	Yes					No
gpc	Generic Packet Classifier					
	c:\windows\system32\drivers\msgpc.sys					Kernel Driver
	Yes	Manual	Running	OK		Normal
	Yes					No
hidusb	Microsoft HID Class Driver					
	c:\windows\system32\drivers\hidusb.sys					Kernel Driver
	Yes	Manual	Running	OK		Ignore
	Yes					No
hpcisss	hpcisss	Not Available				Kernel Driver
	Disabled	Stopped	OK			Normal
						No
http	HTTP	c:\windows\system32\drivers\http.sys				Kernel
Driver	Yes	Manual	Running	OK	Normal	No
	Yes					
i2omgmt	i2omgmt	Not Available				Kernel Driver
	System	Stopped	OK			Normal
						No
i8042prt	i8042prt	c:\windows\system32\drivers\i8042prt.sys				Kernel
Driver	No	System	Stopped	OK	Ignore	No
	No					
iirsp	iirsp	Not Available				Kernel Driver
	Disabled	Stopped	OK			Normal
						No
imapi	CD-Burning Filter Driver					
	c:\windows\system32\drivers\imapi.sys					Kernel Driver
	No	System	Stopped	OK		Normal
	No					No
intelide	IntelIde	c:\windows\system32\drivers\intelide.sys				Kernel
Driver	Yes	Boot	Running	OK	Normal	No
	Yes					
intelppm	Intel Processor Driver	c:\windows\system32\drivers\intelppm.sys				
	Kernel Driver	Yes	Manual	Running	OK	
	Normal	No	Yes			

ip6fw	IPv6 Windows Firewall Driver					
	c:\windows\system32\drivers\ip6fw.sys					Kernel Driver
	No	Manual	Stopped	OK		Normal
	No					No
ipfilterdriver	IP Traffic Filter Driver					
	c:\windows\system32\drivers\ipfltdrv.sys					Kernel Driver
	No	Manual	Stopped	OK		Normal
	No					No
ipinip	IP in IP Tunnel Driver	c:\windows\system32\drivers\ipinip.sys				
	Kernel Driver	No	Manual	Stopped	OK	
	Normal	No	No			
ipnat	IP Network Address Translator					
	c:\windows\system32\drivers\ipnat.sys					Kernel Driver
	No	Manual	Stopped	OK		Normal
	No					No
ipsec	IPSEC driver	c:\windows\system32\drivers\ipsec.sys				
	Kernel Driver	Yes	System	Running	OK	
	Normal	No	Yes			
isapnp	PnP ISA/EISA Bus Driver					
	c:\windows\system32\drivers\isapnp.sys					Kernel Driver
	Yes	Boot	Running	OK		Critical
	Yes					No
kbdclass	Keyboard Class Driver					
	c:\windows\system32\drivers\kbdclass.sys					Kernel Driver
	Yes	System	Running	OK		Normal
	Yes					No
kbdhid	Keyboard HID Driver	c:\windows\system32\drivers\kbdhid.sys				
	Kernel Driver	Yes	System	Running	OK	
	Ignore	No	Yes			
ksecdd	KSecDD	c:\windows\system32\drivers\ksecdd.sys				Kernel
Driver	Yes	Boot	Running	OK		Normal
	Yes					No
ksthunk	Kernel Streaming WOW64 Thunk Service					
	c:\windows\system32\drivers\ksthunk.sys					Kernel Driver
	Yes	Manual	Running	OK		Normal
	Yes					No
lp6nds35	lp6nds35	Not Available				Kernel Driver
	Disabled	Stopped	OK			Normal
						No
mnmd	mnmd	c:\windows\system32\drivers\mnmd.sys				Kernel
Driver	Yes	System	Running	OK		Ignore
	Yes					No
modem	Modem	c:\windows\system32\drivers\modem.sys				Kernel
Driver	No	Manual	Stopped	OK		Ignore
	No					No
mouclass	Mouse Class Driver	c:\windows\system32\drivers\mouclass.sys				
	Kernel Driver	Yes	System	Running	OK	
	Normal	No	Yes			
mouhid	Mouse HID Driver	c:\windows\system32\drivers\mouhid.sys				
	Kernel Driver	Yes	Manual	Running	OK	
	Ignore	No	Yes			
mountmgr	Mount Point Manager	c:\windows\system32\drivers\mountmgr.sys				
	Kernel Driver	Yes	Boot	Running	OK	
	Normal	No	Yes			
mrraid35x	mrraid35x	c:\windows\system32\drivers\mrraid35x.sys				Kernel
Driver	Yes	Boot	Running	OK		Normal
	Yes					No
mrxdav	WebDav Client Redirector					
	c:\windows\system32\drivers\mrxdav.sys					File System Driver
	No	Manual	Stopped	OK		Normal
	No					No
mrxsm	MRXSMB	c:\windows\system32\drivers\mrxsm.sys				File
System Driver	Yes	System	Running	OK		Normal
	No	Yes				
msfs	Msfs	c:\windows\system32\drivers\msfs.sys				File
System Driver	Yes	System	Running	OK		Normal
	No	Yes				
mssmbios	Microsoft System Management BIOS Driver					
	c:\windows\system32\drivers\mssmbios.sys					Kernel Driver
	Yes	Manual	Running	OK		Normal
	Yes					No
mup	Mup	c:\windows\system32\drivers\mup.sys				File
System Driver	Yes	Boot	Running	OK		Normal
	No	Yes				

ndis	NDIS System Driver	c:\windows\system32\drivers\ndis.sys					Yes	System	Running	OK	Normal	No
	Kernel Driver	Yes	Boot	Running	OK		Yes					
	Normal	No	Yes									
ndistapi	Remote Access NDIS TAPI Driver	c:\windows\system32\drivers\ndistapi.sys					Kernel Driver				Kernel Driver	No
	Yes	Manual	Running	OK	Normal	No	Yes	Manual	Running	OK	Normal	No
	Yes											
ndisuio	NDIS Usermode I/O Protocol	c:\windows\system32\drivers\ndisuio.sys					Kernel Driver				Kernel Driver	No
	Yes	Manual	Running	OK	Normal	No	Yes	Manual	Running	OK	Normal	No
	Yes											
ndiswan	Remote Access NDIS WAN Driver	c:\windows\system32\drivers\ndiswan.sys					Kernel Driver					
	Yes	Manual	Running	OK	Normal	No	Yes	Manual	Running	OK	Normal	No
	Yes											
ndproxy	NDIS Proxy	c:\windows\system32\drivers\ndproxy.sys										
	Kernel Driver	Yes	Manual	Running	OK							
	Normal	No	Yes									
netbios	NetBIOS Interface	c:\windows\system32\drivers\netbios.sys										
	File System Driver	Yes	System	Running	OK							
	Normal	No	Yes									
netbt	NetBios over Tcpip	c:\windows\system32\drivers\netbt.sys										
	Kernel Driver	Yes	System	Running	OK		Yes	Manual	Running	OK	Normal	No
	Normal	No	Yes				Yes					
nfrd960	nfrd960	Not Available		Kernel Driver		No	Yes	Manual	Running	OK	Ignore	No
	Disabled	Stopped	OK	Normal	No	No	Yes					
	Npfs	c:\windows\system32\drivers\npfs.sys					File					
System Driver	Npfs	Yes	System	Running	OK	Normal						
	No	Yes										
	Yes											
ntfs	Ntfs	c:\windows\system32\drivers\ntfs.sys			File							
	System Driver	Yes	Disabled	Running	OK	Normal						
	No	Yes										
null	Null	c:\windows\system32\drivers\null.sys			Kernel							
	Driver	Yes	System	Running	OK	Normal	No					
	Yes											
parport	Parport	c:\windows\system32\drivers\parport.sys					Kernel					
	Driver	No	Manual	Stopped	OK	Ignore	No					
	No											
partmgr	Partition Manager	c:\windows\system32\drivers\partmgr.sys										
	Kernel Driver	Yes	Boot	Running	OK							
	Normal	No	Yes									
pci	PCI Bus Driver	c:\windows\system32\drivers\pci.sys										
	Kernel Driver	Yes	Boot	Running	OK							
	Critical	No	Yes									
pciide	PCIIde	c:\windows\system32\drivers\pciide.sys			Kernel							
	Driver	Yes	Boot	Running	OK	Normal	No					
	Yes											
pcmcia	Pcmcia	c:\windows\system32\drivers\pcmcia.sys			Kernel							
	Driver	No	Disabled	Stopped	OK	Normal	No					
	No											
pdcomp	PDCOMP	Not Available		Kernel Driver		No						
	Manual	Stopped	OK	Ignore	No	No						
	Yes											
pdframe	PDFFRAME	Not Available		Kernel Driver								
	No	Manual	Stopped	OK	Ignore	No						
	No											
pdreli	PDRELI	Not Available		Kernel Driver		No						
	Manual	Stopped	OK	Ignore	No	No						
	Yes											
pdrframe	PDRFRAME	Not Available		Kernel Driver								
	No	Manual	Stopped	OK	Ignore	No						
	No											
pptpminiport	WAN Miniport (PPTP)											
	c:\windows\system32\drivers\rasppptp.sys					Kernel Driver						
	Yes	Manual	Running	OK	Normal	No	Yes	Manual	Running	OK	Normal	No
ptilink	Direct Parallel Link Driver	c:\windows\system32\drivers\ptilink.sys					Kernel Driver					
	Yes	Manual	Running	OK	Normal	No	Yes	Manual	Running	OK	Ignore	No
	Yes											
ql2300	ql2300	Not Available		Kernel Driver		No						
	Disabled	Stopped	OK	Normal	No	No						
	Yes											
rasacd	Remote Access Auto Connection Driver	c:\windows\system32\drivers\rasacd.sys					Kernel Driver					
	Yes						Yes	System	Running	OK	Normal	No
	Yes						Yes					

toside	TosIde	Not Available	Kernel Driver	No
	Disabled	Stopped	OK	Normal
udfs	Udfs	c:\windows\system32\drivers\udfs.sys	File	No
System Driver	No	Disabled	Stopped	OK
	No	No	Normal	No
ultra	ultra	Not Available	Kernel Driver	No
	Disabled	Stopped	OK	Normal
update	Microcode Update Driver	c:\windows\system32\drivers\update.sys	Kernel Driver	No
	Yes	Manual	Running	OK
	Yes		Normal	No
usbccgp	Microsoft USB Generic Parent Driver	c:\windows\system32\drivers\usbccgp.sys	Kernel Driver	No
	Yes	Manual	Running	OK
	Yes		Normal	No
usbehci	Microsoft USB 2.0 Enhanced Host Controller Miniport Driver	c:\windows\system32\drivers\usbehci.sys	Kernel Driver	No
	Yes	Manual	Running	OK
	Yes		Normal	No
usbhub	USB2 Enabled Hub	c:\windows\system32\drivers\usbhub.sys	Kernel Driver	No
	Kernel Driver	Yes	Manual	Running
	Normal	No	Yes	OK
usbstor	USB Mass Storage Driver	c:\windows\system32\drivers\usbstor.sys	Kernel Driver	No
	No	Manual	Stopped	OK
	No		Normal	No
usbuhci	Microsoft USB Universal Host Controller Miniport Driver	c:\windows\system32\drivers\usbuhci.sys	Kernel Driver	No
	Yes	Manual	Running	OK
	Yes		Normal	No
vgasave	VGA Display Controller.	c:\windows\system32\drivers\vga.sys	Kernel Driver	No
	Yes	System	Running	OK
	Yes		Ignore	No
viaide	Vialde	Not Available	Kernel Driver	No
	Disabled	Stopped	OK	Normal
volsnap	Storage volumes	c:\windows\system32\drivers\volsnap.sys	Kernel Driver	No
	Kernel Driver	Yes	Boot	Running
	Normal	No	Yes	OK
wanarp	Remote Access IP ARP Driver	c:\windows\system32\drivers\wanarp.sys	Kernel Driver	No
	Yes	Manual	Running	OK
	Yes		Normal	No
wdica	WDICA	Not Available	Kernel Driver	No
	Manual	Stopped	OK	Ignore
wlbs	Network Load Balancing	c:\windows\system32\drivers\wlbs.sys	Kernel Driver	No
	No	Manual	Stopped	OK
	No		Normal	No

[Signed Drivers]

Device Name	Signed	Device Class	Driver Version
Name	Driver Date	Manufacturer	INF Name Driver
Device ID			
Microsoft System Management BIOS Driver	Yes	SYSTEM	
5.2.3790.1830	10/1/2002 (Standard system devices)		
machine.inf	Not Available		
ROOT\SYSTEM\0002			
Microcode Update Device	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available		ROOT\SYSTEM\0001	
Plug and Play Software Device Enumerator	Yes	SYSTEM	
5.2.3790.1830	10/1/2002 (Standard system devices)		
machine.inf	Not Available		
ROOT\SYSTEM\0000			
Terminal Server Mouse Driver	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available		ROOT\RDP_MOU\0000	
Terminal Server Keyboard Driver	Yes	SYSTEM	
5.2.3790.1830	10/1/2002 (Standard system devices)		
machine.inf	Not Available		
ROOT\RDP_KBD\0000			

Terminal Server Device Redirector	Yes	SYSTEM	
5.2.3790.1830	10/1/2002 (Standard system devices)		
machine.inf	Not Available		ROOT\RDPDR\0000
Direct Parallel	Yes	NET	5.2.3790.1830
10/1/2002			
Microsoft netrasa.inf	Not Available		
ROOT\MS_PTMINIPORT\0000			
WAN Miniport (PPTP)	Yes	NET	5.2.3790.1830
10/1/2002	Microsoft netrasa.inf	Not Available	
ROOT\MS_PPTPMINIPORT\0000			
WAN Miniport (PPPOE)	Yes	NET	5.2.3790.1830
10/1/2002	Microsoft netrasa.inf	Not Available	
ROOT\MS_PPPOEMINIPORT\0000			
WAN Miniport (IP)	Yes	NET	5.2.3790.1830
10/1/2002	Microsoft netrasa.inf	Not Available	
ROOT\MS_NDISWANIP\0000			
WAN Miniport (L2TP)	Yes	NET	5.2.3790.1830
10/1/2002	Microsoft netrasa.inf	Not Available	
ROOT\MS_L2TPMINIPORT\0000			
Video Codecs	Yes	MEDIA	5.2.3790.1830
10/1/2002 (Standard system devices)			wave.inf
ROOT\MEDIA\MS_MMVID			
Legacy Video Capture Devices	Yes	MEDIA	5.2.3790.1830
10/1/2002 (Standard system devices)			wave.inf
Available			Not
ROOT\MEDIA\MS_MMVCD			
Media Control Devices	Yes	MEDIA	5.2.3790.1830
10/1/2002 (Standard system devices)			wave.inf
Available			Not
ROOT\MEDIA\MS_MMMCI			
Legacy Audio Drivers	Yes	MEDIA	5.2.3790.1830
10/1/2002 (Standard system devices)			wave.inf
Available			Not
ROOT\MEDIA\MS_MMDRV			
Audio Codecs	Yes	MEDIA	5.2.3790.1830
10/1/2002 (Standard system devices)			wave.inf
Available			Not
ROOT\MEDIA\MS_MMACM			
Remote Access IP ARP Driver	Not Available		LEGACYDRIVER
Not Available			Not Available
Not Available			Not Available
ROOT\LEGACY_WANARP\0000			
volsnap	Not Available	LEGACYDRIVER	Not Available
Not Available			Not Available
Not Available			Not Available
ROOT\LEGACY_VOLSnap\0000			
VGA Display Controller.	Not Available		LEGACYDRIVER
Not Available			Not Available
Not Available			Not Available
ROOT\LEGACY_VGASAVE\0000			
TDTCP	Not Available	LEGACYDRIVER	Not Available
Not Available			Not Available
Not Available			Not Available
ROOT\LEGACY_TDTCP\0000			
TCP/IP Protocol Driver	Not Available		LEGACYDRIVER
Not Available			Not Available
Not Available			Not Available
ROOT\LEGACY_TCPIP\0000			
Security Driver	Not Available		LEGACYDRIVER
Available	Not Available		Not Available
Not Available			Not Available
ROOT\LEGACY_SECDRV\0000			
RDPWD	Not Available	LEGACYDRIVER	Not Available
Not Available			Not Available
Not Available			Not Available
ROOT\LEGACY_RDPWD\0000			
RDPDCC	Not Available	LEGACYDRIVER	Not Available
Not Available			Not Available
Not Available			Not Available
ROOT\LEGACY_RDPDCC\0000			
Remote Access Auto Connection Driver	Not Available		
LEGACYDRIVER			Not Available
Not Available			Not Available
Not Available			Not Available
ROOT\LEGACY_RASACD\0000			
PCIIde	Not Available	LEGACYDRIVER	Not Available
Not Available			Not Available
Not Available			Not Available
ROOT\LEGACY_PCIIDE\0000			
Partition Manager	Not Available		LEGACYDRIVER
Available	Not Available		Not Available
Not Available			Not Available
ROOT\LEGACY_PARTMGR\0000			
Null	Not Available	LEGACYDRIVER	Not Available
Not Available			Not Available
Not Available			Not Available
ROOT\LEGACY_NULL\0000			

NetBios over Tcpip	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_NETBT\0000	
NDProxy	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_NDPROXY\0000	
NDIS Usermode I/O Protocol	Not Available	LEGACYDRIVER	
	Not Available	Not Available	Not Available
	Not Available	Not Available	
		ROOT\LEGACY_NDISUIO\0000	
Remote Access NDIS TAPI Driver		Not Available	
	LEGACYDRIVER	Not Available	Not Available
	Not Available	Not Available	Not Available
		ROOT\LEGACY_NDISTAPI\0000	
NDIS System Driver	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_NDIS\0000	
mountmgr	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_MOUNTMGR\0000	
mmdd	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_MNMDD\0000	
ksecdd	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_KSECDD\0000	
IPSEC driver	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_IPSEC\0000	
IP Network Address Translator	Not Available	LEGACYDRIVER	
	Not Available	Not Available	Not Available
	Not Available	Not Available	
		ROOT\LEGACY_IPNAT\0000	
HTTP	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_HTTP\0000	
Generic Packet Classifier	Not Available	LEGACYDRIVER	
	Not Available	Not Available	Not Available
	Not Available	Not Available	
		ROOT\LEGACY_GPC\0000	
Fips	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_FIPS\0000	
dmload	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_DMLOAD\0000	
dmboot	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_DMBOOT\0000	
CRC Disk Filter Driver	Not Available	LEGACYDRIVER	
	Not Available	Not Available	Not Available
	Not Available	Not Available	
		ROOT\LEGACY_CRCDISK\0000	
CdaD10BA	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_CDAD10BA\0000	
CdaC15BA	Not Available	LEGACYDRIVER	Not Available
Available	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_CDAC15BA\0000	
Beep	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_BEEP\0000	
AFD	Not Available	LEGACYDRIVER	Not Available
	Not Available	Not Available	Not Available
	Not Available	ROOT\LEGACY_AFD\0000	
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATUREEF00EF00	
OFFSETA0029CC00LENGTHB404E6600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATUREEF00EF00	
OFFSET7E00LENGTHA00294E00			

Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATURE58913C5	
DOFFSET1790B5A200LENGTH5EF7BEEA00			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATURE58913C5	
DOFFSETBF04FB400LENGTH5C043F600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATURE58913C5	
DOFFSET7E00LENGTHBFB04F3600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATURE58913C5E	
OFFSET1790B5A200LENGTH5EF7BEEA00			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATURE58913C5E	
OFFSETBF04FB400LENGTH5C043F600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATURE58913C5E	
OFFSET7E00LENGTHBFB04F3600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATURE66F437B8	
OFFSETBF04FB400LENGTH5C043F600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATURE66F437B8	
OFFSET7E00LENGTHBFB04F3600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATURE66F437B9	
OFFSET11B093AA00LENGTH80730C00			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATURE66F437B9	
OFFSETBF04FB400LENGTH5C043F600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATURE66F437B9	
OFFSET7E00LENGTHBFB04F3600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATUREB52C4B0	
1OFFSET1790B5A200LENGTH5EF7BEEA00			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATUREB52C4B0	
1OFFSETBF04FB400LENGTH5C043F600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATUREB52C4B0	
1OFFSET7E00LENGTHBFB04F3600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATUREB52C4B0	
0OFFSET181128AE00LENGTH5E774BDE00			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATUREB52C4B0	
0OFFSETBF04FB400LENGTH5C043F600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATUREB52C4B0	
0OFFSET7E00LENGTHBFB04F3600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
	Microsoft	volume.inf Not Available	
		STORAGE\VOLUME\1&30A96598&0&SIGNATUREDE29EBF	
0OFFSET1790B5A200LENGTH5EF7BEEA00			

Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
Microsoft volume.inf	Not Available		
STORAGE\VOLUME\1&30A96598&0&SIGNATUREDE29EBF00FFSETBF04FB400LENGTH5C043F600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
Microsoft volume.inf	Not Available		
STORAGE\VOLUME\1&30A96598&0&SIGNATUREDE29EBF00FFSET7E00LENGHTHBF04F3600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
Microsoft volume.inf	Not Available		
STORAGE\VOLUME\1&30A96598&0&SIGNATUREDE29EBF10FFSETBF04FB400LENGTH5C043F600			
Generic volume	Yes	VOLUME 5.2.3790.1830	10/1/2002
Microsoft volume.inf	Not Available		
STORAGE\VOLUME\1&30A96598&0&SIGNATUREDE29EBF10FFSET7E00LENGHTHBF04F3600			
Volume Manager	Yes	SYSTEM 5.2.3790.1830	10/1/2002
(Standard system devices)	machine.inf		Not
Available ROOT\FTDISK\0000			
Logical Disk Manager	Yes	SYSTEM 5.2.3790.1830	10/1/2002
(Standard system devices)	machine.inf		Not
Available ROOT\DMIO\0000			
ACPI Fixed Feature Button	Yes	SYSTEM 5.2.3790.1830	
10/1/2002 (Standard system devices)	machine.inf		
Not Available ACPI\FIXEDBUTTON\2&DABA3FF&0			
High precision event timer	Yes	SYSTEM 5.2.3790.1830	
10/1/2002 (Standard system devices)	machine.inf		
Not Available ACPI\PNP0103\0			
Motherboard resources	Yes	SYSTEM 5.2.3790.1830	
10/1/2002 (Standard system devices)	machine.inf		
Not Available ACPI\PNP0C02\1			
Motherboard resources	Yes	SYSTEM 5.2.3790.1830	
10/1/2002 (Standard system devices)	machine.inf		
Not Available ACPI\PNP0C02\0			
Secondary IDE Channel	Yes	HDC 5.2.3790.1830	
10/1/2002 (Standard IDE ATA/ATAPI controllers)	mshdc.inf		
Not Available PCI\IDE\IDECHANNEL\4&16A8F7F1&0&1			
CD-ROM Drive	Yes	CDROM 5.2.3790.1830	10/1/2002
(Standard CD-ROM drives)	cdrom.inf		Not Available
IDE\CDROMSAMSUNG_CD-ROM_SN-124_____N103____\5&31A9A455&0&0.0.0			
Primary IDE Channel	Yes	HDC 5.2.3790.1830	10/1/2002
(Standard IDE ATA/ATAPI controllers)	mshdc.inf		Not
Available PCI\IDE\IDECHANNEL\4&16A8F7F1&0&0			
Intel(R) 82801EB Ultra ATA Storage Controllers - 24DB	Yes		
HDC 5.2.3790.1830	10/1/2002	Intel	mshdc.inf
Not Available PCI\VEN_8086&DEV_24DB&SUBSYS_016F1028&REV_02\3&13C0B0C5&0&F9			
System board	Yes	SYSTEM 5.2.3790.1830	10/1/2002
(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			
Floppy disk drive	Yes	FLOPPYDISK 5.2.3790.1830	
10/1/2002 (Standard floppy disk drives)	flydisk.inf		
Not Available FDC\GENERIC_FLOPPY_DRIVE\5&14BBD7CB&0&0			
Standard floppy disk controller	Yes	FDC 5.2.3790.1830	
10/1/2002 (Standard floppy disk controllers)	fdc.inf		
Not Available ACPI\PNP0700\4&26DD0F47&0			
System timer	Yes	SYSTEM 5.2.3790.1830	10/1/2002
(Standard system devices)	machine.inf		Not
Available ACPI\PNP0100\4&26DD0F47&0			
System CMOS/real time clock	Yes	SYSTEM 5.2.3790.1830	
10/1/2002 (Standard system devices)	machine.inf		
Not Available ACPI\PNP0B00\4&26DD0F47&0			
System speaker	Yes	SYSTEM 5.2.3790.1830	10/1/2002
(Standard system devices)	machine.inf		Not
Available ACPI\PNP0800\4&26DD0F47&0			

Programmable interrupt controller	Yes	SYSTEM 5.2.3790.1830	10/1/2002 (Standard system devices)
5.2.3790.1830			
machine.inf			Not Available
ACPI\PNP0000\4&26DD0F47&0			
Numeric data processor	Yes	SYSTEM 5.2.3790.1830	
10/1/2002 (Standard system devices)	machine.inf		
Not Available ACPI\PNP0C04\4&26DD0F47&0			
Direct memory access controller	Yes	SYSTEM 5.2.3790.1830	
10/1/2002 (Standard system devices)	machine.inf		
Not Available ACPI\PNP0200\4&26DD0F47&0			
Intel(R) 82801EB LPC Interface Controller - 24D0	Yes	SYSTEM 5.2.3790.1830	10/1/2002
5.2.3790.1830	10/1/2002	Intel	machine.inf
Not Available PCI\VEN_8086&DEV_24D0&SUBSYS_00000000&REV_02\3&13C0B0C5&0&F8			
Default Monitor	Yes	MONITOR 5.2.3790.1830	
10/1/2002 (Standard monitor types)	monitor.inf		
Not Available DISPLAY\DEFAULT_MONITOR\5&199D9B00&0&10000000&1C&00			
Radeon 7000 / RADEON VE Family (Microsoft Corporation)	Yes		
DISPLAY 6.14.10.6508	12/3/2004	ATI Technologies	
Inc. atiixpag.inf			Not Available
PCI\VEN_1002&DEV_5159&SUBSYS_016F1028&REV_00\4&1F7DBC9F&0&00F0			
Intel(R) 82801 PCI Bridge - 244E	Yes	SYSTEM 5.2.3790.1830	10/1/2002
5.2.3790.1830	10/1/2002	Intel	machine.inf
Not Available PCI\VEN_8086&DEV_244E&SUBSYS_00000000&REV_C2\3&13C0B0C5&0&F0			
Generic USB Hub	Yes	USB 5.2.3790.1830	10/1/2002
(Generic USB Hub)	usb.inf		Not Available
USB\VID_413C&PID_A001\5&227234D6&0&3			
USB Root Hub	Yes	USB 5.2.3790.1830	10/1/2002
(Standard USB Host Controller)	usbport.inf		Not Available
USB\ROOT_HUB20\4&36AC53BE&0			
Intel(R) 82801EB USB2 Enhanced Host Controller - 24DD	Yes		
USB 5.2.3790.1830	10/1/2002	Intel	usbport.inf
Not Available PCI\VEN_8086&DEV_24DD&SUBSYS_016F1028&REV_02\3&13C0B0C5&0&EF			
HID-compliant consumer control device	Yes	HIDCLASS 5.2.3790.1830	10/1/2002
5.2.3790.1830	10/1/2002	Microsoft	hidserv.inf
Not Available			
HID\VID_0518&PID_0001&MI_01&COL03\7&11BB4CBB&0&0002			
HID-compliant device	Yes	HIDCLASS 5.2.3790.1830	10/1/2002
5.2.3790.1830	10/1/2002 (Standard system devices)		input.inf
Not Available			
HID\VID_0518&PID_0001&MI_01&COL02\7&11BB4CBB&0&0001			
HID-compliant mouse	Yes	MOUSE 5.2.3790.1830	10/1/2002
Microsoft msmouse.inf			Not Available
HID\VID_0518&PID_0001&MI_01&COL01\7&11BB4CBB&0&0000			
USB Human Interface Device	Yes	HIDCLASS 5.2.3790.1830	10/1/2002
5.2.3790.1830	10/1/2002 (Standard system devices)		
input.inf			
Not Available USB\VID_0518&PID_0001&MI_01\6&39FF271C&0&0001			
HID Keyboard Device	Yes	KEYBOARD 5.2.3790.1830	10/1/2002
5.2.3790.1830	10/1/2002 (Standard keyboards)		
keyboard.inf			Not Available
HID\VID_0518&PID_0001&MI_00\7&121BF107&0&0000			
USB Human Interface Device	Yes	HIDCLASS 5.2.3790.1830	10/1/2002
5.2.3790.1830	10/1/2002 (Standard system devices)		
input.inf			
Not Available USB\VID_0518&PID_0001&MI_00\6&39FF271C&0&0000			
USB Composite Device	Yes	USB 5.2.3790.1830	10/1/2002
5.2.3790.1830	10/1/2002 (Standard USB Host Controller)	usb.inf	Not
Available USB\VID_0518&PID_0001\5&12282430&0&2			
HID-compliant consumer control device	Yes	HIDCLASS 5.2.3790.1830	10/1/2002
5.2.3790.1830	10/1/2002	Microsoft	hidserv.inf
Not Available			

