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**TPC Benchmark<sup>TM</sup> H**  
**Full Disclosure Report**  
**DELL PowerEdge 6800/Dual-Core Intel® Xeon<sup>TM</sup> MP**  
**7140M/3.4GHz 16MB L3 Cache**  
**Using**  
**Microsoft Windows Server 2003 Enterprise x64 Edition<sup>TM</sup>**  
**and SQL Server 2005 Enterprise x64 Edition<sup>TM</sup>**



**First Edition**

**Submitted for Review**

**Aug 1, 2006**

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

First Printing Aug 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
<b>Dell PowerEdge 6800 with Quad Dual-Core Intel® Xeon™ MP 7140M/ 3.4GHz Dell PowerVault MD1000 Storage Enclosures</b>	<b>Microsoft Windows Server 2003 Enterprise x64 Edition™ SQL Server 2005 Enterprise x64 Edition™</b>	<b>\$218,609</b>

<b>TPC-H Power@100GB</b>	<b>TPC-H Throughput@100GB</b>	<a href="#"><u><b>QphH@100GB</b></u></a>	<b>\$/QphH@100GB</b>
<b>20,538.8</b>	<b>12,967.9</b>	<b>16,320.1</b>	<b>\$13.40</b>

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: Aug 1, 2006

Revision Date: Aug 1, 2006

**Total System Cost**  
**\$218,609 USD**

**TPC-H Composite Query per Hour**  
**16,320.1 QphH@100GB**

**Price/Performance**  
**\$13.40 USD/ QphH@100GB**

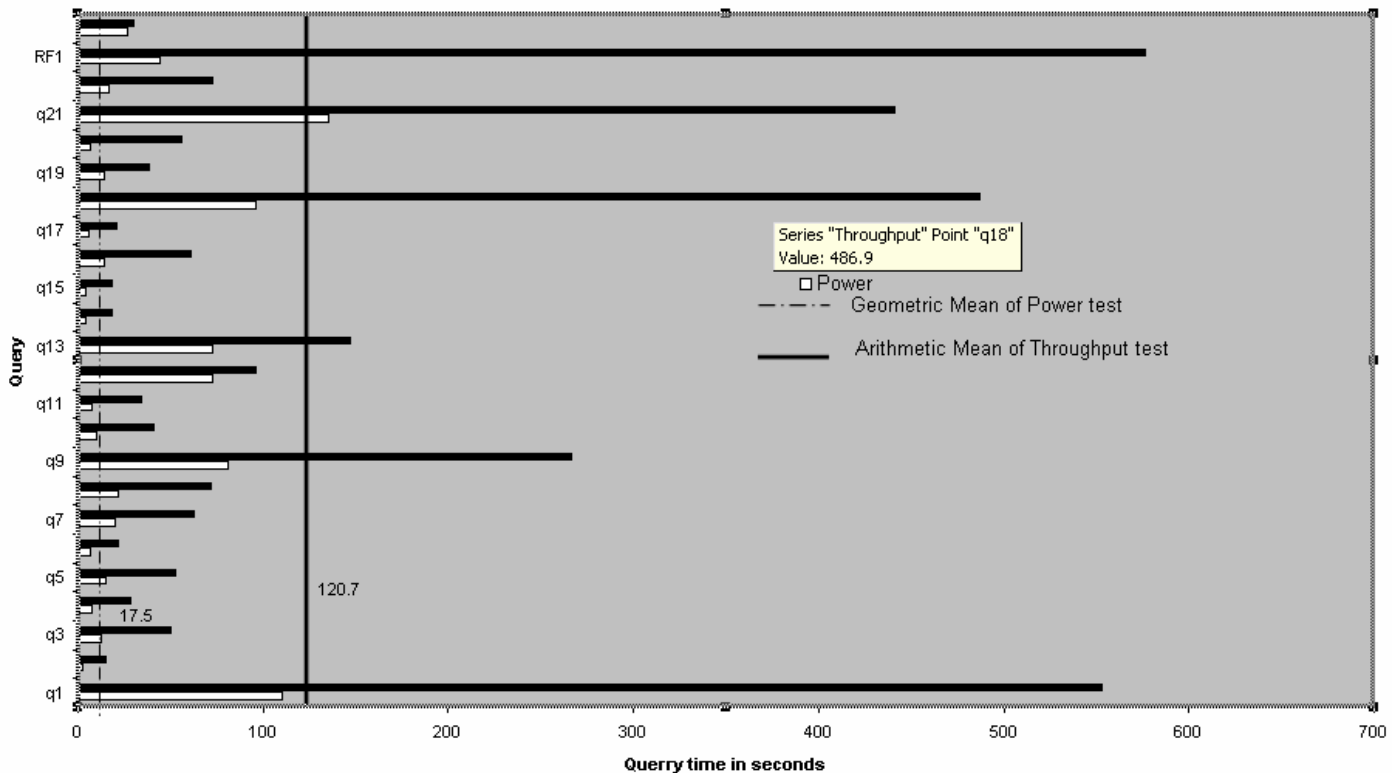
**Database Size**  
**100GB**

**Database Manager**  
 SQL Server 2005 Enterprise x64 Edition™

**Operating System**  
 Microsoft Windows Server 2003 Enterprise x64 Edition™

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

**Availability Date**  
**Aug 28, 2006**



**Database Load Time**  
 1:18:28

**Total Disk/Database Size**  
 92.83

**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™ MP 7140M/3.4GHz 16MB L3 Cache  
**Memory: (per node) :** 64GB RAM  
**Disk Drives:** 270 – 36GB 15k SAS HDD, & 8 – 73GB 10k SCSI HDD

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

Dell		PowerEdge PE6800			TPC-H REV 2.3 EXECUTIVE SUMMARY		
		Server			Report Date: 1-Aug-06		
					Revision Date: 1-Aug-06		
Description	Part Number	Third Party	Unit Price	Qty	Extended Price	3 yr. Maint. Price	
<b>Server Hardware</b>		<b>Brand</b>	<b>Pricing</b>				
Dell PowerEdge 6800 3.4GHz Dual Core XEON MP w/ 16MB L3 cache,800MHZ FSB, 2 onboard Gigabit NICs	911-1234		NIO	\$10,999.00	1	\$10,999.00	\$320.00
7140M,16MB L3/3.4GHz, Quad Proc	911-1235		NIO	\$10,999.00	1	\$10,999.00	
64GB,DDR2,400MHZ(16X4GB),2R	311-5706			\$53,238.00	1	\$53,238.00	
1.44 Floppy Drive	341-1308			\$30.00	1	\$30.00	
24X IDE CD-ROM Drive	313-2700			\$30.00	1	\$30.00	
PERC4e/Di 256MB	341-1903			\$299.00	1	\$299.00	
PERC5E,SAS,2x4,PCIe,ADPTR	341-3023			\$799.00	3	\$2,397.00	
73GB U320M SCSI 10K RPM Hard Drive (OS+LOG)	340-9372			\$299.00	8	\$2,392.00	
E773s 17-inch Color CRT Monitor	E7733YR			\$149.00	1	\$149.00	
					<b>Subtotal</b>	\$80,533.00	\$320.00
<b>PowerVault Disk Subsystem</b>							
PV MD1000,RACK,3U,15 BAY,LBZL	222-2299			\$3,180.00	18	\$57,240.00	\$29,664.00
TWO ENCL MGT MODULES, SAS/SATA	420-5927			\$345.83	18	\$6,224.94	
36GB,3GBPS,SAS,3.5IN,15K	341-2816			\$249.00	270	\$67,230.00	
RACK-111/24U/Dell	A0213544			\$479.95	2	\$959.90	
					<b>Subtotal</b>	\$131,654.84	\$29,664.00
<b>Server Software</b>							
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
					<b>Subtotal</b>	\$14,939.00	\$245.00
All components from Dell are discounted 16% based on total dollar volume of this configuration.				<b>Other Discounts (16%)</b>		\$38,747.49	
					<b>Total</b>	<b>\$188,379</b>	<b>\$30,229</b>
Notes: * Maint. included in PowerVault MD1000 disk pod					<b>Three-Year Cost of Ownership:</b>	<b>\$218,609</b>	<b>USD</b>
** All Microsoft maintenance is covered by the maintenance costs of Microsoft SQL Server							
Pricing: NIO = These components are Not Immediately Orderable; 1 = Microsoft, all others are Dell					<b>QphH@100G</b>	<b>16,320.1</b>	
Pricing may be verified by calling 1-800-BUY-DELL and referencing quote # 308815427 as a complex quote.							
<b>Audited by Lorna Livingtree, Performance Metrics Inc.</b>					<b>\$ / QphH@100G:</b>	<b>\$13.40</b>	<b>USD</b>
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: **Aug 1, 2006**

Revision Date: **Aug 1, 2006**

## Numerical Quantities Summary

### Measurement Results:

Database Scale Factor	100
Total Data Storage/Database Size	92.83
Start of Database Load	2006-07-27 02:46:06
End of Database Load	2006-07-27 04:04:33
Database Load Time	1:18:28
Query Streams for Throughput Test	5
TPC-H Power	20,538.8
TPC-H Throughput	12,967.9
TPC-H Composite Query-per-Hour Metric (QphH@100GB)	16,320.1
Total System Price Over 3 Years	\$218,609
TPC-H Price Performance Metric (\$/QphH@100GB)	\$13.40

### Measurement Interval:

Measurement Interval in Throughput Test (Ts) = 3,053.7 seconds

### Duration of stream execution:

	Seed	Start Date/Time	End Date/Time	Duration
<b>Stream00</b>	727040433	7/27/06 4:19:55	7/27/06 4:31:37	0:11:41
<b>Stream01</b>	727040434	7/27/06 4:32:06	7/27/06 5:16:04	0:43:58
<b>Stream02</b>	727040435	7/27/06 4:32:06	7/27/06 5:16:53	0:44:47
<b>Stream03</b>	727040436	7/27/06 4:32:06	7/27/06 5:17:13	0:45:07
<b>Stream04</b>	727040437	7/27/06 4:32:06	7/27/06 5:15:15	0:43:09
<b>Stream05</b>	727040438	7/27/06 4:32:06	7/27/06 5:16:17	0:44:11
<b>Refresh00</b>		7/27/06 4:19:10	7/27/06 4:19:55	0:00:45
		7/27/06 4:31:37	7/27/06 4:32:04	0:00:27
<b>Refresh01</b>		7/27/06 4:32:06	7/27/06 5:18:19	0:46:14
<b>Refresh02</b>		7/27/06 5:18:23	7/27/06 5:19:27	0:01:04
<b>Refresh03</b>		7/27/06 5:19:30	7/27/06 5:20:39	0:01:09
<b>Refresh04</b>		7/27/06 5:20:42	7/27/06 5:21:50	0:01:08
<b>Refresh05</b>		7/27/06 5:21:53	7/27/06 5:22:59	0:01:07



## Numerical Quantities Summary

### Timing Intervals in Seconds:

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Stream00	110.4	2.4	12.8	7.6	14.8	6.9	19.9	22.0
Stream01	535.5	14.2	64.8	25.1	55.7	17.2	65.4	68.3
Stream02	561.0	15.3	50.5	22.7	47.7	29.8	60.3	56.0
Stream03	558.7	26.5	12.1	32.8	61.3	21.9	67.0	79.8
Stream04	531.1	9.9	61.1	29.7	59.2	16.9	60.8	98.2
Stream05	579.6	10.5	61.0	31.6	40.2	21.6	58.7	54.9
Min Qi	531.1	9.9	12.1	22.7	40.2	16.9	58.7	54.9
Max Qi	579.6	26.5	64.8	32.8	61.3	29.8	67.0	98.2
Avg Qi	553.2	15.3	49.9	28.4	52.8	21.5	62.4	71.4
Query	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Stream00	81.3	10.0	7.2	72.7	35.0	4.4	4.1	14.2
Stream01	212.8	45.4	36.1	128.0	143.3	16.5	16.8	60.8
Stream02	365.7	42.8	35.5	100.8	155.9	19.9	20.4	71.1
Stream03	244.3	34.2	39.5	49.9	154.7	19.4	15.0	52.5
Stream04	254.4	41.2	29.0	71.7	130.0	20.6	19.7	65.0
Stream05	254.8	42.0	30.1	129.2	152.4	16.9	17.5	54.1
Min Qi	212.8	34.2	29.0	49.9	130.0	16.5	15.0	52.5
Max Qi	365.7	45.4	39.5	129.2	155.9	20.6	20.4	71.1
Avg Qi	266.4	41.1	34.0	95.9	147.3	18.7	17.9	60.7
Query	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream00	6.1	95.7	14.2	7.1	135.6	17.1	44.3	26.6
Stream01	18.9	451.3	32.0	104.2	464.2	61.5	2745.3	27.8
Stream02	26.7	464.3	40.2	33.8	382.6	84.1	32.1	28.5
Stream03	24.3	609.3	38.0	43.8	443.8	78.3	37.3	30.3
Stream04	16.7	454.4	38.4	57.8	449.0	74.4	35.4	31.3
Stream05	19.7	455.3	45.2	41.5	467.5	67.0	31.1	30.5
Min Qi	16.7	451.3	32.0	33.8	382.6	61.5	31.1	27.8
Max Qi	26.7	609.3	45.2	104.2	467.5	84.1	2745.3	31.3
Avg Qi	21.3	486.9	38.8	56.2	441.4	73.1	576.2	29.7

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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), DELL PowerEdge 2900 Server, depicted in the next diagram consists of:

- 2 - Dual-Core Intel® Xeon™ MP 7140M/3.4GHz 16MB L3 Cache.
- 64GB RAM.
- 3 - DELL PERC5e-DC RAID Controllers, each with 256MB RAM of cache.
- 18 - DELL PowerVault MD1000.
- 270 – 36GB,3GBPS 15k SAS
- 8 – 36GB 10k SCSI.

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

2xDual-Core Intel Xeon MP 7140M/  
3.4GHz 16MB L3 cache  
64GB DDR2  
3xPERC5E-DC Controllers  
8x73GB, U320, 10K SCSI

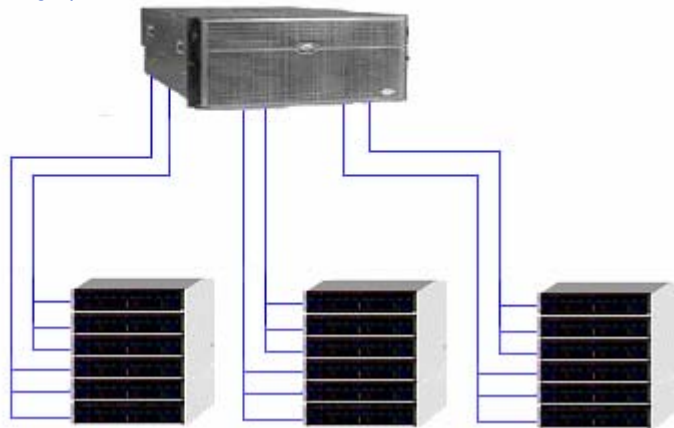
### DBMS

SQL Server 2005 Enterprise  
x64 Edition

### OS

Microsoft Windows Server  
2003 Enterprise x64 Edition

### PE6800



### Storage

18xMD1000  
270x36GB, 15K, U320 SAS

18xMD1000

## Measured Configuration

### PE6800

2xDual-Core Intel Xeon MP 7140M/  
3.4GHz 16MB L3 cache  
64GB DDR2  
3xPERC5E-DC Controllers  
8x73GB, U320, 10K SCSI

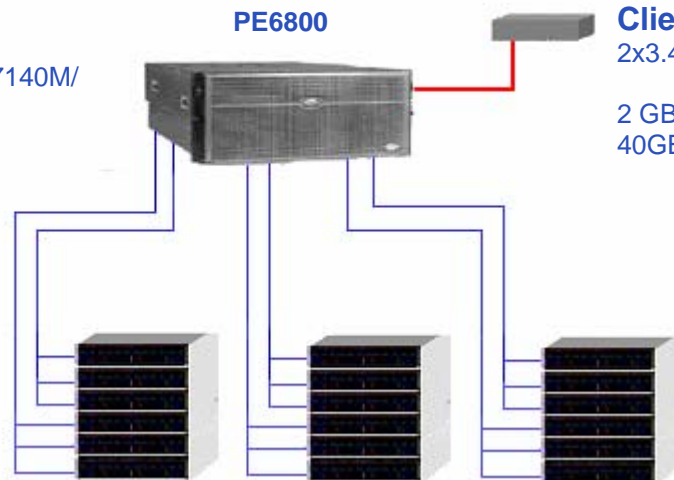
### DBMS

SQL Server 2005 Enterprise  
x64 Edition

### OS

Microsoft Windows Server  
2003 Enterprise x64 Edition

### PE6800



### Client: PE SC 1420

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

### Storage

18xMD1000  
270x36GB, 15K, U320 SAS

18xMD1000

# Clause 1: Logical Database Design

## Table Definitions

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

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

## Physical Organization of Database

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

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

## Horizontal Partitioning

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

Horizontal partitioning was not used in this benchmark.

## Replication

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

Replication was not used for this benchmark.

## Clause 2: Queries and Update Functions

### Query Language

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

SQL was the query language used to implement all queries.

### Random Number Generation

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

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

### Substitution Parameters Generation

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

QGEN version 2.3.0 was used to generate the substitution parameters.

### Query Text and Output Data from Database

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

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

### Query Substitution Parameters and Seeds Used

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

Appendix E contains the seed and query substitution parameters.

### Isolation Level

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

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

## **Refresh Function Source Code**

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

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



## Clause 3: Database System Properties

### Atomicity

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

### Atomicity of Completed Transaction

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

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

### Aborted Transaction

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

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

### Consistency

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

*$$O\_TOTALPRICE = \text{SUM}(\text{trunc}(\text{trunc}(L\_EXTENDEDPRICE * (1 - L\_DISCOUNT), 2) * (1 + L\_TAX), 2))$$
 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 MD1000 enclosure containing re-do log files was removed. As all re-do log files resided on RAID 10 volumes, the test continued uninterrupted. Next, a data drive was removed and a checkpoint submitted. Errors followed and the test was halted. The transaction log was backup up and the system rebooted replacing the failed drive. The database was restored from data and log backups. Post scripts confirmed success.

## **System Crash**

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

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

## **Memory Failure**

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

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

Appendix C contains source code for all transactions.

## Clause 4: Scaling and Database Population

### Initial Cardinality of Tables

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

#### *Initial number of rows*

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

### Distribution of Tables and Logs Across Media

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

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

- 3 x DELL PERC5E-DC Disk Controllers
- 18 x PowerVault MD1000 Disk Enclosures
- 270 x 36GB, 3GBPS, 15k rpm, SAS disk drives
- 8 x 73GB 10k rpm SCSI disk drives

9 logical volumes were configured each spanning 30 physical drives across each SAS channel of the controller in a RAID0 formation. The server had 8 73GB SCSI disks onboard for both the OS and database logs.

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

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

### Distribution of Storage

Windows 2003 Disk Administration			DELL PERC5E-DC Configuration				
Disk 0 1001.24 GB			Controller # 0				
Partition			Slot# 1		Channels		
1	2	3	SAS ID	A	B		
<b>F:</b> Lineitem_fg RAW 42.5 GB	<b>O:</b> General_fg RAW 20.5 GB	<b>C:\B\O</b> backup NTFS 938.23 GB	0	A0-1	B0-1		
			1	A0-2	B0-2		
			2	A0-3	B0-3		
			3	A0-4	B0-4		
			4	A0-5	B0-5		
			5	A0-6	B0-6		
			6	A0-7	B0-7		
			8	A0-8	B0-8		
			9	A0-9	B0-9		
			10	A0-10	B0-10		
			11	A0-11	B0-11		
			12	A0-12	B0-12		
			13	A0-13	B0-13		
			14	A0-14	B0-14		
			15	A0-15	B0-15		

Windows 2003 Disk Administration			DELL PERC5E-DC Configuration				
Disk 1 1001.24 GB			Controller # 0				
Partition			Slot# 1		Channels		
1	2	3	SAS ID	A	B		
<b>G:</b> Lineitem_fg RAW 42.5 GB	<b>P:</b> General_fg RAW 20.5 GB	<b>C:\B\P</b> backup NTFS 938.23 GB	0	A0-1	B0-1		
			1	A0-2	B0-2		
			2	A0-3	B0-3		
			3	A0-4	B0-4		
			4	A0-5	B0-5		
			5	A0-6	B0-6		
			6	A0-7	B0-7		
			8	A0-8	B0-8		
			9	A0-9	B0-9		
			10	A0-10	B0-10		
			11	A0-11	B0-11		
			12	A0-12	B0-12		
			13	A0-13	B0-13		
			14	A0-14	B0-14		
			15	A0-15	B0-15		

Windows 2003 Disk Administration				DELL PERC5E-DC Configuration				
Disk 2 1001.24 GB				Controller # 0				
Partition				Slot# 1	Channels			
1	2	3		SAS ID	A	B		
<b>H:</b> Lineitem_fg RAW 42.5 GB	<b>Q:</b> General_fg RAW 20.5 GB	<b>Y:</b> RF_files NTFS 2 GB	<b>C:\B\Q</b> backup NTFS 936.23	0	A0-1	B0-1		
				1	A0-2	B0-2		
				2	A0-3	B0-3		
				3	A0-4	B0-4		
				4	A0-5	B0-5		
				5	A0-6	B0-6		
				6	A0-7	B0-7		
				8	A0-8	B0-8		
				9	A0-9	B0-9		
				10	A0-10	B0-10		
				11	A0-11	B0-11		
				12	A0-12	B0-12		
				13	A0-13	B0-13		
				14	A0-14	B0-14		
				15	A0-15	B0-15		

Windows 2003 Disk Administration				DELL PERC5E-DC Configuration				
Disk 3 1001.24 GB				Controller # 1				
Partition				Slot# 2	Channels			
1	2	3		SAS ID	A	B		
<b>I:</b> Lineitem_fg RAW 42.5 GB	<b>R:</b> General_fg RAW 20.5 GB	<b>C:\B\R</b> backup NTFS 938.23 GB		0	A0-1	B0-1		
				1	A0-2	B0-2		
				2	A0-3	B0-3		
				3	A0-4	B0-4		
				4	A0-5	B0-5		
				5	A0-6	B0-6		
				6	A0-7	B0-7		
				8	A0-8	B0-8		
				9	A0-9	B0-9		
				10	A0-10	B0-10		
				11	A0-11	B0-11		
				12	A0-12	B0-12		
				13	A0-13	B0-13		
				14	A0-14	B0-14		
				15	A0-15	B0-15		