HID\VID_0518&PID_0001&MI_01&COL03\7&35583EE6&0&0
002
HID-compliant device Yes HIDCLASS 5.2.3790.1830
10/1/2002 (Standard system devices) input.inf Not
Available
HID\VID_0518&PID_0001&MI_01&COL02\7&35583EE6&0&0
001
HID-compliant mouse Yes MOUSE 5.2.3790.1830 10/1/2002
Microsoft msmouse.inf Not Available
HID\VID_0518&PID_0001&MI_01&COL01\7&35583EE6&0&0
000
USB Human Interface Device Yes HIDCLASS
5.2.3790.1830 10/1/2002 (Standard system devices)
input.inf Not Available
USB\VID_0518&PID_0001&MI_01\6&111E0DBA&0&0001
HID Keyboard Device Yes KEYBOARD
5.2.3790.1830 10/1/2002 (Standard keyboards)
keyboard.inf Not Available
HID\VID_0518&PID_0001&MI_00\7&11810124&0&0000
USB Human Interface Device Yes HIDCLASS
5.2.3790.1830 10/1/2002 (Standard system devices)
input.inf Not Available
USB\VID_0518&PID_0001&MI_00\6&111E0DBA&0&0000
USB Composite Device Yes USB 5.2.3790.1830
10/1/2002 (Standard USB Host Controller) usb.inf Not
Available
USB\VID_0518&PID_0001\5&12282430&0&1
USB Root Hub Yes USB 5.2.3790.1830 10/1/2002
(Standard USB Host Controller) usbport.inf Not Available
USB\ROOT_HUB\4&56E8D8E&0
Intel(R) 82801EB USB Universal Host Controller - 24D7 Yes
USB 5.2.3790.1830 10/1/2002 Intel usbport.inf
Not Available
PCI\VEN_8086&DEV_24D7&SUBSYS_016F1028&REV_02\3&
13C0B0C5&0&EA
USB Root Hub Yes USB 5.2.3790.1830 10/1/2002
(Standard USB Host Controller) usbport.inf Not Available
USB\ROOT_HUB\4&2978E436&0
Intel(R) 82801EB USB Universal Host Controller - 24D4 Yes
USB 5.2.3790.1830 10/1/2002 Intel usbport.inf
Not Available
PCI\VEN_8086&DEV_24D4&SUBSYS_016F1028&REV_02\3&
13C0B0C5&0&E9
USB Root Hub Yes USB 5.2.3790.1830 10/1/2002
(Standard USB Host Controller) usbport.inf Not Available
USB\ROOT_HUB\4&39104496&0
Intel(R) 82801EB USB Universal Host Controller - 24D2 Yes
USB 5.2.3790.1830 10/1/2002 Intel usbport.inf
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
Not Available
PCI\VEN_8086&DEV_261D&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&9E
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_261C&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&9D
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_261B&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&9C
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_261A&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&9B
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_2619&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&9A
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_2618&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&99
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_2617&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&98
PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2615&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&8A
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_2614&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&89
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_2613&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&88
PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2612&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&82
PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2611&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&81
PCI standard host CPU bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2610&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&80
PCI standard RAM Controller Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2627&SUBSYS_016F1028&REV_00\3&
13C0B0C5&0&7F
PCI standard RAM Controller Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2626&SUBSYS_016F1028&REV_00\3&
13C0B0C5&0&7E
PCI standard RAM Controller Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2625&SUBSYS_016F1028&REV_00\3&
13C0B0C5&0&7D
PCI standard RAM Controller Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2624&SUBSYS_016F1028&REV_00\3&
13C0B0C5&0&7C
PCI standard RAM Controller Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2623&SUBSYS_016F1028&REV_00\3&
13C0B0C5&0&7B

PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available			
PCI\VEN_8086&DEV_2622&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&7A			
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available			
PCI\VEN_8086&DEV_2621&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&79			
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available			
PCI\VEN_8086&DEV_2620&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&78			
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_260C&SUBSYS_00000000&REV_00\3&13C0B0C5&0&70			
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available			
PCI\VEN_8086&DEV_2627&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&6F			
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available			
PCI\VEN_8086&DEV_2626&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&6E			
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available			
PCI\VEN_8086&DEV_2625&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&6D			
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available			
PCI\VEN_8086&DEV_2624&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&6C			
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available			
PCI\VEN_8086&DEV_2623&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&6B			
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available			
PCI\VEN_8086&DEV_2622&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&6A			
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available			
PCI\VEN_8086&DEV_2621&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&69			
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available			
PCI\VEN_8086&DEV_2620&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&68			
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_260C&SUBSYS_00000000&REV_00\3&13C0B0C5&0&60			
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available			
PCI\VEN_8086&DEV_2627&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&5F			
PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830
10/1/2002 (Standard system devices)			machine.inf
Not Available			

PCI standard RAM Controller	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI\VEN_8086&DEV_2620&SUBSYS_016F1028&REV_00\3&13C0B0C5&0&48				
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_260C&SUBSYS_00000000&REV_00\3&13C0B0C5&0&40				
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI\VEN_8086&DEV_0332&SUBSYS_00000000&REV_06\4&35432062&0&0238				
Disk drive	Yes	DISKDRIVE	5.2.3790.1830	10/1/2002
(Standard disk drives) disk.inf			Not Available	
SCSI\DISK&VEN_PERC&PROD__LD_0_PERCRAID&REV_\6&2A7F8708&0&300				
RAID Virtual Device	Yes	SYSTEM	6.46.3.64	1/4/2005 DELL
oem0.inf			Not Available	
SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&RE V_0000\6&2A7F8708&0&2390				
PE 1x5 Backplane	Yes	SYSTEM	5.2.3790.1830	10/1/2002
Dell			scsidev.inf	Not Available
SCSI\PROCESSOR&VEN_PE/PV&PROD_1X5_SCSI_BP&REV_1.0\6&2A7F8708&0&160				
PE 1x5 Backplane	Yes	SYSTEM	5.2.3790.1830	10/1/2002
Dell			scsidev.inf	Not Available
SCSI\PROCESSOR&VEN_PE/PV&PROD_1X5_SCSI_BP&REV_1.0\6&2A7F8708&0&060				
DELL PERC 4e/Di RAID Controller	Yes	SCSIADAPTER		
6.46.3.64 1/4/2005 DELL			oem1.inf	Not Available
PCI\VEN_1028&DEV_0013&SUBSYS_016F1028&REV_06\5&18D0E4AD&0&700038				
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI\VEN_8086&DEV_0330&SUBSYS_00000000&REV_06\4&35432062&0&0038				
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI\VEN_8086&DEV_2607&SUBSYS_00000000&REV_00\3&13C0B0C5&0&38				
Broadcom NetXtreme Gigabit Ethernet	Yes	NET	7.98.0.0	
10/1/2002 Broadcom net57amd.inf			Not Available	
PCI\VEN_14E4&DEV_1648&SUBSYS_016F1028&REV_10\5&3BFB1AC&0&110230				
Broadcom NetXtreme Gigabit Ethernet	Yes	NET	7.98.0.0	
10/1/2002 Broadcom net57amd.inf			Not Available	
PCI\VEN_14E4&DEV_1648&SUBSYS_016F1028&REV_10\5&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	
PCI\VEN_8086&DEV_032A&SUBSYS_00000000&REV_09\4&2BB21864&0&0230				
Intel(R) 6700PXH PCI Express-to-PCI Bridge A - 0329	Yes	SYSTEM		
5.2.3790.1830			10/1/2002 Intel	machine.inf
Not Available				
PCI\VEN_8086&DEV_0329&SUBSYS_00000000&REV_09\4&2BB21864&0&0030				
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI\VEN_8086&DEV_2606&SUBSYS_00000000&REV_00\3&13C0B0C5&0&30				
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI\VEN_8086&DEV_0332&SUBSYS_00000000&REV_07\4&229221FD&0&0228				
Disk drive	Yes	DISKDRIVE	5.2.3790.1830	10/1/2002
(Standard disk drives) disk.inf			Not Available	
SCSI\DISK&VEN_PERC&PROD__LD_1_PERCRAID&REV_\6&25BA32A&0&310				
Disk drive	Yes	DISKDRIVE	5.2.3790.1830	10/1/2002
(Standard disk drives) disk.inf			Not Available	
SCSI\DISK&VEN_PERC&PROD__LD_0_PERCRAID&REV_\6&25BA32A&0&300				
RAID Virtual Device	Yes	SYSTEM	6.46.3.64	1/4/2005 DELL
oem0.inf			Not Available	
SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&RE V_0000\6&25BA32A&0&2390				
DELL PV22XS Backplane	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 Dell			scsidev.inf	Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.1\6&25BA32A&0&160				
DELL PV22XS Backplane	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 Dell			scsidev.inf	Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.1\6&25BA32A&0&060				
DELL PERC 4e/DC RAID Controller	Yes	SCSIADAPTER		
6.46.3.64 1/4/2005 DELL			oem1.inf	Not Available
PCI\VEN_1000&DEV_0408&SUBSYS_00021028&REV_07\5&6E1FF5D&0&700028				
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI\VEN_8086&DEV_0330&SUBSYS_00000000&REV_07\4&229221FD&0&0028				
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI\VEN_8086&DEV_2605&SUBSYS_00000000&REV_00\3&13C0B0C5&0&28				
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI\VEN_8086&DEV_0332&SUBSYS_00000000&REV_07\4&190119FF&0&0220				
Disk drive	Yes	DISKDRIVE	5.2.3790.1830	10/1/2002
(Standard disk drives) disk.inf			Not Available	
SCSI\DISK&VEN_PERC&PROD__LD_1_PERCRAID&REV_\6&3484200D&0&310				
Disk drive	Yes	DISKDRIVE	5.2.3790.1830	10/1/2002
(Standard disk drives) disk.inf			Not Available	
SCSI\DISK&VEN_PERC&PROD__LD_0_PERCRAID&REV_\6&3484200D&0&300				
RAID Virtual Device	Yes	SYSTEM	6.46.3.64	1/4/2005 DELL
oem0.inf			Not Available	
SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&RE V_0000\6&3484200D&0&2390				
DELL PV22XS Backplane	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 Dell			scsidev.inf	Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.1\6&3484200D&0&160				
DELL PV22XS Backplane	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 Dell			scsidev.inf	Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.1\6&3484200D&0&060				
DELL PERC 4e/DC RAID Controller	Yes	SCSIADAPTER		
6.46.3.64 1/4/2005 DELL			oem1.inf	Not Available
PCI\VEN_1000&DEV_0408&SUBSYS_00021028&REV_07\5&266C47C5&0&700020				
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI\VEN_8086&DEV_0330&SUBSYS_00000000&REV_07\4&190119FF&0&0020				
PCI standard PCI-to-PCI bridge	Yes	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI\VEN_8086&DEV_2604&SUBSYS_00000000&REV_00\3&13C0B0C5&0&20				

PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2603&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&18

PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_0332&SUBSYS_00000000&REV_07\4&
6501B9A&0&0210

Disk drive Yes DISKDRIVE 5.2.3790.1830 10/1/2002
(Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_PERC&PROD_LD_1_PERCRAID&REV_\6&
C41C090&0&310

Disk drive Yes DISKDRIVE 5.2.3790.1830 10/1/2002
(Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_PERC&PROD_LD_0_PERCRAID&REV_\6&
C41C090&0&300

RAID Virtual Device Yes SYSTEM 6.46.3.64 1/4/2005 DELL
oem0.inf Not Available
SCSI\OTHER&VEN__RAID&PROD_DUMMYDEVICE&RE
V_0000\6&C41C090&0&2390

DELL PV22XS Backplane Yes SYSTEM 5.2.3790.1830
10/1/2002 Dell scsidev.inf Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.17\6&
C41C090&0&160

DELL PV22XS Backplane Yes SYSTEM 5.2.3790.1830
10/1/2002 Dell scsidev.inf Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.17\6&
C41C090&0&060

DELL PERC 4e/DC RAID Controller Yes SCSIADAPTER
6.46.3.64 1/4/2005 DELL oem1.inf Not Available
PCI\VEN_1000&DEV_0408&SUBSYS_00021028&REV_07\5&
230D0D0F&0&700010

PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_0330&SUBSYS_00000000&REV_07\4&
6501B9A&0&0010

PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2602&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&10

PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_0332&SUBSYS_00000000&REV_07\4&
2CFDADC&0&0208

Disk drive Yes DISKDRIVE 5.2.3790.1830 10/1/2002
(Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_PERC&PROD_LD_1_PERCRAID&REV_\6&
24290062&0&310

Disk drive Yes DISKDRIVE 5.2.3790.1830 10/1/2002
(Standard disk drives) disk.inf Not Available
SCSI\DISK&VEN_PERC&PROD_LD_0_PERCRAID&REV_\6&
24290062&0&300

RAID Virtual Device Yes SYSTEM 6.46.3.64 1/4/2005 DELL
oem0.inf Not Available
SCSI\OTHER&VEN__RAID&PROD_DUMMYDEVICE&RE
V_0000\6&24290062&0&2390

DELL PV22XS Backplane Yes SYSTEM 5.2.3790.1830
10/1/2002 Dell scsidev.inf Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.17\6&
24290062&0&160

DELL PV22XS Backplane Yes SYSTEM 5.2.3790.1830
10/1/2002 Dell scsidev.inf Not Available
SCSI\PROCESSOR&VEN_DELL&PROD_PV22XS&REV_E.17\6&
24290062&0&060

DELL PERC 4e/DC RAID Controller Yes SCSIADAPTER
6.46.3.64 1/4/2005 DELL oem1.inf Not Available
PCI\VEN_1000&DEV_0408&SUBSYS_00021028&REV_07\5&
1F90A0D&0&700008

PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_0330&SUBSYS_00000000&REV_07\4&
2CFDADC&0&0008

PCI standard PCI-to-PCI bridge Yes SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2601&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&08

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_2600&SUBSYS_00000000&REV_00\3&
13C0B0C5&0&00

PCI bus Yes SYSTEM 5.2.3790.1830 10/1/2002 (Standard
system devices) machine.inf Not Available
ACPI\PNP0A03\1

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\15

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\14

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\13

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\12

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\11

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\10

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\9

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\8

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\7

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\6

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\5

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\4

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\3

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\2

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\1

Intel Processor Yes PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_4\0

Microsoft ACPI-Compliant System Yes SYSTEM
5.2.3790.1830 10/1/2002 Microsoft acpi.inf Not
Available ACPI_HAL\PNP0C08\0

ACPI Multiprocessor x64-based PC Yes COMPUTER
5.2.3790.1830 10/1/2002 (Standard computers) hal.inf
Not Available ROOT\ACPI_HAL\0000

Not Available	Not Available	Not Available	Not Available
Available	Not Available	Not Available	Not Available
	Not Available	HTREE\ROOT\0	

[Environment Variables]

Variable	Value	User Name
ClusterLog	C:\WINDOWS\Cluster\cluster.log	
	<SYSTEM>	
ComSpec	%SystemRoot%\system32\cmd.exe	<SYSTEM>
FP_NO_HOST_CHECK	NO	<SYSTEM>
NUMBER_OF_PROCESSORS	16	<SYSTEM>
OS	Windows_NT	<SYSTEM>
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\Binn\;C:\Program Files (x86)\Microsoft SQL Server\90\Tools\Binn\;C:\Program Files (x86)\Microsoft SQL Server\90\DTS\Binn\;C:\Program Files (x86)\Microsoft SQL Server\90\Tools\Binn\VSShell\Common7\IDE\;C:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\Binn\;	
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\LOCAL SERVICE		
TMP	%USERPROFILE%\Local Settings\Temp	NT
AUTHORITY\LOCAL SERVICE		
TEMP	%USERPROFILE%\Local Settings\Temp	NT
AUTHORITY\NETWORK SERVICE		
TMP	%USERPROFILE%\Local Settings\Temp	NT
AUTHORITY\NETWORK SERVICE		
TEMP	%USERPROFILE%\Local Settings\Temp	
	PE6800\Administrator	
TMP	%USERPROFILE%\Local Settings\Temp	
	PE6800\Administrator	

[Print Jobs]

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

[Network Connections]

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

Name	Path	Process ID	Priority	Min Working Set	Max
Working Set		Start Time	Version	Size	File Date
system idle process		Not Available		0	0
Available	Not Available		Not Available		Not Available
	Not Available		Not Available		
system	Not Available	4	8	0	1413120
	Not Available		Not Available		Not Available
	Not Available				