Windows 2003 Disk Administration			DELL PERC5E-DC Configuration			
Disk 9 133.5 GB			Controller # Int			
Partition			Slot# Int	Channels		
1	2		SAS ID	A	B	
C: OS NTFS 40 GB	E: Log RAW 60 GB		0	A0-1		
			1	A0-2		
			2	A0-3		
			3	A0-4		
			4		B0-5	
			5		B0-6	
			6		B0-7	
			8		B0-8	
			9			
			10			
			11			
			12			
			13			
			14			
			15			

Windows 2003 Disk Administration			DELL PERC5E-DC Configuration			
Disk 4 1001.24 GB			Controller # 1			
Partition			Slot# 2	Channels		
1	2	3	SAS ID	A	B	
J: Lineitem_fg RAW 42.5 GB	S: General_fg RAW 20.5 GB	C:\B\S backup NTFS 938.23 GB	0	A0-1	B0-1	
			1	A0-2	B0-2	
			2	A0-3	B0-3	
			3	A0-4	B0-4	
			4	A0-5	B0-5	
			5	A0-6	B0-6	
			6	A0-7	B0-7	
			8	A0-8	B0-8	
			9	A0-9	B0-9	
			10	A0-10	B0-10	
			11	A0-11	B0-11	
			12	A0-12	B0-12	
			13	A0-13	B0-13	
			14	A0-14	B0-14	
			15	A0-15	B0-15	



Windows 2003 Disk Administration			DELL PERC5E-DC Configuration			
Disk 5 1001.24 GB			Controller # 1			
Partition			Slot# 2	Channels		
1	2	3	SAS ID	A	B	
<b>K:</b> Lineitem_fg RAW 42.5 GB	<b>T:</b> General_fg RAW 20.5 GB	<b>C:\B\T</b> backup NTFS 938.23 GB	0	A0-1	B0-1	
			1	A0-2	B0-2	
			2	A0-3	B0-3	
			3	A0-4	B0-4	
			4	A0-5	B0-5	
			5	A0-6	B0-6	
			6	A0-7	B0-7	
			8	A0-8	B0-8	
			9	A0-9	B0-9	
			10	A0-10	B0-10	
			11	A0-11	B0-11	
			12	A0-12	B0-12	
			13	A0-13	B0-13	
			14	A0-14	B0-14	
			15	A0-15	B0-15	

Windows 2003 Disk Administration			DELL PERC5E-DC Configuration			
Disk 6 1001.24 GB			Controller # 2			
Partition			Slot# 3	Channels		
1	2	3	SAS ID	A	B	
<b>L:</b> Lineitem_fg RAW 42.5 GB	<b>U:</b> General_fg RAW 20.5 GB	<b>C:\B\U</b> backup NTFS 938.23 GB	0	A0-1	B0-1	
			1	A0-2	B0-2	
			2	A0-3	B0-3	
			3	A0-4	B0-4	
			4	A0-5	B0-5	
			5	A0-6	B0-6	
			6	A0-7	B0-7	
			8	A0-8	B0-8	
			9	A0-9	B0-9	
			10	A0-10	B0-10	
			11	A0-11	B0-11	
			12	A0-12	B0-12	
			13	A0-13	B0-13	
			14	A0-14	B0-14	
			15	A0-15	B0-15	

Windows 2003 Disk Administration			DELL PERC5E-DC Configuration			
Disk 7 1001.24 GB			Controller # 2			
Partition			Slot# 3	Channels		
1	2	3	SAS ID	A	B	
<b>M:</b> <b>Lineitem_fg</b> <b>RAW</b> <b>42.5 GB</b>	<b>V:</b> <b>General_fg</b> <b>RAW</b> <b>20.5 GB</b>	<b>C:\B\V</b> <b>backup</b> <b>NTFS</b> <b>938.23 GB</b>	0	A0-1	B0-1	
			1	A0-2	B0-2	
			2	A0-3	B0-3	
			3	A0-4	B0-4	
			4	A0-5	B0-5	
			5	A0-6	B0-6	
			6	A0-7	B0-7	
			8	A0-8	B0-8	
			9	A0-9	B0-9	
			10	A0-10	B0-10	
			11	A0-11	B0-11	
			12	A0-12	B0-12	
			13	A0-13	B0-13	
			14	A0-14	B0-14	
			15	A0-15	B0-15	

Windows 2003 Disk Administration			DELL PERC5E-DC Configuration			
Disk 8 1001.24 GB			Controller # 2			
Partition			Slot# 3	Channels		
1	2	3	SAS ID	A	B	
<b>N:</b> <b>Lineitem_fg</b> <b>RAW</b> <b>42.5 GB</b>	<b>W:</b> <b>General_fg</b> <b>RAW</b> <b>20.5 GB</b>	<b>C:\B\W</b> <b>backup</b> <b>NTFS</b> <b>938.23 GB</b>	0	A0-1	B0-1	
			1	A0-2	B0-2	
			2	A0-3	B0-3	
			3	A0-4	B0-4	
			4	A0-5	B0-5	
			5	A0-6	B0-6	
			6	A0-7	B0-7	
			8	A0-8	B0-8	
			9	A0-9	B0-9	
			10	A0-10	B0-10	
			11	A0-11	B0-11	
			12	A0-12	B0-12	
			13	A0-13	B0-13	
			14	A0-14	B0-14	
			15	A0-15	B0-15	

## Partitioning and Replication

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

The database was not replicated.  
Horizontal partitioning was not used in this benchmark.

## 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

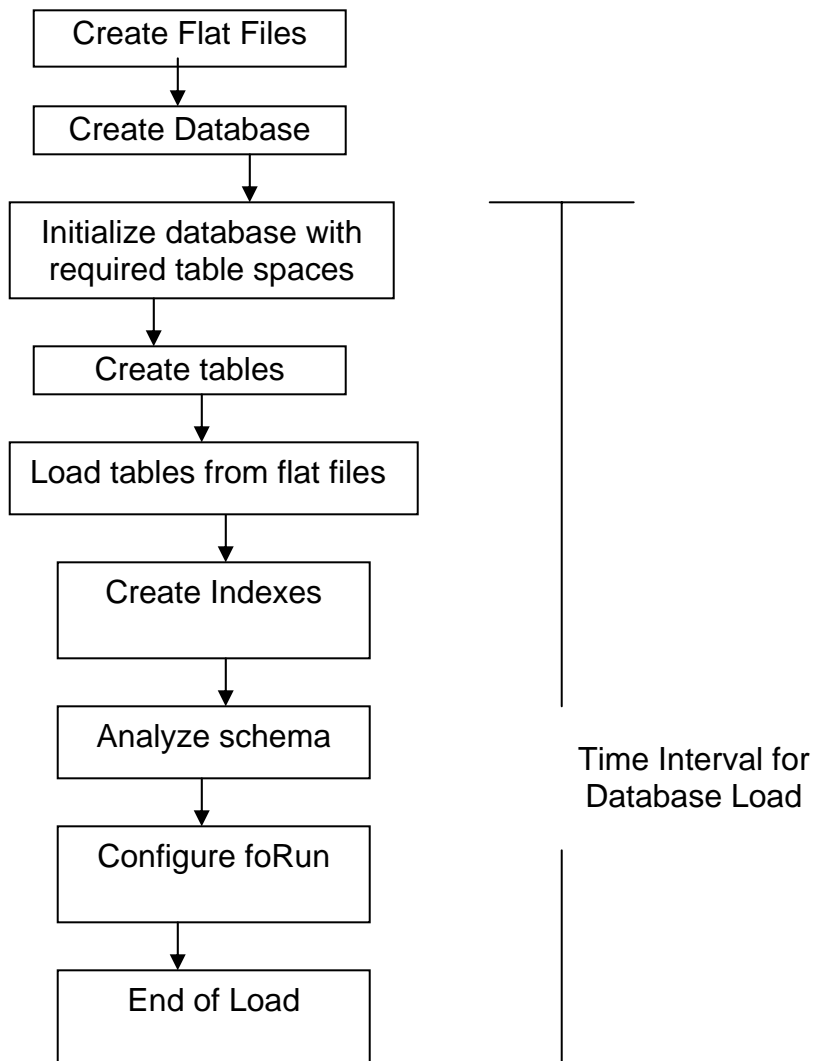
Disk Type	Number of Disks	Space per Disk	Subtotal Disk Space	Total Disk Storage	Data Storage Ratio
36GB 15k	270	33.37GB	9009.9GB		
36GB 15k	8	68.24GB	272.96GB		
				9282.86GB	92.83

## 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 3,053.7 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	20,538.8	12,967.9	16,320.1
2	21,272.3	12,906.2	16,569.4
Percent Difference	0.97%	0.995%	0.98%

## 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 the Availability Date.

## Orderability Date

*For each of the components that are not orderable on the report date of the FDR, the following information must be included in the FDR:*

- *Name and part number of the item that is not orderable*
- *The date when the component can be ordered (on or before the Availability Date)*
- *The method to be used to order the component (at or below the quoted price) when the date arrives*
- *The method for verifying the price*

Some components used in this benchmark are not orderable at the time of this publication. These items will be orderable on or before the stated Availability Date in this submission. For specific information regarding the orderable dates and prices of these items, please refer to the table below:



## Orderable Information

Description	Part #	Order Date	Order Method	Price Verification
Dell PowerEdge 6800 3.4GHz Dual Core XEON MP w/16MB L3 cache,800MHZ FSB, 2 onboard Gigabit NICs	911-1234	8/28/2006	1-800-BUY-DELL	Note 1
7140M,16MB L3, 3.4GHz, Quad Procs	911-1235	8/28/2006	1-800-BUY-DELL	Note 1

Note 1: These parts are not yet immediately orderable. For price verification before the stated Availability Date, please contact the Dell COC Pricing Department at: (512) 724-8493.

## 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](mailto: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



July 30, 2006

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 x64 Edition  
Operating System: Windows Server 2003 Enterprise x64 Edition

CPU's	Memory	Total Disks	Qpph@ 100GB	QthH@100GB	QphH@100GB
4 Intel EM64T @ 3.4 Ghz	65 GB	270 @ 36 GB 8 @ 73 GB	<b>20,538.8</b>	<b>12,967.9</b>	<b>16,320.1</b>

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:**

An I/O issue was noted in the DBMS log for run 1 during Power query 12. This was thoroughly investigated and determined that query 12 returned the correct answer set. The I/O issue added response time, but the response was correct.

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
```

#### 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			
affinity mask	-2147483648	2147483647			
affinity64 I/O mask	-2147483648	2147483647			
affinity64 mask	-2147483648	2147483647			
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		
Database Mail XPs	0	1	0	0	

default full-text language	0	2147483647			
1033	1033				
default language	0	9999	0		
default trace enabled	0	1	1		
disallow results from triggers	0	1	0		
fill factor (%)	0	100	0	0	
ft crawl bandwidth (max)	0	32767	100		
ft crawl bandwidth (min)	0	32767	0		
ft notify bandwidth (max)	0	32767	100		
ft notify bandwidth (min)	0	32767	0		
in-doubt xact resolution	0	2	0		
index create memory (KB)	704	2147483647			
lightweight pooling	0	1	1		
locks	5000	2147483647	0		
max degree of parallelism	0	64	0		
max full-text crawl range	0	256	4		
max server memory (MB)	16	2147483647			
max text repl size (B)	0	2147483647			
max worker threads	128	32767	1024		
media retention	0	365	0		
min memory per query (KB)	512	2147483647			
min server memory (MB)	0	2147483647			
nested triggers	0	1	1	1	
network packet size (B)	512	32767			
Ole Automation Procedures	0	1	0		
open objects	0	2147483647	0		
PH timeout (s)	1	3600	60		
precompute rank	0	1	0		
priority boost	0	1	1	1	
query governor cost limit	0	2147483647			
query wait (s)	-1	2147483647			
recovery interval (min)	0	32767	32767		

```

remote access                0      1      1      1
remote admin connections     0      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

```

```

Processor EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
Processor EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
Processor EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
Processor EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
Processor EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
BIOS Version/Date Dell Computer Corporation X37, 7/12/2006
SMBIOS Version 2.3
Windows Directory C:\WINDOWS
System Directory C:\WINDOWS\system32
Boot Device \Device\HarddiskVolume29
Locale United States
Hardware Abstraction Layer Version = "5.2.3790.1830
(srv03_sp1_rtm.050324-1447)"
User Name Not Available
Time Zone Central Daylight Time
Total Physical Memory 65,530.93 MB
Available Physical Memory 290.59 MB
Total Virtual Memory 70.22 GB
Available Virtual Memory 7.65 GB
Page File Space 7.79 GB
Page File C:\pagefile.sys

```

[Hardware Resources]

[Conflicts/Sharing]

```

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

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

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

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

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

IRQ 18 DELL PERC 5/E Adapter RAID Controller
IRQ 18 DELL PERC 5/E Adapter RAID Controller
IRQ 18 DELL PERC 5/E Adapter RAID Controller
IRQ 18 Intel(R) 82801EB USB Universal Host Controller - 24D7

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

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

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

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

```

## System Information

System Information report written at: 07/30/06 06:48:27  
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
System Name	PE6800
System Manufacturer	Dell Computer Corporation
System Model	PowerEdge 6800
System Type	x64-based PC
Processor	EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
Processor	EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
Processor	EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
Processor	EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
Processor	EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
Processor	EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
Processor	EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
Processor	EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
Processor	EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
Processor	EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz
Processor	EM64T Family 15 Model 6 Stepping 8 GenuineIntel ~3392 Mhz

[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
0x0000D000-0x0000DFFF PCI standard PCI-to-PCI bridge OK
0x0000D000-0x0000DFFF Intel(R) 6700PXH PCI Express-to-PCI
Bridge B - 032A OK
0x0000BCE0-0x0000BCFF Intel(R) 82801EB USB Universal Host
Controller - 24D2 OK
0x0000BCC0-0x0000BCDF Intel(R) 82801EB USB Universal Host
Controller - 24D4 OK
0x0000BCA0-0x0000BCBF Intel(R) 82801EB USB Universal Host
Controller - 24D7 OK
0x0000CC00-0x0000CCFF Radeon 7000 / RADEON VE Family
(Microsoft Corporation) OK
0x000003B0-0x000003BB Radeon 7000 / RADEON VE Family
(Microsoft Corporation) OK
0x000003C0-0x000003DF Radeon 7000 / RADEON VE Family
(Microsoft Corporation) OK
0x00000080-0x0000009F Direct memory access controller OK
0x000000C0-0x000000DF Direct memory access controller OK
0x000000F0-0x000000FF Numeric data processor OK
0x00000020-0x0000003F Programmable interrupt controller
OK
0x000000A0-0x000000BF Programmable interrupt controller
OK
0x000004D0-0x000004D1 Programmable interrupt controller
OK
0x00000061-0x00000061 System speaker OK
0x00000070-0x0000007F System CMOS/real time clock OK
0x00000040-0x0000005F System timer OK
0x000003F0-0x000003F5 Standard floppy disk controller OK
0x000003F7-0x000003F7 Standard floppy disk controller OK
0x000003F8-0x000003FF Communications Port (COM1) OK
0x00000800-0x0000087F System board OK
0x00000880-0x000008BF System board OK
0x000008C0-0x000008DF System board OK
0x00000C00-0x00000C1F System board OK
0x00000C10-0x00000C1F System board OK
0x00000CA0-0x00000CA7 System board OK
0x00000CA9-0x00000CAB System board OK
0x00000CAD-0x00000CAF System board OK
0x00000C20-0x00000C3F System board OK
0x00000E00-0x00000E7 System board OK
0x00000060-0x00000060 System board OK
0x00000064-0x00000064 System board OK
0x00000CA8-0x00000CA8 System board OK
0x00000CAC-0x00000CAC 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 5/E Adapter RAID Controller OK

IRQ 18 DELL PERC 5/E Adapter RAID Controller OK
IRQ 18 DELL PERC 5/E Adapter RAID Controller OK
IRQ 18 Intel(R) 82801EB USB Universal Host Controller - 24D7
OK
IRQ 64 Broadcom NetXtreme Gigabit Ethernet #2 OK
IRQ 110 Dell PERC 4e/Di RAID Controller OK
IRQ 16 Intel(R) 82801EB USB Universal Host Controller - 24D2
OK
IRQ 16 Radeon 7000 / RADEON VE Family (Microsoft Corporation)
OK
IRQ 19 Intel(R) 82801EB USB Universal Host Controller - 24D4
OK
IRQ 23 Intel(R) 82801EB USB2 Enhanced Host Controller - 24DD
OK
IRQ 13 Numeric data processor OK
IRQ 8 System CMOS/real time clock OK
IRQ 0 System timer OK
IRQ 6 Standard floppy disk controller OK
IRQ 4 Communications Port (COM1) OK
IRQ 14 Primary IDE Channel OK
IRQ 15 Secondary IDE Channel OK

[Memory]

Resource Device Status
0xA0000-0xBFFFF PCI bus OK
0xA0000-0xBFFFF Radeon 7000 / RADEON VE Family (Microsoft
Corporation) OK
0xD0000000-0xFEBFFFFFFF PCI bus OK
0xD0000000-0xFEBFFFFFFF Radeon 7000 / RADEON VE Family
(Microsoft Corporation) OK
0xD0000000-0xFEBFFFFFFF PCI standard PCI-to-PCI bridge OK
0xD9300000-0xD93FFFFFFF PCI standard PCI-to-PCI bridge OK
0xD9300000-0xD93FFFFFFF PCI standard PCI-to-PCI bridge OK
0xDFD00000-0xDFEFFFFFFF PCI standard PCI-to-PCI bridge OK
0xD93F0000-0xD93FFFFFFF DELL PERC 5/E Adapter RAID Controller
OK
0xDFDE0000-0xDFDFFFFFFF DELL PERC 5/E Adapter RAID Controller
OK
0xDF900000-0xDFBFFFFFFF PCI standard PCI-to-PCI bridge OK
0xD9200000-0xD92FFFFFFF PCI standard PCI-to-PCI bridge OK
0xD9200000-0xD92FFFFFFF PCI standard PCI-to-PCI bridge OK
0xDFA00000-0xDFBFFFFFFF PCI standard PCI-to-PCI bridge OK
0xD92F0000-0xD92FFFFFFF DELL PERC 5/E Adapter RAID Controller
OK
0xDFAE0000-0xDFAFFFFF DELL PERC 5/E Adapter RAID Controller
OK
0xDF800000-0xDF8FFFFFFF PCI standard PCI-to-PCI bridge OK
0xD8000000-0xD8FFFFFFF PCI standard PCI-to-PCI bridge OK
0xDF500000-0xDF7FFFFFFF PCI standard PCI-to-PCI bridge OK
0xD9100000-0xD91FFFFFFF PCI standard PCI-to-PCI bridge OK
0xD9100000-0xD91FFFFFFF PCI standard PCI-to-PCI bridge OK
0xDF600000-0xDF7FFFFFFF PCI standard PCI-to-PCI bridge OK
0xD91F0000-0xD91FFFFFFF DELL PERC 5/E Adapter RAID Controller
OK
0xDF6E0000-0xDF6FFFFFFF DELL PERC 5/E Adapter RAID Controller
OK
0xDF200000-0xDF4FFFFFFF PCI standard PCI-to-PCI bridge OK
0xDF300000-0xDF4FFFFFFF Intel(R) 6700PXH PCI Express-to-PCI
Bridge B - 032A OK
0xDF3F0000-0xDF3FFFFFFF Broadcom NetXtreme Gigabit Ethernet #2
OK
0xDE000000-0xDF1FFFFFFF PCI standard PCI-to-PCI bridge OK
0xD9000000-0xD90FFFFFFF PCI standard PCI-to-PCI bridge OK
0xD9000000-0xD90FFFFFFF PCI standard PCI-to-PCI bridge OK
0xDF000000-0xDF1FFFFFFF PCI standard PCI-to-PCI bridge OK
0xD90F0000-0xD90FFFFFFF Dell PERC 4e/Di RAID Controller
OK
0xDF0C0000-0xDF0FFFFFFF Dell PERC 4e/Di RAID Controller
OK
0xDFF00000-0xDFF003FF Intel(R) 82801EB USB2 Enhanced Host
Controller - 24DD OK

0xDED0000-0xDEDFFFFF Radeon 7000 / RADEON VE Family  
 (Microsoft Corporation) OK  
 0xFEBFFC00-0xFEBFFFFF Intel(R) 82801EB Ultra ATA Storage  
 Controllers - 24DB OK  
 0xE0000000-0xEFFFFFFF Motherboard resources OK  
 0xFE60C000-0xFE60CFFF 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
(13,824 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM		13.50 KB
c:\windows\system32\msadp32.acm	Microsoft Corporation		OK	C:\WINDOWS\system32\MSADP32.ACM
(24,064 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM		23.50 KB
c:\windows\system32\tsoft32.acm	DSP GROUP, INC.		OK	C:\WINDOWS\system32\TSSOFT32.ACM
(13,50 KB (13,824 bytes))	1.01	3/25/2005 6:00 AM		
c:\windows\system32\msgsm32.acm	Microsoft Corporation		OK	C:\WINDOWS\system32\MSGSM32.ACM
(35,328 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM		34.50 KB
c:\windows\system32\imaadp32.acm	Microsoft Corporation		OK	C:\WINDOWS\system32\IMAADP32.ACM
(24,576 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM		24.00 KB

[Video Codecs]

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

[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
------	-------

[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 75 hertz
Bits/Pixel	32
Memory Address	0xD0000000-0xFEBFFFFFFF
I/O Port	0x0000CC00-0x0000CCFF
Memory Address	0xDED00000-0xDEDFFFFFFF
IRQ Channel	IRQ 16
I/O Port	0x000003B0-0x000003BB
I/O Port	0x000003C0-0x000003DF
Memory Address	0xA0000-0xBFFFFF
Driver	c:\windows\system32\drivers\ati2mtag.sys (6.14.10.6509, 1.39 MB (1,452,544 bytes), 5/24/2006 9:00 PM)

[Infrared]

Item	Value
------	-------

[Input]

[Keyboard]

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

[Pointing Device]

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



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 Not Available  
Product Type Broadcom NetXtreme Gigabit Ethernet  
Installed Yes  
PNP Device ID  
PCI\VEN\_14E4&DEV\_1648&SUBSYS\_016F1028&REV\_10\5&  
34B7D673&0&110230  
Last Reset 7/30/2006 6:04 AM  
Index 1  
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), 5/24/2006 9:01 PM)

Name [00000002] 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&  
34B7D673&0&100230  
Last Reset 7/30/2006 6:04 AM  
Index 2  
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 00:13:72:41:0A:5E  
Memory Address 0xDF3F0000-0xDF3FFFFF  
IRQ Channel IRQ 64  
Driver c:\windows\system32\drivers\b57amd64.sys (7.98.0.0 built by:  
WinDDK, 187.00 KB (191,488 bytes), 5/24/2006 9:01 PM)

Name [00000003] RAS Async Adapter  
Adapter Type Not Available  
Product Type RAS Async Adapter  
Installed Yes  
PNP Device ID Not Available  
Last Reset 7/30/2006 6:04 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 7/30/2006 6:04 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 7/30/2006 6:04 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\raspptp.sys (5.2.3790.1830  
(srv03\_sp1\_rtm.050324-1447), 117.50 KB (120,320 bytes), 3/25/2005 6:00  
AM)

Name [00000006] WAN Miniport (PPPOE)  
Adapter Type Wide Area Network (WAN)  
Product Type WAN Miniport (PPPOE)  
Installed Yes  
PNP Device ID ROOT\MS\_PPPOEMINIPOINT\0000  
Last Reset 7/30/2006 6:04 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\raspppoe.sys (5.2.3790.1830  
(srv03\_sp1\_rtm.050324-1447), 67.50 KB (69,120 bytes), 3/25/2005 6:00 AM)

Name [00000007] Direct Parallel  
Adapter Type Not Available  
Product Type Direct Parallel  
Installed Yes  
PNP Device ID ROOT\MS\_PTIMINIPOINT\0000  
Last Reset 7/30/2006 6:04 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 7/30/2006 6:04 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\wsock32.dll  
 Size 24.50 KB (25,088 bytes)  
 Version 5.2.3790.1830 (srv03\_sp1\_rtm.050324-1447)

[Ports]

[Serial]

Item Value  
 Name Communications Port (COM1)  
 Status OK  
 PNP Device ID ACPI\PNP0501\1  
 Maximum Input Buffer Size 0  
 Maximum Output Buffer Size No  
 Settable Baud Rate Yes  
 Settable Data Bits Yes  
 Settable Flow Control Yes  
 Settable Parity Yes  
 Settable Parity Check Yes  
 Settable Stop Bits Yes  
 Settable RLSD Yes  
 Supports RLSD Yes  
 Supports 16 Bit Mode No  
 Supports Special Characters No  
 Baud Rate 9600  
 Bits/Byte 8  
 Stop Bits 1  
 Parity None  
 Busy No  
 Abort Read/Write on Error No  
 Binary Mode Enabled Yes  
 Continue XMit on XOff No  
 CTS Outflow Control No  
 Discard NULL Bytes No  
 DSR Outflow Control 0  
 DSR Sensitivity 0  
 DTR Flow Control Type Enable

EOF Character 0  
 Error Replace Character 0  
 Error Replacement Enabled No  
 Event Character 0  
 Parity Check Enabled No  
 RTS Flow Control Type Enable  
 XOff Character 19  
 XOffXMit Threshold 512  
 XOn Character 17  
 XOnXMit Threshold 2048  
 XOnXOff InFlow Control 0  
 XOnXOff OutFlow Control 0  
 I/O Port 0x000003F8-0x000003FF  
 IRQ Channel IRQ 4  
 Driver c:\windows\system32\drivers\serial.sys (5.2.3790.1830  
 (srv03\_sp1\_rtm.050324-1447), 118.50 KB (121,344 bytes), 3/25/2005 6:00  
 AM)

[Parallel]

Item Value

[Storage]

[Drives]

Item Value

Drive A:  
 Description 3 1/2 Inch Floppy Drive

Drive C:  
 Description Local Fixed Disk  
 Compressed No  
 File System NTFS  
 Size 40.00 GB (42,952,376,320 bytes)  
 Free Space 25.05 GB (26,898,395,136 bytes)  
 Volume Name  
 Volume Serial Number E0570DEA

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 Not Available  
 File System Not Available  
 Size Not Available  
 Free Space Not Available  
 Volume Name Not Available  
 Volume Serial Number Not Available

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

Size 2.01 GB (2,155,020,288 bytes)  
 Free Space 259.75 MB (272,367,616 bytes)  
 Volume Name  
 Volume Serial Number 0C2926D9

[Disks]

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

Item	Value
Description	Disk drive
Manufacturer	(Standard disk drives)
Model	DELL PERC 5/E Adapter SCSI Disk Device
Bytes/Sector	512
Media Loaded	Yes
Media Type	Fixed hard disk
Partitions	3
SCSI Bus	1
SCSI Logical Unit	0
SCSI Port	5
SCSI Target ID	0
Sectors/Track	63
Size	1,001.24 GB (1,075,076,997,120 bytes)
Total Cylinders	130,704
Total Sectors	2,099,759,760
Total Tracks	33,329,520
Tracks/Cylinder	255
Partition	Disk #7, Partition #0
Partition Size	42.51 GB (45,642,046,464 bytes)
Partition Starting Offset	32,256 bytes
Partition	Disk #7, Partition #1
Partition Size	20.51 GB (22,019,074,560 bytes)
Partition Starting Offset	45,642,078,720 bytes
Partition	Disk #7, Partition #2
Partition Size	938.23 GB (1,007,415,843,840 bytes)
Partition Starting Offset	67,661,153,280 bytes

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

Description	Disk drive
Manufacturer	(Standard disk drives)
Model	DELL PERC 5/E Adapter SCSI Disk Device
Bytes/Sector	512
Media Loaded	Yes
Media Type	Fixed hard disk
Partitions	3
SCSI Bus	1
SCSI Logical Unit	0
SCSI Port	5
SCSI Target ID	1
Sectors/Track	63
Size	1,001.24 GB (1,075,076,997,120 bytes)
Total Cylinders	130,704
Total Sectors	2,099,759,760
Total Tracks	33,329,520
Tracks/Cylinder	255
Partition	Disk #8, Partition #0
Partition Size	42.51 GB (45,642,046,464 bytes)
Partition Starting Offset	32,256 bytes
Partition	Disk #8, Partition #1
Partition Size	20.51 GB (22,019,074,560 bytes)
Partition Starting Offset	45,642,078,720 bytes
Partition	Disk #8, Partition #2
Partition Size	938.23 GB (1,007,415,843,840 bytes)
Partition Starting Offset	67,661,153,280 bytes

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 Not Available  
 File System Not Available  
 Size Not Available  
 Free Space Not Available  
 Volume Name Not Available  
 Volume Serial Number Not Available

Drive U:  
 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 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 Y:  
 Description Local Fixed Disk  
 Compressed No  
 File System NTFS

Description	Disk drive
Manufacturer	(Standard disk drives)
Model	DELL PERC 5/E Adapter SCSI Disk Device
Bytes/Sector	512
Media Loaded	Yes
Media Type	Fixed hard disk
Partitions	4
SCSI Bus	1
SCSI Logical Unit	0
SCSI Port	5
SCSI Target ID	2

Sectors/Track 63  
 Size 1,001.24 GB (1,075,076,997,120 bytes)  
 Total Cylinders 130,704  
 Total Sectors 2,099,759,760  
 Total Tracks 33,329,520  
 Tracks/Cylinder 255  
 Partition Disk #9, Partition #0  
 Partition Size 42.51 GB (45,642,046,464 bytes)  
 Partition Starting Offset 32,256 bytes  
 Partition Disk #9, Partition #1  
 Partition Size 20.51 GB (22,019,074,560 bytes)  
 Partition Starting Offset 45,642,078,720 bytes  
 Partition Disk #9, Partition #2  
 Partition Size 2.01 GB (2,155,023,360 bytes)  
 Partition Starting Offset 67,661,153,280 bytes  
 Partition Disk #9, Partition #3  
 Partition Size 936.22 GB (1,005,260,820,480 bytes)  
 Partition Starting Offset 69,816,176,640 bytes

Description Disk drive  
 Manufacturer (Standard disk drives)  
 Model DELL PERC 5/E Adapter SCSI Disk Device  
 Bytes/Sector 512  
 Media Loaded Yes  
 Media Type Fixed hard disk  
 Partitions 3  
 SCSI Bus 1

SCSI Logical Unit 0  
 SCSI Port 4  
 SCSI Target ID 0  
 Sectors/Track 63  
 Size 1,001.24 GB (1,075,076,997,120 bytes)  
 Total Cylinders 130,704  
 Total Sectors 2,099,759,760  
 Total Tracks 33,329,520  
 Tracks/Cylinder 255  
 Partition Disk #4, Partition #0  
 Partition Size 42.51 GB (45,642,046,464 bytes)  
 Partition Starting Offset 32,256 bytes  
 Partition Disk #4, Partition #1  
 Partition Size 20.51 GB (22,019,074,560 bytes)  
 Partition Starting Offset 45,642,078,720 bytes  
 Partition Disk #4, Partition #2  
 Partition Size 938.23 GB (1,007,415,843,840 bytes)  
 Partition Starting Offset 67,661,153,280 bytes

Description Disk drive  
 Manufacturer (Standard disk drives)  
 Model DELL PERC 5/E Adapter SCSI Disk Device  
 Bytes/Sector 512  
 Media Loaded Yes  
 Media Type Fixed hard disk  
 Partitions 3  
 SCSI Bus 1

SCSI Logical Unit 0  
 SCSI Port 4  
 SCSI Target ID 1  
 Sectors/Track 63  
 Size 1,001.24 GB (1,075,076,997,120 bytes)  
 Total Cylinders 130,704  
 Total Sectors 2,099,759,760  
 Total Tracks 33,329,520  
 Tracks/Cylinder 255  
 Partition Disk #5, Partition #0  
 Partition Size 42.51 GB (45,642,046,464 bytes)  
 Partition Starting Offset 32,256 bytes  
 Partition Disk #5, Partition #1  
 Partition Size 20.51 GB (22,019,074,560 bytes)  
 Partition Starting Offset 45,642,078,720 bytes  
 Partition Disk #5, Partition #2  
 Partition Size 938.23 GB (1,007,415,843,840 bytes)  
 Partition Starting Offset 67,661,153,280 bytes

Description Disk drive  
 Manufacturer (Standard disk drives)  
 Model DELL PERC 5/E Adapter SCSI Disk Device  
 Bytes/Sector 512  
 Media Loaded Yes  
 Media Type Fixed hard disk  
 Partitions 3  
 SCSI Bus 1

SCSI Logical Unit 0  
 SCSI Port 4  
 SCSI Target ID 2  
 Sectors/Track 63  
 Size 1,001.24 GB (1,075,076,997,120 bytes)  
 Total Cylinders 130,704  
 Total Sectors 2,099,759,760  
 Total Tracks 33,329,520  
 Tracks/Cylinder 255  
 Partition Disk #6, Partition #0  
 Partition Size 42.51 GB (45,642,046,464 bytes)  
 Partition Starting Offset 32,256 bytes  
 Partition Disk #6, Partition #1  
 Partition Size 20.51 GB (22,019,074,560 bytes)  
 Partition Starting Offset 45,642,078,720 bytes  
 Partition Disk #6, Partition #2  
 Partition Size 938.23 GB (1,007,415,843,840 bytes)  
 Partition Starting Offset 67,661,153,280 bytes

Description Disk drive  
 Manufacturer (Standard disk drives)  
 Model DELL PERC 5/E Adapter SCSI Disk Device  
 Bytes/Sector 512  
 Media Loaded Yes  
 Media Type Fixed hard disk  
 Partitions 3  
 SCSI Bus 1

SCSI Logical Unit 0  
 SCSI Port 3  
 SCSI Target ID 0  
 Sectors/Track 63  
 Size 1,001.24 GB (1,075,076,997,120 bytes)  
 Total Cylinders 130,704  
 Total Sectors 2,099,759,760  
 Total Tracks 33,329,520  
 Tracks/Cylinder 255  
 Partition Disk #1, Partition #0  
 Partition Size 42.51 GB (45,642,046,464 bytes)  
 Partition Starting Offset 32,256 bytes  
 Partition Disk #1, Partition #1  
 Partition Size 20.51 GB (22,019,074,560 bytes)  
 Partition Starting Offset 45,642,078,720 bytes  
 Partition Disk #1, Partition #2  
 Partition Size 938.23 GB (1,007,415,843,840 bytes)  
 Partition Starting Offset 67,661,153,280 bytes

Description Disk drive  
 Manufacturer (Standard disk drives)  
 Model DELL PERC 5/E Adapter SCSI Disk Device  
 Bytes/Sector 512  
 Media Loaded Yes  
 Media Type Fixed hard disk  
 Partitions 3  
 SCSI Bus 1

SCSI Logical Unit 0  
 SCSI Port 3  
 SCSI Target ID 1  
 Sectors/Track 63  
 Size 1,001.24 GB (1,075,076,997,120 bytes)  
 Total Cylinders 130,704  
 Total Sectors 2,099,759,760  
 Total Tracks 33,329,520  
 Tracks/Cylinder 255  
 Partition Disk #2, Partition #0  
 Partition Size 42.51 GB (45,642,046,464 bytes)

Partition Starting Offset 32,256 bytes  
Partition Disk #2, Partition #1  
Partition Size 20.51 GB (22,019,074,560 bytes)  
Partition Starting Offset 45,642,078,720 bytes  
Partition Disk #2, Partition #2  
Partition Size 938.23 GB (1,007,415,843,840 bytes)  
Partition Starting Offset 67,661,153,280 bytes

Description Disk drive  
Manufacturer (Standard disk drives)  
Model DELL PERC 5/E Adapter SCSI Disk Device  
Bytes/Sector 512  
Media Loaded Yes  
Media Type Fixed hard disk  
Partitions 3  
SCSI Bus 1  
SCSI Logical Unit 0  
SCSI Port 3  
SCSI Target ID 2  
Sectors/Track 63  
Size 1,001.24 GB (1,075,076,997,120 bytes)  
Total Cylinders 130,704  
Total Sectors 2,099,759,760  
Total Tracks 33,329,520  
Tracks/Cylinder 255

Partition Disk #3, Partition #0  
Partition Size 42.51 GB (45,642,046,464 bytes)  
Partition Starting Offset 32,256 bytes  
Partition Disk #3, Partition #1  
Partition Size 20.51 GB (22,019,074,560 bytes)  
Partition Starting Offset 45,642,078,720 bytes  
Partition Disk #3, Partition #2  
Partition Size 938.23 GB (1,007,415,843,840 bytes)  
Partition Starting Offset 67,661,153,280 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 2  
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 #0, Partition #0  
Partition Size 40.00 GB (42,952,379,904 bytes)  
Partition Starting Offset 32,256 bytes  
Partition Disk #0, Partition #1  
Partition Size 60.00 GB (64,428,618,240 bytes)  
Partition Starting Offset 42,952,412,160 bytes

[SCSI]

Item Value  
Name DELL PERC 5/E Adapter RAID Controller  
Manufacturer DELL  
Status OK  
PNP Device ID  
PCI\VEN\_1028&DEV\_0015&SUBSYS\_1F011028&REV\_00\5&24E436EE&0&700008  
Memory Address 0xD93F0000-0xD93FFFFF  
Memory Address 0xDFDE0000-0xDFDFFFFF  
IRQ Channel IRQ 18  
Driver c:\windows\system32\drivers\percscas.sys (1.20.0.64 built by: WinDDK, 26.50 KB (27,136 bytes), 12/9/2005 7:57 AM)

Name DELL PERC 5/E Adapter RAID Controller  
Manufacturer DELL  
Status OK  
PNP Device ID  
PCI\VEN\_1028&DEV\_0015&SUBSYS\_1F011028&REV\_00\5&34039531&0&700010  
Memory Address 0xD92F0000-0xD92FFFFF  
Memory Address 0xDFAE0000-0xDFAFFFFF  
IRQ Channel IRQ 18  
Driver c:\windows\system32\drivers\percscas.sys (1.20.0.64 built by: WinDDK, 26.50 KB (27,136 bytes), 12/9/2005 7:57 AM)

Name DELL PERC 5/E Adapter RAID Controller  
Manufacturer DELL  
Status OK  
PNP Device ID  
PCI\VEN\_1028&DEV\_0015&SUBSYS\_1F011028&REV\_00\5&246E8B3A&0&700028  
Memory Address 0xD91F0000-0xD91FFFFF  
Memory Address 0xDF6E0000-0xDF6FFFFF  
IRQ Channel IRQ 18  
Driver c:\windows\system32\drivers\percscas.sys (1.20.0.64 built by: WinDDK, 26.50 KB (27,136 bytes), 12/9/2005 7:57 AM)

Name Dell PERC 4e/Di RAID Controller  
Manufacturer Dell  
Status OK  
PNP Device ID  
PCI\VEN\_1028&DEV\_0013&SUBSYS\_016F1028&REV\_06\5&142A9BCB&0&700038  
Memory Address 0xD90F0000-0xD90FFFFF  
Memory Address 0xDF0C0000-0xDF0FFFFF  
IRQ Channel IRQ 110  
Driver c:\windows\system32\drivers\mraid35x.sys (6.44.3.64 (NT.040809-2325), 35.50 KB (36,352 bytes), 3/25/2005 6:00 AM)

[IDE]

Item Value  
Name Intel(R) 82801EB Ultra ATA Storage Controllers - 24DB  
Manufacturer Intel  
Status OK  
PNP Device ID  
PCI\VEN\_8086&DEV\_24DB&SUBSYS\_016F1028&REV\_02\3&13C0B0C5&0&F9  
I/O Port 0x0000FC00-0x0000FC0F  
Memory Address 0xFEBFFC00-0xFEBFFFFF  
Driver c:\windows\system32\drivers\intelide.sys (5.2.3790.1830 (srv03\_sp1\_rtm.050324-1447), 9.00 KB (9,216 bytes), 5/24/2006 9:00 PM)

Name Primary IDE Channel  
Manufacturer (Standard IDE ATA/ATAPI controllers)  
Status OK  
PNP Device ID  
PCI\IDE\IDECHANNEL\4&16A8F7F1&0&0  
I/O Port 0x000001F0-0x000001F7  
I/O Port 0x000003F6-0x000003F6  
IRQ Channel IRQ 14  
Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.1830 (srv03\_sp1\_rtm.050324-1447), 145.00 KB (148,480 bytes), 3/25/2005 6:00 AM)

Name Secondary IDE Channel  
Manufacturer (Standard IDE ATA/ATAPI controllers)  
Status OK  
PNP Device ID  
PCI\IDE\IDECHANNEL\4&16A8F7F1&0&1  
I/O Port 0x00000170-0x00000177  
I/O Port 0x00000376-0x00000376  
IRQ Channel IRQ 15  
Driver c:\windows\system32\drivers\atapi.sys (5.2.3790.1830 (srv03\_sp1\_rtm.050324-1447), 145.00 KB (148,480 bytes), 3/25/2005 6:00 AM)

[Printing]

Name	Driver	Port Name	Server Name