smss.exe	Not Available	416	11	204800	1413120
	11/23/2005 11:52 AM	Not Available		Not Available	
	Not Available				
csrss.exe	Not Available	564	13	Not Available	
	Not Available	11/23/2005 11:52 AM	Not Available		
	Not Available	Not Available			
winlogon.exe	c:\windows\system32\winlogon.exe			612	
	13	204800	1413120	11/23/2005 11:52 AM	
	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			672	
	9	204800	1413120	11/23/2005 11:52 AM	
	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	692	9	204800	
	1413120	11/23/2005 11:52 AM	5.2.3790.1830		
(srv03_sp1_rtm.050324-1447)	14.00 KB (14,336 bytes)				3/25/2005 6:00 AM
svchost.exe	c:\windows\system32\svchost.exe			880	
	8	204800	1413120	11/23/2005 11:52 AM	
	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	980	8	Not Available	
Available	Not Available	11/23/2005 11:52 AM	Not Available		
	Not Available	Not Available			
svchost.exe	Not Available	1068	8	Not Available	
Available	Not Available	11/23/2005 11:52 AM	Not Available		
	Not Available	Not Available			
svchost.exe	Not Available	1120	8	Not Available	
Available	Not Available	11/23/2005 11:52 AM	Not Available		
	Not Available	Not Available			
svchost.exe	c:\windows\system32\svchost.exe			1132	
	8	204800	1413120	11/23/2005 11:52 AM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)				24.50 KB
(25,088 bytes)	3/25/2005 6:00 AM				
spoolsv.exe	c:\windows\system32\spoolsv.exe			1408	
	8	204800	1413120	11/23/2005 11:52 AM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)				107.00 KB
(109,568 bytes)	3/25/2005 6:00 AM				
msdtc.exe	Not Available	1444	8	Not Available	
	Not Available	11/23/2005 11:52 AM	Not Available		
	Not Available	Not Available			
svchost.exe	c:\windows\system32\svchost.exe			1596	
	8	204800	1413120	11/23/2005 11:52 AM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)				24.50 KB
(25,088 bytes)	3/25/2005 6:00 AM				
inetinfo.exe	c:\windows\system32\inetrv\inetinfo.exe			1776	
	8	204800	1413120	11/23/2005 11:52 AM	
	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)				17.50 KB
(17,920 bytes)	11/23/2005 4:43 AM				
svchost.exe	Not Available	1820	8	Not Available	
Available	Not Available	11/23/2005 11:52 AM	Not Available		
	Not Available	Not Available			
svchost.exe	c:\windows\system32\svchost.exe			592	
	8	204800	1413120	11/23/2005 11:53 AM	
	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			1476	
	8	204800	1413120	11/23/2005 11:53 AM	
	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)				24.50 KB
(25,088 bytes)	3/25/2005 6:00 AM				
wmiprvse.exe	Not Available	3012	8	Not Available	
Available	Not Available	11/23/2005 11:53 AM	Not Available		
	Not Available	Not Available			
csrss.exe	Not Available	3020	13	Not Available	
	Not Available	11/23/2005 11:59 AM	Not Available		
	Not Available	Not Available			
winlogon.exe	c:\windows\system32\winlogon.exe			1144	
	13	204800	1413120	11/23/2005 11:59 AM	
	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	1864	8	204800	
	1413120	11/23/2005 11:59 AM	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 556 8
204800 1413120 11/23/2005 11:59 AM6.00.3790.1830
(srv03_sp1_rtm.050324-1447) 1.30 MB (1,364,480 bytes) 3/25/2005
6:00 AM
cmd.exe c:\windows\system32\cmd.exe 2692 8
1413120 11/23/2005 11:59 AM5.2.3790.1830
(srv03_sp1_rtm.050324-1447) 538.50 KB (551,424 bytes) 3/25/2005
6:00 AM
sqlservr.exe c:\program files\microsoft sql
server\mssql.1\mssql\bin\sqlservr.exe 2732 13
1413120 11/23/2005 11:59 AM2005.090.1399.00 37.56 MB
(39,379,672 bytes) 10/14/2005 3:37 PM
wpabaln.exe c:\windows\system32\wpabaln.exe 2136
8 204800 1413120 11/23/2005 12:01 PM
5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 33.50 KB
(34,304 bytes) 3/25/2005 6:00 AM
logon.scr Not Available 2160 4 Not Available
Not Available 11/23/2005 12:02 PM Not Available
Not Available Not Available
helpctr.exe c:\windows\pchealth\helpctr\binaries\helpctr.exe 1316
8 204800 1413120 11/24/2005 12:54 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
164 8 204800 1413120 11/24/2005 12:54 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 2640 8 Not
Available Not Available 11/24/2005 12:54 AMNot Available
Not Available Not Available

```

[Loaded Modules]

Name	Version	Size	File Date	Manufacturer	Path
winlogon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	901.00 KB			
(922,624 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\winlogon.exe
ntdll	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.20 MB			
(1,257,472 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\ntdll.dll
kernel32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.43 MB			
(1,500,160 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\kernel32.dll
advapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.00 MB			
(1,051,136 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\advapi32.dll
rpcrt4	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.63 MB			
(1,714,176 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\rpcrt4.dll
crypt32	5.131.3790.1830 (srv03_sp1_rtm.050324-1447)	1.36 MB			
(1,428,992 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\crypt32.dll
msasn1	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	152.50 KB			
(156,160 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\msasn1.dll
msvcrt	7.0.3790.1830 (srv03_sp1_rtm.050324-1447)	508.00 KB			
(520,192 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\msvcrt.dll
user32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.04 MB			
(1,085,952 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\user32.dll
gdi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	592.00 KB			
(606,208 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\gdi32.dll
nddeapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	25.00 KB			
(25,600 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\nddeapi.dll
profmap	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.00 KB			
(36,864 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\profmap.dll

netapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	589.00 KB			
(603,136 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\netapi32.dll
userenv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.02 MB			
(1,069,056 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\userenv.dll
psapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	29.00 KB			
(29,696 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\psapi.dll
regapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	108.50 KB			
(111,104 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\regapi.dll
secur32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	120.00 KB			
(122,880 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\secur32.dll
setupapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.45 MB			
(1,523,200 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\setupapi.dll
version	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	28.00 KB			
(28,672 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\version.dll
winsta	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	89.00 KB			
(91,136 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\winsta.dll
ws2_32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	176.50 KB			
(180,736 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\ws2_32.dll
ws2help	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.50 KB			
(31,232 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\ws2help.dll
msgina	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.14 MB			
(1,193,472 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\msgina.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
shlwapi	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	606.50 KB			
(621,056 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\shlwapi.dll
sfc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.00 KB			
(6,144 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\sfc.dll
sfc_os	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	183.50 KB			
(187,904 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\sfc_os.dll
wintrust	5.131.3790.1830 (srv03_sp1_rtm.050324-1447)	297.50 KB			
(304,640 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\wintrust.dll
imagehlp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	57.50 KB			
(58,880 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\imagehlp.dll
ole32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.43 MB			
(2,543,616 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\ole32.dll
comctl32	6.0 (srv03_sp1_rtm.050324-1447)	1.51 MB (1,584,128 bytes)			
	11/22/2005 10:06 PM	Microsoft Corporation			c:\windows\winsxs\amd64_microsoft.windows.common-controls_6595b64144ccf1df_6.0.3790.1830_x-ww_aced72af\comctl32.dll
winscard	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	230.00 KB			
(235,520 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\winscard.dll
wsapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	29.00 KB			
(29,696 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\wsapi32.dll
winmm	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	303.50 KB			
(310,784 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\winmm.dll
shell32	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	10.01 MB			
(10,492,416 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\shell32.dll
sxs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.91 MB			
(2,003,968 bytes)	3/25/2005 6:00 AM	Microsoft Corporation			c:\windows\system32\sxs.dll

rsaenh	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	241.96 KB	msvcpx60	7.0.3790.1830 (srv03_sp1_rtm.050324-1447)	919.50 KB
(247,768 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(941,568 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\rsaenh.dll			c:\windows\system32\msvcpx60.dll	
wldap32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	390.00 KB	ntdsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	127.50 KB
(399,360 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(130,560 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wldap32.dll			c:\windows\system32\ntdsapi.dll	
cscdll	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	151.50 KB	dnsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	297.50 KB
(155,136 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(304,640 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\cscdll.dll			c:\windows\system32\dnsapi.dll	
dimsntfy	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	28.00 KB	services	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	216.50 KB
(28,672 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(221,696 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\dimsntfy.dll			c:\windows\system32\services.exe	
wlnotify	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	148.00 KB	ncobjapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	80.00 KB
(151,552 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(81,920 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wlnotify.dll			c:\windows\system32\ncobjapi.dll	
mpr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	115.00 KB	scesrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	594.50 KB
(117,760 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(608,768 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\mpr.dll			c:\windows\system32\scesrv.dll	
oleaut32	5.2.3790.1830	1.06 MB (1,116,160 bytes)	authz	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	167.00 KB
6:00 AM Microsoft Corporation			(171,008 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\oleaut32.dll			c:\windows\system32\authz.dll	
winspool	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	247.00 KB	umpnpgmgr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	205.00 KB
(252,928 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(209,920 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\winspool.drv			c:\windows\system32\umpnpgmgr.dll	
comctl32	5.82 (srv03_sp1_rtm.050324-1447)	934.50 KB (956,928 bytes)	eventlog	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	127.00 KB
	11/22/2005 10:06 PM Microsoft Corporation		(130,048 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\winsxs\amd64_microsoft.windows.common-			c:\windows\system32\eventlog.dll	
controls_6595b64144ccf1df_5.82.3790.1830_x-ww_4d792d2a\comctl32.dll			lsass	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	14.00 KB
uxtheme	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	494.50 KB	(14,336 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(506,368 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\lsass.exe	
	c:\windows\system32\uxtheme.dll		lsasrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.50 MB
mprapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	154.50 KB	(1,568,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(158,208 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\lsasrv.dll	
	c:\windows\system32\mprapi.dll		samsrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.01 MB
activeds	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	348.50 KB	(1,059,328 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(356,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\samsrv.dll	
	c:\windows\system32\activeds.dll		cryptdll	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	47.00 KB
adslsdp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	240.50 KB	(48,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(246,272 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\cryptdll.dll	
	c:\windows\system32\adslsdp.dll		msprvs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	47.50 KB
credui	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	202.00 KB	(48,640 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(206,848 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\msprvs.dll	
	c:\windows\system32\credui.dll		kerberos	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	698.00 KB
atl	3.05.2284 96.50 KB (98,816 bytes)	3/25/2005 6:00 AM 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 (536,576 bytes)	wdigest	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	130.50 KB
	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	

esent	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.26 MB	cryptui	5.131.3790.1830 (srv03_sp1_rtm.050324-1447)	705.50 KB
(2,366,976 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(722,432 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\esent.dll			c:\windows\system32\cryptui.dll	
ntdsatq	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	51.00 KB	rasapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	410.00 KB
(52,224 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(419,840 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ntdsatq.dll			c:\windows\system32\rasapi32.dll	
mswsock	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	478.00 KB	rasman	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	95.50 KB
(489,472 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(97,792 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\mswsock.dll			c:\windows\system32\rasman.dll	
scecli	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	308.00 KB	tapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	332.50 KB
(315,392 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(340,480 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\scecli.dll			c:\windows\system32\tapi32.dll	
ws03res	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	794.00 KB	raschap	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	141.00 KB
(813,056 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(144,384 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ws03res.dll			c:\windows\system32\raschap.dll	
ipsecsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	358.50 KB	schedsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	308.50 KB
(367,104 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(315,904 bytes)	11/23/2005 4:26 AM Microsoft Corporation	
	c:\windows\system32\ipsecsvc.dll			c:\windows\system32\schedsvc.dll	
oakley	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	372.50 KB	msidle	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	9.00 KB
(381,440 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(9,216 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\oakley.dll			c:\windows\system32\msidle.dll	
winipsec	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	52.50 KB	wkssvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	221.00 KB
(53,760 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(226,304 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\winipsec.dll			c:\windows\system32\wkssvc.dll	
pstorsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.00 KB	wiarpc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	57.00 KB
(36,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(58,368 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\pstorsvc.dll			c:\windows\system32\wiarpc.dll	
hnetcfg	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	561.00 KB	aelupsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.50 KB
(574,464 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(32,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\hnetcfg.dll			c:\windows\system32\aelupsvc.dll	
wshtcpip	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	29.00 KB	apphelp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	241.00 KB
(29,696 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(246,784 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wshtcpip.dll			c:\windows\system32\apphelp.dll	
psbase	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	124.00 KB	cryptsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	114.00 KB
(126,976 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(116,736 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\psbase.dll			c:\windows\system32\cryptsvc.dll	
dssenh	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	226.96 KB	certcli	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	372.00 KB
(232,408 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(380,928 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\dssenh.dll			c:\windows\system32\certcli.dll	
wlbsctrl	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	137.50 KB	vssapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.26 MB
(140,800 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(1,320,960 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wlbsctrl.dll			c:\windows\system32\vssapi.dll	
w3ssl	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	21.00 KB	es	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	357.00 KB
(21,504 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(365,568 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\w3ssl.dll			c:\windows\system32\es.dll	
strmfilt	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	131.50 KB	pchsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	76.00 KB
(134,656 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(77,824 bytes)	11/23/2005 4:26 AM Microsoft Corporation	
	c:\windows\system32\strmfilt.dll			c:\windows\pchealth\helpctr\binaries\pchsvc.dll	
httpapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.50 KB	hidserv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB
(37,376 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(24,576 bytes)	11/22/2005 10:18 PM Microsoft Corporation	
	c:\windows\system32\httpapi.dll			c:\windows\system32\hidserv.dll	
svchost	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB	hid	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	33.00 KB
(25,088 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(33,792 bytes)	3/24/2005 11:18 AM Microsoft Corporation	
	c:\windows\system32\svchost.exe			c:\windows\system32\hid.dll	
rpcss	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	672.00 KB	dmserver	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.50 KB
(688,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(37,376 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\rpcss.dll			c:\windows\system32\dmserver.dll	
ntmarta	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	222.50 KB	srvsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	156.50 KB
(227,840 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(160,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ntmarta.dll			c:\windows\system32\srvsvc.dll	
wzcsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	492.00 KB	sens	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	63.50 KB
(503,808 bytes)	3/24/2005 11:35 AM Microsoft Corporation		(65,024 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wzcsvc.dll			c:\windows\system32\sens.dll	
wmi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	5.50 KB	seclogon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	27.50 KB
(5,632 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(28,160 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wmi.dll			c:\windows\system32\seclogon.dll	
dhcpcsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	219.00 KB	comsvcs	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	2.06 MB
(224,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(2,156,544 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\dhcpcsvc.dll			c:\windows\system32\comsvcs.dll	
rastls	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	236.50 KB	trkws	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	177.50 KB
(242,176 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(181,760 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\rastls.dll			c:\windows\system32\trkws.dll	

wmisvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	227.00 KB
(232,448 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\wbem\wmisvc.dll	
wuauserv	5.7.3790.1830 (srv03_sp1_rtm.050324-1447)	12.00 KB
(12,288 bytes)	11/23/2005 4:26 AM Microsoft Corporation	
	c:\windows\system32\wuauserv.dll	
wuaueng	5.7.3790.1830 (srv03_sp1_rtm.050324-1447)	2.17 MB
(2,270,720 bytes)	11/23/2005 4:26 AM Microsoft Corporation	
	c:\windows\system32\wuaueng.dll	
advpack	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	146.00 KB
(149,504 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\advpack.dll	
cabinet	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	138.50 KB
(141,824 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\cabinet.dll	
mspatcha	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	48.00 KB
(49,152 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\mspachtd.dll	
shfolder	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	34.00 KB
(34,816 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\shfolder.dll	
winhttp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	508.50 KB
(520,704 bytes)	11/22/2005 10:06 PM Microsoft Corporation	
	c:\windows\winsxs\amd64_microsoft.windows.winhttp_6595b641	
44ccf1df_5.1.3790.1830_x-ww_a61ef4db\winhttp.dll		
browser	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	125.50 KB
(128,512 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\browser.dll	
netrap	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	26.00 KB
(26,624 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\netrap.dll	
wbemcore	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.24 MB
(1,299,968 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\wbem\wbemcore.dll	
esscli	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	626.50 KB
(641,536 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\wbem\esscli.dll	
wmiutils	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	171.00 KB
(175,104 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\wbem\wmiutils.dll	
repdrvfs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	353.50 KB
(361,984 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\wbem\repdrvfs.dll	
wmiprvsd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	743.00 KB
(760,832 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\wbem\wmiprvsd.dll	
wbemess	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	532.50 KB
(545,280 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\wbem\wbemess.dll	
ncprov	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	73.00 KB
(74,752 bytes)	11/23/2005 4:24 AM Microsoft Corporation	
	c:\windows\system32\wbem\ncprov.dll	
netman	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	457.00 KB
(467,968 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\netman.dll	
netshell	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.32 MB
(2,437,120 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\netshell.dll	
clusapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	127.00 KB
(130,048 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\clusapi.dll	
wininet	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	1.13 MB
(1,186,304 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wininet.dll	
wzcsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	49.00 KB
(50,176 bytes)	3/24/2005 11:35 AM Microsoft Corporation	
	c:\windows\system32\wzcsapi.dll	
rasdlg	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	859.50 KB
(880,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\rasdlg.dll	
rasadhlp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	12.00 KB
(12,288 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\rasadhlp.dll	

netcfgx	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.29 MB
(1,354,240 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\netcfgx.dll	
ntlsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	11.00 KB
(11,264 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ntlsapi.dll	
spoolsv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	107.00 KB
(109,568 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\spoolsv.exe	
spoolss	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	163.00 KB
(166,912 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\spoolss.dll	
localspl	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	730.50 KB
(748,032 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\localspl.dll	
cnbjmon	5.2.3790.1224 (dnsvr\skatari).040514-1058	63.00 KB (64,512 bytes)
	3/24/2005 11:15 AM Microsoft Corporation	
	c:\windows\system32\cnbjmon.dll	
pjlmon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	25.50 KB
(26,112 bytes)	3/24/2005 11:22 AM Microsoft Corporation	
	c:\windows\system32\pjlmon.dll	
tcpmon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	91.00 KB
(93,184 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\tcpmon.dll	
wsnmp32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	67.50 KB
(69,120 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wsnmp32.dll	
tcpmib	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	25.00 KB
(25,600 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\tcpmib.dll	
wsock32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB
(25,088 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wsock32.dll	
mgmtapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	22.50 KB
(23,040 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\mgmtapi.dll	
snmpapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.50 KB
(32,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\snmpapi.dll	
usbmon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	28.50 KB
(29,184 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\usbmon.dll	
winmr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.00 KB
(30,720 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\winmr.dll	
wshqos	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	33.50 KB
(34,304 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wshqos.dll	
win32spl	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	167.00 KB
(171,008 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\win32spl.dll	
inetpp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	148.50 KB
(152,064 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\inetpp.dll	
icmp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	3.50 KB
(3,584 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\icmp.dll	
ersvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.00 KB
(31,744 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ersvc.dll	
inetinfo	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	17.50 KB
(17,920 bytes)	11/23/2005 4:43 AM Microsoft Corporation	
	c:\windows\system32\inetinfo\inetinfo.exe	
iisutil	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	316.50 KB
(324,096 bytes)	11/23/2005 4:43 AM Microsoft Corporation	
	c:\windows\system32\inetinfo\iisutil.dll	
rpcref	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	4.50 KB
(4,608 bytes)	11/23/2005 4:43 AM Microsoft Corporation	
	c:\windows\system32\inetinfo\rpcref.dll	
iisrtl	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	225.00 KB
(230,400 bytes)	11/23/2005 4:43 AM Microsoft Corporation	
	c:\windows\system32\iisrtl.dll	

iisadmin	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	30.00 KB	msadp32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	23.50 KB
(30,720 bytes)	11/23/2005 4:43 AM Microsoft Corporation		(24,064 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\inetsrv\iisadmin.dll			c:\windows\system32\msadp32.acm	
coadmin	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	100.50 KB	msg711	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	13.50 KB
(102,912 bytes)	11/23/2005 4:43 AM Microsoft Corporation		(13,824 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\inetsrv\coadmin.dll			c:\windows\system32\msg711.acm	
admwprox	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	66.00 KB	msgsm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	34.50 KB
(67,584 bytes)	11/23/2005 4:43 AM Microsoft Corporation		(35,328 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\admwprox.dll			c:\windows\system32\msgsm32.acm	
iiscfg	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	1.24 MB	tssoft32	1.01 13.50 KB (13,824 bytes)	3/25/2005 6:00 AM
(1,298,432 bytes)	11/23/2005 4:43 AM Microsoft Corporation			DSP GROUP, INC. c:\windows\system32\tssoft32.acm	
	c:\windows\system32\inetsrv\iiscfg.dll		tsd32	1.03 24.50 KB (25,088 bytes)	3/25/2005 6:00 AM
metadata	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	342.00 KB		DSP GROUP, INC. c:\windows\system32\tsd32.dll	
(350,208 bytes)	11/23/2005 4:43 AM Microsoft Corporation		printui	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	928.50 KB
	c:\windows\system32\inetsrv\metadata.dll		(950,784 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
msxml3	8.70.1104.0 2.04 MB (2,141,184 bytes)	3/25/2005		c:\windows\system32\printui.dll	
6:00 AM	Microsoft Corporation		cfgmgr32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	18.00 KB
svcxext	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	60.50 KB	(18,432 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(61,952 bytes)	11/23/2005 4:43 AM Microsoft Corporation			c:\windows\system32\cfgmgr32.dll	
	c:\windows\system32\inetsrv\svcxext.dll		rdpclip	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	99.00 KB
security	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.00 KB	(101,376 bytes)	11/23/2005 4:25 AM Microsoft Corporation	
(6,144 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\rdpclip.exe	
	c:\windows\system32\security.dll		urlmon	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	1.02 MB
iismap	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	97.00 KB	(1,074,176 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(99,328 bytes)	11/23/2005 4:43 AM Microsoft Corporation			c:\windows\system32?urlmon.dll	
	c:\windows\system32\iismap.dll		explorer	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	1.30 MB
wamreg	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	78.50 KB	(1,364,480 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(80,384 bytes)	11/23/2005 4:44 AM Microsoft Corporation			c:\windows\explorer.exe	
	c:\windows\system32\inetsrv\wamreg.dll		browseui	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	1.53 MB
iisw3adm	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	305.00 KB	(1,601,536 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(312,320 bytes)	11/23/2005 4:44 AM Microsoft Corporation			c:\windows\system32\browseui.dll	
	c:\windows\system32\inetsrv\iisw3adm.dll		shdocvw	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	2.30 MB
w3cache	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	27.50 KB	(2,416,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(28,160 bytes)	11/23/2005 4:44 AM Microsoft Corporation			c:\windows\system32\shdocvw.dll	
	c:\windows\system32\inetsrv\w3cache.dll		themeui	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	530.50 KB
w3tp	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	16.00 KB	(543,232 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(16,384 bytes)	11/23/2005 4:44 AM Microsoft Corporation			c:\windows\system32\themeui.dll	
	c:\windows\system32\inetsrv\w3tp.dll		msimg32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.50 KB
lonsint	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	17.50 KB	(6,656 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(17,920 bytes)	11/23/2005 4:43 AM Microsoft Corporation			c:\windows\system32\msimg32.dll	
	c:\windows\system32\inetsrv\lonsint.dll		linkinfo	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.00 KB
termsrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	354.50 KB	(30,720 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(363,008 bytes)	11/23/2005 4:25 AM Microsoft Corporation			c:\windows\system32\linkinfo.dll	
	c:\windows\system32\termsrv.dll		ntshrui	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	184.00 KB
icaapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	27.50 KB	(188,416 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(28,160 bytes)	11/23/2005 4:25 AM Microsoft Corporation			c:\windows\system32\ntshrui.dll	
	c:\windows\system32\icaapi.dll		webcheck	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	439.00 KB
mstlsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	187.00 KB	(449,536 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(191,488 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\webcheck.dll	
	c:\windows\system32\mstlsapi.dll		stobject	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	142.50 KB
rdpwsx	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	170.13 KB	(145,920 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(174,216 bytes)	11/23/2005 4:25 AM Microsoft Corporation			c:\windows\system32\stobject.dll	
	c:\windows\system32\rdpwsx.dll		batmeter	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	41.50 KB
rdpsnd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	25.00 KB	(42,496 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(25,600 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\batmeter.dll	
	c:\windows\system32\rdpsnd.dll		powrprof	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	32.50 KB
scredir	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	38.50 KB	(33,280 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(39,424 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\powrprof.dll	
	c:\windows\system32\scredir.dll		browseui	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	63.00 KB
cscui	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	441.00 KB	(64,512 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(451,584 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\browseui.dll	
	c:\windows\system32\cscui.dll		duser	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	445.00 KB
msacm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.00 KB	(455,680 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(31,744 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\duser.dll	
	c:\windows\system32\msacm32.drv		shdoclc	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	589.50 KB
msacm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	112.00 KB	(603,648 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(114,688 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\shdoclc.dll	
	c:\windows\system32\msacm32.dll		drprov	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB
imaadp32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB	(24,576 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(24,576 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\drprov.dll	
	c:\windows\system32\imaadp32.acm		ntlanman	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	71.50 KB
			(73,216 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
				c:\windows\system32\ntlanman.dll	

netui0 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 130.00 KB
(133,120 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\netui0.dll

netui1 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 338.50 KB
(346,624 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\netui1.dll

davclnt 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 38.00 KB
(38,912 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\davclnt.dll

zipfldr 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) 449.50 KB
(460,288 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\zipfldr.dll

sendmail 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) 64.00 KB
(65,536 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\sendmail.dll

mydocs 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) 101.00 KB
(103,424 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\mydocs.dll

cmd 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 538.50 KB
(551,424 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\cmd.exe

sqlservr 2005.090.1399.00 37.56 MB (39,379,672 bytes)
10/14/2005 3:37 PM Microsoft Corporation c:\program
files\microsoft sql server\mssql.1\mssql\bin\sqlservr.exe

msvcr80 8.00.50727.42 803.50 KB (822,784 bytes) 9/23/2005
12:26 AM Microsoft Corporation
c:\windows\winsxs\amd64_microsoft.vc80.crt_1fc8b3b9a1e18e3b
_8.0.50727.42_x-ww_3fea50ad\msvcr80.dll

msvcpr80 8.00.50727.42 1.05 MB (1,097,728 bytes) 9/23/2005
12:28 AM Microsoft Corporation
c:\windows\winsxs\amd64_microsoft.vc80.crt_1fc8b3b9a1e18e3b
_8.0.50727.42_x-ww_3fea50ad\msvcpr80.dll

opends60 2005.090.1399.00 22.21 KB (22,744 bytes)
10/14/2005 3:31 PM Microsoft Corporation c:\program
files\microsoft sql server\mssql.1\mssql\bin\opends60.dll

instapi 2005.090.1399.00 40.71 KB (41,688 bytes)
10/14/2005 3:23 PM Microsoft Corporation c:\program
files\microsoft sql server\90\shared\instapi.dll

sqlevn70 2005.090.1399.00 1.57 MB (1,642,712 bytes)
10/14/2005 3:32 PM Microsoft Corporation c:\program
files\microsoft sql server\mssql.1\mssql\bin\resources\1033\sqlevn70.rll

sqlos 2005.090.1399.00 15.71 KB (16,088 bytes)
10/14/2005 3:35 PM Microsoft Corporation c:\program
files\microsoft sql server\mssql.1\mssql\bin\sqlos.dll

mscoree 2.0.50727.42 (RTM.050727-4200) 441.00 KB (451,584
bytes) 9/23/2005 12:37 AM Microsoft Corporation
c:\windows\system32\mscoree.dll

xolehlp 2001.12.4720.1830 (srv03_sp1_rtm.050324-1447) 10.50 KB
(10,752 bytes) 11/23/2005 4:24 AM Microsoft Corporation
c:\windows\system32\xolehlp.dll

msdtcprx 2001.12.4720.1830 (srv03_sp1_rtm.050324-1447) 805.50 KB
(824,832 bytes) 11/23/2005 4:24 AM Microsoft Corporation
c:\windows\system32\msdtcprx.dll

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

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

sqlncli 2005.090.1399.00 3.01 MB (3,152,144 bytes)
10/14/2005 3:37 PM Microsoft Corporation
c:\windows\system32\sqlncli.dll

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

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

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\wpabaln.exe

helpctr 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 1.30 MB
(1,363,456 bytes) 11/23/2005 4:26 AM Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\helpctr.exe

hcappres 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 7.50 KB
(7,680 bytes) 11/23/2005 4:26 AM Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\hcappres.dll

itss 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 208.00 KB
(212,992 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\itss.dll

pchshell 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 155.00 KB
(158,720 bytes) 11/23/2005 4:26 AM Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\pchshell.dll

mlang 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) 686.00 KB
(702,464 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\mlang.dll

mshtml 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) 5.65 MB
(5,928,448 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\mshtml.dll

msls31 3.10.349.0 357.00 KB (365,568 bytes) 3/25/2005 6:00 AM
Microsoft Corporation c:\windows\system32\msls31.dll

msimtf 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 380.50 KB
(389,632 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\msimtf.dll

msctf 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 617.50 KB
(632,320 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\msctf.dll

jscrip 5.6.0.8827 974.50 KB (997,888 bytes) 3/25/2005 6:00 AM
Microsoft Corporation c:\windows\system32\jscrip.dll

imm32 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 208.00 KB
(212,992 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\imm32.dll

mshtml 6.00.3790.1830 (srv03_sp1_rtm.050324-1447) 905.50 KB
(927,232 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\mshtml.dll

vbscript 5.6.0.8827 646.50 KB (662,016 bytes) 3/25/2005 6:00 AM
Microsoft Corporation c:\windows\system32\vbscript.dll

msinfo 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 636.00 KB
(651,264 bytes) 11/23/2005 4:26 AM Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\msinfo.dll

mfc42u 6.50.9146.0 1.39 MB (1,462,272 bytes) 3/25/2005
6:00 AM Microsoft Corporation c:\windows\system32\mfc42u.dll

riched32 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 7.00 KB
(7,168 bytes) 3/25/2005 6:00 AM Microsoft Corporation
c:\windows\system32\riched32.dll

riched20 5.31.23.1224 1.10 MB (1,157,120 bytes) 3/25/2005
6:00 AM Microsoft Corporation
c:\windows\system32\riched20.dll

helpsvc 5.2.3790.1830 (srv03_sp1_rtm.050324-1447) 1.52 MB
(1,591,296 bytes) 11/23/2005 4:26 AM Microsoft Corporation
c:\windows\pchealth\helpctr\binaries\helpsvc.exe

[Services]

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

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

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

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

[Program Groups]

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

[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"

Bitmap Image mspaint.exe

[Windows Error Reporting]

Time	Type	Details
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[Internet Settings]

[Internet Explorer]

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

Item	Value
Version	6.0.3790.1830
Build	63790.1830
Application Path	C:\Program Files\Internet Explorer
Language	English (United States)
Active Printer	Not Available

Cipher Strength	128-bit
Content Advisor	Disabled
IEAK Install	No

[File Versions]

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

iepeers.dll	6.0.3790.1830	361 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
iepeers.dll	6.0.3790.1830	361 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
iesetup.dll	6.0.3790.1830	71 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
iesetup.dll	6.0.3790.1830	71 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
ieuinit.inf	Not Available	24 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Not Available	
ieuinit.inf	Not Available	24 KB	3/25/2005 6:00:00 AM
	Not Available		
iexplore.exe	6.0.3790.1830	94 KB	3/25/2005 6:00:00 AM
	C:\Program Files\Internet Explorer	Microsoft Corporation	
imgutil.dll	6.0.3790.1830	61 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
imgutil.dll	6.0.3790.1830	61 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
inetctl.cpl	6.0.3790.1830	428 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
inetctl.cpl	6.0.3790.1830	428 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
inetctl.dll	6.0.3790.1830	110 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
inetctl.dll	6.0.3790.1830	110 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
inseng.dll	6.0.3790.1830	147 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
inseng.dll	6.0.3790.1830	147 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
mlang.dll	6.0.3790.1830	686 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
mlang.dll	6.0.3790.1830	686 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
msencode.dll	<File Missing>	Not Available	Not Available
mshta.exe	6.0.3790.1830	38 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
mshta.exe	6.0.3790.1830	38 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
mshtml.dll	6.0.3790.1830	5,790 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
mshtml.dll	6.0.3790.1830	5,790 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
mshtml.tlb	6.0.3790.1830	1,320 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
mshtml.tlb	6.0.3790.1830	1,320 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
mshtml.dll	6.0.3790.1830	906 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
mshtml.dll	6.0.3790.1830	906 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
mshtml.dll	6.0.3790.1830	56 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
mshtml.dll	6.0.3790.1830	56 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
msident.dll	6.0.3790.1830	69 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
msident.dll	6.0.3790.1830	69 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
msident.dll	6.0.3790.1830	16 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
msident.dll	6.0.3790.1830	16 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
msieftp.dll	6.0.3790.1830	369 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
msieftp.dll	6.0.3790.1830	369 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
msrating.dll	6.0.3790.1830	240 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
msrating.dll	6.0.3790.1830	240 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		

mstime.dll	6.0.3790.1830	878 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
mstime.dll	6.0.3790.1830	878 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
occache.dll	6.0.3790.1830	126 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
occache.dll	6.0.3790.1830	126 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
proctexe.ocx	<File Missing>	Not Available	Not Available
	Available	Not Available	Not Available
sendmail.dll	6.0.3790.1830	64 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
sendmail.dll	6.0.3790.1830	64 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
shdoclc.dll	6.0.3790.1830	590 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
shdoclc.dll	6.0.3790.1830	590 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
shdocvw.dll	6.0.3790.1830	2,360 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
shdocvw.dll	6.0.3790.1830	2,360 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
shfolder.dll	6.0.3790.1830	34 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
shfolder.dll	6.0.3790.1830	34 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
shlwapi.dll	6.0.3790.1830	607 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
shlwapi.dll	6.0.3790.1830	607 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
tdc.ocx	1.3.0.3130 91 KB	3/25/2005 6:00:00 AM	
	C:\WINDOWS\system32	Microsoft Corporation	
tdc.ocx	1.3.0.3130 91 KB	3/25/2005 6:00:00 AM	
	Microsoft Corporation		
url.dll	6.0.3790.1830	40 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
url.dll	6.0.3790.1830	40 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
urlmon.dll	6.0.3790.1830	1,049 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
urlmon.dll	6.0.3790.1830	1,049 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
webcheck.dll	6.0.3790.1830	439 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
webcheck.dll	6.0.3790.1830	439 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		
wininet.dll	6.0.3790.1830	1,159 KB	3/25/2005 6:00:00 AM
	C:\WINDOWS\system32	Microsoft Corporation	
wininet.dll	6.0.3790.1830	1,159 KB	3/25/2005 6:00:00 AM
	Microsoft Corporation		

[Connectivity]

Item	Value
Connection Preference	Never dial

LAN Settings

AutoConfigProxy	wininet.dll
AutoProxyDetectMode	Enabled
AutoConfigURL	
Proxy	Disabled
ProxyServer	
ProxyOverride	

[Cache]

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

Item	Value
Page Refresh Type	Automatic

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

[List of Objects]

Program File	Status	CodeBase
No cached object information available		

[Content]

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

Item	Value
Content Advisor	Disabled

[Personal Certificates]

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

[Other People Certificates]

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

[Publishers]

Name
No publisher information available

[Security]

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

Appendix A

Appendix A

Appendix B: Database Build Scripts

Appendix B

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

```
--
--      Drop the existing database
--
```

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

```
CREATE DATABASE %DBNAME%
ON PRIMARY
(
    NAME          = %DBNAME%_root,
    FILENAME       = "C:%DBNAME%_root.mdf",
    SIZE           = 7MB,
    FILEGROWTH     = 0),
FILEGROUP LINEITEM_FG
(
    NAME          = %DBNAME%_li_1,
    FILENAME       = "G:",
    SIZE           = 48762MB,
    FILEGROWTH     = 0),
(
    NAME          = %DBNAME%_li_2,
    FILENAME       = "H:",
    SIZE           = 48762MB,
    FILEGROWTH     = 0),
(
    NAME          = %DBNAME%_li_3,
    FILENAME       = "I:",
    SIZE           = 48762MB,
    FILEGROWTH     = 0),
(
    NAME          = %DBNAME%_li_4,
    FILENAME       = "J:",
    SIZE           = 48762MB,
    FILEGROWTH     = 0),
(
    NAME          = %DBNAME%_li_5,
    FILENAME       = "K:",
    SIZE           = 48762MB,
    FILEGROWTH     = 0),
(
    NAME          = %DBNAME%_li_6,
    FILENAME       = "L:",
    SIZE           = 48762MB,
    FILEGROWTH     = 0),
(
    NAME          = %DBNAME%_li_7,
    FILENAME       = "B:",
    SIZE           = 48762MB,
    FILEGROWTH     = 0),
(
    NAME          = %DBNAME%_li_8,
    FILENAME       = "M:",
    SIZE           = 48762MB,
    FILEGROWTH     = 0),
FILEGROUP GENERAL_FG
(
    NAME          = %DBNAME%_gen_1,
    FILENAME       = "N:",
    SIZE           = 23478MB,
```

```
    FILEGROWTH    = 0),
(
    NAME          = %DBNAME%_gen_2,
    FILENAME       = "O:",
    SIZE           = 23478MB,
    FILEGROWTH     = 0),
(
    NAME          = %DBNAME%_gen_3,
    FILENAME       = "P:",
    SIZE           = 23478MB,
    FILEGROWTH     = 0),
(
    NAME          = %DBNAME%_gen_4,
    FILENAME       = "Q:",
    SIZE           = 23478MB,
    FILEGROWTH     = 0),
(
    NAME          = %DBNAME%_gen_5,
    FILENAME       = "R:",
    SIZE           = 23478MB,
    FILEGROWTH     = 0),
(
    NAME          = %DBNAME%_gen_6,
    FILENAME       = "S:",
    SIZE           = 23478MB,
    FILEGROWTH     = 0),
(
    NAME          = %DBNAME%_gen_7,
    FILENAME       = "V:",
    SIZE           = 23478MB,
    FILEGROWTH     = 0),
(
    NAME          = %DBNAME%_gen_8,
    FILENAME       = "W:",
    SIZE           = 23478MB,
    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,
```

Appendix B

```

S_ACCTBAL    float          not null,
S_COMMENT    varchar(101)    not null,)
on GENERAL_FG

```

```

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

```

```

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

```

```

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

```

```

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

```

```

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

```

```

on GENERAL_FG

```

```

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

```

```

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

```

```

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

```

```

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

```

```

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

```

```

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

```

```

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

```

```

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

```

```

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

```

```

alter table PARTSUPP add constraint
PK_PS_PARTKEY_PS_SUPPKEY primary key
(PS_PARTKEY, PS_SUPPKEY)
ON GENERAL_FG

```

```

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

```

```

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

```

Appendix B

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

```
-- Drop the LOAD_FG
```

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load1
```

```
go
```

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load2
```

```
go
```

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load3
```

```
go
```

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load4
```

```
go
```

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load5
```

```
go
```

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load6
```

```
go
```

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load7
```

```
go
```

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load8
```

```
go
```

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load9
```

```
go
```

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load10
```

```
go
```

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load11
```

```
go
```

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load12
```

```
go
```

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load13
```

```
go
```

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load14
```

```
go
```


Appendix B

ALTER DATABASE %DBNAME% REMOVE FILE %DBNAME%_load15 go ALTER DATABASE %DBNAME% REMOVE FILE %DBNAME%_load16 go ALTER DATABASE %DBNAME% REMOVE FILEGROUP LOAD_FG Go	-- -- 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')
-- File: CREATEBACKUPDEVICES.SQL -- Microsoft TPC-H Benchmark Kit Ver. 2.00 -- Copyright Microsoft, 1999 -- if exists (select name from sysdevices where name = 'BackupDev1') exec sp_dropdevice BackupDev1 GO	-- -- 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)
if exists (select name from sysdevices where name = 'BackupDev2') exec sp_dropdevice BackupDev2 GO	-- -- Copyright (c) 1999-2000 Intel Corporation -- -- AddTemp.sql
if exists (select name from sysdevices where name = 'BackupDev3') exec sp_dropdevice BackupDev3 GO	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)
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	-- 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
-- File: RESTOREDATABASE.SQL -- Microsoft TPC-H Benchmark Kit Version 2.00	

Appendix B

```
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load5
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load6
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load7
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load8
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load9
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load10
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load11
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load12
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load13
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load14
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load15
go
ALTER DATABASE %DBNAME% REMOVE FILE
%DBNAME%_load16
go
ALTER DATABASE %DBNAME% REMOVE
FILEGROUP LOAD_FG
go
```

Appendix C: ACID Scripts

Appendix C

```

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

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

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

begin
    begin tran T

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

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

        select  @ototal = @ototal -
ROUND((ROUND((@extprice * (1 - @disc)),2,1) * (1 +
@tax)),2,1),
        @rprice =
ROUND((@extprice/@quantity),2,1),

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

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

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

        insert into HISTORY_DUR values(
            @pkey,
            @skey,
            @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
```

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```

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_ACI values( @pkey,
                                @skey,
                                @o_key,
                                @l_key,
                                @delta,
                                getdate())

commit transaction T

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

```

```

@ototal 'Total'

end
go

-- File: ACID_VALUES.SQL
-- Microsoft TPC-H Benchmark Kit Version
2.00
-- Copyright Microsoft, 1999
--
-- Purpose: This script creates a stored procedure that,
when called with the
-- number of desired streams, will populate the
acid_values table.
-- The ACID procedures read this table to
guarantee random and valid input.
-- This table includes a unique clustered index
to guarantee that all values
-- are unique for each stage of the ACI tests.
If an attempt is made to insert
-- a value that currently exists in the table, the
insert errors out and
-- the values are recalculated and another
insert is attempted.
--
-- The first 10 rows, seq_num, are for
atomicity and isolation. The remaining
-- x * 200 rows are for consistency and
durability, where x is the number of streams desired.
--
if exists ( select name from sysobjects where name =
'tpch_acid_values' )
drop procedure tpch_acid_values
go

create proc tpch_acid_values @num_streams int
as

declare @acid_test char(25),
        @rand_o_key int,
        @rand_l_key int,
        @rand_deltatinyint,
        @rand_part_key int,
        @rand_supp_key int,
        @cnt int,
        @multiplier int,
        @counter int,
        @found_one tinyint,
        @cons_rows int

-- set initial values for loop controls
select @found_one = 0,
        @counter = 1,
        @cnt = 0,
        @cons_rows = @num_streams * 200