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[Problem Devices]

Device	PNP Device ID	Error Code
Broadcom NetXtreme Gigabit Ethernet	PCI\VEN_14E4&DEV_1648&SUBSYS_016F1028&REV_10\5&34B7D673&0&110230	This device is disabled.

[USB]

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

[Software Environment]

[System Drivers]

Name	Description	File	Type	Started	Start Mode
		State	Status	Error Control	Accept Pause
Accept Stop					
abiosdsk	Abiosdsk	Not Available	Kernel Driver	No	No
		Disabled Stopped OK	Ignore	No	No
acpi	Microsoft ACPI Driver	c:\windows\system32\drivers\acpi.sys		Kernel Driver	No
		Yes Boot	Running OK	Normal	No
		Yes			
acpiec	ACPIEC	c:\windows\system32\drivers\acpiec.sys		Kernel	No
Driver		No	Disabled Stopped OK	Normal	No
		No			
adpu160m	adpu160m	Not Available	Kernel Driver	No	No
		Disabled Stopped OK	Normal	No	No
adpu320	adpu320	Not Available	Kernel Driver	No	No
		Disabled Stopped OK	Normal	No	No
afd	AFD	c:\windows\system32\drivers\afd.sys		Kernel	No
Driver		Yes System	Running OK	Normal	No
		Yes			
aic78u2	aic78u2	Not Available	Kernel Driver	No	No
		Disabled Stopped OK	Normal	No	No
aic78xx	aic78xx	Not Available	Kernel Driver	No	No
		Disabled Stopped OK	Normal	No	No
aliide	AliIde	Not Available	Kernel Driver	No	No
		Disabled Stopped OK	Normal	No	No
amdide	AmdIde	Not Available	Kernel Driver	No	No
		Disabled Stopped OK	Normal	No	No
arc	arc	Not Available	Kernel Driver	No	No
		Disabled Stopped OK	Normal	No	No
asynmac	RAS Asynchronous Media Driver	c:\windows\system32\drivers\asynmac.sys		Kernel Driver	No
		No Manual	Stopped OK	Normal	No
		No			
atapi	Standard IDE/ESDI Hard Disk Controller	c:\windows\system32\drivers\atapi.sys		Kernel Driver	No
		Yes Boot	Running OK	Normal	No
		Yes			
atdisk	Atdisk	Not Available	Kernel Driver	No	No
		Disabled Stopped OK	Ignore	No	No

ati2mtag	ati2mtag	c:\windows\system32\drivers\ati2mtag.sys		Kernel	No
Driver		Yes Manual	Running OK	Ignore	No
		Yes			
atmarpc	ATM ARP Client Protocol				
	c:\windows\system32\drivers\atmarpc.sys		Kernel Driver		
	No Manual	Stopped OK	Normal	No	No
	No				
audstub	Audio Stub Driver	c:\windows\system32\drivers\audstub.sys		Kernel Driver	OK
		Yes Manual	Running	Normal	OK
		No Yes			
b57nd	Broadcom NetXtreme Gigabit Ethernet				
	c:\windows\system32\drivers\b57amd64.sys		Kernel Driver		
	Yes Manual	Running OK	Normal	No	No
	Yes				
beep	Beep	c:\windows\system32\drivers\beep.sys		Kernel	No
Driver		Yes System	Running OK	Normal	No
		Yes			
cdac15ba	CdaC15BA	c:\windows\system32\drivers\cdac15ba.sys		Kernel Driver	OK
		Yes Auto	Running	Normal	OK
		No Yes			
cdad10ba	CdaD10BA	c:\windows\system32\drivers\cdad10ba.sys		Kernel Driver	OK
		Yes Auto	Running	Normal	OK
		No Yes			
cdfs	Cdfs	c:\windows\system32\drivers\cdfs.sys		File	Normal
System Driver		Yes Disabled	Running OK	Normal	Normal
		No Yes			
cdrom	CD-ROM Driver	c:\windows\system32\drivers\cdrom.sys		Kernel Driver	OK
		Yes System	Running	Normal	OK
		No Yes			
changer	Changer	Not Available		Kernel Driver	No
		System Stopped	OK	Ignore	No
		OK		No	No
clusdisk	Cluster Disk Driver	c:\windows\system32\drivers\clusdisk.sys		Kernel Driver	OK
		No Disabled	Stopped	Normal	OK
		No No			
cmdide	CmdIde	Not Available		Kernel Driver	No
		Disabled Stopped	OK	Normal	No
		OK		No	No
cpqcissm	cpqcissm	Not Available		Kernel Driver	No
		Disabled Stopped	OK	Normal	No
		OK		No	No
crdisk	CRC Disk Filter Driver			Kernel Driver	No
	c:\windows\system32\drivers\crdisk.sys		Kernel Driver	Normal	No
	Yes Boot	Running OK	Normal	No	No
	Yes				
dfsdriver	DfsDriver	c:\windows\system32\drivers\dfs.sys		File	Normal
System Driver		Yes Boot	Running OK	Normal	Normal
		No Yes			
disk	Disk Driver	c:\windows\system32\drivers\disk.sys		Kernel Driver	OK
		Yes Boot	Running	Normal	OK
		No Yes			
dmboot	dmboot	c:\windows\system32\drivers\dmboot.sys		Kernel	No
Driver		No Disabled	Stopped OK	Normal	No
		No			
dmio	Logical Disk Manager Driver			Kernel Driver	No
	c:\windows\system32\drivers\dmio.sys		Kernel Driver	Normal	No
	Yes Boot	Running OK	Normal	No	No
	Yes				
dmload	dmload	c:\windows\system32\drivers\dmload.sys		Kernel	No
Driver		Yes Boot	Running OK	Normal	No
		Yes			
dpti2o	dpti2o	Not Available		Kernel Driver	No
		Disabled Stopped	OK	Normal	No
		OK		No	No
elxstor	elxstor	Not Available		Kernel Driver	No
		Disabled Stopped	OK	Normal	No
		OK		No	No
fastfat	Fastfat	c:\windows\system32\drivers\fastfat.sys		File	Normal
System Driver		No Disabled	Stopped OK	Normal	Normal
		No No			
fdc	Floppy Disk Controller Driver			Kernel Driver	No
	c:\windows\system32\drivers\fdc.sys		Kernel Driver	Normal	No
	Yes Manual	Running OK	Normal	No	No
	Yes				
fips	Fips	c:\windows\system32\drivers\fips.sys		Kernel	No
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	Yes	Boot	Running	OK	Normal	
	No	Yes							
ftdisk	Volume Manager Driver	c:\windows\system32\drivers\ftdisk.sys	Kernel Driver	Yes	Boot	Running	OK	Normal	No
	Yes								
gpc	Generic Packet Classifier	c:\windows\system32\drivers\msgpc.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
	Yes								
hidusb	Microsoft HID Class Driver	c:\windows\system32\drivers\hidusb.sys	Kernel Driver	Yes	Manual	Running	OK	Ignore	No
	Yes								
hpciss	hpciss	Not Available	Kernel Driver	Disabled	Stopped	OK	Normal	No	No
	HTTP Driver	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	No
	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	No
	imapi	CD-Burning Filter Driver	c:\windows\system32\drivers\imapi.sys	Kernel Driver	No	System	Stopped	OK	Normal
	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
	Kernel Driver	Yes	Manual	Running	OK	Normal	No	Yes	
	No								
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	Normal	No	No	Manual	Stopped	OK
	Kernel Driver	No	Manual	Stopped	OK	Normal	No	Yes	
	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	Normal	No	Yes	System	Running	OK
	Kernel Driver	Yes	System	Running	OK	Normal	No	Yes	
	No								
isapnp	PnP ISA/EISA Bus Driver	c:\windows\system32\drivers\isapnp.sys	Kernel Driver	Yes	Boot	Running	OK	Critical	No
	Yes								
kbdclass	Keyboard Class Driver	c:\windows\system32\drivers\kbdclass.sys	Kernel Driver	Yes	System	Running	OK	Normal	No
	Yes								
kbdhid	Keyboard HID Driver	c:\windows\system32\drivers\kbdhid.sys	Kernel Driver	Ignore	No	Yes	System	Running	OK
	Kernel Driver	Yes	System	Running	OK	Normal	No	Yes	
	No								
ksecdd	KSecDD	c:\windows\system32\drivers\ksecdd.sys	Kernel Driver	Yes	Boot	Running	OK	Normal	No
	Yes								
ksthunk	Kernel Streaming WOW64 Thunk Service	c:\windows\system32\drivers\ksthunk.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
	Kernel Driver	Yes	Manual	Running	OK	Normal	No	Yes	
	Yes								
lp6nds35	lp6nds35	Not Available	Kernel Driver	Disabled	Stopped	OK	Normal	No	No
	Kernel Driver	Yes	System	Running	OK	Ignore	No	Yes	
	Yes								
mnmdd	mnmdd	c:\windows\system32\drivers\mnmdd.sys	Kernel Driver	Yes	System	Running	OK	Ignore	No
	Kernel Driver	Yes	System	Running	OK	Ignore	No	Yes	
	Yes								
modem	Modem Driver	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	Normal	No	Yes	System	Running	OK
	Kernel Driver	Yes	System	Running	OK	Normal	No	Yes	
	Normal	No	Yes						
mouhid	Mouse HID Driver	c:\windows\system32\drivers\mouhid.sys	Kernel Driver	Yes	Manual	Running	OK	Ignore	No
	Kernel Driver	Yes	Manual	Running	OK	Ignore	No	Yes	
	Ignore	No	Yes						
mountmgr	Mount Point Manager	c:\windows\system32\drivers\mountmgr.sys	Kernel Driver	Normal	No	Yes	Yes	Boot	Running
	Kernel Driver	Yes	Boot	Running	OK	Normal	No	Yes	
	Normal	No	Yes						
mraid35x	mraid35x	c:\windows\system32\drivers\mraid35x.sys	Kernel Driver	Yes	Boot	Running	OK	Normal	No
	Kernel Driver	Yes	Boot	Running	OK	Normal	No	Yes	
	Yes								
mrxdav	WebDav Client Redirector	c:\windows\system32\drivers\mrxdav.sys	File System Driver	No	Manual	Stopped	OK	Normal	No
	File System Driver	Yes	System	Running	OK	Normal	No	Yes	
	No								
mrxsm	MRXSMB	c:\windows\system32\drivers\mrxsm.sys	File System Driver	No	Yes	System	Running	OK	Normal
	File System Driver	Yes	System	Running	OK	Normal	No	Yes	
	No								
msfs	Msf	c:\windows\system32\drivers\msfs.sys	File System Driver	No	Yes	System	Running	OK	Normal
	File System Driver	Yes	System	Running	OK	Normal	No	Yes	
	No								
mssmbios	Microsoft System Management BIOS Driver	c:\windows\system32\drivers\mssmbios.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
	Kernel Driver	Yes	Manual	Running	OK	Normal	No	Yes	
	Yes								
mup	Mup	c:\windows\system32\drivers\mup.sys	File System Driver	No	Yes	Boot	Running	OK	Normal
	File System Driver	Yes	Boot	Running	OK	Normal	No	Yes	
	No								
ndis	NDIS System Driver	c:\windows\system32\drivers\ndis.sys	Kernel Driver	Normal	No	Yes	Yes	Boot	Running
	Kernel Driver	Yes	Boot	Running	OK	Normal	No	Yes	
	Normal	No	Yes						
ndistapi	Remote Access NDIS TAPI Driver	c:\windows\system32\drivers\ndistapi.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
	Kernel Driver	Yes	Manual	Running	OK	Normal	No	Yes	
	Yes								
ndisuio	NDIS Usermode I/O Protocol	c:\windows\system32\drivers\ndisuio.sys	Kernel Driver	No	Manual	Stopped	OK	Normal	No
	Kernel Driver	Yes	Manual	Running	OK	Normal	No	Yes	
	No								
ndiswan	Remote Access NDIS WAN Driver	c:\windows\system32\drivers\ndiswan.sys	Kernel Driver	Yes	Manual	Running	OK	Normal	No
	Kernel Driver	Yes	Manual	Running	OK	Normal	No	Yes	
	Yes								
ndproxy	NDIS Proxy	c:\windows\system32\drivers\ndproxy.sys	Kernel Driver	Normal	No	Yes	Manual	Running	OK
	Kernel Driver	Yes	Manual	Running	OK	Normal	No	Yes	
	Normal	No	Yes						
netbios	NetBIOS Interface	c:\windows\system32\drivers\netbios.sys	File System Driver	Normal	No	Yes	System	Running	OK
	File System Driver	Yes	System	Running	OK	Normal	No	Yes	
	Normal	No	Yes						
netbt	NetBios over Tcpip	c:\windows\system32\drivers\netbt.sys	Kernel Driver	Normal	No	Yes	System	Running	OK
	Kernel Driver	Yes	System	Running	OK	Normal	No	Yes	
	Normal	No	Yes						
nfrd960	nfrd960	Not Available	Kernel Driver	Disabled	Stopped	OK	Normal	No	No
	Kernel Driver	Yes	System	Running	OK	Normal	No	Yes	
	Yes								
npfs	Npfs	c:\windows\system32\drivers\npfs.sys	File System Driver	No	Yes	System	Running	OK	Normal
	File System Driver	Yes	System	Running	OK	Normal	No	Yes	
	No								
ntfs	Ntfs	c:\windows\system32\drivers\ntfs.sys	File System Driver	No	Yes	Disabled	Running	OK	Normal
	File System Driver	Yes	Disabled	Running	OK	Normal	No	Yes	
	No								



null Driver	Null	Yes	System	Running	OK	Normal	No	Kernel	secdrv	Security Driver	Kernel Driver	Yes	Auto	Running	OK
	Yes									Normal	No	Yes			
parport Driver	Parport	No	Manual	Stopped	OK	Ignore	No	Kernel	serenum	Serenum Filter Driver	Kernel Driver	Yes	Manual	Running	OK
	No									Normal	No	Yes			
partmgr	Partition Manager							c:\windows\system32\drivers\partmgr.sys	serial	Serial port driver	Kernel Driver	Yes	System	Running	OK
	Kernel Driver	Yes	Boot	Running	OK					Kernel Driver	Yes	System	Running	OK	
	Normal	No	Yes							Ignore	No	Yes			
pci	PCI Bus Driver							c:\windows\system32\drivers\pci.sys	sfloppy Driver	Sfloppy	Kernel Driver	No	System	Stopped	OK
	Kernel Driver	Yes	Boot	Running	OK					No					
	Critical	No	Yes							No					
pciide Driver	PCIIde	Yes	Boot	Running	OK	Normal	No	Kernel	simbad	Simbad	Not Available	Kernel Driver	Disabled	Stopped	OK
	Yes									Disabled	Stopped	OK	Normal	No	No
	Yes									Normal	No	Yes			
pcmcia Driver	Pcmcia	No	Disabled	Stopped	OK	Normal	No	Kernel	srv	Srv	c:\windows\system32\drivers\srv.sys	File	System Driver	No	Manual
	No									No	Manual	Stopped	OK	Normal	
	No									No	No				
pdcomp	PDCOMP	Not Available						Kernel Driver	swenum	Software Bus Driver	Kernel Driver	Yes	Manual	Running	OK
	Manual	Stopped	OK	Ignore	No	No				Kernel Driver	Yes	Manual	Running	OK	
	Normal	No	Yes							Normal	No	Yes			
pdframe	PDFRAME							Kernel Driver	symc8xx	symc8xx	Not Available	Kernel Driver	Disabled	Stopped	OK
	No	Manual	Stopped	OK	Ignore	No				Disabled	Stopped	OK	Normal	No	No
	No									Normal	No	Yes			
pdreli	PDRELI	Not Available						Kernel Driver	symmpi	symmpi	Not Available	Kernel Driver	Disabled	Stopped	OK
	Manual	Stopped	OK	Ignore	No	No				Disabled	Stopped	OK	Normal	No	No
	Yes									Normal	No	Yes			
pdrframe	PDRFRAME							Kernel Driver	sym_hi	sym_hi	Not Available	Kernel Driver	Disabled	Stopped	OK
	No	Manual	Stopped	OK	Ignore	No				Disabled	Stopped	OK	Normal	No	No
	No									Normal	No	Yes			
percsas Driver	percsas	Yes	Boot	Running	OK	Normal	No	Kernel	sym_u3	sym_u3	Not Available	Kernel Driver	Yes	System	Running
	Yes									Yes	System	Running	OK	Normal	No
	Yes									Yes	System	Running	OK	Normal	No
pptpminiport	WAN Miniport (PPTP)							Kernel Driver	tdpipe Driver	TDPIPE	c:\windows\system32\drivers\tdpipe.sys	Kernel	Yes	Manual	Running
	c:\windows\system32\drivers\rasppptp.sys	Yes	Manual	Running	OK	Normal	No	Kernel Driver		No	Manual	Stopped	OK	Ignore	No
	Yes									No					
ptilink	Direct Parallel Link Driver							Kernel Driver	tdtcp Driver	TDTCP	c:\windows\system32\drivers\tdtcp.sys	Kernel	Yes	Manual	Running
	c:\windows\system32\drivers\ptilink.sys	Yes	Manual	Running	OK	Normal	No	Kernel Driver		Yes	Manual	Running	OK	Ignore	No
	Yes									Yes	Manual	Running	OK	Ignore	No
ql2300	ql2300	Not Available						Kernel Driver	termdd	Terminal Device Driver	c:\windows\system32\drivers\termdd.sys	Kernel Driver	Yes	System	Running
	Disabled	Stopped	OK	Normal	No	No				c:\windows\system32\drivers\termdd.sys	Kernel Driver	Yes	System	Running	OK
	Yes									Yes	System	Running	OK	Normal	No
rasacd	Remote Access Auto Connection Driver							Kernel Driver	toside	TosIde	Not Available	Kernel Driver	Disabled	Stopped	OK
	c:\windows\system32\drivers\rasacd.sys	Yes	System	Running	OK	Normal	No	Kernel Driver		Disabled	Stopped	OK	Normal	No	No
	Yes									Normal	No	Yes			
rasl2tp	WAN Miniport (L2TP)							Kernel Driver	udfs System Driver	Udfs	c:\windows\system32\drivers\udfs.sys	File	Yes	Manual	Running
	c:\windows\system32\drivers\rasl2tp.sys	Yes	Manual	Running	OK	Normal	No	Kernel Driver		No	Disabled	Stopped	OK	Normal	
	Yes									No					
rasppoe	Remote Access PPPOE Driver							Kernel Driver	ultra	ultra	Not Available	Kernel Driver	Disabled	Stopped	OK
	c:\windows\system32\drivers\rasppoe.sys	Yes	Manual	Running	OK	Normal	No	Kernel Driver		Disabled	Stopped	OK	Normal	No	No
	Yes									Normal	No	Yes			
raspti	Direct Parallel							Kernel Driver	update	Microcode Update Driver	c:\windows\system32\drivers\update.sys	Kernel Driver	Yes	Manual	Running
	Kernel Driver	Yes	Manual	Running	OK	Normal	No	Kernel Driver		c:\windows\system32\drivers\update.sys	Kernel Driver	Yes	Manual	Running	OK
	Normal	No	Yes							Yes	Manual	Running	OK	Normal	No
	Yes									Yes	Manual	Running	OK	Normal	No
rdbss System Driver	Rdbss	Yes	System	Running	OK	Normal		File	usbccgp	Microsoft USB Generic Parent Driver	c:\windows\system32\drivers\usbccgp.sys	Kernel Driver	Yes	Manual	Running
	c:\windows\system32\drivers\rdbss.sys	Yes	System	Running	OK	Normal		File		c:\windows\system32\drivers\usbccgp.sys	Kernel Driver	Yes	Manual	Running	OK
	No	Yes								Yes	Manual	Running	OK	Normal	No
	Yes									Yes	Manual	Running	OK	Normal	No
rdpcdd Driver	RDPCDD	Yes	System	Running	OK	Ignore	No	Kernel	usbhci	Microsoft USB 2.0 Enhanced Host Controller Miniport Driver	c:\windows\system32\drivers\usbhci.sys	Kernel Driver	Yes	Manual	Running
	c:\windows\system32\drivers\rdpcdd.sys	Yes	System	Running	OK	Ignore	No	Kernel		c:\windows\system32\drivers\usbhci.sys	Kernel Driver	Yes	Manual	Running	OK
	Yes									Yes	Manual	Running	OK	Normal	No
	Yes									Yes	Manual	Running	OK	Normal	No
rdpdr	Terminal Server Device Redirector Driver							Kernel Driver	usbhub	USB2 Enabled Hub	Kernel Driver	Yes	Manual	Running	OK
	c:\windows\system32\drivers\rdpdr.sys	Yes	Manual	Running	OK	Normal	No	Kernel Driver		Kernel Driver	Yes	Manual	Running	OK	
	Yes									Normal	No	Yes			
	Yes									Normal	No	Yes			
rdpwd Driver	RDPWD	Yes	Manual	Running	OK	Ignore	No	Kernel	usbstor	USB Mass Storage Driver	c:\windows\system32\drivers\usbstor.sys	Kernel Driver	No	Manual	Stopped
	c:\windows\system32\drivers\rdpwd.sys	Yes	Manual	Running	OK	Ignore	No	Kernel		c:\windows\system32\drivers\usbstor.sys	Kernel Driver	No	Manual	Stopped	OK
	Yes									No	Manual	Stopped	OK	Normal	No
	Yes									No	Manual	Stopped	OK	Normal	No
redbook	Digital CD Audio Playback Filter Driver							Kernel Driver	usbuhci	Microsoft USB Universal Host Controller Miniport Driver	c:\windows\system32\drivers\usbuhci.sys	Kernel Driver	Yes	Manual	Running
	c:\windows\system32\drivers\redbook.sys	Yes	System	Running	OK	Normal	No	Kernel Driver		c:\windows\system32\drivers\usbuhci.sys	Kernel Driver	Yes	Manual	Running	OK
	Yes									Yes	Manual	Running	OK	Normal	No
	Yes									Yes	Manual	Running	OK	Normal	No

vgasave	VGA Display Controller.							Audio Codecs	No	MEDIA	5.2.3790.1830	10/1/2002
	c:\windows\system32\drivers\vga.sys		Kernel Driver					(Standard system devices)		wave.inf	Not Available	
	Yes	System	Running	OK	Ignore	No		ROOT\MEDIA\MS_MMCM				
	Yes							Remote Access IP ARP Driver	Not Available		LEGACYDRIVER	
viaide	ViaIde	Not Available	Kernel Driver	No				Not Available	Not Available		Not Available	
	Disabled	Stopped	OK	Normal	No	No		Not Available	Not Available			
volsnap	Storage volumes		c:\windows\system32\drivers\volsnap.sys					ROOT\LEGACY_WANARP\0000				
	Kernel Driver	Yes	Boot	Running	OK			volsnap	Not Available	LEGACYDRIVER	Not Available	
	Normal	No	Yes					Not Available	Not Available		Not Available	
wanarp	Remote Access IP ARP Driver							ROOT\LEGACY_VOLSNAP\0000				
	c:\windows\system32\drivers\wanarp.sys		Kernel Driver					VGA Display Controller.	Not Available		LEGACYDRIVER	
	Yes	Manual	Running	OK	Normal	No		Not Available	Not Available		Not Available	
	Yes							Not Available	Not Available			
wdica	WDICA	Not Available	Kernel Driver	No				ROOT\LEGACY_VGASAVE\0000				
	Manual	Stopped	OK	Ignore	No	No		TDTCP	Not Available	LEGACYDRIVER	Not Available	
wlbs	Network Load Balancing							Not Available	Not Available		Not Available	
	c:\windows\system32\drivers\wlbs.sys		Kernel Driver					Not Available	Not Available	ROOT\LEGACY_TDTCP\0000		
	No	Manual	Stopped	OK	Normal	No		TCP/IP Protocol Driver	Not Available		LEGACYDRIVER	
	No							Not Available	Not Available		Not Available	
								Not Available	Not Available			
								ROOT\LEGACY_TCPIP\0000				
[Signed Drivers]								Security Driver	Not Available	LEGACYDRIVER	Not	
Device Name	Signed	Device Class	Driver Version					Available	Not Available	Not Available	Not Available	
	Driver Date	Manufacturer	INF Name	Driver				Not Available	Not Available	ROOT\LEGACY_SECDRV\0000		
Name	Device ID							RDPWD	Not Available	LEGACYDRIVER	Not Available	
Microsoft System Management BIOS Driver	No	SYSTEM	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf		Not Available	Not Available	ROOT\LEGACY_RDPWD\0000		
	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf				Not Available	Not Available	LEGACYDRIVER	Not Available	
	machine.inf	Not Available						Not Available	Not Available	ROOT\LEGACY_RDPWD\0000		
	ROOT\SYSTEM\0002							Not Available	Not Available	LEGACYDRIVER	Not Available	
Microcode Update Device	No	SYSTEM	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf		Not Available	Not Available	ROOT\LEGACY_RDPDCC\0000		
	10/1/2002	(Standard system devices)	machine.inf					Not Available	Not Available	LEGACYDRIVER	Not Available	
	Not Available	ROOT\SYSTEM\0001						Not Available	Not Available	LEGACYDRIVER	Not Available	
Plug and Play Software Device Enumerator	No	SYSTEM	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf		Not Available	Not Available	ROOT\LEGACY_RASACD\0000		
	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf				Not Available	Not Available	LEGACYDRIVER	Not Available	
	machine.inf	Not Available						Not Available	Not Available	ROOT\LEGACY_RASACD\0000		
	ROOT\SYSTEM\0000							Not Available	Not Available	LEGACYDRIVER	Not Available	
Terminal Server Mouse Driver	No	SYSTEM	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf		Not Available	Not Available	ROOT\LEGACY_PCIIIDE\0000		
	10/1/2002	(Standard system devices)	machine.inf					Not Available	Not Available	LEGACYDRIVER	Not Available	
	Not Available	ROOT\RDP_MOU\0000						Not Available	Not Available	LEGACYDRIVER	Not Available	
Terminal Server Keyboard Driver	No	SYSTEM	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf		Not Available	Not Available	LEGACYDRIVER	Not Available	
	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf				Not Available	Not Available	LEGACYDRIVER	Not Available	
	machine.inf	Not Available						Not Available	Not Available	ROOT\LEGACY_NULL\0000		
	ROOT\RDP_KBD\0000							Not Available	Not Available	LEGACYDRIVER	Not Available	
Terminal Server Device Redirector	No	SYSTEM	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf		Not Available	Not Available	LEGACYDRIVER	Not Available	
	5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf				Not Available	Not Available	LEGACYDRIVER	Not Available	
	machine.inf	Not Available						Not Available	Not Available	LEGACYDRIVER	Not Available	
	ROOT\RDPDR\0000							Not Available	Not Available	LEGACYDRIVER	Not Available	
Direct Parallel	No	NET	5.2.3790.1830	10/1/2002				NDProxy	Not Available	LEGACYDRIVER	Not Available	
	Microsoft netrasa.inf	Not Available						Not Available	Not Available	LEGACYDRIVER	Not Available	
	ROOT\MS_PTMINIPORT\0000							Not Available	Not Available	LEGACYDRIVER	Not Available	
WAN Miniport (PPTP)	No	NET	5.2.3790.1830	10/1/2002	Microsoft netrasa.inf	Not Available		NDIS Usermode I/O Protocol	Not Available	LEGACYDRIVER	Not Available	
	10/1/2002	Microsoft netrasa.inf	Not Available					Not Available	Not Available	LEGACYDRIVER	Not Available	
	ROOT\MS_PPTPMINIPORT\0000							Not Available	Not Available	LEGACYDRIVER	Not Available	
WAN Miniport (PPPOE)	No	NET	5.2.3790.1830	10/1/2002	Microsoft netrasa.inf	Not Available		Remote Access NDIS TAPI Driver	Not Available	LEGACYDRIVER	Not Available	
	10/1/2002	Microsoft netrasa.inf	Not Available					Not Available	Not Available	LEGACYDRIVER	Not Available	
	ROOT\MS_PPPOEMINIPORT\0000							Not Available	Not Available	LEGACYDRIVER	Not Available	
WAN Miniport (IP)	No	NET	5.2.3790.1830	10/1/2002	Microsoft netrasa.inf	Not Available		ROOT\LEGACY_NDISUIO\0000				
	10/1/2002	Microsoft netrasa.inf	Not Available					Remote Access NDIS TAPI Driver	Not Available	LEGACYDRIVER	Not Available	
	ROOT\MS_NDISWANIP\0000							Not Available	Not Available	LEGACYDRIVER	Not Available	
WAN Miniport (L2TP)	No	NET	5.2.3790.1830	10/1/2002	Microsoft netrasa.inf	Not Available		NDIS System Driver	Not Available	LEGACYDRIVER	Not Available	
	10/1/2002	Microsoft netrasa.inf	Not Available					Available	Not Available	LEGACYDRIVER	Not Available	
	ROOT\MS_L2TPMINIPORT\0000							Not Available	Not Available	LEGACYDRIVER	Not Available	
Video Codecs	No	MEDIA	5.2.3790.1830	10/1/2002	(Standard system devices)	wave.inf		Not Available	Not Available	LEGACYDRIVER	Not Available	