```

Appendix C

```

--      loop to populate table for ACID
while (@counter <= (@cons_rows + 10) )
begin

    --      Set ACI test name based on counter
    select @acid_test = case      @counter
        when 1 then 'Atomicity_Commit'
        when 2 then 'Atomicity_Rollback'
        when 3 then 'Isolation 1'
        when 4 then 'Isolation 2'
        when 5 then 'Isolation 3'
        when 6 then 'Isolation 3'
        when 7 then 'Isolation 4'
        when 8 then 'Isolation 4'
        when 9 then 'Isolation 5'
        when 10 then 'Isolation 6'
        else 'Consistency_Durability'
    end

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

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

        if (@counter = 9)
        begin
            while (@cnt =
0)
                --      Insert @rand_o_key, @rand_o_key, and
                @rand_delta into acid_values table
                select @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
    end
end

```

Appendix C

```

insert into acid_values
values(@acid_test,

      @rand_o_key,

      @rand_l_key,

      @rand_delta,

      @rand_part_key,

      @rand_supp_key,

      @counter)

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

```


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```

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

```

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```

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_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
```

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```

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

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

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

    commit transaction P

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

end

go

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

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

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

```

```

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

begin
    begin tran T

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

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

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

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

```

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```

L_LINENUMBER =
@l_key

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

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

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

insert into HISTORY_ACI values( @pkey,
                                @skey,

                                @o_key,

                                @l_key,
                                @delta,

                                getdate())

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

commit transaction T

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

```

```

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

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

end

go

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

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

create proc iso_query @o_key int
as

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

```

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```

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

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

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

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

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

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

begin
        begin tran T

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

```

```

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

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

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

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

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

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

```

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```

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

update      ORDERS
set         O_TOTALPRICE      =

@new_ototal      where      O_ORDERKEY = @o_key

insert into HISTORY_ACI values( @pkey,
                                @skey,

                                @o_key,

                                @l_key,
                                @delta,

                                getdate())

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

commit transaction T

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

select convert(char(30), getdate(),9)
print " "
--      ACID CODE END

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

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

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

begin

begin tran T

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

```

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```

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

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

-- ACID CODE BEGIN
print " "
print "Data from LINEITEM before updates:"
select L_QUANTITY 'L_QUANTITY',
       L_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 +
@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

```

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```

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

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

end

go

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

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

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

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

exec tran_w_com @rand_o_key,
               @rand_l_key,
               @rand_delta

GO

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

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

declare @acid_test      char(25),
        @rand_o_key     int

```

```

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

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

exec iso_query  @rand_o_key
GO

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

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

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

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

exec tran_w_rb  @rand_o_key,
               @rand_l_key,
               @rand_delta

GO

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

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

declare @acid_test      char(25),
        @rand_o_key     int

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

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

exec iso_query  @rand_o_key
GO

-- File:  ISOL3_1.SQL

```


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

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

select  top 1
        @rand_o_key     = acid_o_key,
        @rand_l_key     = acid_l_key,
        @rand_delta     = acid_delta

from    acid_values
where   acid_test= 'Isolation 3'
order   by seq_num asc

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

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

GO

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

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

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

select  top 1
        @rand_o_key     = acid_o_key,
        @rand_l_key     = acid_l_key

from    acid_values
where   acid_test= 'Isolation 3'
order   by seq_num asc

select  top 1
        @rand_delta     = acid_delta

from    acid_values
where   acid_test= 'Isolation 3'
order   by seq_num desc

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

```
exec iso34_tran_w_com @rand_o_key,
```

```
@rand_l_key,
@rand_delta
```

GO

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

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

select  top 1
        @rand_o_key     = acid_o_key,
        @rand_l_key     = acid_l_key,
        @rand_delta     = acid_delta

from    acid_values
where   acid_test= 'Isolation 4'
order   by seq_num asc

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

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

GO

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

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

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

select  top 1
        @rand_o_key     = acid_o_key,
        @rand_l_key     = acid_l_key

from    acid_values
where   acid_test= 'Isolation 4'
order   by seq_num asc

select  top 1
        @rand_delta     = acid_delta

from    acid_values
where   acid_test= 'Isolation 4'
order   by seq_num desc

select  'Random Values Used',
```

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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_EXTENDEDPRI)
                AS SUM_BASE_PRICE,
                SUM(L_EXTENDEDPRI*(1-L_DISCOUNT))
                AS SUM_DISC_PRICE,
                SUM(L_EXTENDEDPRI*(1-
L_DISCOUNT)*(1+L_TAX))    AS SUM_CHARGE,
                AVG(L_QUANTITY    )
                AS AVG_QTY,
                AVG(L_EXTENDEDPRI)
                AS AVG_PRICE,
                AVG(L_DISCOUNT)
                AS AVG_DISC,
                COUNT(*)
                AS COUNT_ORDER
FROM  LINEITEM
WHERE L_SHIPDATE <= dateadd(dd, 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

```
@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
```

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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 L_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

```

```
select *
from HISTORY_DUR
where H_O_KEY = acid_o_key
      H_L_KEY = acid_l_key
      H_DELTA = acid_delta
```

from HISTORY_DUR

```
-- Durability Stream 6
select  *
from    acid_values
where   seq_num between 1011 and 1210 and
```

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```

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

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

and
                                     H_L_KEY = acid_l_key

and
                                     H_DELTA = acid_delta
                                     )

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

and
                                     H_L_KEY = acid_l_key

and
                                     H_DELTA = acid_delta
                                     )

-- File:  DUR_VERIFY1.SQL
--      Microsoft TPC-H Kit Ver. 2.00
--      Copyright Microsoft, 1999
--

-- Durability Verification test 1
-- -----
--
-- Comment: ORDERS.O_TOTALPRICE should equal
-- LINEITEM sums

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

select count(*) from HISTORY_DUR
GO

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

CREATE      TABLE temp_dur1_output

INSERT INTO temp_dur1_output
        SELECT      DISTINCT(o.O_ORDERKEY),
                    o.O_TOTALPRICE,
                    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_dur1_output

print ''
print 'Select any rows where o_totalprice is not equal to
lineitem_sum'
print ''
SELECT      *
FROM    temp_dur1_output
WHERE o_totalprice <> lineitem_sum

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

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

-- File:  DUR_VERIFY2.SQL

```

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

-- Durability Verification test 2
-- -----
--
-- Comment: ORDERS.O_TOTALPRICE should equal
LINEITEM sums

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

select count(*) from HISTORY_DUR
GO

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

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

INSERT INTO temp_dur2_output
SELECT DISTINCT(o.O_ORDERKEY),
    o.O_TOTALPRICE,
    l.L_ORDERKEY,

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

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

```
lineitem_sum 'LineItem Sum'
FROM temp_dur2_output

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

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

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

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

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

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

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

exec tran_w_com @rand_o_key,
    @rand_l_key,
    @rand_delta

GO

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

Appendix C

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

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

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

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

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

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

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

```
WHERE o_totalprice <> lineitem_sum

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

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

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

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

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

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

Appendix C

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

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

```
print ''
```

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

```
print ''
```

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

```
FROM temp_con2_output
```

```
print ''
```

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

```
print ''
```

```
SELECT      *
```

```
FROM temp_con2_output
```

```
WHERE o_totalprice <> lineitem_sum
```

```
print ''
```

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

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

```
print ''
```

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

```
    drop table temp_con2_output
```

```
GO
```


Appendix C

Appendix D: Query text and Output

Appendix D

(4 row(s) affected)

-- using default substitutions

/* TPC_H Query 2 - Minimum Cost Supplier */

```
SELECT          TOP 100
                S_ACCTBAL,
                S_NAME,
                N_NAME,
                P_PARTKEY,
                P_MFGR,
                S_ADDRESS,
                S_PHONE,
                S_COMMENT
FROM            PART,
                SUPPLIER,
                PARTSUPP,
                NATION,
                REGION
WHERE P_PARTKEY = PS_PARTKEY AND
      S_SUPPKEY = PS_SUPPKEY AND
      P_SIZE    = 15 AND
      P_TYPE    LIKE '%%BRASS' AND
      S_NATIONKEY = N_NATIONKEY AND
      N_REGIONKEY = R_REGIONKEY AND
      R_NAME     = 'EUROPE' AND
      PS_SUPPLYCOST = ( SELECT
                        MIN(PS_SUPPLYCOST)
                        FROM PARTSUPP,
                        SUPPLIER,
                        NATION,
                        REGION
                        WHERE P_PARTKEY
                        = PS_PARTKEY AND
                        S_SUPPKEY
                        = PS_SUPPKEY AND
                        S_NATIONKEY
                        = N_NATIONKEY AND
                        N_REGIONKEY
                        = R_REGIONKEY AND
                        R_NAME
                        = 'EUROPE'
                        )
ORDER BY        S_ACCTBAL DESC,
                N_NAME,
                S_NAME,
                P_PARTKEY
S_ACCTBAL      S_NAME      N_NAME
P_PARTKEY     P_MFGR      S_ADDRESS
S_PHONE       S_COMMENT
-----
9938.530000    Supplier#000005359    UNITED
KINGDOM      185358    Manufacturer#4
QKuHYh,vZGiwu2FWEJoLDx04    33-429-790-
```

-- using default substitutions

/* TPC_H Query 1 - Pricing Summary Report */

```
SELECT          L_RETURNFLAG,
                L_LINESTATUS,
                SUM(L_QUANTITY)
                AS SUM_QTY,
                SUM(L_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
```

Appendix D

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
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
t5L67YdBYyH6o,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		

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```
2628192      373133.309400      1995-02-22
00:00:00.000 0
993600       371407.459500      1995-03-05
00:00:00.000 0
2300070      367371.145200      1995-03-13
00:00:00.000 0
```

(10 row(s) affected)

-- using default substitutions

/* TPC_H Query 4 - Order Priority Checking */

```
SELECT      O_ORDERPRIORITY,
            COUNT(*)          AS ORDER_COUNT
FROM  ORDERS
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_EXTENDEDPRI*(1-L_DISCOUNT))
            AS REVENUE
FROM  CUSTOMER,
      ORDERS,
      LINEITEM,
      SUPPLIER,
      NATION,
      REGION
WHERE C_CUSTKEY = O_CUSTKEY AND
      L_ORDERKEY = O_ORDERKEY AND
      L_SUPPKEY = S_SUPPKEY AND
      C_NATIONKEY = S_NATIONKEY AND
      S_NATIONKEY = N_NATIONKEY AND
      N_REGIONKEY = R_REGIONKEY AND
      R_NAME = 'ASIA' AND
      O_ORDERDATE >= '1994-01-01' AND
```

```
O_ORDERDATE < DATEADD(YY, 1,
'1994-01-01')
GROUP BY    N_NAME
ORDER BY    REVENUE DESC
N_NAME      REVENUE
-----
INDONESIA    55502041.169700
VIETNAM     55295086.996700
CHINA       53724494.256600
INDIA       52035512.000200
JAPAN       45410175.695400
```

(5 row(s) affected)

-- using default substitutions

/* TPC_H Query 6 - Forecasting Revenue Change */

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

(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_EXTENDEDPRI*(1-
L_DISCOUNT) AS VOLUME
      FROM  SUPPLIER,
            LINEITEM,
            ORDERS,
            CUSTOMER,
            NATION N1,
            NATION N2
      WHERE S_SUPPKEY = L_SUPPKEY
      AND
```

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```

O_ORDERKEY =
L_ORDERKEY AND
AND
S_NATIONKEY =
N1.N_NATIONKEY AND
C_NATIONKEY =
N2.N_NATIONKEY AND
( (N1.N_NAME =
'FRANCE' AND N2.N_NAME = 'GERMANY')
OR
(N1.N_NAME =
'GERMANY' AND N2.N_NAME = 'FRANCE')
) AND
L_SHIPDATE BETWEEN
'1995-01-01' AND '1996-12-31'
) AS SHIPPING
GROUP BY SUPP_NATION,
CUST_NATION,
L_YEAR
ORDER BY SUPP_NATION,
CUST_NATION,
L_YEAR
SUPP_NATION CUST_NATION L_YEAR
REVENUE
-----
-----

```

FRANCE	GERMANY	1995
54639732.733600		
FRANCE	GERMANY	1996
54633083.307600		
GERMANY	FRANCE	1995
52531746.669700		
GERMANY	FRANCE	1996
52520549.022400		

(4 row(s) affected)

-- using default substitutions

/* TPC_H Query 8 - National Market Share */

```

SELECT O_YEAR,
SUM(CASE WHEN NATION =
'BRAZIL'
THEN VOLUME
ELSE 0
END) / SUM(VOLUME) AS
MKT_SHARE
FROM ( SELECT
datepart(yy,O_ORDERDATE) AS
O_YEAR,
L_EXTENDEDPRICE * (1-
L_DISCOUNT) AS VOLUME,
N2.N_NAME
AS NATION
FROM PART,
SUPPLIER,
LINEITEM,

```

```

ORDERS,
CUSTOMER,
NATION N1,
NATION N2,
REGION
WHERE P_PARTKEY = L_PARTKEY
AND
S_SUPPKEY = L_SUPPKEY
AND
L_ORDERKEY =
O_ORDERKEY AND
O_CUSTKEY = C_CUSTKEY
AND
C_NATIONKEY =
N1.N_NATIONKEY AND
N1.N_REGIONKEY =
R_REGIONKEY AND
R_NAME =
'AMERICA' AND
S_NATIONKEY =
N2.N_NATIONKEY AND
O_ORDERDATE
BETWEEN '1995-01-01' AND '1996-12-31' AND
P_TYPE = 'ECONOMY
ANODIZED STEEL'
) AS ALL_NATIONS
GROUP BY O_YEAR
ORDER BY O_YEAR
O_YEAR MKT_SHARE
-----
-----

```

1995	0.034436
1996	0.041486

(2 row(s) affected)

-- using default substitutions

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

```

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

```

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```

AND      PS_PARTKEY = L_PARTKEY
AND      P_PARTKEY  = L_PARTKEY
AND      O_ORDERKEY =
L_ORDERKEY AND
N_NATIONKEY AND
P_NAME   LIKE

```

'%%green%%'

```

) AS PROFIT
GROUP BY NATION,
O_YEAR
ORDER BY NATION,
O_YEAR DESC
NATION O_YEAR SUM_PROFIT
-----
ALGERIA 1998 31342867.234500
ALGERIA 1997 57138193.023300
ALGERIA 1996 56140140.133000
ALGERIA 1995 53051469.653400
ALGERIA 1994 53867582.128600
ALGERIA 1993 54942718.132400
ALGERIA 1992 54628034.712700
ARGENTINA 1998 30211185.708100
ARGENTINA 1997 50805741.752300
ARGENTINA 1996 51923746.575500
ARGENTINA 1995 49298625.766600
ARGENTINA 1994 50835610.109500
ARGENTINA 1993 51646079.177500
ARGENTINA 1992 50410314.994800
BRAZIL 1998 27217924.383200
BRAZIL 1997 48378669.198900
BRAZIL 1996 50482870.357200
BRAZIL 1995 47623383.634900
BRAZIL 1994 47840165.725600
BRAZIL 1993 49054694.035100
BRAZIL 1992 48667639.084200
CANADA 1998 30379833.768500
CANADA 1997 50465052.311400
CANADA 1996 52560501.390400
CANADA 1995 52375332.809200
CANADA 1994 52600364.658700
CANADA 1993 52644504.073500
CANADA 1992 53932871.697000
CHINA 1998 31075466.164900
CHINA 1997 50551874.449900
CHINA 1996 51039293.875400
CHINA 1995 49287534.616900
CHINA 1994 50851090.067400
CHINA 1993 54229629.833000
CHINA 1992 52400529.372000
EGYPT 1998 29054433.385600
EGYPT 1997 50627611.452400
EGYPT 1996 49542212.844600
EGYPT 1995 48311550.320700
EGYPT 1994 49790644.736000
EGYPT 1993 48904292.969200
EGYPT 1992 49434932.619200

```

```

ETHIOPIA 1998 28040717.267400
ETHIOPIA 1997 47455009.866400
ETHIOPIA 1996 46491097.572900
ETHIOPIA 1995 46804449.300900
ETHIOPIA 1994 48516143.917000
ETHIOPIA 1993 46551891.562900
ETHIOPIA 1992 44934648.642800

```

.....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,

```

Appendix D

ORDER BY	N_NAME, C_ADDRESS, C_COMMENT	REVENUE	DESC
C_CUSTKEY	C_NAME	REVENUE	
C_ACCTBAL	N_NAME	C_ADDRESS	
C_PHONE	C_COMMENT		
57040	Customer#000057040	734235.245500	
632.870000	JAPAN	Eioyzjf4pp	
22-895-641-3466	requests sleep blithely about the furiously i		
143347	Customer#000143347	721002.694800	
2557.470000	EGYPT	1aReFYv,Kw4	
14-742-935-3718	fluffily bold excuses haggle finally after the		
u			
60838	Customer#000060838	679127.307700	
2454.770000	BRAZIL		
64EaJ5vMAHWJIBOXJklpNc2RJiWE		12-913-494-	
9813	furiously even pinto beans integrate under the ruthless		
foxes; ironic, even dolphins across the slyl			
101998	Customer#000101998	637029.566700	
3790.890000	UNITED KINGDOM		
01c9CILnNtfOQYmZj		33-593-865-6378	
accounts doze blithely! enticing, final deposits sleep blithely			
special accounts. slyly express accounts pla			
125341	Customer#000125341	633508.086000	
4983.510000	GERMANY		
S29ODD6bceU8QSuUEJznkNaK		17-582-695-5962	
quickly express requests wake quickly blithely			
25501	Customer#000025501	620269.784900	
7725.040000	ETHIOPIA		
W556MXuoiaYCCZamJI,Rn0B4ACUGdkQ8DZ		15-874-	
808-6793	quickly special requests sleep evenly among the		
special deposits. special deposi			
115831	Customer#000115831	596423.867200	
5098.100000	FRANCE	rFeBbEEyk dl	
ne7zV5fDrmiq1oK09wV7pxqCgIc		16-715-386-3788	
carefully bold excuses sleep alongside of the thinly idle			
84223	Customer#000084223	594998.023900	
528.650000	UNITED KINGDOM		
nAVZCs6BaWap rrM27N 2qBnzc5WBauxbA		33-442-	
824-8191	pending, final ideas haggle final requests. unusual,		
regular asymptotes affix according to the even foxes.			
54289	Customer#000054289	585603.391800	
5583.020000	IRAN		
vXCxoCsU0Bad5JQI ,oobkZ		20-834-292-4707	
express requests sublate blithely regular requests. regular,			
even ideas solve.			
39922	Customer#000039922	584878.113400	
7321.110000	GERMANY		
Zgy4s50l2GKN4pLDPBU8m342glw6R		17-147-757-	
8036	even pinto beans haggle. slyly bold accounts inte		
6226	Customer#000006226	576783.760600	
2230.090000	UNITED KINGDOM		
8gPu8,NPGkfyQQ0hcIYUGPIBWc,ybP5g,		33-657-701-	

3391 quickly final requests against the regular instructions
wake blithely final instructions. pa
922 Customer#000000922 576767.533300
3869.250000 GERMANY
Az9RFaut7NkPnc5zSD2PwHgVwr4jRzq 17-945-916-
9648 boldly final requests cajole blith
147946 Customer#000147946 576455.132000
2030.130000 ALGERIA
iANyZHjqhy7Ajah0pTrYyhJ 10-886-956-3143
furiously even accounts are blithely above the furiously
115640 Customer#000115640 569341.193300
6436.100000 ARGENTINA Vtgfia9ql
7EpHgecU1X 11-411-543-4901 final instructions
are slyly according to the
73606 Customer#000073606 568656.857800
1785.670000 JAPAN
xuR0Tro5yChDfOCrjkd2ol 22-437-653-6966
furiously bold orbits about the furiously busy requests wake
across the furiously quiet theodolites. d
110246 Customer#000110246 566842.981500
7763.350000 VIETNAM 7KzflgX
MDOq7sOkI 31-943-426-9837 dolphins sleep
blithely among the slyly final
142549 Customer#000142549 563537.236800
5085.990000 INDONESIA
ChqEoK43OysjdHbtKCp6dKqjNyvvi9 19-955-562-
2398 regular, unusual dependencies boost slyly; ironic
attainments nag fluffily into the unusual packages?
146149 Customer#000146149 557254.986500
1791.550000 ROMANIA s87fvzFQpU
29-744-164-6487 silent, unusual requests detect quickly slyly
regul
52528 Customer#000052528 556397.350900
551.790000 ARGENTINA
NFztyTOR10UOJ 11-208-192-3205 unusual
requests detect. slyly dogged theodolites use slyly. deposit
23431 Customer#000023431 554269.536000
3381.860000 ROMANIA
HgiV0phqhaIa9aydNoIlb 29-915-458-2654
instructions nag quickly. furiously bold accounts cajol

(20 row(s) affected)

-- using default substitutions

/* TPC_H Query 11 - Important Stock Identification */

```

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

```

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```
(
  SELECT
    SUM(P$SUPPLYCOST*P$AVAILQTY) *
0.0001000000
    FROM PARTSUPP,
        SUPPLIER,
        NATION
    WHERE P$SUPPKEY =
S_SUPPKEY AND
        S_NATIONKEY =
N_NATIONKEY AND
        N_NAME
        = 'GERMANY'
)
```

```
ORDER BY VALUE DESC
PS_PARTKEY VALUE
```

129760	17538456.860000
166726	16503353.920000
191287	16474801.970000
161758	16101755.540000
34452	15983844.720000
139035	15907078.340000
9403	15451755.620000
154358	15212937.880000
38823	15064802.860000
85606	15053957.150000
33354	14408297.400000
154747	14407580.680000
82865	14235489.780000
76094	14094247.040000
222	13937777.740000

.....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,
            SUM( CASE WHEN O_ORDERPRIORITY =
'1-URGENT' OR
                O_ORDERPRIORITY = '2-
HIGH'
                THEN 1
                ELSE 0
            END) AS HIGH_LINE_COUNT,
            SUM( CASE WHEN O_ORDERPRIORITY <>
'1-URGENT' AND
                O_ORDERPRIORITY <> '2-
HIGH'
                THEN 1
                ELSE 0
            END) AS LOW_LINE_COUNT
FROM ORDERS,
    LINEITEM
WHERE O_ORDERKEY = L_ORDERKEY
    AND
    L_SHIPMODE IN ('MAIL','SHIP')
    AND
    L_COMMITDATE < L_RECEIPTDATE
    AND
    L_SHIPDATE < L_COMMITDATE
    AND
    L_RECEIPTDATE >= '1994-01-01'
    AND
    L_RECEIPTDATE < dateadd(yy, 1, '1994-01-
01')
```

```
GROUP BY    L_SHIPMODE
ORDER BY    L_SHIPMODE
L_SHIPMODE HIGH_LINE_COUNT LOW_LINE_COUNT
-----
MAIL      6202      9324
SHIP      6200      9262
```

(2 row(s) affected)

-- 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
```


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ORDER BY CUSTDIST DESC,
C_COUNT CUSTDIST DESC

```
-----
0      50004
9      6641
10     6566
11     6058
8      5949
12     5553
13     4989
19     4748
7      4707
18     4625
15     4552
17     4530
14     4484
20     4461
16     4323
21     4217
22     3730
6      3334
23     3129
24     2622
25     2079
5      1972
26     1593
27     1185
4      1033
28     869
29     559
3      398
30     373
31     235
2      144
32     128
33     71
34     48
35     33
1      23
36     17
37     7
40     4
38     4
39     2
41     1
```

(42 row(s) affected)

-- using default substitutions

/* TPC_H Query 14 - Promotion Effect */

```
SELECT      100.00 * SUM (      CASE WHEN
P_TYPE LIKE 'PROMO%%'
L_EXTENDEDPRICE*(1-L_DISCOUNT)
ELSE 0
```

```
END) /
SUM(L_EXTENDEDPRICE*(1-L_DISCOUNT)) AS
PROMO_REVENUE
FROM LINEITEM,
PART
WHERE L_PARTKEY = P_PARTKEY AND
L_SHIPDATE >= '1995-09-01' AND
L_SHIPDATE < dateadd(mm, 1, '1995-09-01')
PROMO_REVENUE
-----
16.380779

(1 row(s) affected)

-- using default substitutions

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

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

/* TPC_H Query 15 - Top Supplier */

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

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

(1 row(s) affected)

-- using default substitutions

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

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```

SELECT      P_BRAND,
            P_TYPE,
            P_SIZE,
            COUNT(DISTINCT PS_SUPPKEY)      AS
SUPPLIER_CNT
FROM PARTSUPP,
PART
WHERE P_PARTKEY = PS_PARTKEY
AND
P_BRAND      <> 'Brand#45'
AND
P_TYPE      NOT LIKE 'MEDIUM
POLISHED%%'
AND
P_SIZE      IN (49, 14, 23, 45, 19, 3, 36, 9)
AND
PS_SUPPKEY  NOT IN (      SELECT
S_SUPPKEY
FROM
SUPPLIER
WHERE
S_COMMENT LIKE
'%%Customer%%Complaints%%'
)
GROUP BY    P_BRAND,
            P_TYPE,
            P_SIZE
ORDER BY    SUPPLIER_CNT DESC,
            P_BRAND,
            P_TYPE,
            P_SIZE
P_BRAND    P_TYPE      P_SIZE
SUPPLIER_CNT
-----
Brand#41 MEDIUM BRUSHED TIN      3      28
Brand#54 STANDARD BRUSHED COPPER 14      27
Brand#11 STANDARD BRUSHED TIN      23      24
Brand#11 STANDARD BURNISHED BRASS 36      24
Brand#15 MEDIUM ANODIZED NICKEL   3      24
Brand#15 SMALL ANODIZED BRASS      45      24
Brand#15 SMALL BURNISHED NICKEL    19      24
Brand#21 MEDIUM ANODIZED COPPER    3      24
Brand#22 SMALL BRUSHED NICKEL      3      24
Brand#22 SMALL BURNISHED BRASS      19      24
Brand#25 MEDIUM BURNISHED COPPER    36      24
Brand#31 PROMO POLISHED COPPER      36      24
Brand#33 LARGE POLISHED TIN         23      24
Brand#33 PROMO POLISHED STEEL       14      24
Brand#35 PROMO BRUSHED NICKEL        14      24
Brand#41 ECONOMY BRUSHED STEEL       9      24
Brand#41 ECONOMY POLISHED TIN        19      24
Brand#41 LARGE PLATED COPPER         36      24
Brand#42 ECONOMY PLATED BRASS         3      24
Brand#42 STANDARD POLISHED TIN       49      24
Brand#43 PROMO BRUSHED TIN           3      24

```

.....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
WHERE P_PARTKEY = L_PARTKEY AND
P_BRAND      = 'Brand#23'
AND
P_CONTAINER = 'MED BOX'      AND
L_QUANTITY < (      SELECT
0.2 * AVG(L_QUANTITY)
FROM
LINEITEM
WHERE
L_PARTKEY = P_PARTKEY
)
AVG_YEARLY

```

Appendix D

```
-----
348406.054286

(1 row(s) affected)

-- 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
WHEREO_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
```

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```

Customer#000003566      3566      2329187      1998-
01-04 00:00:00.000 439803.360000      304.000000
Customer#000045538      45538      4527553      1994-
05-22 00:00:00.000 436275.310000      305.000000
Customer#000081581      81581      4739650      1995-
11-04 00:00:00.000 435405.900000      305.000000
Customer#000119989      119989      1544643      1997-
09-20 00:00:00.000 434568.250000      320.000000
Customer#000003680      3680      3861123      1998-
07-03 00:00:00.000 433525.970000      301.000000
Customer#000113131      113131      967334      1995-
12-15 00:00:00.000 432957.750000      301.000000
Customer#000141098      141098      565574      1995-
09-24 00:00:00.000 430986.690000      301.000000
Customer#000093392      93392      5200102      1997-
01-22 00:00:00.000 425487.510000      304.000000
Customer#000015631      15631      1845057      1994-
05-12 00:00:00.000 419879.590000      302.000000
Customer#000112987      112987      4439686      1996-
09-17 00:00:00.000 418161.490000      305.000000
Customer#000012599      12599      4259524      1998-
02-12 00:00:00.000 415200.610000      304.000000
Customer#000105410      105410      4478371      1996-
03-05 00:00:00.000 412754.510000      302.000000
Customer#000149842      149842      5156581      1994-
05-30 00:00:00.000 411329.350000      302.000000
Customer#000010129      10129      5849444      1994-
03-21 00:00:00.000 409129.850000      309.000000
Customer#000069904      69904      1742403      1996-
10-19 00:00:00.000 408513.000000      305.000000
Customer#000017746      17746      6882      1997-
04-09 00:00:00.000 408446.930000      303.000000
Customer#000013072      13072      1481925      1998-
03-15 00:00:00.000 399195.470000      301.000000
Customer#000082441      82441      857959      1994-
02-07 00:00:00.000 382579.740000      305.000000
Customer#000088703      88703      2995076      1994-
01-30 00:00:00.000 363812.120000      302.000000

```

(57 row(s) affected)

-- using default substitutions

/* TPC_H Query 19 - Discounted Revenue */

```

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

```

```

P_SIZE      BETWEEN 1 AND 5
            AND
L_SHIPMODE  IN ('AIR', 'AIR REG')
            AND
L_SHIPINSTRUCT      = 'DELIVER IN
PERSON'
            )
            OR
            (
P_PARTKEY    = L_PARTKEY
            AND
P_BRAND      = 'Brand#23'
            AND
P_CONTAINER IN ( 'MED BAG', 'MED
BOX', 'MED PKG', 'MED PACK')
            AND
L_QUANTITY   >= 10
            AND
L_QUANTITY   <= 10 + 10
            AND
P_SIZE      BETWEEN 1 AND 10
            AND
L_SHIPMODE  IN ('AIR', 'AIR REG')
            AND
L_SHIPINSTRUCT      = 'DELIVER IN
PERSON'
            )
            OR
            (
P_PARTKEY    = L_PARTKEY
            AND
P_BRAND      = 'Brand#34'
            AND
P_CONTAINER IN ( 'LG CASE', 'LG
BOX', 'LG PACK', 'LG PKG')
            AND
L_QUANTITY   >= 20
            AND
L_QUANTITY   <= 20 + 10
            AND
P_SIZE      BETWEEN 1 AND 15
            AND
L_SHIPMODE  IN ('AIR', 'AIR REG')
            AND
L_SHIPINSTRUCT      = 'DELIVER IN
PERSON'
            )
REVENUE
-----
3083843.057800

```

(1 row(s) affected)

-- using default substitutions

/* TPC_H Query 20 - Potential Part Promotion */

```

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

```

Appendix D

```

PARTSUPP
FROM
WHERE
PS_PARTKEY in ( SELECT
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
YV45D7TkfdQanOOZ7q9QxkyGUapU1oOWU6q3
Supplier#000000197
YC2Acon6kjY3zj3Fbxs2k4Vdf7X0cd2F
Supplier#000000226 83qOdU2EYRdPQAQhEtn GRZEd
Supplier#000000285 Br7e1nnt1yxrw6ImgpJ7YdhFDjuBf
Supplier#000000378 FfbhyCxWvcPrO8ltp9
Supplier#000000402
i9Sw4DoyMhzhKXCH9By,AYSgmD
Supplier#000000530 0qwCMwobKY
OcmLyfRXlagA8ukENJv,
Supplier#000000688 D
fw5ocppmZpYBBIP1718hCihLDZ5KhKX
Supplier#000000710 f19YPvOyb
QoYwjKC,oPycpGfieBAcwKJo
Supplier#000000736
l6i2nMwVuovfKnuVgaSGK2rDy65DlAFLegiL7
Supplier#000000761
zlSLelQUj2XrvTTFnv7WAcYZGvvMTx882d4
Supplier#000000884 bmhEShejaS
Supplier#000000887 urEaTejH5POADP2ARrf

```

```

Supplier#000000935 ij98czM
2KzWe7dDToxB8sq0UfCdvR
Supplier#000000975 ,AC e,tBpNwKb5xMUzeohxlRn,
hdZJo73gFQF8y
Supplier#000001263 rQWr6nf8ZhB2TAiIDlvo5Io
Supplier#000001399 LmrocnIMSyYOWuANx7
Supplier#000001446 lch9HMNU1R7a0LIybsUodVknk6
Supplier#000001454 TOpimgu2TVXIjhiL93h,
Supplier#000001500 wDmF5xLxtQch9ctVu,
Supplier#000001602 uKNWleafaM644
Supplier#000001626 UhxNRzUu1dtFmp0
Supplier#000001682 pXTkGxrTQVyH1Rr
Supplier#000001699 Q9C4rfJ26oijVPqqcqVXeRI
Supplier#000001700 7hMlCof1Y5zLFg
Supplier#000001726 TeRY7TtTH24sEword7yAaSkjx8
Supplier#000001730 Rc8e,1Pybn r6zo0VJIEiD0UD vkh
Supplier#000001746
qWsendlOekQG1aW4uq06uQaCm51se8lirv7 hBRd

```

.....Additional Rows Deleted

```

Supplier#000008972 w2vF6 D5YZO3visPXsqVfLADTK
Supplier#000009032 qK,trB6Sdy4Dz1BRUFNy
Supplier#000009147 rOAuryHxpZ9eOvx
Supplier#000009252 F7cZaPUHwh1
ZKyj3xmAVWC1XdP ue1p5m,i
Supplier#000009278 RqYTzgxj93CLX 0mcYfCENOfD
Supplier#000009327 uoqMdf7e7Gj9dbQ53
Supplier#000009430 igRqmneFt
Supplier#000009567 r4Wfx4c3xsEAjcGj71HHZByornl
D9vrztXlv4
Supplier#000009601 51m637bO,Rw5DnHWFUvLacRx9
Supplier#000009709
rRnCbHYgDgl9PZYnyWKVYSUW0vKg
Supplier#000009753 wLhVEcRmd7PkJF4FBnGK7Z
Supplier#000009796 z,y4Idmr15DOvPUqYG
Supplier#000009799 4wNjXGa4OKWl
Supplier#000009811 E3iuyq7UnZxU7oPZIE2Gu6
Supplier#000009812
APFRMy3lCbGfGa53n5t9DxxFPQPgnjrGt32
Supplier#000009862 rJzweWeN58
Supplier#000009868 ROjGgx5gvtkmnUUoeyy7v
Supplier#000009869
ucLqxrpbTRMewGSM29t0rNTM30g1Tu3Xgg3mKag
Supplier#000009899 7XdpaHrzr1t,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,

```

Appendix D

```

ORDERS,
NATION
WHERE S_SUPPKEY = L1.L_SUPPKEY
AND
O_ORDERKEY = L1.L_ORDERKEY
AND
O_ORDERSTATUS = 'F'
AND
L1.L_RECEIPTDATE > L1.L_COMMITDATE
AND
EXISTS (
    SELECT *
    FROM LINEITEM L2
    WHERE L2.L_ORDERKEY
    = L1.L_ORDERKEY AND
    L2.L_SUPPKEY <>
    L1.L_SUPPKEY
) AND
NOT EXISTS (
    SELECT *
    FROM LINEITEM L3
    WHERE
    L3.L_ORDERKEY =
    L1.L_ORDERKEY AND
    L3.L_SUPPKEY
    <> L1.L_SUPPKEY AND

    L3.L_RECEIPTDATE > L3.L_COMMITDATE
    ) AND
S_NATIONKEY = N_NATIONKEY AND
N_NAME = 'SAUDI ARABIA'
GROUP BY S_NAME
ORDER BY NUMWAIT DESC,
S_NAME
S_NAME NUMWAIT
-----
Supplier#000002829 20
Supplier#000005808 18
Supplier#000000262 17
Supplier#000000496 17
Supplier#000002160 17
Supplier#000002301 17
Supplier#000002540 17
Supplier#000003063 17
Supplier#000005178 17
Supplier#000008331 17
Supplier#000002005 16
Supplier#000002095 16
Supplier#000005799 16
Supplier#000005842 16
Supplier#000006450 16
Supplier#000006939 16
Supplier#000009200 16
Supplier#000009727 16
Supplier#000000486 15
Supplier#000000565 15
Supplier#000001046 15
Supplier#000001047 15
Supplier#000001161 15

```

```

Supplier#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

.....Additional Rows Deleted

Appendix D

17	861	6460573.720000
18	964	7236687.400000
23	892	6701457.950000
29	948	7158866.630000
30	909	6808436.130000
31	922	6806670.180000

(7 row(s) affected)

Appendix E: Seed and Input Parameters

Appendix E

Seed

1123085448

Stream0

1 104
 2 40 BRASS ASIA
 3 MACHINERY 1995-03-16
 4 1995-07-01
 5 MIDDLE EAST 1997-01-01
 6 1997-01-01 0.07 24
 7 MOZAMBIQUE FRANCE
 8 FRANCE EUROPE ECONOMY
 POLISHED BRASS
 9 rosy
 10 1994-02-01
 11 UNITED KINGDOM 0.0000010000
 12 REG AIR AIR 1994-01-01
 13 special requests
 14 1994-10-01
 15 1997-08-01
 16 Brand#45 PROMO BURNISHED 32
 31 10 38 26 20 24
 40
 17 Brand#55 LG BAG
 18 315
 19 Brand#24 Brand#25 Brand#32
 3 15 28
 20 pale 1994-01-01 SAUDI ARABIA
 21 INDIA
 22 30 16 21 15 23 28
 22

Stream1

21 ALGERIA
 3 BUILDING 1995-03-02
 18 313
 5 AFRICA 1997-01-01
 11 IRAQ 0.0000010000
 7 INDIA UNITED KINGDOM
 6 1997-01-01 0.04 25
 20 black 1993-01-01 INDONESIA
 17 Brand#52 LG PKG
 12 FOB AIR 1994-01-01
 16 Brand#25 SMALL POLISHED 17
 3 47 40 23 9 39
 32
 15 1995-05-01
 13 pending requests
 10 1994-11-01
 2 28 NICKEL AFRICA

8 UNITED KINGDOM EUROPE
 ECONOMY BURNISHED BRASS
 14 1995-01-01
 19 Brand#21 Brand#12 Brand#31
 8 16 24
 9 plum
 22 19 32 18 29 22 23
 15
 1 112
 4 1993-04-01

Stream2

6 1997-01-01 0.02 25
 17 Brand#54 MED CASE
 14 1995-05-01
 16 Brand#15 LARGE BRUSHED 22
 16 41 40 13 11 15
 37
 19 Brand#33 Brand#45 Brand#21
 3 17 20
 10 1993-08-01
 9 orchid
 2 15 TIN ASIA
 15 1997-11-01
 8 MOROCCO AFRICA LARGE
 BRUSHED BRASS
 5 AMERICA 1997-01-01
 22 21 19 26 17 28 12
 32
 12 MAIL RAIL 1995-01-01
 7 ALGERIA MOROCCO
 13 pending requests
 18 314
 1 120
 4 1995-11-01
 20 lime 1996-01-01 UNITED STATES
 3 MACHINERY 1995-03-18
 11 UNITED STATES 0.0000010000
 21 PERU

Stream3

8 GERMANY EUROPE LARGE
 PLATED BRASS
 5 ASIA 1993-01-01
 4 1993-08-01
 6 1993-01-01 0.07 24
 17 Brand#51 MED BAG
 7 PERU GERMANY
 1 67
 18 312
 22 24 17 26 14 13 27
 16
 14 1995-08-01
 9 misty
 10 1994-05-01

Appendix E

15 1995-08-01
 11 JAPAN 0.0000010000
 20 steel 1994-01-01 KENYA
 2 3 COPPER AFRICA
 21 INDONESIA
 19 Brand#35 Brand#23 Brand#25
 9 18 27
 13 pending accounts
 16 Brand#45 STANDARD BURNISHED
 30 47 20 29 34 11
 12 13
 12 TRUCK RAIL 1995-01-01
 3 BUILDING 1995-03-04

Stream4

5 EUROPE 1993-01-01
 21 BRAZIL
 14 1995-11-01
 19 Brand#32 Brand#11 Brand#24
 4 19 23
 15 1993-05-01
 17 Brand#53 MED PKG
 12 RAIL TRUCK 1993-01-01
 6 1993-01-01 0.05 25
 4 1996-03-01
 9 magenta
 8 UNITED STATES AMERICA LARGE
 ANODIZED BRASS
 16 Brand#25 MEDIUM PLATED 38
 17 50 32 20 15 18
 21
 11 ALGERIA 0.0000010000
 2 41 STEEL EUROPE
 10 1993-02-01
 18 313
 1 75
 13 pending accounts
 7 INDONESIA UNITED STATES
 22 11 22 26 17 32 23
 28
 3 HOUSEHOLD 1995-03-20
 20 gainsboro 1993-01-01 EGYPT

Stream5

21 ROMANIA
 15 1995-11-01
 4 1993-12-01
 6 1993-01-01 0.02 25
 7 ARGENTINA MOZAMBIQUE
 16 Brand#15 ECONOMY BRUSHED 5
 47 39 20 9 28 10
 50
 19 Brand#44 Brand#44 Brand#13
 9 20 30
 18 315

14 1996-02-01
 22 28 19 23 16 34 21
 24
 11 JAPAN 0.0000010000
 13 pending accounts
 3 AUTOMOBILE 1995-03-06
 1 83
 2 29 NICKEL AFRICA
 5 MIDDLE EAST 1993-01-01
 8 MOZAMBIQUE AFRICA MEDIUM
 POLISHED STEEL
 20 purple 1996-01-01 CHINA
 12 AIR RAIL 1996-01-01
 17 Brand#55 JUMBO CASE
 10 1993-12-01
 9 lavender

Appendix F: Benchmark Scripts

print.c

```
/*
 * $Id: print.c,v 1.2 2005/01/03 20:08:59 jms Exp $
 *
 * Revision History
 * =====
 * $Log: print.c,v $
 * Revision 1.2 2005/01/03 20:08:59 jms
 * change line terminations
 *
 * Revision 1.1.1.1 2004/11/24 23:31:47 jms
 * re-establish external server
 *
 * Revision 1.4 2004/02/18 16:26:49 jms
 * 32/64 bit changes for overflow handling needed additional
 * changes when ported back to windows
 *
 * Revision 1.3 2004/02/18 14:05:53 jms
 * porting changes for LINUX and 64 bit RNG
 *
 * Revision 1.2 2004/01/22 05:49:29 jms
 * AIX porting (AIX 5.1)
 *
 * Revision 1.1.1.1 2003/08/07 17:58:34 jms
 * recreation after CVS crash
 *
 * Revision 1.2 2003/08/07 17:58:34 jms
 * Convery RNG to 64bit space as preparation for new large
 * scale RNG
 *
 * Revision 1.1.1.1 2003/04/03 18:54:21 jms
 * initial checkin
 *
 */
/* generate flat files for data load */
#include <stdio.h>
#ifdef VMS
#include <sys/types.h>
#endif
#ifdef SUN
#include <unistd.h>
#endif
#include <math.h>

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

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

FILE *
```

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

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

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

                this_segment=++insert_orders_segment;
                else

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

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

                env_config(PATH_TAG,
                PATH_DFLT),
                PATH_SEP,
                tdefs[table].name, update);
            }
            else /* deletes */
            if ( delete_segments )
            {
                ++delete_segment;
                sprintf(upath,
"%s%cdelete.u%d.%d",

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

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

```

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

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

```

```

        break;
    }

#ifdef EOL_HANDLING
    if (sep)
#endif /* EOL_HANDLING */
    if (!columnar)
        fprintf(target, "%c", SEPARATOR);

    return(0);
}

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

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

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

    return(0);
}

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

    if (fp_o == NULL || mode != last_mode)
    {
        if (fp_o)
            fclose(fp_o);
        fp_o = print_prep(ORDER, mode);
        last_mode = mode;
    }
    PR_STRT(fp_o);
    PR_STR(fp_o, o->odate, DATE_LEN);
    PR_HUGE(fp_o, &o->key);
    PR_HUGE(fp_o, &o->custkey);
    PR_STR(fp_o, o->opriority, O_OPRIO_LEN);

```

```

PR_INT(fp_o, o->spriority);
PR_STR(fp_o, o->clerk, O_CLRK_LEN);
PR_CHR(fp_o, &o->orderstatus);
PR_MONEY(fp_o, &o->totalprice);
PR_VSTR_LAST(fp_o, o->comment,
(columnar)?(long)(ceil(O_CMNT_LEN *
V_STR_HGH)):o->clen);
PR_END(fp_o);

return(0);
}

/*
 * print an order's lineitems
 */
int
pr_line(order_t *o, int mode)
{
    static FILE *fp_l = NULL;
    static int last_mode = 0;
    long i;

    if (fp_l == NULL || mode != last_mode)
    {
        if (fp_l)
            fclose(fp_l);
        fp_l = print_prep(LINE, mode);
        last_mode = mode;
    }

    for (i = 0; i < o->lines; i++)
    {
        PR_STRT(fp_l);
        PR_STR(fp_l, o->l[i].sdate, DATE_LEN);
        PR_HUGE(fp_l, &o->l[i].okey);
        PR_MONEY(fp_l, &o->l[i].discount);
        PR_MONEY(fp_l, &o->l[i].eprice);
        PR_HUGE(fp_l, &o->l[i].supkey);
        PR_HUGE(fp_l, &o->l[i].quantity);
        PR_CHR(fp_l, &o->l[i].rflag[0]);
        PR_HUGE(fp_l, &o->l[i].partkey);
        PR_CHR(fp_l, &o->l[i].lstatus[0]);
        PR_MONEY(fp_l, &o->l[i].tax);
        PR_STR(fp_l, o->l[i].cdate, DATE_LEN);
        PR_STR(fp_l, o->l[i].rdate, DATE_LEN);
        PR_STR(fp_l, o->l[i].shipmode, L_SMODE_LEN);
        PR_HUGE(fp_l, &o->l[i].lcnt);
        PR_STR(fp_l, o->l[i].shipinstruct, L_INST_LEN);
        PR_VSTR_LAST(fp_l, o->l[i].comment,
(columnar)?(long)(ceil(L_CMNT_LEN *
V_STR_HGH)):o->l[i].clen);
        PR_END(fp_l);
    }

    return(0);
}

/*
 * print the numbered order *and* its associated lineitems

```

```

*/
int
pr_order_line(order_t *o, int mode)
{
    tdefs[ORDER].name = tdefs[ORDER_LINE].name;
    pr_order(o, mode);
    pr_line(o, mode);

    return(0);
}

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

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

    PR_STRT(p_fp);
    PR_HUGE(p_fp, &part->partkey);
    PR_VSTR(p_fp, part->type,
(columnar)?(long)P_TYPE_LEN:part->tlen);
    PR_HUGE(p_fp, &part->size);
    PR_STR(p_fp, part->brand, P_BRND_LEN);
    PR_VSTR(p_fp, part->name,
(columnar)?(long)P_NAME_LEN:part->nlen);
    PR_STR(p_fp, part->container, P_CNTR_LEN);
    PR_STR(p_fp, part->mfgr, P_MFG_LEN);
    PR_MONEY(p_fp, &part->retailprice);
    PR_VSTR_LAST(p_fp, part->comment,
(columnar)?(long)(ceil(P_CMNT_LEN *
V_STR_HGH)):part->clen);
    PR_END(p_fp);

    return(0);
}

/*
 * print the given part's suppliers
 */
int
pr_psupp(part_t *part, int mode)
{
    static FILE *ps_fp = NULL;
    long i;

    if (ps_fp == NULL)
        ps_fp = print_prep(PSUPP, mode);

    for (i = 0; i < SUPP_PER_PART; i++)
    {
        PR_STRT(ps_fp);
        PR_HUGE(ps_fp, &part->s[i].partkey);
        PR_HUGE(ps_fp, &part->s[i].supkey);
        PR_MONEY(ps_fp, &part->s[i].scost);

```

```

    PR_HUGE(ps_fp, &part->s[i].qty);
    PR_VSTR_LAST(ps_fp, part->s[i].comment,
        (columnar)?(long)(ceil(PS_CMNT_LEN *
V_STR_HGH)):part->s[i].clen);
    PR_END(ps_fp);
}

return(0);
}

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

    return(0);
}

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

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

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

    return(0);
}

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

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

    PR_STRT(fp);
    PR_HUGE(fp, &c->code);
    PR_STR(fp, c->text, NATION_LEN);

```

```

    PR_INT(fp, c->join);
    PR_VSTR_LAST(fp, c->comment,
        (columnar)?(long)(ceil(N_CMNT_LEN *
V_STR_HGH)):c->clen);
    PR_END(fp);

    return(0);
}

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

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

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

    return(0);
}

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

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

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

```

```

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

                rows_per_segment = (cnt / delete_segments) + 1;

                if(++rows_this_segment) > rows_per_segment)
                {

                    fclose(dfp);

dfp =
                    if (dfp
                    == NULL) return(-1);

                    last_num = num;

                    rows_this_segment=1;

                }

                PR_STRT(dfp);
                PR_HUGE(dfp, &new);

```

```

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

return(0);
}

/*
 * verify functions: routines which replace the pr_routines and
generate a pseudo checksum
 * instead of generating the actual contents of the tables.
Meant to allow large scale data
 * validation without requiring a large amount of storage
 */
int
vrf_cust(customer_t *c, int mode)
{
    VRF_STRT(CUST);
    VRF_INT(CUST, c->custkey);
    VRF_STR(CUST, c->name);
    VRF_STR(CUST, c->address);
    VRF_INT(CUST, c->nation_code);
    VRF_STR(CUST, c->phone);
    VRF_MONEY(CUST, c->acctbal);
    VRF_STR(CUST, c->mktsegment);
    VRF_STR(CUST, c->comment);
    VRF_END(CUST);

    return(0);
}

/*
 * print the numbered order
 */
int
vrf_order(order_t *o, int mode)
{
    VRF_STRT(ORDER);
    VRF_HUGE(ORDER, o->okey);
    VRF_INT(ORDER, o->custkey);
    VRF_CHR(ORDER, o->orderstatus);
    VRF_MONEY(ORDER, o->totalprice);
    VRF_STR(ORDER, o->odate);
    VRF_STR(ORDER, o->opriority);
    VRF_STR(ORDER, o->clerk);
    VRF_INT(ORDER, o->spriority);
    VRF_STR(ORDER, o->comment);
    VRF_END(ORDER);

    return(0);
}

```



```

}

/*
 * print an order's lineitems
 */
int
vrf_line(order_t *o, int mode)
{
    int i;

    for (i = 0; i < o->lines; i++)
    {
        VRF_STRT(LINE);
        VRF_HUGE(LINE, o->l[i].okey);
        VRF_INT(LINE, o->l[i].partkey);
        VRF_INT(LINE, o->l[i].suppkey);
        VRF_INT(LINE, o->l[i].lcnt);
        VRF_INT(LINE, o->l[i].quantity);
        VRF_MONEY(LINE, o->l[i].eprice);
        VRF_MONEY(LINE, o->l[i].discount);
        VRF_MONEY(LINE, o->l[i].tax);
        VRF_CHR(LINE, o->l[i].rflag[0]);
        VRF_CHR(LINE, o->l[i].lstatus[0]);
        VRF_STR(LINE, o->l[i].sdate);
        VRF_STR(LINE, o->l[i].cdate);
        VRF_STR(LINE, o->l[i].rdate);
        VRF_STR(LINE, o->l[i].shipinstruct);
        VRF_STR(LINE, o->l[i].shipmode);
        VRF_STR(LINE, o->l[i].comment);
        VRF_END(LINE);
    }

    return(0);
}

/*
 * print the numbered order *and* its associated lineitems
 */
int
vrf_order_line(order_t *o, int mode)
{
    vrf_order(o, mode);
    vrf_line(o, mode);

    return(0);
}

/*
 * print the given part
 */
int
vrf_part(part_t *part, int mode)
{
    VRF_STRT(PART);
    VRF_INT(PART, part->partkey);
    VRF_STR(PART, part->name);
    VRF_STR(PART, part->mfg);
    VRF_STR(PART, part->brand);

```

```

    VRF_STR(PART, part->type);
    VRF_INT(PART, part->size);
    VRF_STR(PART, part->container);
    VRF_MONEY(PART, part->retailprice);
    VRF_STR(PART, part->comment);
    VRF_END(PART);

    return(0);
}

/*
 * print the given part's suppliers
 */
int
vrf_psupp(part_t *part, int mode)
{
    long i;

    for (i = 0; i < SUPP_PER_PART; i++)
    {
        VRF_STRT(PSUPP);
        VRF_INT(PSUPP, part->s[i].partkey);
        VRF_INT(PSUPP, part->s[i].suppkey);
        VRF_INT(PSUPP, part->s[i].qty);
        VRF_MONEY(PSUPP, part->s[i].scost);
        VRF_STR(PSUPP, part->s[i].comment);
        VRF_END(PSUPP);
    }

    return(0);
}

/*
 * print the given part *and* its suppliers
 */
int
vrf_part_psupp(part_t *part, int mode)
{
    vrf_part(part, mode);
    vrf_psupp(part, mode);

    return(0);
}

int
vrf_supp(supplier_t *supp, int mode)
{
    VRF_STRT(SUPP);
    VRF_INT(SUPP, supp->suppkey);
    VRF_STR(SUPP, supp->name);
    VRF_STR(SUPP, supp->address);
    VRF_INT(SUPP, supp->nation_code);
    VRF_STR(SUPP, supp->phone);
    VRF_MONEY(SUPP, supp->acctbal);
    VRF_STR(SUPP, supp->comment);
    VRF_END(SUPP);

    return(0);
}

```

```

int
vrf_nation(code_t *c, int mode)
{
    VRF_STRT(NATION);
    VRF_INT(NATION, c->code);
    VRF_STR(NATION, c->text);
    VRF_INT(NATION, c->join);
    VRF_STR(NATION, c->comment);
    VRF_END(NATION);

    return(0);
}

```

```

int
vrf_region(code_t *c, int mode)
{
    VRF_STRT(REGION);
    VRF_INT(REGION, c->code);
    VRF_STR(REGION, c->text);
    VRF_STR(REGION, c->comment);
    VRF_END(fp);

    return(0);
}

```

CreateRF1proc.sql

```

-- File:  CREATERF1PROC.SQL
--      Microsoft TPC-H Benchmark Kit Ver. 1.00
--      Copyright Microsoft, 1999
--
IF exists (SELECT name FROM sysobjects WHERE name =
'RF1')
    DROP PROCEDURE RF1
GO

--
-- Create a stored RefreshInsert procedure which will catch
the deadlock
-- victim abort and restart the insert transaction.
--
CREATE PROCEDURE RF1
    @current_execution INTEGER, @insert_sets INTEGER,
@parallel_executions INTEGER, @total_executions
INTEGER
AS
BEGIN

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

    DECLARE @success INTEGER

```

```

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

```

```

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

```

```

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

```

```

IF (@total_executions > @parallel_executions)
    BEGIN
        SET @div = (@index-1)/@skip
        SET @mod = (@index-1) - @div * @skip
        SET @rangeSize = datediff(day, @startdate,
@enddate)/@parallel_executions + 1
        SET @totRangeSize = @rangeSize
        SET @rangeSum = 0
        SET @rangeStart = @div * @rangeSize
        SET @i = @mod
        while (@i > 0)
            BEGIN
                SET @rangeSize = (@totRangeSize -
@rangeSum)/2
                SET @rangeSum = @rangeSum +
@rangeSize
                SET @rangeStart = @rangeStart +
@rangeSize
                SET @insert_sets = @insert_sets/2
                SET @i = @i - 1
            end

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

```

```

end
ELSE
    BEGIN
        SET @rangeSize = datediff(day, @startdate,
@enddate)/@total_executions
        SET @rangeStart = @rangeSize * (@index - 1)
        end

SET @startdate = dateadd(day, @rangeStart, @startdate)
IF (@index < @total_executions)
    SET @enddate = dateadd(day, @rangeSize,
@startdate)

SET @range = datediff(day, @startdate, @enddate) /
@insert_sets

--
-- This handles the case when the max-min/insert_sets is less
that 1
--
IF @range = 0
    SET @range = 1

--
-- Generate the two insert statements
--
SET @edate = dateadd(day, @range, @startdate)
SET @orderSql = N'INSERT INTO ORDERS
(O_ORDERKEY, O_CUSTKEY, O_ORDERSTATUS,
O_TOTALPRICE,

O_ORDERDATE, O_ORDERPRIORITY, O_CLERK,
O_SHIPPRIORITY, O_COMMENT)
        (SELECT O_ORDERKEY,
O_CUSTKEY, O_ORDERSTATUS, O_TOTALPRICE,

O_ORDERDATE, O_ORDERPRIORITY, O_CLERK,
O_SHIPPRIORITY, O_COMMENT
        FROM NEWORDERS
        WHERE O_ORDERDATE >
@startdate AND O_ORDERDATE <= @edate)
        option (loop join)'
SET @liSql = N'INSERT INTO LINEITEM
(L_ORDERKEY,L_PARTKEY,L_SUPPKEY,L_LINENUM
BER,L_QUANTITY,
        L_EXTENDEDPRICE,
L_DISCOUNT, L_TAX, L_RETURNFLAG,
L_LINESTATUS,
        L_SHIPDATE,
L_COMMITDATE, L_RECEIPTDATE,
L_SHIPINSTRUCT, L_SHIPMODE, L_COMMENT)
        (SELECT
L_ORDERKEY,L_PARTKEY,L_SUPPKEY,L_LINENUMB
ER,L_QUANTITY,
        L_EXTENDEDPRICE,
L_DISCOUNT, L_TAX, L_RETURNFLAG,
L_LINESTATUS,

```

```

        L_SHIPDATE,
L_COMMITDATE, L_RECEIPTDATE,
L_SHIPINSTRUCT, L_SHIPMODE, L_COMMENT
        FROM NEWLINEITEM,
NEWORDERS
        WHERE L_ORDERKEY =
O_ORDERKEY AND O_ORDERDATE > @startdate AND
        O_ORDERDATE <= @edate)
        option (loop join)'

--
-- Loop through the order keys inserting sets into the
-- ORDERS and LINEITEM tables
--
WHILE @startdate < @enddate
    BEGIN
        --
        -- Insert into ORDERS and LINEITEM tables
        --
        INSERT_TRANS:
        SET @success = 1
        BEGIN TRANSACTION

        BEGIN TRY
            EXEC sp_executesql @orderSql,
N'@startdate datetime, @edate datetime', @startdate, @edate
            EXEC sp_executesql @liSql, N'@startdate
datetime, @edate datetime', @startdate, @edate
        END TRY
        BEGIN CATCH
            SET @success = 0
            IF (error_number() = 1205) --
deadlock victim
                PRINT 'Insert deadlock - restarting
RF1'
            ELSE
                BEGIN -- not a
deadlock
                    PRINT 'Error - Not a deadlock'
                    PRINT ERROR_NUMBER()
                    PRINT ERROR_SEVERITY()
                    PRINT ERROR_MESSAGE()
                    PRINT ERROR_STATE()
                    PRINT XACT_STATE()
                    END
                    IF (@@trancount>0)
                        ROLLBACK TRANSACTION
                END CATCH

            IF (@@success = 0) --
deadlock - redo the inserts
                GOTO INSERT_TRANS

            COMMIT TRANSACTION

            SET @startdate = @edate
            SET @edate = dateadd(day, @range, @edate)