	(Standard system devices)	wave.inf	Not Available					Not Available	Not Available	LEGACYDRIVER	Not Available	
	ROOT\MEDIA\MS_MMVID							Not Available	Not Available	LEGACYDRIVER	Not Available	
Legacy Video Capture Devices	No	MEDIA	5.2.3790.1830	10/1/2002	(Standard system devices)	wave.inf		mountmgr	Not Available	LEGACYDRIVER	Not Available	
	10/1/2002	(Standard system devices)	wave.inf	Not Available				Not Available	Not Available	LEGACYDRIVER	Not Available	
	Available	ROOT\MEDIA\MS_MMVCD						Not Available	Not Available	LEGACYDRIVER	Not Available	
Media Control Devices	No	MEDIA	5.2.3790.1830	10/1/2002	(Standard system devices)	wave.inf		Not Available	Not Available	LEGACYDRIVER	Not Available	
	10/1/2002	(Standard system devices)	wave.inf	Not Available				Not Available	Not Available	LEGACYDRIVER	Not Available	
	Available	ROOT\MEDIA\MS_MMMCI						Not Available	Not Available	LEGACYDRIVER	Not Available	
Legacy Audio Drivers	No	MEDIA	5.2.3790.1830	10/1/2002	(Standard system devices)	wave.inf		IPSEC driver	Not Available	LEGACYDRIVER	Not Available	
	(Standard system devices)	wave.inf	Not Available					Available	Not Available	LEGACYDRIVER	Not Available	
	ROOT\MEDIA\MS_MMDRV							Not Available	Not Available	LEGACYDRIVER	Not Available	

IP Network Address Translator	Not Available	LEGACYDRIVER	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available	Microsoft	volume.inf	Not Available	
	Not Available	Not Available	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0		
	ROOT\LEGACY_IPNAT\0000		00FFSETAA07ADA00LENGTH520706A00			
HTTP	Not Available	LEGACYDRIVER	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available	Microsoft	volume.inf	Not Available	
	Not Available	Not Available	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0		
	ROOT\LEGACY_HTTP\0000		00FFSET7E00LENGTHHAA07A5C00			
Generic Packet Classifier	Not Available	LEGACYDRIVER	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available	Microsoft	volume.inf	Not Available	
	Not Available	Not Available	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0		
	ROOT\LEGACY_GPC\0000		FOFFSET10415E5000LENGTHHAA0E36D000			
Fips	Not Available	LEGACYDRIVER	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available	Microsoft	volume.inf	Not Available	
	Not Available	Not Available	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0		
	ROOT\LEGACY_FIPS\0000		FOFFSETFC0EB4400LENGTH80730C00			
dmload	Not Available	LEGACYDRIVER	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available	Microsoft	volume.inf	Not Available	
	Not Available	Not Available	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0		
	ROOT\LEGACY_DMLOAD\0000		FOFFSETAA07ADA00LENGTH520706A00			
dmbboot	Not Available	LEGACYDRIVER	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
	Not Available	Not Available	Microsoft	volume.inf	Not Available	
	Not Available	Not Available	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0		
	ROOT\LEGACY_DMBBOOT\0000		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
CRC Disk Filter Driver	Not Available	LEGACYDRIVER	Microsoft	volume.inf	Not Available	
	Not Available	Not Available	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0		
	Not Available	Not Available	FOFFSET7E00LENGTHHAA07A5C00			
	ROOT\LEGACY_CRCDISK\0000		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
CdaD10BA	Not Available	LEGACYDRIVER	Microsoft	volume.inf	Not Available	
Available	Not Available	Not Available	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0		
	Not Available	Not Available	DOFFSETFC0EB4400LENGTHHAA8EA9DC00			
	ROOT\LEGACY_CDAD10BA\0000		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
CdaC15BA	Not Available	LEGACYDRIVER	Microsoft	volume.inf	Not Available	
Available	Not Available	Not Available	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0		
	Not Available	Not Available	DOFFSETAA07ADA00LENGTH520706A00			
	ROOT\LEGACY_CDAC15BA\0000		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
Beep	Not Available	LEGACYDRIVER	Microsoft	volume.inf	Not Available	
	Not Available	Not Available	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0		
	Not Available	Not Available	DOFFSETAA07ADA00LENGTH520706A00			
	ROOT\LEGACY_BEEP\0000		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
AFD	Not Available	LEGACYDRIVER	Microsoft	volume.inf	Not Available	
	Not Available	Not Available	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0		
	Not Available	Not Available	DOFFSET7E00LENGTHHAA07A5C00			
	ROOT\LEGACY_AFD\0000		Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002
Generic volume	No	VOLUME 5.2.3790.1830	Microsoft	volume.inf	Not Available	
	Microsoft	volume.inf	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE51B951B9		
	OFFSETA0029CC00LENGTHF003EB200		COFFSETFC0EB4400LENGTHHAA8EA9DC00			
	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002		
	Microsoft	volume.inf	Not Available			
	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE51B951B9				
	OFFSET7E00LENGTHHAA00294E00		COFFSETAA07ADA00LENGTH520706A00			
	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002		
	Microsoft	volume.inf	Not Available			
	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0				
	30FFSETFC0EB4400LENGTHHAA8EA9DC00		COFFSET7E00LENGTHHAA07A5C00			
	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002		
	Microsoft	volume.inf	Not Available			
	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0				
	30FFSETAA07ADA00LENGTH520706A00		60FFSETFC0EB4400LENGTHHAA8EA9DC00			
	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002		
	Microsoft	volume.inf	Not Available			
	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0				
	30FFSET7E00LENGTHHAA07A5C00		60FFSETAA07ADA00LENGTH520706A00			
	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002		
	Microsoft	volume.inf	Not Available			
	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0				
	20FFSETFC0EB4400LENGTHHAA8EA9DC00		60FFSET7E00LENGTHHAA07A5C00			
	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002		
	Microsoft	volume.inf	Not Available			
	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0				
	20FFSETAA07ADA00LENGTH520706A00		50FFSETFC0EB4400LENGTHHAA8EA9DC00			
	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002		
	Microsoft	volume.inf	Not Available			
	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0				
	20FFSET7E00LENGTHHAA07A5C00		50FFSETAA07ADA00LENGTH520706A00			
	Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002		
	Microsoft	volume.inf	Not Available			
	STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED0				
	00FFSETFC0EB4400LENGTHHAA8EA9DC00		50FFSET7E00LENGTHHAA07A5C00			

Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002	machine.inf	Not Available
Microsoft	volume.inf	Not Available		ACPI\PNP0000\4&26DD0F47&0	
STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED040FFSETFC0EB4400LENGTHEA8EA9DC00			Numeric data processor	No SYSTEM 5.2.3790.1830
Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002	Not Available	ACPI\PNP0C04\4&26DD0F47&0
Microsoft	volume.inf	Not Available		Direct memory access controller	No SYSTEM 5.2.3790.1830
STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED040FFSETAA07ADA00LENGHTH520706A00			10/1/2002 (Standard system devices)	machine.inf
Generic volume	No	VOLUME 5.2.3790.1830	10/1/2002	Not Available	ACPI\PNP0200\4&26DD0F47&0
Microsoft	volume.inf	Not Available		Intel(R) 82801EB LPC Interface Controller - 24D0	No SYSTEM
STORAGE\	VOLUME\1&30A96598&0&SIGNATURE1F25ED040FFSET7E00LENGHTHAA07A5C00			5.2.3790.1830	10/1/2002 Intel
Volume Manager	No	SYSTEM 5.2.3790.1830	10/1/2002	Not Available	machine.inf
(Standard system devices)		machine.inf	Not	PCI\VEN_8086&DEV_24D0&SUBSYS_00000000&REV_02\3&13C0B0C5&0&F8	
Available	ROOT\FTDISK\0000			Default Monitor	No MONITOR 5.2.3790.1830
Logical Disk Manager	No	SYSTEM 5.2.3790.1830	10/1/2002	Not Available	10/1/2002 (Standard monitor types)
(Standard system devices)	machine.inf	Not		Not Available	monitor.inf
Available	ROOT\DMIO\0000			DISPLAY\DEFAULT_MONITOR\5&199D9B00&0&10000000&1A&00	
ACPI Fixed Feature Button	No	SYSTEM 5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf
10/1/2002 (Standard system devices)		machine.inf	Not	Radeon 7000 / RADEON VE Family (Microsoft Corporation)	No
Not Available	ACPI\FIXEDBUTTON\2&DABA3FF&0			DISPLAY 6.14.10.6508	12/3/2004 ATI Technologies
High precision event timer	No	SYSTEM 5.2.3790.1830	10/1/2002	Not Available	atiixpag.inf
10/1/2002 (Standard system devices)		machine.inf		PCI\VEN_1002&DEV_5159&SUBSYS_016F1028&REV_00\4&1F7DBC9F&0&00F0	
Not Available	ACPI\PNP0103\0			Intel(R) 82801 PCI Bridge - 244E	No SYSTEM
Motherboard resources	No	SYSTEM 5.2.3790.1830	10/1/2002	5.2.3790.1830	10/1/2002 Intel
10/1/2002 (Standard system devices)		machine.inf		Not Available	machine.inf
Not Available	ACPI\PNP0C02\1			PCI\VEN_8086&DEV_244E&SUBSYS_00000000&REV_C2\3&13C0B0C5&0&F0	
Motherboard resources	No	SYSTEM 5.2.3790.1830	10/1/2002	(Standard system devices)	machine.inf
10/1/2002 (Standard system devices)		machine.inf		Generic USB Hub	No USB 5.2.3790.1830
Not Available	ACPI\PNP0C02\0			(Generic USB Hub)	usb.inf
Secondary IDE Channel	No	HDC 5.2.3790.1830	10/1/2002	Not Available	USB\VID_413C&PID_A001\5&227234D6&0&3
10/1/2002 (Standard IDE ATA/ATAPI controllers)		mshdc.inf		USB Root Hub	No USB 5.2.3790.1830
Not Available	PCI\IDE\IDECHANNEL\4&16A8F7F1&0&1			(Standard USB Host Controller)	usbport.inf
CD-ROM Drive	No	CDROM 5.2.3790.1830	10/1/2002	Not Available	USB\ROOT_HUB20\4&36AC53BE&0
(Standard CD-ROM drives)	cdrom.inf	Not Available		Intel(R) 82801EB USB2 Enhanced Host Controller - 24DD	No
IDE\CDROMSAMSUNG_CD-ROM_SN-124_____N103_____5&31A9A455&0&0.0.0				USB 5.2.3790.1830	10/1/2002 Intel
Primary IDE Channel	No	HDC 5.2.3790.1830	10/1/2002	Not Available	usbport.inf
(Standard IDE ATA/ATAPI controllers)		mshdc.inf	Not	PCI\VEN_8086&DEV_24DD&SUBSYS_016F1028&REV_02\3&13C0B0C5&0&EF	
Available	PCI\IDE\IDECHANNEL\4&16A8F7F1&0&0			HID-compliant consumer control device	No HIDCLASS
Intel(R) 82801EB Ultra ATA Storage Controllers - 24DB				5.2.3790.1830	10/1/2002 Microsoft
HDC 5.2.3790.1830	10/1/2002 Intel	mshdc.inf		Available	hidserv.inf
Not Available	PCI\VEN_8086&DEV_24DB&SUBSYS_016F1028&REV_02\3&13C0B0C5&0&F9			HID\VID_0518&PID_0001&MI_01&COL03\7&35583EE6&0&0	002
System board	No	SYSTEM 5.2.3790.1830	10/1/2002	HID-compliant device	No HIDCLASS
(Standard system devices)		machine.inf	Not	10/1/2002 (Standard system devices)	input.inf
Available	ACPI\PNP0C01\1			Available	Not
System board	No	SYSTEM 5.2.3790.1830	10/1/2002	HID\VID_0518&PID_0001&MI_01&COL02\7&35583EE6&0&0	001
(Standard system devices)		machine.inf	Not	HID-compliant mouse	No MOUSE 5.2.3790.1830
Available	ACPI\PNP0C01\0			Microsoft	msmouse.inf
Communications Port	No	PORTS 5.2.3790.1830	10/1/2002	Not Available	HID\VID_0518&PID_0001&MI_01&COL01\7&35583EE6&0&0
(Standard port types)	msports.inf	Not Available		000	
ACPI\PNP0501\1				USB Human Interface Device	No HIDCLASS
Floppy disk drive	No	FLOPPYDISK 5.2.3790.1830	10/1/2002	5.2.3790.1830	10/1/2002 (Standard system devices)
10/1/2002 (Standard floppy disk drives)		flpydisk.inf		input.inf	Not Available
Not Available	FDC\GENERIC_FLOPPY_DRIVE\5&14BBD7CB&0&0			USB\VID_0518&PID_0001&MI_01\6&111E0DBA&0&0001	
Standard floppy disk controller	No	FDC 5.2.3790.1830	10/1/2002	HID Keyboard Device	No KEYBOARD
10/1/2002 (Standard floppy disk controllers)		fdc.inf		5.2.3790.1830	10/1/2002 (Standard keyboards)
Not Available	ACPI\PNP0700\4&26DD0F47&0			keyboard.inf	Not Available
System timer	No	SYSTEM 5.2.3790.1830	10/1/2002	HID\VID_0518&PID_0001&MI_00\7&11810124&0&0000	
(Standard system devices)		machine.inf	Not	USB Human Interface Device	No HIDCLASS
Available	ACPI\PNP0100\4&26DD0F47&0			5.2.3790.1830	10/1/2002 (Standard system devices)
System CMOS/real time clock	No	SYSTEM 5.2.3790.1830	10/1/2002	input.inf	Not Available
10/1/2002 (Standard system devices)		machine.inf		USB\VID_0518&PID_0001&MI_00\6&111E0DBA&0&0000	
Not Available	ACPI\PNP0B00\4&26DD0F47&0			USB Composite Device	No USB 5.2.3790.1830
System speaker	No	SYSTEM 5.2.3790.1830	10/1/2002	10/1/2002 (Standard USB Host Controller)	usb.inf
(Standard system devices)		machine.inf	Not	Available	Not
Available	ACPI\PNP0800\4&26DD0F47&0			USB\VID_0518&PID_0001\5&12282430&0&1	
Programmable interrupt controller	No	SYSTEM 5.2.3790.1830	10/1/2002	USB Root Hub	No USB 5.2.3790.1830
(Standard system devices)		machine.inf		(Standard USB Host Controller)	usbport.inf
Not Available	ACPI\PNP0800\4&26DD0F47&0			Not Available	usbport.inf
Intel(R) 82801EB USB Universal Host Controller - 24D7				USB\ROOT_HUB\4&56E8D8E&0	
USB 5.2.3790.1830	10/1/2002 Intel	usbport.inf		Intel(R) 82801EB USB Universal Host Controller - 24D7	No
				USB 5.2.3790.1830	10/1/2002 Intel
					usbport.inf



PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2620&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&58
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard host CPU bridge	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2625&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&6D
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_260C&SUBSYS_00000000&REV_10\3&13C0B0C5&0&50
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2624&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&6C
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2627&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&4F
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2626&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&4E
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2622&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&6A
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2621&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&69
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2620&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&68
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard host CPU bridge	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_260C&SUBSYS_00000000&REV_10\3&13C0B0C5&0&60
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2627&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&5F
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2626&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&5E
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2625&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&5D
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2624&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&5C
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2623&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&5B
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2622&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&5A
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2621&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&59
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2620&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&58
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard host CPU bridge	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_260C&SUBSYS_00000000&REV_10\3&13C0B0C5&0&50
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2624&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&4E
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2625&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&4D
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2624&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&4C
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard host CPU bridge	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2623&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&4B
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2622&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&4A
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2621&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&49
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard RAM Controller	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_2620&SUBSYS_016F1028&REV_10\3&13C0B0C5&0&48
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard host CPU bridge	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_260C&SUBSYS_00000000&REV_10\3&13C0B0C5&0&40
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	PCI\VEN_8086&DEV_0332&SUBSYS_00000000&REV_06\4&34CCB4C9&0&0238
10/1/2002 (Standard system devices)			machine.inf	
Not Available				
Disk drive	No	DISKDRIVE	5.2.3790.1830	10/1/2002 (Standard disk drives) disk.inf Not Available
(Standard disk drives)				
SCSI\DISK&VEN_PERC&PROD__LD__0_PERCRAID&REV_6&397C1CF6&0&300				
RAID Virtual Device	No	SYSTEM	5.2.3790.1830	10/1/2002 American Megatrends, Inc. scsidev.inf Not Available
American Megatrends, Inc.				
SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&REV_0000\6&397C1CF6&0&2390				
PE 1x5 Backplane	No	SYSTEM	5.2.3790.1830	10/1/2002 Dell scsidev.inf Not Available
Dell				
SCSI\PROCESSOR&VEN_PE/PV&PROD_1X5_SCSI_BP&REV_1.0\6&397C1CF6&0&160				
PE 1x5 Backplane	No	SYSTEM	5.2.3790.1830	10/1/2002 Dell scsidev.inf Not Available
Dell				
SCSI\PROCESSOR&VEN_PE/PV&PROD_1X5_SCSI_BP&REV_1.0\6&397C1CF6&0&060				

Dell PERC 4e/Di RAID Controller	No	SCSIADAPTER		PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	
5.2.3790.1830	10/1/2002	Dell	pnpscsi.inf	10/1/2002 (Standard system devices)	Not Available			machine.inf
Available				PCI\VEN_1028&DEV_0013&SUBSYS_016F1028&REV_06\5&142A9BCB&0&700038				
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)	Not Available		machine.inf	10/1/2002 (Standard system devices)	Not Available			machine.inf
PCI\VEN_8086&DEV_0330&SUBSYS_00000000&REV_06\4&34CCB4C9&0&0038				PCI\VEN_8086&DEV_2604&SUBSYS_00000000&REV_10\3&13C0B0C5&0&20				
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)	Not Available		machine.inf	10/1/2002 (Standard system devices)	Not Available			machine.inf
PCI\VEN_8086&DEV_2607&SUBSYS_00000000&REV_10\3&13C0B0C5&0&38				PCI\VEN_8086&DEV_2603&SUBSYS_00000000&REV_10\3&13C0B0C5&0&18				
Broadcom NetXtreme Gigabit Ethernet	No	NET	7.98.0.0	PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	
10/1/2002	Broadcom net57amd.inf	Not Available		10/1/2002 (Standard system devices)	Not Available			machine.inf
PCI\VEN_14E4&DEV_1648&SUBSYS_016F1028&REV_10\5&34B7D673&0&110230				PCI\VEN_8086&DEV_0372&SUBSYS_00000000&REV_00\4&5D9B001&0&0210				
Broadcom NetXtreme Gigabit Ethernet	No	NET	7.98.0.0	RAID Virtual Device	No	SYSTEM	5.2.3790.1830	10/1/2002
10/1/2002	Broadcom net57amd.inf	Not Available		American Megatrends, Inc.		scsidev.inf	Not Available	
PCI\VEN_14E4&DEV_1648&SUBSYS_016F1028&REV_10\5&34B7D673&0&110230				SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&REV_0001\6&1F4275EC&0&1400				
Intel(R) 6700PXH PCI Express-to-PCI Bridge B - 032A	No	SYSTEM	5.2.3790.1830	Disk drive	No	DISKDRIVE	5.2.3790.1830	10/1/2002
10/1/2002	Intel	Not Available	machine.inf	(Standard disk drives)		disk.inf	Not Available	
PCI\VEN_8086&DEV_032A&SUBSYS_00000000&REV_09\4&2B3BACCB&0&0230				SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV_1.00\6&1F4275EC&0&120				
Intel(R) 6700PXH PCI Express-to-PCI Bridge A - 0329	No	SYSTEM	5.2.3790.1830	Disk drive	No	DISKDRIVE	5.2.3790.1830	10/1/2002
10/1/2002	Intel	Not Available	machine.inf	(Standard disk drives)		disk.inf	Not Available	
PCI\VEN_8086&DEV_0329&SUBSYS_00000000&REV_09\4&2B3BACCB&0&0030				SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV_1.00\6&1F4275EC&0&100				
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	DELL PERC 5/E Adapter RAID Controller	No	SCSIADAPTER		
10/1/2002 (Standard system devices)	Not Available		machine.inf	1.20.0.64	12/9/2005	DELL	oem0.inf	Not Available
PCI\VEN_8086&DEV_2606&SUBSYS_00000000&REV_10\3&13C0B0C5&0&30				PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&34039531&0&700010				
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)	Not Available		machine.inf	10/1/2002 (Standard system devices)	Not Available			machine.inf
PCI\VEN_8086&DEV_2606&SUBSYS_00000000&REV_10\3&13C0B0C5&0&30				PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\4&5D9B001&0&0010				
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)	Not Available		machine.inf	10/1/2002 (Standard system devices)	Not Available			machine.inf
PCI\VEN_8086&DEV_0372&SUBSYS_00000000&REV_00\4&221BB664&0&0228				PCI\VEN_8086&DEV_2602&SUBSYS_00000000&REV_10\3&13C0B0C5&0&10				
RAID Virtual Device	No	SYSTEM	5.2.3790.1830	PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	
American Megatrends, Inc.		scsidev.inf	Not Available	10/1/2002 (Standard system devices)	Not Available			machine.inf
SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&REV_0001\6&2CE209&0&1400				PCI\VEN_8086&DEV_0372&SUBSYS_00000000&REV_00\4&3464666&0&0208				
Disk drive	No	DISKDRIVE	5.2.3790.1830	RAID Virtual Device	No	SYSTEM	5.2.3790.1830	10/1/2002
(Standard disk drives)		disk.inf	Not Available	American Megatrends, Inc.		scsidev.inf	Not Available	
SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV_1.00\6&2CE209&0&120				SCSI\OTHER&VEN__RAID&PROD__DUMMYDEVICE&REV_0001\6&A1DB248&0&1400				
Disk drive	No	DISKDRIVE	5.2.3790.1830	Disk drive	No	DISKDRIVE	5.2.3790.1830	10/1/2002
(Standard disk drives)		disk.inf	Not Available	(Standard disk drives)		disk.inf	Not Available	
SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV_1.00\6&2CE209&0&110				SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV_1.00\6&A1DB248&0&120				
Disk drive	No	DISKDRIVE	5.2.3790.1830	Disk drive	No	DISKDRIVE	5.2.3790.1830	10/1/2002
(Standard disk drives)		disk.inf	Not Available	(Standard disk drives)		disk.inf	Not Available	
SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV_1.00\6&2CE209&0&100				SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV_1.00\6&A1DB248&0&110				
DELL PERC 5/E Adapter RAID Controller	No	SCSIADAPTER		Disk drive	No	DISKDRIVE	5.2.3790.1830	10/1/2002
1.20.0.64	12/9/2005	DELL	oem0.inf	Not Available				
PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&246E8B3A&0&700028				SCSI\DISK&VEN_DELL&PROD_PERC_5/E_ADAPTER&REV_1.00\6&A1DB248&0&100				
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	DELL PERC 5/E Adapter RAID Controller	No	SCSIADAPTER		
10/1/2002 (Standard system devices)	Not Available		machine.inf	1.20.0.64	12/9/2005	DELL	oem0.inf	Not Available
PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\4&221BB664&0&0028				PCI\VEN_1028&DEV_0015&SUBSYS_1F011028&REV_00\5&24E436EE&0&700008				
PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	PCI standard PCI-to-PCI bridge	No	SYSTEM	5.2.3790.1830	
10/1/2002 (Standard system devices)	Not Available		machine.inf	10/1/2002 (Standard system devices)	Not Available			machine.inf
PCI\VEN_8086&DEV_2605&SUBSYS_00000000&REV_10\3&13C0B0C5&0&28				Not Available				