```

```

        IF (@edate > @enddate)
            SET @edate = @enddate
    END
END
GO

```

CreateRF2proc.sql

```

-- File:  CREATERF2PROC.SQL
--      Microsoft TPC-H Benchmark Kit Ver. 1.00
--      Copyright Microsoft, 1999
--
IF exists (SELECT name FROM sysobjects WHERE name =
'RF2')
    DROP PROCEDURE RF2
GO
--
-- Create a stored Refresh Delete procedure which will catch
the deadlock
-- victim abort and restart the delete transaction.
--
CREATE PROCEDURE RF2
    @current_execution INTEGER, @delete_sets INTEGER,
    @parallel_executions INTEGER, @total_executions
    INTEGER
AS
BEGIN
    DECLARE @startdate DATETIME
    DECLARE @enddate DATETIME
    DECLARE @edate DATETIME
    DECLARE @rangeStart INTEGER
    DECLARE @rangeSize INTEGER
    DECLARE @range INTEGER
    declare @success INTEGER
    declare @index INTEGER
    declare @div INTEGER
    declare @mod INTEGER
    declare @skip INTEGER
    declare @i INTEGER
    declare @rangeSum INTEGER
    declare @totRangeSize INTEGER
    declare @sql NCHAR(1000)
    declare @orderSql NCHAR(1000)
    declare @liSql NCHAR(1000)
    SET @skip = @total_executions/@parallel_executions
    SET @div = floor((@current_execution-
    1)/@parallel_executions)
    SET @mod = (@current_execution - 1) - @div *
    @parallel_executions
    SET @index = @mod*@skip + @div + 1

```

```

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

```

```

IF (@total_executions > @parallel_executions)
    BEGIN
        SET @div = (@index-1)/@skip
        SET @mod = (@index-1) - @div * @skip
        SET @rangeSize = datediff(day, @startdate,
@enddate)/@parallel_executions + 1
        SET @totRangeSize = @rangeSize
        SET @rangeSum = 0
        SET @rangeStart = @div * @rangeSize
        SET @i = @mod
        WHILE (@i > 0)
            BEGIN
                SET @rangeSize = (@totRangeSize -
@rangeSum)/2
                SET @rangeSum = @rangeSum +
@rangeSize
                SET @rangeStart = @rangeStart +
@rangeSize
                SET @delete_sets = @delete_sets/2
                SET @i = @i - 1
            END
        IF (@mod + 1 = @skip) -- last allocation
            SET @rangeSize = @totRangeSize -
@rangeSum
        ELSE
            SET @rangeSize = (@totRangeSize -
@rangeSum)/2
        IF (@rangeSize < 0)
            SET @rangeSize = 0
        IF (@delete_sets <= 0)
            SET @delete_sets = 1
        END
    ELSE
        BEGIN
            SET @rangeSize = datediff(day, @startdate,
@enddate)/@total_executions
            SET @rangeStart = @rangeSize * (@index - 1)
        END
        SET @startdate = dateadd(day, @rangeStart, @startdate)
        IF (@index < @total_executions)
            SET @enddate = dateadd(day, @rangeSize,
@startdate)
        SET @range = datediff(day, @startdate, @enddate) /
@delete_sets
        --
        -- This handles the case when the max-min/delete_sets is less
        -- that 1
        --

```

```

IF @range = 0
    SET @range = 1

--
-- Loop through the order keys deleting sets from orders
-- and lineitem tables
--
SET @edate = dateadd(day, @range, @startdate)
SET @liSql = N'DELETE FROM LINEITEM WHERE
L_ORDERKEY in
    (SELECT O_ORDERKEY FROM
MOD_OLDORDERS
    WHERE O_ORDERDATE >
@startdate AND O_ORDERDATE <= @edate)
option (loop join)'
SET @orderSql = N'DELETE FROM ORDERS WHERE
O_ORDERKEY in
    (SELECT O_ORDERKEY FROM
MOD_OLDORDERS
    WHERE O_ORDERDATE >
@startdate AND O_ORDERDATE <= @edate)
option (loop join)'

WHILE @startdate < @enddate
    BEGIN

        DELETE_TRANS:
        SET @success = 1
        BEGIN TRANSACTION

        BEGIN TRY
            EXEC sp_executesql @liSql, N'@startdate
datetime, @edate datetime', @startdate, @edate
            EXEC sp_executesql @orderSql,
N'@startdate datetime, @edate datetime', @startdate, @edate
        END TRY
        BEGIN CATCH
            SET @success = 0
            IF (error_number() = 1205)        --
deadlock victim
                PRINT 'Insert deadlock - restarting
RF2'
            ELSE
                BEGIN                -- not a
deadlock
                    PRINT 'Error - Not a deadlock'
                    PRINT ERROR_NUMBER()
                    PRINT ERROR_SEVERITY()
                    PRINT ERROR_MESSAGE()
                    PRINT ERROR_STATE()
                    PRINT XACT_STATE()
                    END
                    IF (@@trancount>0)
                        ROLLBACK TRANSACTION
                END CATCH

            IF (@success = 0)        --
deadlock - redo the inserts
                GOTO DELETE_TRANS

```

COMMIT TRANSACTION

```

SET @startdate = @edate
SET @edate = dateadd(day, @range, @edate)

```

```

IF (@edate > @enddate)
    SET @edate = @enddate

```

END

END

GO

ErrHandling.bas

```

Attribute VB_Name = "ErrHandling"
' FILE:    ErrHandling.bas
'        Reporting Program for Microsoft TPC-H Kit Ver.
1.00
'        Copyright Microsoft, 1999
'        All Rights Reserved
'
' PURPOSE:  Error handling module for TPCHMetrics
report generation program
' Contact:  Reshma Tharamal (reshmat@microsoft.com)
'

```

Option Explicit

Public Sub DisplayErrors()

' Display error information such as error number, description, etc to the user

```

Dim strError As String
Dim errLoop As DAO.Error
Dim errCode As Long

```

If Err.Number <> 0 Then

' Visual Basic Error

If Err.Number > vbObjectError And Err.Number < (vbObjectError + 65536) Then

errCode = Err.Number - vbObjectError

Else

errCode = Err.Number

End If

strError = "Error # " & Str(errCode) & " was generated

by " _

& Err.Source & Chr(13) & Err.Description

MsgBox strError, , "Error", Err.HelpFile,

Err.HelpContext

Else

' DAO Error

' Enumerate Errors collection and display properties of each Error object.

For Each errLoop In DAO.Errors

With errLoop

```

        If Err.Number > vbObjectError And Err.Number <
(vbObjectError + 65536) Then
            errCode = .Number - vbObjectError
        Else
            errCode = .Number
        End If
        strError = "Error #" & errCode & vbCrLf
        strError = strError & " " & .Description & vbCrLf
        strError = strError & _
            " (Source: " & .Source & ")" & vbCrLf
    End With

    MsgBox strError
Next
End If

```

End Sub

TPCHReports.bas

```

Attribute VB_Name = "TPCHReports"
' FILE:    TPCHReports.bas
'    Reporting Program for Microsoft TPC-H Kit Ver.
1.00
'    Copyright Microsoft, 1999
'    All Rights Reserved
'
' PURPOSE:  This is the main module that contains the
report generation
'    functions for TPCHMetrics
' Contact:  Reshma Tharamal (reshmat@microsoft.com)
'
Option Explicit

' DAO workspace, database and recordset objects
Private mwrkJet As DAO.Workspace
Private mDB As DAO.Database
Private mrecDtls As DAO.Recordset

' Constants for Power and Throughput runs
' Must correspond to index for checkboxes, chkRun on
frmTPCHMetrics
Public Enum eRunType
    Power = 1
    Throughput = 2
End Enum

' Range of streams for which the Power/Throughput run
reports can be generated
Private Const miStreamIdMin As Integer = 0 ' Corresponds to
PowerRun
Private Const miStreamIdMax As Integer = 10

' Power Run corresponds to Stream 0
Private Const miStreamPowerRun As Integer =
miStreamIdMin

```

```

' Range of Power/Throughput run queries
Private Const miQueryIdMin As Integer = 1
Private Const miQueryIdMax As Integer = 24 ' Includes RF
functions

' Constant for Query 15 since it is split into view creation and
execution
' in the non-standard version of the kit
Private Const miQuery15 As Integer = 15

' Constants for refresh functions, RF1 and RF2
Private Const miQueryIdRF1 As Integer = 23
Private Const miQueryIdRF2 As Integer = 24

' Number of refresh functions
Private Const miRefreshFuncs As Integer = 2

' Constant for the first iterator value for the refresh functions
Private Const msFirstRFIterator As String = "1"

' Upper bound for Scale Factor (& number of streams) array
Private Const miSFUBound As Integer = 8

' Array of valid scale factors
Private marrSF(miSFUBound) As Single
' Array of minimum number of throughput streams for each
scale factor
Private marrStreams(miSFUBound) As Integer

' Default scale factor array location
Private Const miDefaultSF As Integer = 0

' Default number of insert segments per update set
Private Const miDefInsSegmentsPerUpdateSet As Integer =
16
' Default number of delete segments per update set
Private Const miDefDelSegmentsPerUpdateSet As Integer =
16

#If Not TPCH_KIT Then
    ' Default value for first update set for throughput run
    Private Const miDefUpdateSetFirst As Integer = 2
#End If

' Module-level variables for all report inputs
Private msDbFile As String ' Workspace definition file
name
Private msOutput As String ' Report file name
Private mbRunType(eRunType.Power To
eRunType.Throughput) As Boolean
' Array with Yes/No values for type of
report
' being generated
Private miStreamIdLo As Integer ' Will be initialized to 0 or 1,
depending on whether the
' PowerRun Metric is being generated or
not

```

```

Private miStreamIdHi As Integer ' Will be initialized to
number of throughput
    ' streams or 0, depending on whether the
    ' ThroughputRun Metric is being
generated or not
Private mlRunId As Long      ' Run identifier
Private mfSF As Single      ' Scale factor for the run
Private miInsSegmentsPerUpdateSet As Integer ' Number of
insert segments per update set
Private miDelSegmentsPerUpdateSet As Integer ' Number
of delete segments per update set

#If Not TPCH_KIT Then
    Private miUpdateSetFirst As Integer      ' First update set
for throughput run
#End If

' Constants for each of the dimensions (stream and query ) in
the arQuerySequence array
Private Const miDimensionStream As Integer = 1
Private Const miDimensionQuery As Integer = 2

' Array containing the sequence in which queries are executed,
excluding the refresh functions
Private arQuerySequence(miStreamIdMin To
miStreamIdMax, miQueryIdMin To miQueryIdMax -
miRefreshFuncs) As Integer

' Stucture containing step execution statistics
Private Type StepExecutionDtls
    StartTime As Currency
    EndTime As Currency
    StartTimeNextStep As Currency
    ElapsedTime As Double
    ElapsedTpch As Double
    sStartTm As String
    sEndTm As String
    sStartNextTm As String
End Type

' Array containing step execution statistics for each query in
each stream
Private arExecutionDtls(miStreamIdMin To miStreamIdMax,
miQueryIdMin To miQueryIdMax) As StepExecutionDtls

' Constants used to format dates and timestamps
Private Const msDtSeparator As String = "-"
Private Const msTmSeparator As String = ":"
Private Const msMsSeparator As String = "."
Private Const msBlank As String = " "
Private Const msFmtMsPadWZeroes As String = "000"
Private Const msFmtYrPadWZeroes As String = "0000"

' Constants used to format stream and query identifiers
Private Const msFmtNumberWOZeroes As String = "##"
Private Const msFmtNumberPadWZeroes As String = "00"

' Constant used to format fractions
Private Const miNumDecimalPlaces As Integer = 1

```

```

' Constants used by the metrics calculation functions
Private Const mfMinElapsed As Single = 0.05
Private Const mfMinElapsedRound As Single = 0.1

' String constants for labels in workspace. Edit these labels if
the workspace is modified.
' Two versions of the workspace currently exist - the one in
the tpch kit and the
' one that Larry and Grace use
' PowerRun labels
#If TPCH_KIT Then
    Private Const msStartStepLabelPowerRF1 As String =
"Power - Execute RF1"
    Private Const msStartStepLabelPowerRF2 As String =
"Power - Execute RF2"
    Private Const msStartStepLabelPowerOther As String =
"Power - Execute Query "

    Private Const msEndStepLabelPowerRF1 As String =
"Power - Execute RF1"
    Private Const msEndStepLabelPowerRF2 As String =
"Power - Execute RF2"
#Else
    Private Const msStartStepLabelPowerRF1 As String =
"Execute RF1 in Parallel"
    Private Const msStartStepLabelPowerRF2 As String =
"Execute Query RF2 Thread"
    Private Const msStartStepLabelPower15 As String =
"Create REVENUE View"
    Private Const msStartStepLabelPowerOther As String =
"Execute Query "

    Private Const msEndStepLabelPowerRF1 As String =
"Execute RF1 in Parallel"
    Private Const msEndStepLabelPowerRF2 As String =
"Execute Query RF2 Thread"
    Private Const msEndStepLabelPower15 As String =
"Execute using REVENUE"
#End If

' ThroughputRun labels
#If TPCH_KIT Then
    Private Const msStartStepLabelThroughputRF1First As
String = "Throughput - Semaphore Loop for RF Delay"
    Private Const msEndStepLabelThroughputRF2Rest As
String = "Throughput - Stream - Increment Update Set"

    Private Const msLabelThroughputRF As String =
"Sequential Refresh Stream Execution"
    Private Const msLblThroughputRF12Mgr As String =
"Throughput - Refresh Streams"
    Private Const msLabelThroughputRF1 As String =
"Throughput - RF1 - Stream%STREAM_NUM%"
    Private Const msLabelThroughputRF2 As String =
"Throughput - RF2 - Stream%STREAM_NUM%"
    Private Const msLblThroughputRF1 As String =
"Throughput - Execute Stream%STREAM_NUM% RF1"

```

```

Private Const msLblThroughputRF2 As String =
"Throughput - Execute Stream%STREAM_NUM% RF2"

Private Const msStepLabelThroughputOther As String =
"Throughput - Query Stream "
#Else
Private Const msStartStepLabelThroughputRF1 As String =
"Wait for Throughput Run"
Private Const msStartStepLabelThroughputRF2 As String =
"Throughput RF2"
Private Const msStartStepLabelThroughputOther As String
= "Execute Query for Stream "

Private Const msEndStepLabelThroughputRF1 As String =
"Throughput RF1"

Private Const msLabelThroughputRF As String = "Refresh
Streams"
Private Const msLabelThroughputRFWithIt As String =
"Refresh Streams with Iterators"
Private Const msLabelThroughputRF1 As String = "RF1"
Private Const msLabelThroughputRF2 As String = "RF2"
Private Const msLabelThroughputRF12 As String = "RF1
post Throughput Queries"
#End If

Private Sub CalcElapsedTmAndPrint()
' This is the main function that computes the elapsed time
for each
' step, the Qpp for the Power and Throughput runs and the
composite
' QppH

Dim iStreamId As Integer
Dim iQueryId As Integer
Dim lMinElapsed As Double
Dim lMaxElapsed As Double
Dim fSigma As Double
Dim fQppPower As Double
Dim fQppThroughput As Double
Dim fQppH As Double
Dim cStart As Currency
Dim cEnd As Currency
Dim fElapsedThroughput As Double
Dim ftemp As Double
Dim sStartTm As String
Dim sEndTm As String

' Calculate the timing interval for each query in each stream
For iStreamId = miStreamIdLo To miStreamIdHi

For iQueryId = miQueryIdMin To miQueryIdMax Step 1

' Calculate the elapsed time for a query as the
difference
' between the end time and the start time for a step
arExecutionDtls(iStreamId, iQueryId).ElapsedTime =

```

```

(arExecutionDtls(iStreamId, iQueryId).EndTime -
_
arExecutionDtls(iStreamId,
iQueryId).StartTime) * 10

' If the timing interval for a query is less than 0.05
seconds,
' it must be rounded up to 0.1 second to avoid 0 values
' Refer to Section 5.3.7.5 of the TPC-H Spec Rev.
1.1.0
If (arExecutionDtls(iStreamId,
iQueryId).ElapsedTime) < mfMinElapsed Then
arExecutionDtls(iStreamId, iQueryId).ElapsedTime
= mfMinElapsedRound
Else
arExecutionDtls(iStreamId, iQueryId).ElapsedTime
= _
Round(arExecutionDtls(iStreamId,
iQueryId).ElapsedTime, miNumDecimalPlaces)
End If

' Calculate the timing interval for the TPC-H Metric as
the difference
' between the start time of the next step and the start
time for a step
arExecutionDtls(iStreamId, iQueryId).ElapsedTpch =
_
(arExecutionDtls(iStreamId,
iQueryId).StartTimeNextStep - _
arExecutionDtls(iStreamId,
iQueryId).StartTime) * 10

' If the timing interval for a query is less than 0.05
seconds,
' it must be rounded up to 0.1 second to avoid 0 values
' Refer to Section 5.3.7.5 of the TPC-H Spec Rev.
1.1.0
If (arExecutionDtls(iStreamId,
iQueryId).ElapsedTpch) < mfMinElapsed Then
arExecutionDtls(iStreamId, iQueryId).ElapsedTpch
= mfMinElapsedRound
Else
arExecutionDtls(iStreamId, iQueryId).ElapsedTpch
= _
Round(arExecutionDtls(iStreamId,
iQueryId).ElapsedTpch, miNumDecimalPlaces)
End If
Next iQueryId

Next iStreamId

If mbRunType(eRunType.Power) Then
lMinElapsed = arExecutionDtls(miStreamPowerRun,
miQueryIdMin).ElapsedTpch
lMaxElapsed = 0

' Determine minimum and maximum query timing
intervals for the PowerRun

```



```

For iQueryId = miQueryIdMin To miQueryIdMax -
miRefreshFuncs Step 1

    If arExecutionDtls(miStreamPowerRun,
iQueryId).ElapsedTpch > lMaxElapsed Then
        lMaxElapsed =
arExecutionDtls(miStreamPowerRun, iQueryId).ElapsedTpch
    End If

    If arExecutionDtls(miStreamPowerRun,
iQueryId).ElapsedTpch < lMinElapsed Then
        lMinElapsed =
arExecutionDtls(miStreamPowerRun, iQueryId).ElapsedTpch
    End If

Next iQueryId

' If the ratio between the longest query timing interval
and the shortest query
' timing interval in the PowerRun is greater than 1000,
then increase all query
' timing intervals which are smaller than
max[QI(i,0)]/1000 to max[QI(i,0)]/1000
' Refer to Section 5.4.1.4 of the TPC-H Spec Rev. 1.1.0
If lMaxElapsed / lMinElapsed > 1000 Then
    lMinElapsed = lMaxElapsed / 1000

For iQueryId = miQueryIdMin To miQueryIdMax
Step 1

    If arExecutionDtls(miStreamPowerRun,
iQueryId).ElapsedTpch > lMaxElapsed Then
        lMaxElapsed =
arExecutionDtls(miStreamPowerRun, iQueryId).ElapsedTpch
    End If

    If arExecutionDtls(miStreamPowerRun,
iQueryId).ElapsedTpch < (lMaxElapsed / 1000) Then
        arExecutionDtls(miStreamPowerRun,
iQueryId).ElapsedTpch = lMinElapsed
    End If

Next iQueryId
End If

' Determine the Power Metric
fSigma = 0
For iQueryId = miQueryIdMin To miQueryIdMax Step 1
    fSigma = fSigma +
Log(arExecutionDtls(miStreamPowerRun,
iQueryId).ElapsedTpch)
Next iQueryId
fSigma = fSigma * (-1 / 24)
fQppPower = Round(Exp(fSigma) * 3600 * mfSF,
miNumDecimalPlaces)
End If

If mbRunType(eRunType.Throughput) Then
    ' Determine the elapsed time for the throughput run

```

```

cStart = arExecutionDtls(miStreamPowerRun + 1,
miQueryIdMin).StartTime
cEnd = 0

For iStreamId = miStreamPowerRun + 1 To
miStreamIdHi

    For iQueryId = miQueryIdMin To miQueryIdMax
Step 1

        If arExecutionDtls(iStreamId, iQueryId).StartTime
< cStart Then
            cStart = arExecutionDtls(iStreamId,
iQueryId).StartTime
        End If

        If arExecutionDtls(iStreamId, iQueryId).EndTime >
cEnd Then
            cEnd = arExecutionDtls(iStreamId,
iQueryId).EndTime
        End If

    Next iQueryId

Next iStreamId

sStartTm = JulianToString(cStart)
sEndTm = JulianToString(cEnd)

fElapsedThroughput = Round((cEnd - cStart) * 10,
miNumDecimalPlaces)
fSigma = 3600 / fElapsedThroughput
fQppThroughput = Round(fSigma * miStreamIdHi * 22
* mfSF, miNumDecimalPlaces)
End If

' Compute the composite QppH value
fQppH = Round(Sqr(fQppPower * fQppThroughput),
miNumDecimalPlaces)

Call PrintStatistics(fQppPower, fElapsedThroughput,
fQppThroughput, fQppH, _
sStartTm, sEndTm)

End Sub
Private Sub CloseDbAndWsp()
    ' Close the database structures

On Error Resume Next

If Not mDB Is Nothing Then
    mDB.Close
    Set mDB = Nothing
End If

If Not mwrkJet Is Nothing Then
    mwrkJet.Close
    Set mwrkJet = Nothing
End If

```

```

End Sub

Public Sub NumStreamsEnabled(Index As Integer)
    ' Enables the number of throughput streams only if the
    throughput
    ' metric report is being generated

    If Index = eRunType.Throughput Then
        frmTPCHMetrics.cboStreams.Enabled = _

    (frmTPCHMetrics.chkRun(eRunType.Throughput).Value =
    vbChecked)
    #If Not TPC_H_KIT Then
        ' Enables the first throughput update set only if the
        throughput
        ' metric report is being generated
        frmTPCHMetrics.txtUpdateSetFirst.Enabled = _

    (frmTPCHMetrics.chkRun(eRunType.Throughput).Value =
    vbChecked)
    #End If
    End If

End Sub

Private Function ParentInstId(iStreamId As Integer, iQueryId
As Integer) As Long
    ' Determines the parent instance identifier for the refresh
    functions
    ' Uses the refresh function label that marks the start of
    execution for
    ' the refresh function
    ' E.g. TPC-H Kit, Stream1, RF1: the start time for the
    refresh function
    ' is the start time for the step, 'Throughput - Semaphore
    Loop for RF Delay'
    ' but the end time for the refresh function is the end time for
    the step,
    ' 'Throughput - Execute Stream1 RF1'
    ' Similarly, in the HP version of the TPC-H Kit, RF1: the
    start time
    ' for the refresh function is the start time for the step,
    ' 'Wait for Throughput Run' but the end time for the refresh
    function
    ' is the end time for the step, 'Throughput RF1'

    Dim sLabel As String
    Dim sSql As String
    Dim sIt As String
    Dim lInstId As Long

    ParentInstId = 0

    ' Start at the top level step and work down to the parent of
    the refresh
    ' function. Initialize the step label and iterator values at
    every
    ' step, build a query and determine the instance identifier

```

```

sLabel = msLabelThroughputRF
sSql = "step_label = " & MakeStringFieldValid(sLabel)
mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
    MsgBox "Step " & "" & sLabel & "" & " not found! " &
-
    "The Throughput Run was not completely
    executed!"
    Exit Function
End If

lInstId = mrecDtls.Fields("instance_id").Value

#If TPC_H_KIT Then
    If (iStreamId = miStreamPowerRun + 1) And iQueryId =
    miQueryIdRF1 Then
        ParentInstId = lInstId
        Exit Function
    End If

    sLabel = msLblThroughputRF12Mgr
    sIt = CStr(iStreamId)
#Else
    sLabel = msLabelThroughputRFWithIt
    ' Stream 1 in Throughput run has iterator value first update
    set,
    ' Stream 2 in Throughput run has iterator value first update
    set + 1, ... and so on
    sIt = Format(iStreamId + miUpdateSetFirst - 1,
    msFmtNumberWOZeroes)
#End If

sSql = "step_label = " & MakeStringFieldValid(sLabel) & _
    " and parent_instance_id = " & CStr(lInstId) & _
    " and iterator_value = " & MakeStringFieldValid(sIt)
mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
    MsgBox "Step " & "" & sLabel & "" & _
        " not found for iterator " & "" & sIt & "" & ". " & _
        "The Throughput Run was not completely
    executed!"
    Exit Function
End If

lInstId = mrecDtls.Fields("instance_id").Value

sLabel = IIf(iQueryId = miQueryIdRF1,
msLabelThroughputRF1, msLabelThroughputRF2)

sSql = "step_label = " & MakeStringFieldValid(sLabel) & _
    " and parent_instance_id = " & CStr(lInstId)

mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
    MsgBox "Step " & "" & sLabel & "" & _
        " not found for iterator " & "" & sIt & "" & ". " & _
        "The Throughput Run was not completely
    executed!"

```

```

Exit Function
End If

ParentInstId = mrecDtls.Fields("instance_id").Value

End Function
Private Function ParentInstIdEnd(iStreamId As Integer,
iQueryId As Integer) As Long
' Determines the parent instance identifier for the refresh
functions
' Uses the refresh function label that marks the end of
execution for
' the refresh function
' E.g. TPC-H Kit, Stream1, RF1: the start time for the
refresh function
' is the start time for the step, 'Throughput - Semaphore
Loop for RF Delay'
' but the end time for the refresh function is the end time for
the step,
' 'Throughput - Execute Stream1 RF1'
' Similarly, in the HP version of the TPC-H Kit, RF1: the
start time
' for the refresh function is the start time for the step,
' 'Wait for Throughput Run' but the end time for the refresh
function
' is the end time for the step, 'Throughput RF1'

Dim sLabel As String
Dim sSql As String
Dim sIt As String
Dim lInstId As Long

' Start at the top level step and work down to the parent of
the refresh
' function. Initialize the step label and iterator values at
every
' step, build a query and determine the instance identifier

ParentInstIdEnd = 0

#If TPCH_KIT Then
sLabel = msLabelThroughputRF
sSql = "step_label = " & MakeStringFieldValid(sLabel)
mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
MsgBox "Step " & "" & sLabel & "" & " not found! " & _
-
"The Throughput Run was not completely
executed!"
Exit Function
End If

lInstId = mrecDtls.Fields("instance_id").Value

sLabel = msLblThroughputRF12Mgr
sIt = CStr(iStreamId)
sSql = "step_label = " & MakeStringFieldValid(sLabel) & _
" and parent_instance_id = " & CStr(lInstId) & _
" and iterator_value = " & MakeStringFieldValid(sIt)

```

```

mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
MsgBox "Step " & "" & sLabel & "" & _
" not found for iterator " & "" & sIt & "" & ". " & _
"The Throughput Run was not completely
executed!"
Exit Function
End If

lInstId = mrecDtls.Fields("instance_id").Value

If iQueryId = miQueryIdRF2 And iStreamId <>
miStreamIdHi Then
ParentInstIdEnd = lInstId
Exit Function
End If

sLabel = IIf(iQueryId = miQueryIdRF1,
msLabelThroughputRF1, msLabelThroughputRF2)
sSql = "step_label = " & MakeStringFieldValid(sLabel) & _
" and parent_instance_id = " & CStr(lInstId)
mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
MsgBox "Step " & "" & sLabel & "" & " not found! " & _
-
"The Throughput Run was not completely
executed!"
Exit Function
End If

ParentInstIdEnd = mrecDtls.Fields("instance_id").Value
#Else
sLabel = msLabelThroughputRF
sSql = "step_label = " & MakeStringFieldValid(sLabel)

mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
MsgBox "Step " & "" & sLabel & "" & _
" not found for iterator " & "" & sIt & "" & ". " & _
"The Throughput Run was not completely
executed!"
Exit Function
End If

lInstId = mrecDtls.Fields("instance_id").Value

' Stream 1 in Throughput run has iterator value first update
set,
' Stream 2 in Throughput run has iterator value first update
set + 1, ... and so on
sIt = Format(iStreamId + miUpdateSetFirst - 1,
msFmtNumberWOZeroes)
sLabel = msLabelThroughputRFWithIt
sSql = "step_label = " & MakeStringFieldValid(sLabel) & _
" and parent_instance_id = " & CStr(lInstId) & _
" and iterator_value = " & MakeStringFieldValid(sIt)

mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then

```

```

MsgBox "Step " & "" & sLabel & "" & _
    " not found for iterator " & "" & sIt & "" & ". " & _
    "The Throughput Run was not completely
executed!"
Exit Function
End If

lInstId = mrecDtls.Fields("instance_id").Value
sLabel = IIf(iQueryId = miQueryIdRF1,
msLabelThroughputRF1, msLabelThroughputRF2)

sSql = "step_label = " & MakeStringFieldValid(sLabel) & _
    " and parent_instance_id = " & CStr(lInstId)

mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
    MsgBox "Step " & "" & sLabel & "" & _
        " not found for iterator " & "" & sIt & "" & ". " & _
        "The Throughput Run was not completely
executed!"
Exit Function
End If

lInstId = mrecDtls.Fields("instance_id").Value

If iQueryId = miQueryIdRF1 Then
    sLabel = msLabelThroughputRF12

    sSql = "step_label = " & MakeStringFieldValid(sLabel)
& _
    " and parent_instance_id = " & CStr(lInstId)

mrecDtls.FindFirst sSql
If mrecDtls.NoMatch = True Then
    MsgBox "Step " & "" & sLabel & "" & _
        " not found for iterator " & "" & sIt & "" & ". "
& _
    "The Throughput Run was not completely
executed!"
Exit Function
End If

lInstId = mrecDtls.Fields("instance_id").Value
End If

ParentInstIdEnd = lInstId

#End If

End Function
Public Sub Initialize()

' Initialize an array of valid scale factors
marrSF(0) = 0.1
marrSF(1) = 1
marrSF(2) = 10
marrSF(3) = 30
marrSF(4) = 100
marrSF(5) = 300

```

```

marrSF(6) = 1000
marrSF(7) = 3000
marrSF(8) = 10000

' and the number of streams for each scale factor
marrStreams(0) = 2
marrStreams(1) = 2
marrStreams(2) = 3
marrStreams(3) = 4
marrStreams(4) = 5
marrStreams(5) = 6
marrStreams(6) = 7
marrStreams(7) = 8
marrStreams(8) = 9

' Load the valid scale factors and number of streams for
each
' scale factor in the combo boxes on the form
Call LoadSFAndStreams(frmTPCHMetrics.cboSF,
frmTPCHMetrics.cboStreams)

' Initialize the number of insert and delete segments per
update
' set to default values
frmTPCHMetrics.txtInsertSegments.Text =
miDefInsSegmentsPerUpdateSet
frmTPCHMetrics.txtDeleteSegments.Text =
miDefDelSegmentsPerUpdateSet

#If TPC_H_KIT Then
    frmTPCHMetrics.lblFirstUpdateSet.Enabled = False
    frmTPCHMetrics.txtUpdateSetFirst.Enabled = False
#Else
    frmTPCHMetrics.lblFirstUpdateSet.Enabled = True
    frmTPCHMetrics.txtUpdateSetFirst.Enabled = True
' Initialize the first update set for the throughput run
    frmTPCHMetrics.txtUpdateSetFirst.Text =
miDefUpdateSetFirst
#End If

' Initialize the sequence in which queries are executed for
PowerRun
arQuerySequence(miStreamPowerRun, miQueryIdMin) =
14
arQuerySequence(miStreamPowerRun, miQueryIdMin + 1)
= 2
arQuerySequence(miStreamPowerRun, miQueryIdMin + 2)
= 9
arQuerySequence(miStreamPowerRun, miQueryIdMin + 3)
= 20
arQuerySequence(miStreamPowerRun, miQueryIdMin + 4)
= 6
arQuerySequence(miStreamPowerRun, miQueryIdMin + 5)
= 17
arQuerySequence(miStreamPowerRun, miQueryIdMin + 6)
= 18
arQuerySequence(miStreamPowerRun, miQueryIdMin + 7)
= 8

```

```

arQuerySequence(miStreamPowerRun, miQueryIdMin + 8)
= 21
arQuerySequence(miStreamPowerRun, miQueryIdMin + 9)
= 13
arQuerySequence(miStreamPowerRun, miQueryIdMin +
10) = 3
arQuerySequence(miStreamPowerRun, miQueryIdMin +
11) = 22
arQuerySequence(miStreamPowerRun, miQueryIdMin +
12) = 16
arQuerySequence(miStreamPowerRun, miQueryIdMin +
13) = 4
arQuerySequence(miStreamPowerRun, miQueryIdMin +
14) = 11
arQuerySequence(miStreamPowerRun, miQueryIdMin +
15) = 15
arQuerySequence(miStreamPowerRun, miQueryIdMin +
16) = 1
arQuerySequence(miStreamPowerRun, miQueryIdMin +
17) = 10
arQuerySequence(miStreamPowerRun, miQueryIdMin +
18) = 19
arQuerySequence(miStreamPowerRun, miQueryIdMin +
19) = 5
arQuerySequence(miStreamPowerRun, miQueryIdMin +
20) = 7
arQuerySequence(miStreamPowerRun, miQueryIdMin +
21) = 12

```

' Initialize the sequence in which throughput run queries are executed

```

arQuerySequence(miStreamPowerRun + 1, miQueryIdMin)
= 21
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 1) = 3
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 2) = 18
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 3) = 5
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 4) = 11
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 5) = 7
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 6) = 6
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 7) = 20
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 8) = 17
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 9) = 12
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 10) = 16
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 11) = 15
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 12) = 13
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 13) = 10

```

```

arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 14) = 2
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 15) = 8
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 16) = 14
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 17) = 19
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 18) = 9
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 19) = 22
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 20) = 1
arQuerySequence(miStreamPowerRun + 1, miQueryIdMin
+ 21) = 4

arQuerySequence(miStreamPowerRun + 2, miQueryIdMin)
= 6
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 1) = 17
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 2) = 14
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 3) = 16
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 4) = 19
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 5) = 10
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 6) = 9
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 7) = 2
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 8) = 15
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 9) = 8
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 10) = 5
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 11) = 22
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 12) = 12
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 13) = 7
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 14) = 13
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 15) = 18
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 16) = 1
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 17) = 4
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 18) = 20
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 19) = 3
arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 20) = 11

```

```

arQuerySequence(miStreamPowerRun + 2, miQueryIdMin
+ 21) = 21

arQuerySequence(miStreamPowerRun + 3, miQueryIdMin)
= 8
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 1) = 5
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 2) = 4
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 3) = 6
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 4) = 17
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 5) = 7
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 6) = 1
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 7) = 18
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 8) = 22
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 9) = 14
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 10) = 9
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 11) = 10
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 12) = 15
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 13) = 11
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 14) = 20
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 15) = 2
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 16) = 21
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 17) = 19
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 18) = 13
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 19) = 16
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 20) = 12
arQuerySequence(miStreamPowerRun + 3, miQueryIdMin
+ 21) = 3

arQuerySequence(miStreamPowerRun + 4, miQueryIdMin)
= 5
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 1) = 21
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 2) = 14
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 3) = 19
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 4) = 15

```

```

arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 5) = 17
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 6) = 12
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 7) = 6
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 8) = 4
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 9) = 9
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 10) = 8
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 11) = 16
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 12) = 11
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 13) = 2
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 14) = 10
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 15) = 18
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 16) = 1
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 17) = 13
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 18) = 7
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 19) = 22
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 20) = 3
arQuerySequence(miStreamPowerRun + 4, miQueryIdMin
+ 21) = 20

arQuerySequence(miStreamPowerRun + 5, miQueryIdMin)
= 21
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 1) = 15
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 2) = 4
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 3) = 6
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 4) = 7
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 5) = 16
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 6) = 19
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 7) = 18
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 8) = 14
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 9) = 22
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 10) = 11
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 11) = 13

```

```

arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 12) = 3
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 13) = 1
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 14) = 2
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 15) = 5
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 16) = 8
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 17) = 20
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 18) = 12
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 19) = 17
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 20) = 10
arQuerySequence(miStreamPowerRun + 5, miQueryIdMin
+ 21) = 9

arQuerySequence(miStreamPowerRun + 6, miQueryIdMin)
= 10
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 1) = 3
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 2) = 15
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 3) = 13
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 4) = 6
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 5) = 8
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 6) = 9
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 7) = 7
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 8) = 4
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 9) = 11
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 10) = 22
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 11) = 18
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 12) = 12
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 13) = 1
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 14) = 5
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 15) = 16
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 16) = 2
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 17) = 14
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 18) = 19

```

```

arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 19) = 20
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 20) = 17
arQuerySequence(miStreamPowerRun + 6, miQueryIdMin
+ 21) = 21

arQuerySequence(miStreamPowerRun + 7, miQueryIdMin)
= 18
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 1) = 8
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 2) = 20
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 3) = 21
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 4) = 2
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 5) = 4
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 6) = 22
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 7) = 17
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 8) = 1
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 9) = 11
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 10) = 9
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 11) = 19
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 12) = 3
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 13) = 13
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 14) = 5
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 15) = 7
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 16) = 10
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 17) = 16
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 18) = 6
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 19) = 14
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 20) = 15
arQuerySequence(miStreamPowerRun + 7, miQueryIdMin
+ 21) = 12

arQuerySequence(miStreamPowerRun + 8, miQueryIdMin)
= 19
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 1) = 1
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 2) = 15

```

```

arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 3) = 17
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 4) = 5
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 5) = 8
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 6) = 9
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 7) = 12
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 8) = 14
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 9) = 7
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 10) = 4
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 11) = 3
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 12) = 20
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 13) = 16
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 14) = 6
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 15) = 22
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 16) = 10
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 17) = 13
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 18) = 2
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 19) = 21
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 20) = 18
arQuerySequence(miStreamPowerRun + 8, miQueryIdMin
+ 21) = 11

arQuerySequence(miStreamPowerRun + 9, miQueryIdMin)
= 8
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 1) = 13
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 2) = 2
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 3) = 20
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 4) = 17
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 5) = 3
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 6) = 6
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 7) = 21
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 8) = 18
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 9) = 11

```

```

arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 10) = 19
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 11) = 10
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 12) = 15
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 13) = 4
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 14) = 22
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 15) = 1
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 16) = 7
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 17) = 12
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 18) = 9
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 19) = 14
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 20) = 5
arQuerySequence(miStreamPowerRun + 9, miQueryIdMin
+ 21) = 16

arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin) = 6
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 1) = 15
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 2) = 18
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 3) = 17
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 4) = 12
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 5) = 1
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 6) = 7
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 7) = 2
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 8) = 22
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 9) = 13
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 10) = 21
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 11) = 10
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 12) = 14
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 13) = 9
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 14) = 3
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 15) = 16
arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 16) = 20

```



```

    arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 17) = 19
    arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 18) = 11
    arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 19) = 4
    arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 20) = 8
    arQuerySequence(miStreamPowerRun + 10,
miQueryIdMin + 21) = 5

End Sub

Private Sub QueryRunDetails()
' Queries step execution records from the database

    Dim strSql As String

    On Error GoTo QueryRunDetailsErr

    Screen.MousePointer = vbHourglass

    Set mwrkJet = CreateWorkspace("tpch", "admin",
gsEmptyString, dbUseJet)

' Open database for exclusive access
    Set mDB = mwrkJet.OpenDatabase(msDbFile,
Options:=True)

    strSql = "select a.step_id, a.version_no, a.command, " & _
        " a.instance_id, a.parent_instance_id, a.iterator_value,
" & _
        " a.start_time, a.end_time, " & _
        " b.step_label, b.step_file_name, b.step_text, " & _
        " b.step_level, b.sequence_no, " & _
        " b.iterator_name " & _
        " from run_step_details a, att_steps b " & _
        " where a.step_id = b.step_id " & _
        " and a.version_no = b.version_no " & _
        " and a.run_id = " & CStr(mlRunId) & _
        " order by b.step_level, b.sequence_no, a.instance_id"

    Set mrecDtls = mDB.OpenRecordset(strSql,
dbOpenSnapshot)
    If mrecDtls.RecordCount = 0 Then
        Screen.MousePointer = vbDefault
        MsgBox "There are no records in the database for the run
identifier." & _
            " Unable to generate reports."
    Else
        Call CollectStats
    End If

    mrecDtls.Close
    CloseDbAndWsp

    Screen.MousePointer = vbDefault

Exit Sub

```

QueryRunDetailsErr:

```

    Screen.MousePointer = vbDefault
    DisplayErrors

    CloseDbAndWsp

End Sub
Public Sub GenerateSelected()
' Called when the user clicks on Generate on the
TPCHMetrics form.
' Validates all the user inputs and calls a function to
generate
' the reports if inputs are valid.
' Initializes module-level variables to the values input by the
user
    Dim sTemp As String

    On Error GoTo GenerateSelectedErr

' Initialize the enabled value for the type of report being
generated
    mbRunType(eRunType.Power) = _
        (frmTPCHMetrics.chkRun(eRunType.Power).Value =
vbChecked)
    mbRunType(eRunType.Throughput) = _
        (frmTPCHMetrics.chkRun(eRunType.Throughput).Value =
vbChecked)

    If (Not mbRunType(eRunType.Power) And Not
mbRunType(eRunType.Throughput)) Then
        MsgBox "Atleast one report type must be selected."
        Exit Sub
    End If

' Initialize the stream identifier bounds depending on the
type of
' report being generated
    miStreamIdLo = IIf(mbRunType(eRunType.Power),
miStreamPowerRun, miStreamPowerRun + 1)
    miStreamIdHi = IIf(mbRunType(eRunType.Throughput),
miStreamIdMax, miStreamPowerRun)
    If mbRunType(eRunType.Throughput) Then
        ' Initialize the number of throughput streams if a
throughput
        ' metric is being generated
        sTemp = Trim(frmTPCHMetrics.cboStreams.Text)
        If sTemp = gsEmptyString Then
            MsgBox "Please enter the number of throughput
streams that were executed."
            Exit Sub
        End If

        If IsNumeric(sTemp) = False Then
            MsgBox "The number of throughput streams must be
numeric."
            Exit Sub

```

```

End If

miStreamIdHi = CInt(sTemp)
If miStreamIdHi < 1 Or miStreamIdHi > miStreamIdMax
Then
    MsgBox "Number of throughput streams must range
from 1 to 10. " & _
        "Disable the throughput run checkbox if no
throughput streams were executed."
    Exit Sub
End If

' Initialize the run identifier
sTemp = Trim(frmTPCHMetrics.cboRunId.Text)
If sTemp = gsEmptyString Then
    MsgBox "Please enter the run identifier."
    Exit Sub
End If

If IsNumeric(sTemp) = False Then
    MsgBox "The run identifier must be numeric."
    Exit Sub
End If
mlRunId = CLng(sTemp)

' Initialize the scale factor for the run
sTemp = Trim(frmTPCHMetrics.cboSF.Text)
If sTemp = gsEmptyString Then
    MsgBox "Please enter the scale factor for the run."
    Exit Sub
End If

If IsNumeric(sTemp) = False Then
    MsgBox "The scale factor must be numeric."
    Exit Sub
End If
mfSF = CSng(sTemp)

' Initialize the workspace definition file
msDbFile = Trim(frmTPCHMetrics.txtDbFile)
If msDbFile = gsEmptyString Then
    MsgBox "Please enter the workspace definition file (.stp)
containing the run history."
    Exit Sub
End If

' Initialize the report file and ensure that it doesn't already
exist
msOutput = Trim(frmTPCHMetrics.txtReport)
If msOutput = gsEmptyString Then
    MsgBox "Please enter the output file name."
    Exit Sub
End If

msOutput = MakePathValid(msOutput)
If msOutput = gsEmptyString Then
    MsgBox "The output file path is not valid. Please enter a
valid path."

```

```

Exit Sub
End If

If Dir$(msOutput, vbNormal + vbHidden + vbReadOnly +
vbSystem) <> gsEmptyString Then
    MsgBox "The output file already exists. Please delete it
or enter a new one."
    Exit Sub
End If

' Initialize the number of insert and delete segments per
update set
sTemp = Trim(frmTPCHMetrics.txtInsertSegments.Text)
If sTemp = gsEmptyString Then
    MsgBox "Please enter the number of insert segments per
update set. (StepMaster parameter:
INSERT_SEGMENTS_PER_UPDATE_SET)"
    Exit Sub
End If

If IsNumeric(sTemp) = False Then
    MsgBox "The number of insert segments must be
numeric. (StepMaster parameter:
INSERT_SEGMENTS_PER_UPDATE_SET)"
    Exit Sub
End If
miInsSegmentsPerUpdateSet = CInt(sTemp)

sTemp = Trim(frmTPCHMetrics.txtDeleteSegments.Text)
If sTemp = gsEmptyString Then
    MsgBox "Please enter the number of delete segments per
update set. (StepMaster parameter:
DELETE_SEGMENTS_PER_UPDATE_SET)"
    Exit Sub
End If

If IsNumeric(sTemp) = False Then
    MsgBox "The number of delete segments must be
numeric. (StepMaster parameter:
DELETE_SEGMENTS_PER_UPDATE_SET)"
    Exit Sub
End If
miDelSegmentsPerUpdateSet = CInt(sTemp)

#If Not TPCH_KIT Then
If mbRunType(eRunType.Throughput) Then
    ' Initialize the value of the first update set
sTemp = Trim(frmTPCHMetrics.txtUpdateSetFirst.Text)
If sTemp = gsEmptyString Then
    MsgBox "Please enter the first update set for the
throughput run. (StepMaster parameter:
1ST_THRUPUT_UPDATE_SET)"
    Exit Sub
End If

If IsNumeric(sTemp) = False Then
    MsgBox "The first update set for the throughput run
must be numeric. (StepMaster parameter:
1ST_THRUPUT_UPDATE_SET)"

```

```

Exit Sub
End If
miUpdateSetFirst = CInt(sTemp)
End If
#End If

' The user inputs are valid. Call a procedure to query step
execution
' details and generate the TPCHEMetric report.
Call QueryRunDetails

Exit Sub

GenerateSelectedErr:
DisplayErrors

End Sub
Private Function LabelStartPower(iQueryId As Integer) As
String
' Returns the step label for the passed in power query
identifier
' Uses the label that marks the start of execution for the
query
' E.g. TPC-H Kit, Stream1, RF1: the start time for the
refresh function
' is the start time for the step, 'Throughput - Semaphore
Loop for RF Delay'
' but the end time for the refresh function is the end time for
the step,
' 'Throughput - Execute Stream1 RF1'
' Similarly, in the HP version of the TPC-H Kit, Throughput
Run, RF1:
' the start time for RF1 is the start time for the step,
' 'Wait for Throughput Run' but the end time for RF1 is the
end time
' for the step, 'Throughput RF1'
' E.g. in the HP version of the TPC-H Kit, query 15 is
executed in
' 2 parts. Therefore, the start time for query 15 is the start
time
' for the step, 'Create REVENUE View' but the end time for
query 15
' is the end time for the step, 'Execute using REVENUE'

Select Case iQueryId
Case miQueryIdRF1
LabelStartPower = msStartStepLabelPowerRF1

Case miQueryIdRF2
LabelStartPower = msStartStepLabelPowerRF2

#If Not TPCHEKIT Then
Case miQuery15
LabelStartPower = msStartStepLabelPower15
#End If

Case Else
LabelStartPower = msStartStepLabelPowerOther &
Format$(iQueryId, msFmtNumberPadWZeroes)

```

```

End Select

End Function
Private Function LabelEndPower(iQueryId As Integer) As
String
' Returns the step label for the passed in power query
identifier
' Uses the label that marks the end of execution for the
query
' E.g. TPC-H Kit, Stream1, RF1: the start time for the
refresh function
' is the start time for the step, 'Throughput - Semaphore
Loop for RF Delay'
' but the end time for the refresh function is the end time for
the step,
' 'Throughput - Execute Stream1 RF1'
' Similarly, in the HP version of the TPC-H Kit, Throughput
Run, RF1:
' the start time for RF1 is the start time for the step,
' 'Wait for Throughput Run' but the end time for RF1 is the
end time
' for the step, 'Throughput RF1'
' E.g. in the HP version of the TPC-H Kit, query 15 is
executed in
' 2 parts. Therefore, the start time for query 15 is the start
time
' for the step, 'Create REVENUE View' but the end time for
query 15
' is the end time for the step, 'Execute using REVENUE'

#If TPCHEKIT Then
Debug.Assert iQueryId = miQueryIdRF1 Or iQueryId =
miQueryIdRF2
Select Case iQueryId
Case miQueryIdRF1
LabelEndPower = msEndStepLabelPowerRF1
Case miQueryIdRF2
LabelEndPower = msEndStepLabelPowerRF2
End Select
#Else
Debug.Assert iQueryId = miQueryIdRF1 Or iQueryId =
miQueryIdRF2 Or iQueryId = miQuery15
Select Case iQueryId
Case miQueryIdRF1
LabelEndPower = msEndStepLabelPowerRF1
Case miQueryIdRF2
LabelEndPower = msEndStepLabelPowerRF2
Case miQuery15
LabelEndPower = msEndStepLabelPower15
End Select
#End If

End Function
#If Not TPCHEKIT Then
Private Function GetEndStepIfThroughput(iQueryId As
Integer) As String
' Returns the iterator value for the passed in query identifier
' for the throughput run

```

```

' Returns the iterator value that marks the end of execution
for the query
' E.g. in the HP version of the TPC-H Kit, query 15 is
executed in
' 2 parts. Therefore, the iterator value for the start of query
15
' is 15V but the the iterator value for the end of query 15 is
15

Debug.Assert iQueryId = miQuery15
GetEndStepItThroughput = miQuery15

End Function
#End If

Private Function LabelStartThroughput(iStream As Integer, _
    iQuery As Integer) As String
' Returns the step label for the passed in query and stream in
the
' throughput run
' Returns the label that marks the start of execution for the
query
' E.g. TPC-H Kit, Stream1, RF1: the start time for the
refresh function
' is the start time for the step, 'Throughput - Semaphore
Loop for RF Delay'
' but the end time for the refresh function is the end time for
the step,
' 'Throughput - Execute Stream1 RF1'
' Similarly, in the HP version of the TPC-H Kit, Throughput
Run, RF1:
' the start time for RF1 is the start time for the step,
' 'Wait for Throughput Run' but the end time for RF1 is the
end time
' for the step, 'Throughput RF1'

#If TPC_H_KIT Then
    Select Case iQuery
        Case miQueryIdRF1
            LabelStartThroughput = IIf(iStream =
miStreamPowerRun + 1, _
                msStartStepLabelThroughputRF1First, _
                msLblThroughputRF1)

        Case miQueryIdRF2
            LabelStartThroughput = msLblThroughputRF2

        Case Else
            LabelStartThroughput =
msStepLabelThroughputOther & _
                Format$(iStream, msFmtNumberWOZeroes)
    End Select
#Else
    Select Case iQuery
        Case miQueryIdRF1
            LabelStartThroughput =
msStartStepLabelThroughputRF1

        Case miQueryIdRF2

```

```

            LabelStartThroughput =
msStartStepLabelThroughputRF2

        Case Else
            LabelStartThroughput =
msStartStepLabelThroughputOther & _
                Format$(iStream, msFmtNumberPadWZeroes)
    End Select
#End If

End Function

Private Function LabelEndThroughput(iStream As Integer,
iQuery As Integer) As String
' Returns the step label for the passed in query and stream in
the
' throughput run
' Returns the label that marks the end of execution for the
query
' E.g. TPC-H Kit, Stream1, RF1: the start time for the
refresh function
' is the start time for the step, 'Throughput - Semaphore
Loop for RF Delay'
' but the end time for the refresh function is the end time for
the step,
' 'Throughput - Execute Stream1 RF1'
' Similarly, in the HP version of the TPC-H Kit, Throughput
Run, RF1:
' the start time for RF1 is the start time for the step,
' 'Wait for Throughput Run' but the end time for RF1 is the
end time
' for the step, 'Throughput RF1'

#If TPC_H_KIT Then
    Select Case iQuery
        Case miQueryIdRF1
            LabelEndThroughput = msLblThroughputRF1

        Case miQueryIdRF2
            LabelEndThroughput = IIf(iStream = miStreamIdHi, _
                msLblThroughputRF2,
msEndStepLabelThroughputRF2Rest)

        Case Else
            Debug.Assert True
    End Select
#Else
    LabelEndThroughput = msEndStepLabelThroughputRF1
#End If

End Function

Private Function IteratorThroughput(iStream As Integer,
iQuery As Integer) As String
' Returns the iterator value for the passed in stream and
query
' for the throughput run
' Returns the iterator value that marks the start of execution
for the query

```

' E.g. in the HP version of the TPC-H Kit, query 15 is executed in
 ' 2 parts. Therefore, the iterator value for the start of query 15
 ' is 15V but the the iterator value for the end of query 15 is 15

```
#If TPC_H_KIT Then
  Dim iQIndex As Integer
#End If
```

```
Select Case iQuery
  Case miQueryIdRF1
    IteratorThroughput = msFirstRFIterator

  Case miQueryIdRF2
    IteratorThroughput = msFirstRFIterator

  Case Else
    #If TPC_H_KIT Then
      ' The step iterates from 1 to 22 but the queries are
      ' generated
      ' by qgen in the order that they should be executed
      ' in.
      ' e.g. Stream1Q1.sql contains the query
      ' corresponding to
      ' Stream 1, Query 21
      For iQIndex = miQueryIdMin To miQueryIdMax
        Step 1
          If arQuerySequence(iStream, iQIndex) = iQuery
            Then
              Exit For
            End If
          Next iQIndex
```

```
        IteratorThroughput = Format$(iQIndex,
msFmtNumberWOZeroes)
      #Else
        IteratorThroughput = Format$(iQuery,
msFmtNumberWOZeroes)
        If iQuery = miQuery15 Then
          ' Query 15 starts with the creation of the view
          ' The query file is 15V + StreamId.sql and the
          iterator
          ' value is 15V
          IteratorThroughput = IteratorThroughput & "V"
        End If
      #End If
    End Select
```

```
End Function
Private Function IteratorPowerRF(iStream As Integer, iQuery
As Integer) As String
  ' Returns the iterator value for the passed in query in the
  PowerRun
```

```
  Debug.Assert iQuery = miQueryIdRF1 Or iQuery =
miQueryIdRF2
```

```
Select Case iQuery
  Case miQueryIdRF1
    IteratorPowerRF = msFirstRFIterator

  Case miQueryIdRF2
    IteratorPowerRF = msFirstRFIterator
```

```
End Select
```

```
End Function
```

```
Private Sub CollectStats()
  ' This function determines the start time, end time and start
  time for
  ' the next step (if applicable) for each query in each stream
```

```
  Dim iStreamId As Integer
  Dim iParentInstId As Long
  Dim iQueryId As Integer
  Dim iNextQuery As Integer
  Dim iNextStream As Integer
  Dim sLabel As String
  Dim sIt As String
  Dim sSql As String
  Dim iUBound As Integer
```

```
  If mbRunType(eRunType.Power) Then
    ' Populate start and end times for the PowerRun
    iStreamId = miStreamPowerRun
```

```
  For iQueryId = miQueryIdMin To miQueryIdMax Step 1
    ' Determine the start time for the step using the step
    label
    sLabel = LabelStartPower(iQueryId)
```

```
    sSql = "step_label = " &
    MakeStringFieldValid(sLabel)
```

```
    If (iQueryId = miQueryIdRF1 Or iQueryId =
miQueryIdRF2) Then
      sIt = IteratorPowerRF(iStreamId, iQueryId)
      sSql = sSql & " and iterator_value = " &
      MakeStringFieldValid(sIt)
    End If
```

```
    mrecDtls.FindFirst sSql
    If mrecDtls.NoMatch = True Then
      MsgBox "Step " & "" & sLabel & "" & " not found."
      " & _
      "The PowerRun was not completely executed!"
    Exit Sub
  End If
```

```
  arExecutionDtls(iStreamId, iQueryId).StartTime =
mrecDtls.Fields("start_time").Value
```

```
  ' Determine the end time for the step
```

```

        If iQueryId = miQueryIdRF1 Or iQueryId =
miQueryIdRF2 Then
            ' RF1 and RF2, find the time at which the last
refresh function
            ' completed
            sLabel = LabelEndPower(iQueryId)
            arExecutionDtls(iStreamId, iQueryId).EndTime = 0

            iUBound = IIf(iQueryId = miQueryIdRF1,
miInsSegmentsPerUpdateSet, _
miDelSegmentsPerUpdateSet)

            For iNextQuery = msFirstRFIterator To iUBound
Step 1
                sSql = "step_label = " &
MakeStringFieldValid(sLabel) & _
                " and iterator_value = "
                sIt = Format$(iNextQuery,
msFmtNumberWOZeroes)
                sSql = sSql & MakeStringFieldValid(sIt)
                mrecDtls.FindFirst sSql
                If mrecDtls.NoMatch = True Then
                    MsgBox "Step " & "" & sLabel & "" & _
                        " not found for iterator " & "" & sIt & ""
& ". " & _
                    "The PowerRun was not completely
executed!"
                    Exit Sub
                End If
                If mrecDtls.Fields("end_time").Value > _
arExecutionDtls(iStreamId,
iQueryId).EndTime Then
                    arExecutionDtls(iStreamId,
iQueryId).EndTime = _
mrecDtls.Fields("end_time").Value
                End If
                Next iNextQuery
                #If Not TPCH_KIT Then
                ElseIf iQueryId = miQuery15 Then
                    sLabel = LabelEndPower(iQueryId)
                    sSql = "step_label = " &
MakeStringFieldValid(sLabel)
                    mrecDtls.FindFirst sSql
                    If mrecDtls.NoMatch = True Then
                        MsgBox "Step " & "" & sLabel & "" & " not
found. " & _
                            "The PowerRun was not completely
executed!"
                        Exit Sub
                    End If
                    arExecutionDtls(iStreamId, iQueryId).EndTime =
mrecDtls.Fields("end_time").Value
                #End If
                Else
                    arExecutionDtls(iStreamId, iQueryId).EndTime =
mrecDtls.Fields("end_time").Value
                End If
            End For
        End If
    End Sub