```

PCI\VEN_8086&DEV_0370&SUBSYS_00000000&REV_00\4&
3464666&0&0008
PCI standard PCI-to-PCI bridge No SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2601&SUBSYS_00000000&REV_10\3&
13C0B0C5&0&08
PCI standard host CPU bridge No SYSTEM 5.2.3790.1830
10/1/2002 (Standard system devices) machine.inf
Not Available
PCI\VEN_8086&DEV_2600&SUBSYS_00000000&REV_10\3&
13C0B0C5&0&00
PCI bus No SYSTEM 5.2.3790.1830 10/1/2002 (Standard
system devices) machine.inf Not Available
ACPI\PNP0A03\1
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\15
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\14
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\13
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\12
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\11
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\10
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\9
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\8
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\7
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\6
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\5
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\4
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\3
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\2
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\1
Intel Processor No PROCESSOR 5.2.3790.1830
10/1/2002 Intel cpu.inf Not Available
ACPI\GENUINEINTEL_-_EM64T_FAMILY_15_MODEL_6\0
Microsoft ACPI-Compliant System No SYSTEM
5.2.3790.1830 10/1/2002 Microsoft acpi.inf Not
Available ACPI_HAL\PNP0C08\0
ACPI Multiprocessor x64-based PC No 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 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%\Syste
m32\Wbem;C:\Program Files (x86)\Microsoft SQL
Server\80\Tools\Binn\;C:\Program Files\Microsoft SQL
Server\90\Tools\bin\;C:\Program Files (x86)\Microsoft SQL
Server\90\Tools\bin\;C:\Program Files (x86)\Microsoft SQL
Server\90\DTS\Binn\;C:\Program Files (x86)\Microsoft SQL
Server\90\Tools\Binn\VSShell\Common7\IDE\;C:\Program Files\Microsoft
SQL Server\MSSQL.1\MSSQL\Binn\; <SYSTEM>
PATHEXT
.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH
<SYSTEM>
PROCESSOR_ARCHITECTURE AMD64 <SYSTEM>
PROCESSOR_IDENTIFIER EM64T Family 15 Model 6 Stepping 8,
GenuineIntel <SYSTEM>
PROCESSOR_LEVEL 15 <SYSTEM>
PROCESSOR_REVISION 0608 <SYSTEM>
TEMP %SystemRoot%\TEMP <SYSTEM>
TMP %SystemRoot%\TEMP <SYSTEM>
windir %SystemRoot% <SYSTEM>
TEMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\SYSTEM
TMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\SYSTEM
TEMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\NETWORK SERVICE
TMP %USERPROFILE%\Local Settings\Temp NT
AUTHORITY\NETWORK SERVICE
TEMP %USERPROFILE%\Local Settings\Temp
PE6800\Administrator
TMP %USERPROFILE%\Local Settings\Temp
PE6800\Administrator

```

[Print Jobs]

Document	Size	Owner	Notify	Status	Time Submitted
					Pages Printed
					Print Processor
					Host Print Queue
					Data Type Name

[Network Connections]

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

[Running Tasks]

Name	Path	Process ID	Priority	Min Working Set	Max
Working Set		Start Time	Version	Size	File Date
system	idle process	Not Available		0	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	Not Available
smss.exe	Not Available	416	11	204800	1413120
Not Available	7/30/2006 6:05 AM	Not Available		Not Available	Not Available
csrss.exe	Not Available	532	13	Not Available	Not Available
Not Available	Not Available	7/30/2006 6:05 AM		Not Available	Not Available
Not Available	Not Available	Not Available		Not Available	Not Available
winlogon.exe	c:\windows\system32\winlogon.exe				556
13	204800	1413120	7/30/2006 6:05 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	600
9 204800 1413120 7/30/2006 6:05 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	612 9 204800
1413120 7/30/2006 6:05 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	772
8 204800 1413120 7/30/2006 6:05 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 856 8 Not	
Available Not Available 7/30/2006 6:05 AM Not Available	
Not Available Not Available	
svchost.exe Not Available 912 8 Not	
Available Not Available 7/30/2006 6:05 AM Not Available	
Not Available Not Available	
svchost.exe c:\windows\system32\svchost.exe	956
8 204800 1413120 7/30/2006 6:05 AM	
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB
(25,088 bytes) 3/25/2005 6:00 AM	
msdtc.exe Not Available 1020 8 Not Available	
Not Available 7/30/2006 6:05 AM Not Available	
Not Available Not Available	
inetinfo.exe c:\windows\system32\inetinfo.exe	1312
8 204800 1413120 7/30/2006 6:05 AM	
6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	17.50 KB
(17,920 bytes) 5/25/2006 2:38 AM	
rsys.exe Not Available 1332 8 Not Available	
Not Available 7/30/2006 6:05 AM Not Available	
Not Available Not Available	
wmiapsrv.exe c:\windows\system32\wbem\wmiapsrv.exe	1424
8 204800 1413120 7/30/2006 6:05 AM	
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	218.00 KB
(223,232 bytes) 5/25/2006 2:05 AM	
svchost.exe c:\windows\system32\svchost.exe	1484
8 204800 1413120 7/30/2006 6:05 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	1812
8 204800 1413120 7/30/2006 6:05 AM	
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB
(25,088 bytes) 3/25/2005 6:00 AM	
csrss.exe Not Available 1932 13 Not Available	
Not Available 7/30/2006 6:06 AM Not Available	
Not Available Not Available	
winlogon.exe c:\windows\system32\winlogon.exe	1960
13 204800 1413120 7/30/2006 6:06 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	316 8 204800
1413120 7/30/2006 6:06 AM 5.2.3790.1830	
(srv03_sp1_rtm.050324-1447) 99.00 KB (101,376 bytes)	5/25/2006
2:06 AM	
explorer.exe c:\windows\explorer.exe	484 8
204800 1413120 7/30/2006 6:06 AM 6.00.3790.1830	
(srv03_sp1_rtm.050324-1447) 1.30 MB (1,364,480 bytes)	3/25/2005
6:00 AM	
wmiprvse.exe Not Available 1644 8 Not	
Available Not Available 7/30/2006 6:06 AM Not Available	
Not Available Not Available	
cmd.exe c:\windows\system32\cmd.exe	2188 8 204800
1413120 7/30/2006 6:11 AM 5.2.3790.1830	
(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\binn\sqlservr.exe	2200 13 204800
1413120 7/30/2006 6:11 AM 2005.090.2047.00	37.44 MB
(39,263,520 bytes) 4/14/2006 11:59 AM	

logon.scr	Not Available	2420	4	Not Available
	Not Available	7/30/2006	6:15 AM	Not Available
	Not Available	Not Available	Not Available	
helpctr.exe	c:\windows\pchealth\helpctr\binaries\helpctr.exe	2668		
8	204800 1413120 7/30/2006 6:47 AM			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)		1.30 MB		
(1,363,456 bytes) 5/25/2006 2:07 AM				
wmiprvse.exe	Not Available	2748	8	Not
Available	Not Available	7/30/2006	6:47 AM	Not Available
	Not Available	Not Available	Not Available	
helpsvc.exe	c:\windows\pchealth\helpctr\binaries\helpsvc.exe			
2756	8 204800 1413120 7/30/2006 6:47 AM			
5.2.3790.1830 (srv03_sp1_rtm.050324-1447)		1.52 MB		
(1,591,296 bytes) 5/25/2006 2:07 AM				

[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				
rpert4	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\rpert4.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	oleaut32	5.2.3790.1830	1.06 MB (1,116,160 bytes)	3/25/2005
(28,672 bytes)	3/25/2005 6:00 AM Microsoft Corporation		6:00 AM	Microsoft Corporation		
	c:\windows\system32\version.dll			c:\windows\system32\oleaut32.dll		
winsta	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	89.00 KB	winspool	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	247.00 KB	
(91,136 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(252,928 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\winsta.dll			c:\windows\system32\winspool.drv		
ws2_32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	176.50 KB	comctl32	5.82 (srv03_sp1_rtm.050324-1447)	934.50 KB (956,928 bytes)	
(180,736 bytes)	3/25/2005 6:00 AM Microsoft Corporation		5/24/2006 8:54 PM	Microsoft Corporation		
	c:\windows\system32\ws2_32.dll			c:\windows\winsxs\amd64_microsoft.windows.common-controls_6595b64144ccf1df_5.82.3790.1830_x-ww_4d792d2a\comctl32.dll		
ws2help	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.50 KB	uxtheme	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	494.50 KB	
(31,232 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(506,368 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\ws2help.dll			c:\windows\system32\uxtheme.dll		
msgina	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.14 MB	services	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	216.50 KB	
(1,193,472 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(221,696 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\msgina.dll			c:\windows\system32\services.exe		
shsvcs	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	193.50 KB	ncobjapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	80.00 KB	
(198,144 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(81,920 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\shsvcs.dll			c:\windows\system32\ncobjapi.dll		
shlwapi	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	606.50 KB	msvcp60	7.0.3790.1830 (srv03_sp1_rtm.050324-1447)	919.50 KB	
(621,056 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(941,568 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\shlwapi.dll			c:\windows\system32\msvcp60.dll		
sfc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.00 KB	scesrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	594.50 KB	
(6,144 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(608,768 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\sfc.dll			c:\windows\system32\scesrv.dll		
sfc_os	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	183.50 KB	authz	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	167.00 KB	
(187,904 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(171,008 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\sfc_os.dll			c:\windows\system32\authz.dll		
wintrust	5.131.3790.1830 (srv03_sp1_rtm.050324-1447)	297.50 KB	umpnpmgr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	205.00 KB	
(304,640 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(209,920 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\wintrust.dll			c:\windows\system32\umpnpmgr.dll		
imagehlp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	57.50 KB	eventlog	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	127.00 KB	
(58,880 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(130,048 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\imagehlp.dll			c:\windows\system32\eventlog.dll		
ole32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.43 MB	lsass	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	14.00 KB	
(2,543,616 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(14,336 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\ole32.dll			c:\windows\system32\lsass.exe		
comctl32	6.0 (srv03_sp1_rtm.050324-1447)	1.51 MB (1,584,128 bytes)	lsasrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.50 MB	
5/24/2006 8:54 PM	Microsoft Corporation		(1,568,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\winsxs\amd64_microsoft.windows.common-controls_6595b64144ccf1df_6.0.3790.1830_x-ww_aced72af\comctl32.dll			c:\windows\system32\lsasrv.dll		
winscard	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	230.00 KB	ntdsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	127.50 KB	
(235,520 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(130,560 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\winscard.dll			c:\windows\system32\ntdsapi.dll		
wtsapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	29.00 KB	dnsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	297.50 KB	
(29,696 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(304,640 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\wtsapi32.dll			c:\windows\system32\dnsapi.dll		
winmm	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	303.50 KB	samlib	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	69.00 KB	
(310,784 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(70,656 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\winmm.dll			c:\windows\system32\samlib.dll		
shell32	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	10.01 MB	samsrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.01 MB	
(10,492,416 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(1,059,328 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\shell32.dll			c:\windows\system32\samsrv.dll		
sxs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.91 MB	cryptdll	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	47.00 KB	
(2,003,968 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(48,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\sxs.dll			c:\windows\system32\cryptdll.dll		
rsaenh	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	241.96 KB	msprivs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	47.50 KB	
(247,768 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(48,640 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\rsaenh.dll			c:\windows\system32\msprivs.dll		
wldap32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	390.00 KB	kerberos	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	698.00 KB	
(399,360 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(714,752 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\wldap32.dll			c:\windows\system32\kerberos.dll		
csccdll	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	151.50 KB	msv1_0	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	253.00 KB	
(155,136 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(259,072 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\csccdll.dll			c:\windows\system32\msv1_0.dll		
dimsntfy	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	28.00 KB	iphlpapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	177.00 KB	
(28,672 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(181,248 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\dimsntfy.dll			c:\windows\system32\iphlpapi.dll		
wlnotify	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	148.00 KB	netlogon	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	666.00 KB	
(151,552 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(681,984 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\wlnotify.dll			c:\windows\system32\netlogon.dll		
mpr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	115.00 KB	w32time	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	400.50 KB	
(117,760 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(410,112 bytes)	3/25/2005 6:00 AM Microsoft Corporation		
	c:\windows\system32\mpr.dll			c:\windows\system32\w32time.dll		

schannel	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	248.00 KB	aelupsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.50 KB
(253,952 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(32,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\schannel.dll			c:\windows\system32\aelupsvc.dll	
wdigest	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	130.50 KB	apphelp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	241.00 KB
(133,632 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(246,784 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wdigest.dll			c:\windows\system32\apphelp.dll	
rassfm	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.00 KB	es	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	357.00 KB
(36,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(365,568 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\rassfm.dll			c:\windows\system32\es.dll	
kdcsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	409.00 KB	hidserv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB
(418,816 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(24,576 bytes)	5/24/2006 9:01 PM Microsoft Corporation	
	c:\windows\system32\kdcsvc.dll			c:\windows\system32\hidserv.dll	
ntdsa	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.81 MB	hid	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	33.00 KB
(2,948,096 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(33,792 bytes)	3/24/2005 11:18 AM Microsoft Corporation	
	c:\windows\system32\ntdsa.dll			c:\windows\system32\hid.dll	
esent	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.26 MB	sens	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	63.50 KB
(2,366,976 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(65,024 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\esent.dll			c:\windows\system32\sens.dll	
ntdsatq	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	51.00 KB	wmisvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	227.00 KB
(52,224 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(232,448 bytes)	5/25/2006 2:06 AM Microsoft Corporation	
	c:\windows\system32\ntdsatq.dll			c:\windows\system32\wbem\wmisvc.dll	
mswsock	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	478.00 KB	vssapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.26 MB
(489,472 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(1,320,960 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\mswsock.dll			c:\windows\system32\vssapi.dll	
scecli	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	308.00 KB	atl	3.05.2284 96.50 KB (98,816 bytes)	3/25/2005 6:00 AM
(315,392 bytes)	3/25/2005 6:00 AM Microsoft Corporation			Microsoft Corporation	c:\windows\system32\atl.dll
	c:\windows\system32\scecli.dll				
ws03res	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	794.00 KB	comsvcs	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	2.06 MB
(813,056 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(2,156,544 bytes)	5/25/2006 2:06 AM Microsoft Corporation	
	c:\windows\system32\ws03res.dll			c:\windows\system32\comsvcs.dll	
hnetcfg	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	561.00 KB	wbemcore	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.24 MB
(574,464 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(1,299,968 bytes)	5/25/2006 2:05 AM Microsoft Corporation	
	c:\windows\system32\hnetcfg.dll			c:\windows\system32\wbem\wbemcore.dll	
wshtcpip	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	29.00 KB	esscli	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	626.50 KB
(29,696 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(641,536 bytes)	5/25/2006 2:05 AM Microsoft Corporation	
	c:\windows\system32\wshtcpip.dll			c:\windows\system32\wbem\esscli.dll	
w3ssl	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	21.00 KB	wbemcomn	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	524.00 KB
(21,504 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(536,576 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\w3ssl.dll			c:\windows\system32\wbem\wbemcomn.dll	
strmfilt	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	131.50 KB	fastprox	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	866.50 KB
(134,656 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(887,296 bytes)	5/25/2006 2:05 AM Microsoft Corporation	
	c:\windows\system32\strmfilt.dll			c:\windows\system32\wbem\fastprox.dll	
httpapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.50 KB	wbemsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	58.00 KB
(37,376 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(59,392 bytes)	5/25/2006 2:05 AM Microsoft Corporation	
	c:\windows\system32\httpapi.dll			c:\windows\system32\wbem\wbemsvc.dll	
dssenh	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	226.96 KB	wmiutils	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	171.00 KB
(232,408 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(175,104 bytes)	5/25/2006 2:06 AM Microsoft Corporation	
	c:\windows\system32\dssenh.dll			c:\windows\system32\wbem\wmiutils.dll	
svchost	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB	repdrvfs	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	353.50 KB
(25,088 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(361,984 bytes)	5/25/2006 2:05 AM Microsoft Corporation	
	c:\windows\system32\svchost.exe			c:\windows\system32\wbem\repdrvfs.dll	
rpsch	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	672.00 KB	wmiprvsd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	743.00 KB
(688,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(760,832 bytes)	5/25/2006 2:05 AM Microsoft Corporation	
	c:\windows\system32\rpsch.dll			c:\windows\system32\wbem\wmiprvsd.dll	
xpsp2res	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.77 MB	wbemess	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	532.50 KB
(2,899,456 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(545,280 bytes)	5/25/2006 2:05 AM Microsoft Corporation	
	c:\windows\system32\xpsp2res.dll			c:\windows\system32\wbem\wbemess.dll	
clbcatq	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	865.00 KB	netman	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	457.00 KB
(885,760 bytes)	5/25/2006 2:06 AM Microsoft Corporation		(467,968 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\clbcatq.dll			c:\windows\system32\netman.dll	
comres	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	779.50 KB	mprapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	154.50 KB
(798,208 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(158,208 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\comres.dll			c:\windows\system32\mprapi.dll	
ntmarta	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	222.50 KB	activeds	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	348.50 KB
(227,840 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(356,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\ntmarta.dll			c:\windows\system32\activeds.dll	
wkssvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	221.00 KB	adslidpc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	240.50 KB
(226,304 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(246,272 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wkssvc.dll			c:\windows\system32\adslidpc.dll	
wiarpc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	57.00 KB	credui	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	202.00 KB
(58,368 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(206,848 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wiarpc.dll			c:\windows\system32\credui.dll	

rtutils	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	66.00 KB	coadmin	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	100.50 KB
(67,584 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(102,912 bytes)	5/25/2006 2:38 AM Microsoft Corporation	
	c:\windows\system32\rtutils.dll			c:\windows\system32\inetrv\coadmin.dll	
netshell	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	2.32 MB	admwxprox	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	66.00 KB
(2,437,120 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(67,584 bytes)	5/25/2006 2:38 AM Microsoft Corporation	
	c:\windows\system32\netshell.dll			c:\windows\system32\admwxprox.dll	
clusapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	127.00 KB	iiscfg	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	1.24 MB
(130,048 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(1,298,432 bytes)	5/25/2006 2:38 AM Microsoft Corporation	
	c:\windows\system32\clusapi.dll			c:\windows\system32\inetrv\iiscfg.dll	
rasapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	410.00 KB	metadata	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	342.00 KB
(419,840 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(350,208 bytes)	5/25/2006 2:38 AM Microsoft Corporation	
	c:\windows\system32\rasapi32.dll			c:\windows\system32\inetrv\metadata.dll	
rasman	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	95.50 KB	msxml3	8.70.1104.0	2.04 MB (2,141,184 bytes)
(97,792 bytes)	3/25/2005 6:00 AM Microsoft Corporation		6:00 AM	Microsoft Corporation	3/25/2005
	c:\windows\system32\rasman.dll			c:\windows\system32\msxml3.dll	
tapi32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	332.50 KB	svcxext	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	60.50 KB
(340,480 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(61,952 bytes)	5/25/2006 2:38 AM Microsoft Corporation	
	c:\windows\system32\tapi32.dll			c:\windows\system32\inetrv\svcxext.dll	
wininet	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	1.13 MB	security	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.00 KB
(1,186,304 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(6,144 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wininet.dll			c:\windows\system32\security.dll	
wzcsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	49.00 KB	iismap	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	97.00 KB
(50,176 bytes)	3/24/2005 11:35 AM Microsoft Corporation		(99,328 bytes)	5/25/2006 2:38 AM Microsoft Corporation	
	c:\windows\system32\wzcsapi.dll			c:\windows\system32\iismap.dll	
wzcsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	492.00 KB	wamreg	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	78.50 KB
(503,808 bytes)	3/24/2005 11:35 AM Microsoft Corporation		(80,384 bytes)	5/25/2006 2:38 AM Microsoft Corporation	
	c:\windows\system32\wzcsvc.dll			c:\windows\system32\inetrv\wamreg.dll	
wmi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	5.50 KB	wmiaprv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	218.00 KB
(5,632 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(223,232 bytes)	5/25/2006 2:05 AM Microsoft Corporation	
	c:\windows\system32\wmi.dll			c:\windows\system32\wbem\wmiaprv.exe	
dhcpcsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	219.00 KB	loadperf	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	130.50 KB
(224,256 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(133,632 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\dhcpcsvc.dll			c:\windows\system32\loadperf.dll	
rasdlg	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	859.50 KB	wbemprox	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	38.00 KB
(880,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(38,912 bytes)	5/25/2006 2:05 AM Microsoft Corporation	
	c:\windows\system32\rasdlg.dll			c:\windows\system32\wbem\wbemprox.dll	
rasadhlp	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	12.00 KB	iisw3adm	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	305.00 KB
(12,288 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(312,320 bytes)	5/25/2006 2:38 AM Microsoft Corporation	
	c:\windows\system32\rasadhlp.dll			c:\windows\system32\inetrv\iisw3adm.dll	
ncprov	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	73.00 KB	w3cache	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	27.50 KB
(74,752 bytes)	5/25/2006 2:05 AM Microsoft Corporation		(28,160 bytes)	5/25/2006 2:38 AM Microsoft Corporation	
	c:\windows\system32\wbem\ncprov.dll			c:\windows\system32\inetrv\w3cache.dll	
dmserver	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	36.50 KB	w3tp	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	16.00 KB
(37,376 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(16,384 bytes)	5/25/2006 2:38 AM Microsoft Corporation	
	c:\windows\system32\dmserver.dll			c:\windows\system32\inetrv\w3tp.dll	
netcfgx	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.29 MB	lonsint	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	17.50 KB
(1,354,240 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(17,920 bytes)	5/25/2006 2:38 AM Microsoft Corporation	
	c:\windows\system32\netcfgx.dll			c:\windows\system32\inetrv\lonsint.dll	
winipsec	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	52.50 KB	termsrv	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	354.50 KB
(53,760 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(363,008 bytes)	5/25/2006 2:06 AM Microsoft Corporation	
	c:\windows\system32\winipsec.dll			c:\windows\system32\termsrv.dll	
pchsvc	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	76.00 KB	icaapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	27.50 KB
(77,824 bytes)	5/25/2006 2:07 AM Microsoft Corporation		(28,160 bytes)	5/25/2006 2:06 AM Microsoft Corporation	
	c:\windows\pchealth\helpctr\binaries\pchsvc.dll			c:\windows\system32\icaapi.dll	
wbemcons	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	65.50 KB	mstlsapi	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	187.00 KB
(67,072 bytes)	5/25/2006 2:05 AM Microsoft Corporation		(191,488 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\wbem\wbemcons.dll			c:\windows\system32\mstlsapi.dll	
inetinfo	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	17.50 KB	rdpwsx	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	170.13 KB
(17,920 bytes)	5/25/2006 2:38 AM Microsoft Corporation		(174,216 bytes)	5/25/2006 2:06 AM Microsoft Corporation	
	c:\windows\system32\inetrv\inetinfo.exe			c:\windows\system32\rdpwsx.dll	
iisutil	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	316.50 KB	rdpsnd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	25.00 KB
(324,096 bytes)	5/25/2006 2:38 AM Microsoft Corporation		(25,600 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\inetrv\iisutil.dll			c:\windows\system32\rdpsnd.dll	
rpcref	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	4.50 KB	scredir	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	38.50 KB
(4,608 bytes)	5/25/2006 2:38 AM Microsoft Corporation		(39,424 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\inetrv\rpcref.dll			c:\windows\system32\scredir.dll	
iisrtl	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	225.00 KB	cscui	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	441.00 KB
(230,400 bytes)	5/25/2006 2:38 AM Microsoft Corporation		(451,584 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\iisrtl.dll			c:\windows\system32\cscui.dll	
iisadmin	6.0.3790.1830 (srv03_sp1_rtm.050324-1447)	30.00 KB	msacm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	31.00 KB
(30,720 bytes)	5/25/2006 2:38 AM Microsoft Corporation		(31,744 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\inetrv\iisadmin.dll			c:\windows\system32\msacm32.drv	

msacm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	112.00 KB	ntlanman	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	71.50 KB
(114,688 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(73,216 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msacm32.dll			c:\windows\system32\ntlanman.dll	
imaadp32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB	netui0	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	130.00 KB
(24,576 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(133,120 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\imaadp32.acm			c:\windows\system32\netui0.dll	
msadp32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	23.50 KB	netui1	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	338.50 KB
(24,064 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(346,624 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msadp32.acm			c:\windows\system32\netui1.dll	
msg711	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	13.50 KB	davclnt	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	38.00 KB
(13,824 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(38,912 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msg711.acm			c:\windows\system32\davclnt.dll	
msgsm32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	34.50 KB	browsecl	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	63.00 KB
(35,328 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(64,512 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msgsm32.acm			c:\windows\system32\browsecl.dll	
tssoft32	1.01 13.50 KB (13,824 bytes)	3/25/2005 6:00 AM	shdoclc	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	589.50 KB
	DSP GROUP, INC. c:\windows\system32\tssoft32.acm		(603,648 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
tsd32	1.03 24.50 KB (25,088 bytes)	3/25/2005 6:00 AM		c:\windows\system32\shdoclc.dll	
	DSP GROUP, INC. c:\windows\system32\tsd32.dll			zipfldr	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)
rdpclip	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	99.00 KB	(460,288 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(101,376 bytes)	5/25/2006 2:06 AM Microsoft Corporation			c:\windows\system32\zipfldr.dll	
	c:\windows\system32\rdpclip.exe			cmd	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)
wsock32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.50 KB	(551,424 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
(25,088 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\system32\cmd.exe	
	c:\windows\system32\wsock32.dll			sqlservr	2005.090.2047.00 37.44 MB (39,263,520 bytes)
urlmon	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	1.02 MB	11:59 AM Microsoft Corporation	c:\program files\microsoft sql	
(1,074,176 bytes)	3/25/2005 6:00 AM Microsoft Corporation			server\mssql.1\mssql\bin\sqlservr.exe	
	c:\windows\system32\urlmon.dll			msvcr80	8.00.50727.42 803.50 KB (822,784 bytes)
explorer	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	1.30 MB	11:26 PM Microsoft Corporation		
(1,364,480 bytes)	3/25/2005 6:00 AM Microsoft Corporation			c:\windows\winsxs\amd64_microsoft.vc80.crt_1fc8b3b9a1e18e3b	
	c:\windows\explorer.exe			_8.0.50727.42_x-ww_3fea50ad\msvcr80.dll	
browseui	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	1.53 MB	msvcpr80	8.00.50727.42 1.05 MB (1,097,728 bytes)	9/22/2005
(1,601,536 bytes)	3/25/2005 6:00 AM Microsoft Corporation		11:28 PM Microsoft Corporation		
	c:\windows\system32\browseui.dll			c:\windows\winsxs\amd64_microsoft.vc80.crt_1fc8b3b9a1e18e3b	
shdocvw	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	2.30 MB	_8.0.50727.42_x-ww_3fea50ad\msvcpr80.dll		
(2,416,128 bytes)	3/25/2005 6:00 AM Microsoft Corporation			opends60	2005.090.1399.00 22.21 KB (22,744 bytes)
	c:\windows\system32\shdocvw.dll			10/14/2005 2:31 PM Microsoft Corporation	c:\program
cryptui	5.131.3790.1830 (srv03_sp1_rtm.050324-1447)	705.50 KB	files\microsoft sql server\mssql.1\mssql\bin\opends60.dll		
(722,432 bytes)	3/25/2005 6:00 AM Microsoft Corporation		instapi	2005.090.1399.00 40.71 KB (41,688 bytes)	
	c:\windows\system32\cryptui.dll		10/14/2005 2:23 PM Microsoft Corporation		c:\program
themeui	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	530.50 KB	files\microsoft sql server\90\shared\instapi.dll		
(543,232 bytes)	3/25/2005 6:00 AM Microsoft Corporation		sqllevn70	2005.090.2047.00 1.58 MB (1,652,512 bytes)	4/14/2006
	c:\windows\system32\themeui.dll		11:53 AM Microsoft Corporation		c:\program files\microsoft sql
msimg32	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	6.50 KB	server\mssql.1\mssql\bin\resources\1033\sqllevn70.rll		
(6,656 bytes)	3/25/2005 6:00 AM Microsoft Corporation		sqlqs	2005.090.1399.00 15.71 KB (16,088 bytes)	
	c:\windows\system32\msimg32.dll		10/14/2005 2:35 PM Microsoft Corporation		c:\program
actxprxy	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	220.50 KB	files\microsoft sql server\mssql.1\mssql\bin\sqlqs.dll		
(225,792 bytes)	3/25/2005 6:00 AM Microsoft Corporation		mscoree	2.0.50727.42 (RTM.050727-4200) 441.00 KB (451,584 bytes)	9/22/2005 11:37 PM Microsoft Corporation
	c:\windows\system32\actxprxy.dll				c:\windows\system32\mscoree.dll
linkinfo	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.00 KB	xolehlp	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	10.50 KB
(30,720 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(10,752 bytes)	5/25/2006 2:06 AM Microsoft Corporation	
	c:\windows\system32\linkinfo.dll			c:\windows\system32\xolehlp.dll	
ntshrui	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	184.00 KB	msdtcprx	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	805.50 KB
(188,416 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(824,832 bytes)	5/25/2006 2:06 AM Microsoft Corporation	
	c:\windows\system32\ntshrui.dll			c:\windows\system32\msdtcprx.dll	
msi	3.1.4000.1830 4.27 MB (4,476,416 bytes)	3/25/2005	mtxclu	2001.12.4720.1830 (srv03_sp1_rtm.050324-1447)	141.50 KB
6:00 AM Microsoft Corporation			(144,896 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\msi.dll			c:\windows\system32\mtxclu.dll	
webcheck	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	439.00 KB	resutils	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	98.50 KB
(449,536 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(100,864 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\webcheck.dll			c:\windows\system32\resutils.dll	
stobject	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	142.50 KB	winnr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	30.00 KB
(145,920 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(30,720 bytes)	3/25/2005 6:00 AM Microsoft Corporation	
	c:\windows\system32\stobject.dll			c:\windows\system32\winnr.dll	
batmeter	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	41.50 KB	helpctr	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	1.30 MB
(42,496 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(1,363,456 bytes)	5/25/2006 2:07 AM Microsoft Corporation	
	c:\windows\system32\batmeter.dll			c:\windows\pchealth\helpctr\binaries\helpctr.exe	
powrprof	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	32.50 KB	hcappres	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	7.50 KB
(33,280 bytes)	3/25/2005 6:00 AM Microsoft Corporation		(7,680 bytes)	5/25/2006 2:07 AM Microsoft Corporation	
	c:\windows\system32\powrprof.dll			c:\windows\pchealth\helpctr\binaries\hcappres.dll	
drprov	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	24.00 KB			
(24,576 bytes)	3/25/2005 6:00 AM Microsoft Corporation				
	c:\windows\system32\drprov.dll				

itss (212,992 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM	Microsoft Corporation	208.00 KB	Background Intelligent Transfer Service	BITS	Stopped	Manual	Share Process	c:\windows\system32\svchost.exe -k netsvcs
pchshell (158,720 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	5/25/2006 2:07 AM	Microsoft Corporation	155.00 KB	Computer Browser	Browser	Stopped	Manual	Share Process	c:\windows\system32\svchost.exe -k netsvcs
mlang (702,464 bytes)	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM	Microsoft Corporation	686.00 KB	Indexing Service	CiSvc	Stopped	Disabled	Share Process	c:\windows\system32\cisvc.exe
mshhtml (5,928,448 bytes)	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM	Microsoft Corporation	5.65 MB	ClipBook	ClipSrv	Stopped	Disabled	Own Process	c:\windows\system32\clipsrv.exe
msls31 (365,568 bytes)	3.10.349.0 357.00 KB (365,568 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	380.50 KB	.NET Runtime Optimization Service	v2.0.50727_X86	Stopped	Manual	Own	clr_optimization_v2.0.50727_32
msimtf (389,632 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM	Microsoft Corporation	617.50 KB	Process	c:\windows\microsoft.net\framework\v2.0.50727\mscorsvw.exe	Ignore	LocalSystem	0	
msctf (632,320 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM	Microsoft Corporation	617.50 KB	.NET Runtime Optimization Service	v2.0.50727_x64	Stopped	Manual	Own	clr_optimization_v2.0.50727_64
jscript (997,888 bytes)	5.6.0.8827 974.50 KB (997,888 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	208.00 KB	Process	c:\windows\microsoft.net\framework64\v2.0.50727\mscorsvw.exe	Ignore	LocalSystem	0	
imm32 (212,992 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM	Microsoft Corporation	208.00 KB	COM+ System Application	COMSysApp	Stopped	Manual	Own Process	c:\windows\system32\dllhost.exe
mshhtml (927,232 bytes)	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM	Microsoft Corporation	905.50 KB	Process	{02d4b3f1-fd88-11d1-960d-00805fc79235}	Normal	LocalSystem	0	
vbscript (662,016 bytes)	5.6.0.8827 646.50 KB (662,016 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	905.50 KB	Cryptographic Services	CryptSvc	Stopped	Manual	Share	
msinfo (651,264 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	5/25/2006 2:07 AM	Microsoft Corporation	636.00 KB	Process	c:\windows\system32\svchost.exe -k netsvcs	Normal	LocalSystem	0	
mfc42u (1,462,272 bytes)	6.50.9146.0 1.39 MB (1,462,272 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	636.00 KB	DCOM Server Process Launcher	DcomLaunch	Running	Auto	Share Process	c:\windows\system32\svchost.exe -k
comdlg32 (457,216 bytes)	6.00.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM	Microsoft Corporation	446.50 KB	dcomlaunch	Normal	LocalSystem	0		
riched32 (7,168 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	3/25/2005 6:00 AM	Microsoft Corporation	7.00 KB	Distributed File System	Dfs	Stopped	Manual	Own	
riched20 (1,157,120 bytes)	5.31.23.1224 1.10 MB (1,157,120 bytes)	3/25/2005 6:00 AM	Microsoft Corporation	7.00 KB	Process	c:\windows\system32\dfsrv.exe	Normal	LocalSystem	0	
helpsvc (1,591,296 bytes)	5.2.3790.1830 (srv03_sp1_rtm.050324-1447)	5/25/2006 2:07 AM	Microsoft Corporation	1.52 MB	DHCP Client	Dhcp	Running	Auto	Share Process	c:\windows\system32\svchost.exe -k networkservice
[Services]										
Display Name	Name	State	Start Mode	Service Type	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	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 Process	AppMgmt	Stopped	Manual	Share						
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.exe									
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						
Share Process	c:\windows\system32\svchost.exe -k netsvcs									
Normal	LocalSystem	0								
Computer Browser	Browser	Stopped	Manual	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	Stopped	Manual	Own						
clr_optimization_v2.0.50727_32	Process	c:\windows\microsoft.net\framework\v2.0.50727\mscorsvw.exe	Ignore	LocalSystem	0					
.NET Runtime Optimization Service	v2.0.50727_x64	Stopped	Manual	Own						
clr_optimization_v2.0.50727_64	Process	c:\windows\microsoft.net\framework64\v2.0.50727\mscorsvw.exe	Ignore	LocalSystem	0					
COM+ System Application	COMSysApp	Stopped	Manual	Own Process	c:\windows\system32\dllhost.exe					
/processid:{02d4b3f1-fd88-11d1-960d-00805fc79235}	Normal	LocalSystem	0							
Cryptographic Services	CryptSvc	Stopped	Manual	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\dfsrv.exe	Normal	LocalSystem	0						
DHCP Client	Dhcp	Running	Auto	Share Process	c:\windows\system32\svchost.exe -k networkservice					
NT AUTHORITY\NetworkService	Normal	LocalSystem	0							
Logical Disk Manager Administrative Service	dmadmin	Stopped	Manual	Share Process	c:\windows\system32\dmadmin.exe /com					
Manual	Share Process	Normal	LocalSystem	0						
Logical Disk Managerdmsrver	Running	Manual	Share	Process	c:\windows\system32\svchost.exe -k netsvcs					
LocalSystem	0									
DNS Client	Dnscache	Stopped	Manual	Share Process	c:\windows\system32\svchost.exe -k networkservice					
NT AUTHORITY\NetworkService	Normal	LocalSystem	0							
Error Reporting Service	ERSvc	Stopped	Manual	Share						
Process	c:\windows\system32\svchost.exe -k winerr	Ignore	LocalSystem	0						
Event Log	Eventlog	Running	Auto	Share Process	c:\windows\system32\services.exe					
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	Manual	Share Process	c:\windows\system32\svchost.exe -k netsvcs					
LocalSystem	0									
HID Input Service	HidSrv	Running	Auto	Share Process	c:\windows\system32\svchost.exe -k netsvcs					
LocalSystem	0									
HTTP SSLHTTPFilter	Running	Manual	Share	Process	c:\windows\system32\lsass.exe					
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\inetres\inetinfo.exe	Normal	LocalSystem	0						
IMAPI CD-Burning COM Service	ImapiService	Stopped	Manual	Share						
Disabled	Own Process	c:\windows\system32\imapi.exe	Normal	LocalSystem	0					

Intersite Messaging	IsmServ	Stopped	Disabled	Own Process	Protected Storage	ProtectedStorage	Stopped	Manual	Share
	c:\windows\system32\ismsserv.exe			Normal	Process	c:\windows\system32\lsass.exe	Normal	LocalSystem	
	LocalSystem	0				0			
Kerberos Key Distribution Center			kdc	Stopped	Remote Access Auto Connection Manager	RasAuto	Stopped	Manual	
	Share Process	c:\windows\system32\lsass.exe		Normal	Share Process	c:\windows\system32\svchost.exe -k netsvcs			
	LocalSystem	0			Normal	LocalSystem	0		
Server	lanmanserver	Stopped	Manual	Share Process	Remote Access Connection Manager	RasMan	Stopped	Manual	
	c:\windows\system32\svchost.exe -k netsvcs			Normal	Share Process	c:\windows\system32\svchost.exe -k netsvcs			
	LocalSystem	0			Normal	LocalSystem	0		
Workstation	lanmanworkstation	Running	Auto	Share	Remote Desktop Help Session Manager	RDSessMgr		Stopped	
Process	c:\windows\system32\svchost.exe -k netsvcs			Normal	Manual	Own Process			
	LocalSystem	0			c:\windows\system32\sessmgr.exe			Normal	
					LocalSystem	0			
License Logging	LicenseService	Stopped	Disabled	Own	Routing and Remote Access	RemoteAccess	Stopped	Disabled	
Process	c:\windows\system32\llssrv.exe			Normal	Share Process	c:\windows\system32\svchost.exe -k netsvcs			
	AUTHORITY\NetworkService	0		NT	Normal	LocalSystem	0		
TCP/IP NetBIOS Helper	LmHosts	Stopped	Manual	Share	Remote Registry	RemoteRegistry	Stopped	Manual	Share
Process	c:\windows\system32\svchost.exe -k localservice			Normal	Process	c:\windows\system32\svchost.exe -k regsvc		Normal	NT
	NT AUTHORITY\LocalService	0			AUTHORITY\LocalService	0			
Messenger	Messenger	Stopped	Share	Process	Remote Command Service	RMSYS	Running	Auto	Own
	c:\windows\system32\svchost.exe -k netsvcs			Normal	Process	"c:\program files (x86)\benchmark\rsys.exe"		Normal	
	LocalSystem	0			.\Administrator	0			
NetMeeting Remote Desktop Sharing		mnmsrvc	Stopped	Disabled	Remote Procedure Call (RPC) Locator	RpcLocator		Stopped	
	Own Process	c:\windows\system32\mnmsrvc.exe			Manual	Own Process	c:\windows\system32\locator.exe		
	Normal	LocalSystem	0		Normal	NT AUTHORITY\NetworkService	0		
Distributed Transaction Coordinator		MSDTC	Running	Auto	Remote Procedure Call (RPC)	RpcSs	Running	Auto	Share
	Own Process	c:\windows\system32\msdtc.exe		Normal	Process	c:\windows\system32\svchost.exe -k rpcss		Normal	NT
	NT AUTHORITY\NetworkService	0			AUTHORITY\NetworkService	0			
Windows Installer	MSIServer	Stopped	Manual	Share Process	Resultant Set of Policy Provider	RSOPProv	Stopped	Manual	Share
	c:\windows\system32\msiexec.exe /v			Normal	Process	c:\windows\system32\rsopprov.exe		Normal	
	LocalSystem	0			LocalSystem	0			
SQL Server (MSSQLSERVER)	MSSQLSERVER	Stopped	Manual		Special Administration Console Helper	sacsrv	Stopped	Manual	
	Own Process	"c:\program files\microsoft sql server\mssql.1\mssql\bin\sqlservr.exe" -smssqlserver		Normal	Share Process	c:\windows\system32\svchost.exe -k netsvcs			
	LocalSystem	0			Normal	LocalSystem	0		
SQL Server Active Directory Helper		MSSQLServerADHelper			Security Accounts Manager	SamSs	Running	Auto	Share
	Stopped	Disabled	Own Process	"c:\program files\microsoft sql server\90\shared\sqladhlp90.exe"	Process	c:\windows\system32\lsass.exe		Normal	LocalSystem
	AUTHORITY\NetworkService	0		Normal	0				
Network DDE	NetDDE	Stopped	Disabled	Share Process	Smart Card	SCardSvr	Stopped	Manual	Share Process
	c:\windows\system32\netdde.exe			Normal		c:\windows\system32\scardsvr.exe			Ignore
	LocalSystem	0			AUTHORITY\LocalService	0			NT
Network DDE DSDM	NetDDEdsdm	Stopped	Disabled	Share	Task Scheduler	Schedule	Stopped	Manual	Share Process
Process	c:\windows\system32\netdde.exe			Normal		c:\windows\system32\svchost.exe -k netsvcs		Normal	
	LocalSystem	0			LocalSystem	0			
Net Logon	Netlogon	Stopped	Manual	Share Process	Secondary Logon	seclogon	Stopped	Manual	Share Process
	c:\windows\system32\lsass.exe			Normal		c:\windows\system32\svchost.exe -k netsvcs			Ignore
	LocalSystem	0			LocalSystem	0			
Network Connections	Netman	Running	Manual	Share Process	System Event Notification	SENS	Running	Auto	Share
	c:\windows\system32\svchost.exe -k netsvcs			Normal	Process	c:\windows\system32\svchost.exe -k netsvcs		Normal	
	LocalSystem	0			LocalSystem	0			
Network Location Awareness (NLA)		Nla	Running	Manual	Windows Firewall/Internet Connection Sharing (ICS)		SharedAccess		
	Share Process	c:\windows\system32\svchost.exe -k netsvcs			Stopped	Disabled	Share Process		
	Normal	LocalSystem	0		c:\windows\system32\svchost.exe -k netsvcs		Normal		
File Replication	NtFrs	Stopped	Manual	Own Process	Shell Hardware Detection	ShellHWDetection	Running	Auto	
	c:\windows\system32\ntfrs.exe			Ignore	Share Process	c:\windows\system32\svchost.exe -k netsvcs			
	LocalSystem	0			Ignore	LocalSystem	0		
NT LM Security Support Provider		NtLmSsp	Stopped	Manual	Print Spooler	Spooler	Stopped	Manual	Own Process
	Share Process	c:\windows\system32\lsass.exe		Normal		c:\windows\system32\spoolsv.exe			Normal
	LocalSystem	0			LocalSystem	0			
Removable Storage	NtmsSvc	Stopped	Manual	Share Process	SQL Server Browser	SQLBrowser	Stopped	Disabled	Own
	c:\windows\system32\svchost.exe -k netsvcs			Normal	Process	"c:\program files (x86)\microsoft sql server\90\shared\sqlbrowser.exe"		Normal	LocalSystem
	LocalSystem	0			server\90\shared\sqlagent90.exe" -i mssqlserver			Normal	LocalSystem
Office Source Engine	ose	Stopped	Manual	Own Process	SQL Server Agent (MSSQLSERVER)	SQLSERVERAGENT			
	"c:\program files (x86)\common files\microsoft shared\source engine\ose.exe"			Normal	Stopped	Manual	Own Process	"c:\program files\microsoft sql server\mssql.1\mssql\bin\sqlagent90.exe"	
	LocalSystem	0			Normal	LocalSystem	0		
Plug and Play	PlugPlay	Running	Auto	Share Process	SQL Server VSS Writer	SQLWriter	Stopped	Manual	Own
	c:\windows\system32\services.exe			Normal	Process	"c:\program files\microsoft sql server\90\shared\sqlwriter.exe"		Normal	LocalSystem
	LocalSystem	0			Normal	LocalSystem	0		
IPSEC Services	PolicyAgent	Stopped	Manual	Share	Windows Image Acquisition (WIA)	stisvc	Stopped	Disabled	
Process	c:\windows\system32\lsass.exe			Normal	Share Process	c:\windows\system32\svchost.exe -k imgsvc			
	LocalSystem	0			Normal	NT AUTHORITY\LocalService	0		