```

```

        ' The timing interval for a query is the time between
the start
        ' time of the next query and the start time of the query,
except
        ' for the last query of the set for which it is the time
between
        ' the end time of the query and the start time
        ' The timing interval for the execution of the refresh
function
        ' must be measured between the start time for the first
        ' refresh function and the end time for the last refresh
function
        ' Refer to Sections 5.3.7.2 and 5.3.7.3 of the TPC-H
Spec. Rev 1.1.0
        If NextStepExists(iStreamId, iQueryId, iNextQuery)
Then
            ' Determine the start time of the next step, if
applicable
            sLabel = LabelStartPower(iNextQuery)

            sSql = "step_label = " &
MakeStringFieldValid(sLabel)
            mrecDtls.FindFirst sSql
            If mrecDtls.NoMatch = True Then
                MsgBox "Step " & "" & sLabel & "" & " not
found. " & _
                    "The PowerRun was not completely
executed!"
                Exit Sub
            End If

            arExecutionDtls(iStreamId,
iQueryId).StartTimeNextStep = _
mrecDtls.Fields("start_time").Value
            Else
                ' Else, initialize start time for the next step to the end
time for the step
                arExecutionDtls(iStreamId,
iQueryId).StartTimeNextStep = _
arExecutionDtls(iStreamId,
iQueryId).EndTime
            End If

            ' Convert all the 64-bit timestamps to string values
            arExecutionDtls(iStreamId, iQueryId).sStartTm =
JulianToString(arExecutionDtls(iStreamId,
iQueryId).StartTime)
            arExecutionDtls(iStreamId, iQueryId).sEndTm =
JulianToString(arExecutionDtls(iStreamId,
iQueryId).EndTime)
            arExecutionDtls(iStreamId, iQueryId).sStartNextTm =
JulianToString(arExecutionDtls(iStreamId,
iQueryId).StartTimeNextStep)
            Next iQueryId
        End If

        If mbRunType(eRunType.Throughput) Then
            ' Populate start and end times for the ThroughputRun
            For iStreamId = miStreamIdMin + 1 To miStreamIdHi

```

```

For iQueryId = miQueryIdMin To miQueryIdMax
Step 1
    ' Determine the start time for the step using the step
    label
    sLabel = LabelStartThroughput(iStreamId,
iQueryId)
    sSql = "step_label = " &
MakeStringFieldValid(sLabel)

    #If TPCCH_KIT Then
        If (iQueryId <> miQueryIdRF1 Or iStreamId <>
miStreamPowerRun + 1) Then
            sIt = IteratorThroughput(iStreamId, iQueryId)
            sSql = sSql & " and iterator_value = " &
MakeStringFieldValid(sIt)
            End If
        #Else
            If iQueryId <> miQueryIdRF1 Then
                sIt = IteratorThroughput(iStreamId, iQueryId)
                sSql = sSql & " and iterator_value = " &
MakeStringFieldValid(sIt)
                End If
            #End If

        If iQueryId = miQueryIdRF1 Or iQueryId =
miQueryIdRF2 Then
            lParentInstId = ParentInstId(iStreamId, iQueryId)
            If lParentInstId = 0 Then Exit Sub
            sSql = sSql & " and parent_instance_id = " &
CStr(lParentInstId)
            End If

            mrecDtls.FindFirst sSql
            If mrecDtls.NoMatch = True Then
                MsgBox "Step " & "" & sLabel & "" & _
                    " not found for iterator " & "" & sIt & "" &
                    ". " & _
                    "The Throughput Run was not completely
executed!"
                Exit Sub
            End If

            arExecutionDtls(iStreamId, iQueryId).StartTime =
mrecDtls.Fields("start_time").Value

            ' Determine the end time for the step

            If iQueryId = miQueryIdRF1 Or iQueryId =
miQueryIdRF2 Then
                ' RF1 and RF2, find the time at which the last
refresh
                ' function completed
                arExecutionDtls(iStreamId, iQueryId).EndTime =
0

                iUBound = IIf(iQueryId = miQueryIdRF1,
miInsSegmentsPerUpdateSet, _
miDelSegmentsPerUpdateSet)

```

```

#If TPCCH_KIT Then
    sLabel = LabelEndThroughput(iStreamId,
iQueryId)
#Else
    If iQueryId = miQueryIdRF1 Then
        sLabel = LabelEndThroughput(iStreamId,
iQueryId)
    End If
#End If
lParentInstId = ParentInstIdEnd(iStreamId,
iQueryId)

#If TPCCH_KIT Then
    If iQueryId = miQueryIdRF2 And iStreamId
<> miStreamIdHi Then
        sSql = "step_label = " &
MakeStringFieldValid(sLabel) & _
            " and parent_instance_id = " &
CStr(lParentInstId)

        mrecDtls.FindFirst sSql
        If mrecDtls.NoMatch = True Then
            MsgBox "Step " & "" & sLabel & "" & _
                " not found for iterator " & "" & sIt
                & "" & ". " & _
                "The Throughput run was not
completely executed!"
            Exit Sub
        End If
        arExecutionDtls(iStreamId,
iQueryId).EndTime = _
            mrecDtls.Fields("end_time").Value
        Else
            #End If

        ' Find the time at which the last refresh
function completed
        For iNextQuery = msFirstRFIterator To
iUBound Step 1
            sIt = Format$(iNextQuery,
msFmtNumberWOZeroes)
            sSql = "step_label = " &
MakeStringFieldValid(sLabel) & _
                " and iterator_value = " &
MakeStringFieldValid(sIt)
            sSql = sSql & " and parent_instance_id = "
& CStr(lParentInstId)

            mrecDtls.FindFirst sSql
            If mrecDtls.NoMatch = True Then
                MsgBox "Step " & "" & sLabel & "" & _
                    " not found for iterator " & "" & sIt
                    & "" & ". " & _
                    "The Throughput run was not
completely executed!"
                Exit Sub
            End If
            If mrecDtls.Fields("end_time").Value > _

```

```

        arExecutionDtls(iStreamId,
iQueryId).EndTime Then
        arExecutionDtls(iStreamId,
iQueryId).EndTime = _
            mrecDtls.Fields("end_time").Value
        End If
        Next iNextQuery

        #If TPC_H_KIT Then
        End If
        #End If

        #If Not TPC_H_KIT Then
        ElseIf iQueryId = miQuery15 Then
            sLabel = LabelStartThroughput(iStreamId,
iQueryId)

            sIt = GetEndStepItThroughput(iQueryId)
            sSql = "step_label = " &
MakeStringFieldValid(sLabel) & _
                " and iterator_value = " &
MakeStringFieldValid(sIt)

            mrecDtls.FindFirst sSql
            If mrecDtls.NoMatch = True Then
                MsgBox "Step " & "" & sLabel & "" & _
                    " not found for iterator " & "" & sIt &
"" & ". " & _
                    "The Throughput run was not
completely executed!"
                Exit Sub
            End If
            arExecutionDtls(iStreamId,
iQueryId).EndTime = mrecDtls.Fields("end_time").Value
        #End If
        Else
            arExecutionDtls(iStreamId, iQueryId).EndTime =
mrecDtls.Fields("end_time").Value
        End If

        ' The timing interval for a query is the time between
the start
        ' time of the next query and the start time of the
query, except
        ' for the last query of the set for which it is the time
between
        ' the end time of the query and the start time
        ' The timing interval for the execution of the refresh
function
        ' must be measured between the start time for the
first
        ' refresh function and the end time for the last
refresh function
        ' Refer to Sections 5.3.7.2 and 5.3.7.3 of the TPC-H
Spec. Rev 1.1.0
        If NextStepExists(iStreamId, iQueryId, iNextQuery)
Then
            ' Determine the start time of the next step, if
applicable
            iNextStream = iStreamId

```

```

            sLabel = LabelStartThroughput(iNextStream,
iNextQuery)
            sSql = "step_label = " &
MakeStringFieldValid(sLabel)
            #If TPC_H_KIT Then
                sIt = IteratorThroughput(iNextStream,
iNextQuery)
                sSql = sSql & " and iterator_value = " &
MakeStringFieldValid(sIt)
            #Else
                sIt = IteratorThroughput(iNextStream,
iNextQuery)
                sSql = sSql & " and iterator_value = " &
MakeStringFieldValid(sIt)
            #End If

            If iQueryId = miQueryIdRF1 Or iQueryId =
miQueryIdRF2 Then
                lParentInstId = ParentInstId(iNextStream,
iNextQuery)
                If lParentInstId = 0 Then Exit Sub
                sSql = sSql & " and parent_instance_id = " &
CStr(lParentInstId)
            End If

            mrecDtls.FindFirst sSql
            If mrecDtls.NoMatch = True Then
                MsgBox "Step " & "" & sLabel & "" & _
                    " not found for iterator " & "" & sIt & ""
& ". " & _
                    "The Throughput run was not completely
executed!"
                Exit Sub
            End If

            arExecutionDtls(iStreamId,
iQueryId).StartTimeNextStep =
mrecDtls.Fields("start_time").Value
        Else
            ' Else, initialize start time for the next step to the
end time for the step
            arExecutionDtls(iStreamId,
iQueryId).StartTimeNextStep = arExecutionDtls(iStreamId,
iQueryId).EndTime
        End If

        ' Convert all the 64-bit timestamps to string values
        arExecutionDtls(iStreamId, iQueryId).sStartTm =
JulianToString(arExecutionDtls(iStreamId,
iQueryId).StartTime)
        arExecutionDtls(iStreamId, iQueryId).sEndTm =
JulianToString(arExecutionDtls(iStreamId,
iQueryId).EndTime)
        arExecutionDtls(iStreamId, iQueryId).sStartNextTm
= JulianToString(arExecutionDtls(iStreamId,
iQueryId).StartTimeNextStep)

        Next iQueryId
        Next iStreamId

```



```

End If

' Call a procedure to calculate the elapsed time for each step
and
' the Power and Throughput Metrics
Call CalcElapsedTmAndPrint

End Sub
Private Function JulianToString(cJTime As Currency)
' Converts the passed in 64-bit date to a formatted string
that can
' be printed in the report
' The format of date/time in reports is yyyy-mm-dd
hh:mm:ss.sss
' This format has these benefits:
' - is sortable, since all fields are arranged most to least
significant
' and all numeric
' - is directly interpreted by Excel as a time/date value
' - is fixed width
' - is Y2K compliant

Dim lYr As Long
Dim lMon As Long
Dim lDt As Long
Dim lHr As Long
Dim lMin As Long
Dim lSec As Long
Dim lMs As Long
Dim cJTemp As Currency

Call smtimelib.JulianToTime(cJTime, lYr, lMon, lDt, lHr,
lMin, lSec, lMs)
JulianToString = Format$(lYr, msFmtYrPadWZeroes) &
msDtSeparator & _
Format$(lMon, msFmtNumberPadWZeroes) &
msDtSeparator & _
Format$(lDt, msFmtNumberPadWZeroes) & msBlank
& _
Format$(lHr, msFmtNumberPadWZeroes) &
msTmSeparator & _
Format$(lMin, msFmtNumberPadWZeroes) &
msTmSeparator & _
Format$(lSec, msFmtNumberPadWZeroes) &
msMsSeparator & _
Format$(lMs, msFmtMsPadWZeroes)

End Function
Public Sub LoadRunIds(cboLoad As ComboBox, sDbFile As
String)
' Opens the passed in workspace definition file and loads all
the
' run identifiers in the passed in combo box

Dim strSql As String
Dim lRunId As Long

On Error GoTo LoadRunIdsErr

```

```

Screen.MousePointer = vbHourglass

Set mwrkJet = CreateWorkspace("tpch", "admin",
gsEmptyString, dbUseJet)

' Open database for exclusive access
Set mDB = mwrkJet.OpenDatabase(sDbFile,
Options:=True)

strSql = "select run_id from run_header order by run_id
desc"
Set mrecDtls = mDB.OpenRecordset(strSql,
dbOpenSnapshot)

cboLoad.Clear

If mrecDtls.RecordCount = 0 Then
Screen.MousePointer = vbDefault
MsgBox "There are no run records. Unable to load list of
run ids."
Else
mrecDtls.MoveFirst
While Not mrecDtls.EOF
' Add run identifier to the combo box
lRunId = mrecDtls.Fields("run_id").Value
cboLoad.AddItem CStr(lRunId)

mrecDtls.MoveNext
Wend
If cboLoad.ListCount > 0 Then
cboLoad.ListIndex = 0
End If
End If

mrecDtls.Close
CloseDbAndWsp

Screen.MousePointer = vbDefault

Exit Sub

LoadRunIdsErr:

Screen.MousePointer = vbDefault
DisplayErrors

CloseDbAndWsp

End Sub
Public Sub LoadSFAndStreams(cboSF As ComboBox,
cboStreams As ComboBox)
' Loads all the valid scale factors in cboSF
' Loads the number of throughput streams for each scale
factor in
' cboStreams
' This procedure assumes that the arrays, marrSF and
marrStreams have
' already been initialized.

```

```

Dim iIndex As Integer

On Error GoTo LoadSFAndStreamsErr

cboSF.Clear
cboStreams.Clear

For iIndex = LBound(marrSF) To UBound(marrSF)
    cboSF.AddItem CStr(marrSF(iIndex))
    cboSF.ItemData(iIndex) = iIndex

    cboStreams.AddItem CStr(marrStreams(iIndex))
    cboStreams.ItemData(iIndex) = iIndex
Next iIndex

cboSF.ListIndex = miDefaultSF
cboStreams.ListIndex = miDefaultSF

Exit Sub

LoadSFAndStreamsErr:

    DisplayErrors

End Sub

Private Function NextStepExists(iStream As Integer, iQuery
As Integer, _
    iNextQuery As Integer) As Boolean
    ' Returns False if this is the last step in the query stream
    ' If not, populates iNextQuery with the index of the next
    query

    Dim iQIndex As Integer

    If iQuery = miQueryIdRF1 Or iQuery = miQueryIdRF2
Then
        NextStepExists = False
    Else
        For iQIndex = LBound(arQuerySequence,
miDimensionQuery) _
            To UBound(arQuerySequence, miDimensionQuery)
Step 1
            If arQuerySequence(iStream, iQIndex) = iQuery Then
                Exit For
            End If
        Next iQIndex

        NextStepExists = (iQIndex < UBound(arQuerySequence,
miDimensionQuery))

        If NextStepExists Then
            iNextQuery = arQuerySequence(iStream, iQIndex + 1)
        End If
    End If

End Function

Private Sub PrintStatistics(fQppPower As Double,
fElapsedThroughput As Double, _

```

```

    fQppThroughput As Double, fQppH As Double,
sStartTm As String, _
    sEndTm As String)
    ' This function prints the execution statistics for each step
    ' and the Power and Throughput Metrics to the output file

    Dim iQIndex As Integer
    Dim iSIndex As Integer
    Dim sPrint As String
    Dim hOutputFile As Integer

    hOutputFile = 0

    hOutputFile = FreeFile
    Open msOutput For Output Shared As hOutputFile
    ' Header information
    Print #hOutputFile, "Workspace file:" & vbTab &
msDbFile
    Print #hOutputFile, "Run identifier:" & vbTab &
CStr(mlRunId)
    Print #hOutputFile, "Database Scale Factor:" & vbTab &
CStr(mfSF)
    Print #hOutputFile, "Query Streams for Throughput Test:"
& vbTab & CStr(miStreamIdHi)
    Print #hOutputFile, "Measurement Interval in Throughput
Test (Ts):" & vbTab & CStr(fElapsedThroughput) & vbTab &
vbTab & _
        "Start Time: " & vbTab & sStartTm & vbTab
& vbTab & _
        "End Time: " & vbTab & sEndTm
    Print #hOutputFile, "TPC-H Power:" & vbTab &
CStr(fQppPower)
    Print #hOutputFile, "TPC-H Throughput:" & vbTab &
CStr(fQppThroughput)
    Print #hOutputFile, "TPC-H Composite Query-Per-Hour
Rating (QphH):" & vbTab & CStr(fQppH)
    Print #hOutputFile,

    ' Print Query names in column header
    Print #hOutputFile, vbTab;

    For iQIndex = miQueryIdMin To miQueryIdRF1 - 1
        sPrint = "Q" & Format$(iQIndex,
msFmtNumberWOZeroes) & vbTab
        Print #hOutputFile, sPrint;
    Next iQIndex

    For iQIndex = miQueryIdRF1 To miQueryIdRF2
        sPrint = "RF" & Format$(iQIndex - miQueryIdRF1 + 1,
msFmtNumberWOZeroes) & vbTab
        Print #hOutputFile, sPrint;
    Next iQIndex

    Print #hOutputFile,

    ' Print TPC-H timing intervals for each query in timing grid
    For iSIndex = miStreamIdLo To miStreamIdHi

```

```

sPrint = "Stream " & Format$(iSIndex,
msFmtNumberPadWZeroes) & vbTab
Print #hOutputFile, sPrint;

For iQIndex = miQueryIdMin To miQueryIdMax Step 1

    sPrint = CStr(arExecutionDtls(iSIndex,
iQIndex).ElapsedTpch) & vbTab
    Print #hOutputFile, sPrint;
    Next iQIndex

    Print #hOutputFile,

Next iSIndex

Print #hOutputFile,
Print #hOutputFile, "Elapsed times for each step"
Print #hOutputFile,

' Print elapsed times for each query in timing grid
For iSIndex = miStreamIdLo To miStreamIdHi

    sPrint = "Stream " & Format$(iSIndex,
msFmtNumberPadWZeroes) & vbTab
    Print #hOutputFile, sPrint;

    For iQIndex = miQueryIdMin To miQueryIdMax Step 1

        sPrint = CStr(arExecutionDtls(iSIndex,
iQIndex).ElapsedTime) & vbTab
        Print #hOutputFile, sPrint;
        Next iQIndex

        Print #hOutputFile,

    Next iSIndex

    Print #hOutputFile,
    Print #hOutputFile, vbTab & "Query Id" & vbTab & "Start
Time" & vbTab & _
        "End Time" & vbTab & "Start Next Step" & vbTab &
"Step Delta" & vbTab & _
        "Official Query Elapsed" & vbTab & "Difference"

' Print step execution details, viz. start time, end time,
TPCH timing
' interval and elapsed times for each query
For iSIndex = miStreamIdLo To miStreamIdHi

    sPrint = "Stream " & Format$(iSIndex,
msFmtNumberPadWZeroes)
    Print #hOutputFile, sPrint;

    For iQIndex = miQueryIdMin To miQueryIdMax Step 1

        sPrint = vbTab & CStr(iQIndex) & vbTab & _
            arExecutionDtls(iSIndex, iQIndex).sStartTm &
vbTab & _

```

```

arExecutionDtls(iSIndex, iQIndex).sEndTm &
vbTab & _
            arExecutionDtls(iSIndex, iQIndex).sStartNextTm
& vbTab & _
            CStr(arExecutionDtls(iSIndex,
iQIndex).ElapsedTime) & vbTab & _
            CStr(arExecutionDtls(iSIndex,
iQIndex).ElapsedTpch) & vbTab & _
            Round(CStr(arExecutionDtls(iSIndex,
iQIndex).ElapsedTpch - arExecutionDtls(iSIndex,
iQIndex).ElapsedTime), miNumDecimalPlaces)
            Print #hOutputFile, sPrint
            Next iQIndex

        Print #hOutputFile,

    Next iSIndex

    Close hOutputFile
    hOutputFile = 0

    MsgBox "The report has been generated at " & gsSQ &
msOutput & gsSQ & "!"

    Exit Sub

GenerateSelectedErr:
    DisplayErrors

    If hOutputFile <> 0 Then
        Close hOutputFile
    End If

End Sub
Public Sub SFChanged()

    ' Called when the scale factor is changed - modifies the
number
    ' of streams depending on the scale factor
    frmTPCHMetrics.cboStreams.ListIndex =
frmTPCHMetrics.cboSF.ListIndex

End Sub

```

Utility.bas

```

Attribute VB_Name = "Utility"
' FILE:    Utility.bas
'         Reporting Program for Microsoft TPC-H Kit Ver.
1.00
'         Copyright Microsoft, 1999
'         All Rights Reserved
'
' PURPOSE:  Utility functions for TPCHMetrics report
generation program
' Contact:  Reshma Tharamal (reshmat@microsoft.com)

```

'

Option Explicit

Private Type OPENFILENAME

lStructSize As Long
hwndOwner As Long
hInstance As Long
lpstrFilter As String
lpstrCustomFilter As String
nMaxCustFilter As Long
nFilterIndex As Long
lpstrFile As String
nMaxFile As Long
lpstrFileName As String
nMaxFileName As Long
lpstrInitialDir As String
lpstrTitle As String
Flags As Long
nFileOffset As Integer
nFileExtension As Integer
lpstrDefExt As String
lCustData As Long
lpfnHook As Long
lpTemplateName As Long

End Type

Private Declare Function GetOpenFileName Lib

"COMDLG32" _

Alias "GetOpenFileNameA" (file As OPENFILENAME)
As Long

Public Const MAX_PATH = 255

Public Const gsEmptyString As String = ""

Public Const gsSQ As String = ""

Public Const gsPeriod As String = "."

Public Const gsDefDBFileExt As String = ".stp"

Public Const gsFileSeparator = "\"

Public Const gsPipe = "|"

Public Const gsNullValue = "null"

Private Const ms_DLG_TITLE_OPEN = "Open"

Private Enum EOpenFile

OFN_OVERWRITEPROMPT = &H2
OFN_HIDEREADONLY = &H4
OFN_FILEMUSTEXIST = &H1000
OFN_EXPLORER = &H80000

End Enum

Private Const ml_FILE_DB_FLAGS =
OFN_FILEMUSTEXIST

' Note: The flag below is meaningless, since it doesn't work
for open file dialogs

Private Const ml_FILE_OUTPUT_FLAGS =
OFN_OVERWRITEPROMPT

Private Const ms_FILE_ALL_FILTER = "|All Files (*.*)|*.*"

Private Const ms_FILE_DB_FILTER = "Stepmaster
Workspace Files (*.\" & gsDefDBFileExt & ")|*\" &
gsDefDBFileExt

Private Const ms_FILE_OUTPUT_FILTER = "Text Files
(*.*|*.txt)"

Public Function MakeStringFieldValid(strField As String) As
String

' Returns a string that can be appended to any insert
' or modify (sql) statement

' It checks whether the text is empty

' If so, it returns the string, "null"

If strField = gsEmptyString Then

MakeStringFieldValid = gsNullValue

Else

' Single-quotes have to be replaced by two single-quotes,

' since a single-quote is the identifier delimiter

' character - call a procedure to do the replace

MakeStringFieldValid = ReplaceSubString(strField,
gsSQ, gsSQ & gsSQ)

' Replace pipe characters with the corresponding chr
function

MakeStringFieldValid = ReplaceSubString(strField,
gsPipe, "\" & Chr(124) & ")

' Enclose the string in single quotes

MakeStringFieldValid = gsSQ & strField & gsSQ

End If

End Function

Public Function ReplaceSubString(ByVal MainString As
String, _

ByVal ReplaceString As String, _

ByVal ReplaceWith As String) As String

' Replaces all occurrences of ReplaceString in MainString
with ReplaceWith

Dim intPos As Integer

Dim strTemp As String

strTemp = MainString

intPos = InStr(strTemp, ReplaceString)

Do While intPos <> 0

strTemp = Left(strTemp, intPos - 1) & ReplaceWith & _
Mid(strTemp, intPos + Len(ReplaceString))

intPos = InStr(intPos + Len(ReplaceString) + 1, strTemp,
ReplaceString)

Loop

ReplaceSubString = strTemp

End Function

Public Function ShowFileDialog(ByVal strFilter As
String, _

```

    ByVal strDialogTitle As String, ByVal lngFlags As
Long, _
    Optional ByVal strOldFile As String = gsEmptyString)
As String

```

```

' Returns the file name selected by the user
Dim strInitDir As String
Dim intPos As Integer
Dim opfile As OPENFILENAME
Dim sFile As String

```

```

On Error GoTo ShowFileDialogErr

```

```

If Not strOldFile <> gsEmptyString Then
    intPos = InstrR(strOldFile, gsPeriod)
    If intPos > 0 Then
        strInitDir = Left$(strOldFile, intPos - 1)
    End If
End If

```

```

With opfile
    .StructSize = Len(opfile)
    .Flags = lngFlags
    .lpstrInitialDir = strInitDir
    .lpstrTitle = strDialogTitle
    .lpstrFilter = MakeWindowsFilter(strFilter)
    sFile = strOldFile & String$(MAX_PATH -

```

```

Len(strOldFile), 0)
    .lpstrFile = sFile
    .nMaxFile = MAX_PATH
End With

```

```

If GetOpenFileName(opfile) Then
    ShowFileDialog = Left$(opfile.lpstrFile,
InStr(opfile.lpstrFile, vbNullChar) - 1)
Else
    ShowFileDialog = strOldFile
End If

```

```

Exit Function

```

```

ShowFileDialogErr:

```

```

    Call DisplayErrors
    ' Reset the selection to the passed in file, if any
    ShowFileDialog = strOldFile

```

```

End Function

```

```

Public Function InstrR(strMain As String, _
    strSearch As String) As Integer
    ' Finds the last occurrence of the passed in string

```

```

    Dim intPos As Integer
    Dim intPrev As Integer

```

```

    intPrev = intPos
    intPos = InStr(1, strMain, strSearch)

```

```

    Do While intPos > 0
        intPrev = intPos
        intPos = InStr(intPos + 1, strMain, strSearch)
    Loop

```

```

    Loop
    InstrR = intPrev

```

```

End Function

```

```

Private Function MakeWindowsFilter(sFilter As String) As
String

```

```

    Dim s As String, ch As String, iTemp As Integer

```

```

    ' To make Windows-style filter, replace | and : with nulls
    For iTemp = 1 To Len(sFilter)
        ch = Mid$(sFilter, iTemp, 1)
        If ch = "|" Then
            s = s & vbNullChar
        Else
            s = s & ch
        End If
    Next iTemp

```

```

    ' Put double null at end
    s = s & vbNullChar & vbNullChar
    MakeWindowsFilter = s

```

```

End Function

```

```

Public Function BrowseStpFile(ByVal strDefaultFile As
String) As String

```

```

    ' This function initializes the values of the filter property,
    ' the dialog title and flags for the File Open dialog
    depending
    ' on the FileType passed in
    ' It then calls ShowFileDialog to set these properties
    and
    ' display the File Open dialog to the user

```

```

On Error GoTo BrowseStpFileErr

```

```

BrowseStpFile = ShowFileDialog( _
    ms_FILE_DB_FILTER & ms_FILE_ALL_FILTER, _
    ms_DLG_TITLE_OPEN, _
    ml_FILE_DB_FLAGS, _
    strDefaultFile)

```

```

Exit Function

```

```

BrowseStpFileErr:

```

```

    DisplayErrors
    BrowseStpFile = gsEmptyString

```

```

End Function

```

```

Public Function BrowseOutputFile(ByVal strDefaultFile As
String) As String

```

```

    ' This function initializes the values of the filter property,
    ' the dialog title and flags for the File Open dialog
    depending
    ' on the FileType passed in
    ' It then calls ShowFileDialog to set these properties
    and
    ' display the File Open dialog to the user

```

```

On Error GoTo BrowseOutputFileErr

BrowseOutputFile = ShowFileOpenDialog( _
    ms_FILE_OUTPUT_FILTER &
ms_FILE_ALL_FILTER, _
    ms_DLG_TITLE_OPEN, _
    ml_FILE_OUTPUT_FLAGS, _
    strDefaultFile)

Exit Function

BrowseOutputFileErr:
    DisplayErrors
    BrowseOutputFile = gsEmptyString

End Function

Public Function MakePathValid(strFileName As String) As
String
    ' Makes the passed in file path valid

    Dim strFileDir As String
    Dim strTempDir As String
    Dim strTempFile As String
    Dim sTemp As String
    Dim intPos As Integer
    Dim intStart As Integer

    strTempFile = strFileName
    intPos = InstrR(strFileName, gsFileSeparator)

    If intPos > 0 Then
        strFileDir = Left$(strTempFile, intPos - 1)
        If Dir$(strFileDir, vbDirectory) = "" Then
            ' Loop through the entire path starting at the root
            ' since Mkdir can create only one level of sub-directory
            ' at a time
            intStart = Instr(strFileDir, gsFileSeparator)
            If Mid(strFileDir, 2, 1) = ":" Then
                ' Remove drive from directory specification
                intStart = Instr(intStart + 1, strFileDir,
gsFileSeparator)
            End If

            Do While strTempDir <> strFileDir

                If intStart > 0 Then
                    strTempDir = Left$(strFileDir, intStart - 1)
                Else
                    strTempDir = strFileDir
                End If

                If Dir$(strTempDir, vbDirectory) <> "" Then
                    ' If the specified directory doesn't exist, try to
                    ' create it.
                    MkDir strTempDir
                Else
                    ' The directory exists - go to it's sub-directory
                    End If
            End If

```

```

                intStart = Instr(intStart + 1, strFileDir,
gsFileSeparator)
            Loop

            ' Sanity check
            If Dir$(strFileDir, vbDirectory) <> "" Then
                ' We were unable to create the file directory
                MsgBox "Unable to create directory " & strFileDir
                MakePathValid = gsEmptyString
            Else
                MakePathValid = strTempFile
            End If
        Else
            ' The specified directory exists - we should be able
            ' to create the output file in it
            MakePathValid = strTempFile
        End If
    Else
        ' The user has only specified a filename - VB will try
        ' to create it in the current directory
        MakePathValid = strTempFile
    End If

End Function

```

MoveTempDB.sql

```

--
-- 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')

```

AddTempDB.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)
```

Appendix G: Price Quotations

Appendix G

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399

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

Microsoft

December 13, 2005

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</i> <i>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</i> <i>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</i> <i>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

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.

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 jamie@microsoft.com.

Appendix G

Reference ID: PHgepu0513123291.

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

, 916-315-5081