```

Microsoft Software Shadow Copy Provider swprv Stopped Manual
Own Process c:\windows\system32\svchost.exe -k swprv
Normal LocalSystem 0
Performance Logs and Alerts SysmonLog Stopped Auto
Own Process c:\windows\system32\smlogsvc.exe
Normal NT Authority\NetworkService 0
Telephony TapiSrv Stopped Manual Share Process
c:\windows\system32\svchost.exe -k tapisrv Normal
LocalSystem 0
Terminal Services TermService Running Manual Share
Process c:\windows\system32\svchost.exe -k termsvc
LocalSystem 0
Themes Themes Stopped Disabled Share Process
c:\windows\system32\svchost.exe -k netsvc Normal
LocalSystem 0
Telnet TlntSvr Stopped Disabled Own Process
c:\windows\system32\tlntsvr.exe Normal NT
AUTHORITY\LocalService 0
Distributed Link Tracking Server TrkSrv Stopped Disabled Share
Process c:\windows\system32\svchost.exe -k netsvc Normal
LocalSystem 0
Distributed Link Tracking Client TrkWks Stopped Manual Share
Process c:\windows\system32\svchost.exe -k netsvc Normal
LocalSystem 0
Terminal Services Session Directory Tssdis Stopped Disabled
Own Process c:\windows\system32\tssdis.exe Normal
LocalSystem 0
Windows User Mode Driver Framework UMWdf Stopped Manual
Own Process c:\windows\system32\wdfmgr.exe
Normal NT AUTHORITY\LocalService 0
Uninterruptible Power Supply UPS Stopped Manual Own
Process c:\windows\system32\ups.exe Normal NT
AUTHORITY\LocalService 0
Virtual Disk Service vds Stopped Manual Own Process
c:\windows\system32\vds.exe Normal LocalSystem
0
Volume Shadow Copy VSS Stopped Manual Own
Process c:\windows\system32\vssvc.exe Normal LocalSystem
0
Windows Time W32Time Stopped Manual Share Process
c:\windows\system32\svchost.exe -k localservice Normal
NT AUTHORITY\LocalService 0
World Wide Web Publishing Service W3SVC Running Auto
Share Process c:\windows\system32\svchost.exe -k iissvc
Normal LocalSystem 0
WebClient WebClient Stopped Disabled Share Process
c:\windows\system32\svchost.exe -k localservice Normal
NT AUTHORITY\LocalService 0
WinHTTP Web Proxy Auto-Discovery Service
WinHttpAutoProxySvc Stopped Manual Share
Process c:\windows\system32\svchost.exe -k localservice Normal
NT AUTHORITY\LocalService 0
Windows Management Instrumentation winmgmt Running Auto
Share Process c:\windows\system32\svchost.exe -k netsvc
Ignore LocalSystem 0
Portable Media Serial Number Service WmdmPmSN Stopped
Manual Share Process
c:\windows\system32\svchost.exe -k netsvc Normal
LocalSystem 0
Windows Management Instrumentation Driver Extensions Wmi
Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvc Normal
LocalSystem 0
WMI Performance Adapter WmiApSrv Running Auto
Own Process c:\windows\system32\wbem\wmiaprv.exe
Normal LocalSystem 0
Automatic Updates wuauclt Stopped Manual Share Process
c:\windows\system32\svchost.exe -k netsvc Normal
LocalSystem 0
Wireless Configuration WZCSVC Stopped Manual Share
Process c:\windows\system32\svchost.exe -k netsvc Normal
LocalSystem 0

```

```

Network Provisioning Service xmlprov Stopped Manual Share
Process c:\windows\system32\svchost.exe -k netsvc 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
Benchcraft PE6800\Administrator:Benchcraft
PE6800\Administrator
Startup PE6800\Administrator:Startup PE6800\Administrator

```

[Startup Programs]

```

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

[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 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
actxprxy.dll	6.0.3790.1830	221 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
advpack.dll	6.0.3790.1830	146 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
advpack.dll	6.0.3790.1830	146 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
asctrls.ocx	6.0.3790.1830	147 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
asctrls.ocx	6.0.3790.1830	147 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
browsecl.dll	6.0.3790.1830	63 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
browsecl.dll	6.0.3790.1830	63 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
browseui.dll	6.0.3790.1830	1,564 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
browseui.dll	6.0.3790.1830	1,564 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
cdfview.dll	6.0.3790.1830	216 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
cdfview.dll	6.0.3790.1830	216 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
comctl32.dll	5.82.3790.1830	935 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
comctl32.dll	5.82.3790.1830	935 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
dxttrans.dll	6.3.3790.1830	320 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
dxttrans.dll	6.3.3790.1830	320 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
dxtmsft.dll	6.3.3790.1830	549 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
dxtmsft.dll	6.3.3790.1830	549 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iecont.dll	<File Missing>	Not Available	Not Available		
iecont.dll	<File Missing>	Not Available	Not Available		
iecontl.dll	<File Missing>	Not Available	Not Available		
iecontl.dll	<File Missing>	Not Available	Not Available		
iedkcs32.dll	16.0.3790.1830	417 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation

iedkcs32.dll	16.0.3790.1830	417 KB	3/25/2005 7:00:00 AM		Microsoft Corporation
iepeers.dll	6.0.3790.1830	361 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iepeers.dll	6.0.3790.1830	361 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iesetup.dll	6.0.3790.1830	71 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
iesetup.dll	6.0.3790.1830	71 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
ieunit.inf	Not Available	24 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Not Available
ieunit.inf	Not Available	24 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Not Available
ieexplore.exe	6.0.3790.1830	94 KB	3/25/2005 7:00:00 AM	C:\Program Files\Internet Explorer	Microsoft Corporation
imgutil.dll	6.0.3790.1830	61 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
imgutil.dll	6.0.3790.1830	61 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inetctl.cpl	6.0.3790.1830	428 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inetctl.cpl	6.0.3790.1830	428 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inetctl.dll	6.0.3790.1830	110 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inetctl.dll	6.0.3790.1830	110 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inseng.dll	6.0.3790.1830	147 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
inseng.dll	6.0.3790.1830	147 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mlang.dll	6.0.3790.1830	686 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mlang.dll	6.0.3790.1830	686 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msencode.dll	<File Missing>	Not Available	Not Available		
mshta.exe	6.0.3790.1830	38 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshta.exe	6.0.3790.1830	38 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtml.dll	6.0.3790.1830	5,790 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtml.dll	6.0.3790.1830	5,790 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtml.tlb	6.0.3790.1830	1,320 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtml.tlb	6.0.3790.1830	1,320 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtmlmled.dll	6.0.3790.1830	906 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtmlmled.dll	6.0.3790.1830	906 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtmlmld.dll	6.0.3790.1830	56 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
mshtmlmld.dll	6.0.3790.1830	56 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msident.dll	6.0.3790.1830	69 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msident.dll	6.0.3790.1830	69 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msidntld.dll	6.0.3790.1830	16 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msidntld.dll	6.0.3790.1830	16 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msieft.dll	6.0.3790.1830	369 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msieft.dll	6.0.3790.1830	369 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation
msrating.dll	6.0.3790.1830	240 KB	3/25/2005 7:00:00 AM	C:\WINDOWS\system32	Microsoft Corporation

msrating.dll	6.0.3790.1830	240 KB	3/25/2005 7:00:00 AM
Microsoft Corporation			
mstime.dll	6.0.3790.1830	878 KB	3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation			
mstime.dll	6.0.3790.1830	878 KB	3/25/2005 7:00:00 AM
Microsoft Corporation			
occache.dll	6.0.3790.1830	126 KB	3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation			
occache.dll	6.0.3790.1830	126 KB	3/25/2005 7:00:00 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 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation			
sendmail.dll	6.0.3790.1830	64 KB	3/25/2005 7:00:00 AM
Microsoft Corporation			
shdoclc.dll	6.0.3790.1830	590 KB	3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation			
shdoclc.dll	6.0.3790.1830	590 KB	3/25/2005 7:00:00 AM
Microsoft Corporation			
shdocvw.dll	6.0.3790.1830	2,360 KB	3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation			
shdocvw.dll	6.0.3790.1830	2,360 KB	3/25/2005 7:00:00 AM
Microsoft Corporation			
shfolder.dll	6.0.3790.1830	34 KB	3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation			
shfolder.dll	6.0.3790.1830	34 KB	3/25/2005 7:00:00 AM
Microsoft Corporation			
shlwapi.dll	6.0.3790.1830	607 KB	3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation			
shlwapi.dll	6.0.3790.1830	607 KB	3/25/2005 7:00:00 AM
Microsoft Corporation			
tdc.ocx	1.3.0.3130 91 KB	3/25/2005 7:00:00 AM	
C:\WINDOWS\system32 Microsoft Corporation			
tdc.ocx	1.3.0.3130 91 KB	3/25/2005 7:00:00 AM	
Microsoft Corporation			
url.dll	6.0.3790.1830	40 KB	3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation			
url.dll	6.0.3790.1830	40 KB	3/25/2005 7:00:00 AM
Microsoft Corporation			
urlmon.dll	6.0.3790.1830	1,049 KB	3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation			
urlmon.dll	6.0.3790.1830	1,049 KB	3/25/2005 7:00:00 AM
Microsoft Corporation			
webcheck.dll	6.0.3790.1830	439 KB	3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation			
webcheck.dll	6.0.3790.1830	439 KB	3/25/2005 7:00:00 AM
Microsoft Corporation			
wininet.dll	6.0.3790.1830	1,159 KB	3/25/2005 7:00:00 AM
C:\WINDOWS\system32 Microsoft Corporation			
wininet.dll	6.0.3790.1830	1,159 KB	3/25/2005 7:00:00 AM
Microsoft Corporation			

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

[Connectivity]

Item	Value
Connection Preference	Never dial

LAN Settings

AutoConfigProxy	wininet.dll
AutoProxyDetectMode	Disabled
AutoConfigURL	
Proxy	Disabled
ProxyServer	
ProxyOverride	

[Cache]

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

Item	Value
------	-------

## 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 = "F:",
  SIZE = 43350MB,
  FILEGROWTH = 0),
```

```
( NAME = %DBNAME%_li_2,
  FILENAME = "G:",
  SIZE = 43350MB,
  FILEGROWTH = 0),
```

```
( NAME = %DBNAME%_li_3,
  FILENAME = "H:",
  SIZE = 43350MB,
  FILEGROWTH = 0),
```

```
( NAME = %DBNAME%_li_4,
  FILENAME = "I:",
  SIZE = 43350MB,
  FILEGROWTH = 0),
```

```
( NAME = %DBNAME%_li_5,
  FILENAME = "J:",
  SIZE = 43350MB,
  FILEGROWTH = 0),
```

```
( NAME = %DBNAME%_li_6,
  FILENAME = "K:",
  SIZE = 43350MB,
  FILEGROWTH = 0),
```

```
( NAME = %DBNAME%_li_7,
  FILENAME = "L:",
  SIZE = 43350MB,
  FILEGROWTH = 0),
```

```
( NAME = %DBNAME%_li_8,
  FILENAME = "M:",
  SIZE = 43350MB,
  FILEGROWTH = 0),
```

```
( NAME = %DBNAME%_li_9,
  FILENAME = "N:",
  SIZE = 43350MB,
  FILEGROWTH = 0),
```

```
FILEGROUP GENERAL_FG
( NAME = %DBNAME%_gen_1,
  FILENAME = "O:",
  SIZE = 20880MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_gen_2,
  FILENAME = "P:",
  SIZE = 20880MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_gen_3,
  FILENAME = "Q:",
  SIZE = 20880MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_gen_4,
  FILENAME = "R:",
  SIZE = 20880MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_gen_5,
  FILENAME = "S:",
  SIZE = 20880MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_gen_6,
  FILENAME = "T:",
  SIZE = 20880MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_gen_7,
  FILENAME = "U:",
  SIZE = 20880MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_gen_8,
  FILENAME = "V:",
  SIZE = 20880MB,
  FILEGROWTH = 0),
( NAME = %DBNAME%_gen_9,
  FILENAME = "W:",
  SIZE = 20880MB,
  FILEGROWTH = 0)
```

```
LOG ON
```

```
( NAME = %DBNAME%_log,
  FILENAME = "E:",
  SIZE = 61420MB,
  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,
```

## Appendix B

```
P_COMMENT varchar(23) not null)
on GENERAL_FG
```

```
create table SUPPLIER
```

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

```
on GENERAL_FG
```

```
create table PARTSUPP
```

```
(PS_PARTKEY int not null,
 PS_SUPPKEY int not null,
 PS_SUPPLYCOST float not null,
 PS_AVAILQTY int not null,
 PS_COMMENT varchar(199) not null)
```

```
on GENERAL_FG
```

```
create table CUSTOMER
```

```
(C_CUSTKEY int not null,
 C_MKTSEGMENT char(10) not null,
 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
```

## Appendix B

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

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

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

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

```
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
```

## Appendix B

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

-- File:  CREATEBACKUPDEVICES.SQL
--      Microsoft TPC-H Benchmark Kit Ver. 2.00
--      Copyright Microsoft, 1999
--
if exists (select name from sysdevices where name =
'BackupDev1')
    exec sp_dropdevice BackupDev1
GO

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

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

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

if exists (select name from sysdevices where name =
'BackupDev5')
    exec sp_dropdevice BackupDev5
GO

sp_addumpdevice 'disk', 'BackupDev1',
'C:\B\S\TPCHbackup1'
GO
sp_addumpdevice 'disk', 'BackupDev2',
'C:\B\T\TPCHbackup2'
GO
sp_addumpdevice 'disk', 'BackupDev3',
'C:\B\U\TPCHbackup3'
GO

sp_addumpdevice 'disk', 'BackupDev4',
'C:\B\V\TPCHbackup4'
GO
sp_addumpdevice 'disk', 'BackupDev5',
'C:\B\W\TPCHbackup5'
GO

--      File:  BACKUPDATABASE.SQL
--      Microsoft TPC-H Benchmark Kit Version
--      2.00
--      Copyright Microsoft, 1999
--
backup database %DBNAME% to BackupDev1,
BackupDev2, BackupDev3, BackupDev4, BackupDev5 with
init, stats=10

--      File:  RESTOREDATABASE.SQL
--      Microsoft TPC-H Benchmark Kit Version
--      2.00
--      Copyright Microsoft, 1999
--
restore database tpch from BackupDev1, BackupDev2,
BackupDev3, BackupDev4, BackupDev5 with replace,
stats=1

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

alter database tempdb modify file
(name='tempdev',filename='C:\B\O\TempdB.mdf')

alter database tempdb modify file
(name='templog',filename='C:\B\P\Templog.ldf')

alter database tempdb modify file
(name=tempdev,
filename='C:\B\O\TempdB.mdf',size=30000mb)
alter database tempdb modify file
(name=templog,
filename='C:\B\P\Templog.ldf',size=30000mb)
alter database tempdb add file
(name=tempdev2,
filename='C:\B\Q\tempdev_2',size=15000mb),
(name=tempdev3,
filename='C:\B\R\tempdev_3',size=15000mb),
(name=tempdev4,
filename='C:\B\S\tempdev_4',size=15000mb),
```



## Appendix B

```
(name=tempdev5,  
filename='C:\B\T\tempdev_5',size=15000mb),  
(name=tempdev6,  
filename='C:\B\U\tempdev_6',size=15000mb),  
(name=tempdev7,  
filename='C:\B\U\tempdev_7',size=15000mb),  
(name=tempdev8,  
filename='C:\B\V\tempdev_8',size=15000mb),  
(name=tempdev9,  
filename='C:\B\V\tempdev_9',size=15000mb),  
(name=tempdev10,  
filename='C:\B\W\tempdev_10',size=15000mb),  
(name=tempdev11,  
filename='C:\B\W\tempdev_11',size=15000mb)
```

```
-- Drop the LOAD_FG
```

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

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

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

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

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

        commit transaction T

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

    end
go

-- File: ACID_HIST.SQL

```

## Appendix C

```

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

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

GO

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

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

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

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

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

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

go

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

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

begin
    begin tran T

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

```

## Appendix C

```

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

```

## Appendix C

```

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

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

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

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

```

```

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

select
select
from
WHERE
PS_PARTKEY = @rand_part_key
end
set
rowcount @cnt

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

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

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

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

set rowcount @cnt

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

set rowcount 0

select @rand_delta = (RAND()*100)

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

```

## Appendix C

```

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

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

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

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

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

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

```

```

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

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

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

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

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

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

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

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

create proc cons_tran @counter int
as

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

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

```

## Appendix C

```

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

exec    acid_tran_com  @rand_o_key,
                   @rand_l_key,
                   @rand_delta

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

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

go

create proc dur_tran      @counter      int

as

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

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

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

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

exec    acid_dur_tran_com      @rand_o_key,
                               @rand_l_key,
                               @rand_delta

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

```

```

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

go

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

as

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

begin

        begin tran T

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

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

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

print " "
--        ACID CODE END

```



## Appendix C

```

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

-- ACID CODE END

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

end

go

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

go

```

## Appendix C

```

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

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

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

    commit transaction P

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

end

go

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

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

create proc iso6_tran_w_com
    @o_key int,
    @l_key int,
    @delta int
as
    declare @ototal money,
            @new_ototal money,
            @quantity money,
            @extprice money,
            @new_extprice money,
            @pkey int,
            @skey int,
            @tax money,
            @disc money,
            @cost money,
            @rprice money

    begin
        begin tran T

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

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

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

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

```

## Appendix C

```

                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)

```

## Appendix C

```

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

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

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

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

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

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

begin
        begin tran T

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

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

print " "
--      ACID CODE END

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

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

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

```

## Appendix C

```

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

update  ORDERS
set     O_TOTALPRICE      =

@new_ototal

where   O_ORDERKEY = @o_key

insert into HISTORY_ACI values( @pkey,
                                @skey,

                                @o_key,

                                @l_key,
                                @delta,

                                getdate())

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

commit transaction T

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

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

end

go

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

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

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

begin

begin tran T

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

```

## Appendix C

```

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

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

-- ACID CODE BEGIN
print " "
print "Data from LINEITEM before updates:"
select L_QUANTITY 'L_QUANTITY',
L_EXTENDEDPRIE 'L_EXTENDEDPRIE',
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_EXTENDEDPRIE,
@pkey = L_PARTKEY,
@skey = L_SUPPKEY,
@tax = L_TAX,
@disc = L_DISCOUNT
from LINEITEM
where L_ORDERKEY = @o_key and
L_LINENUMBER =
@l_key

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

update LINEITEM
set L_EXTENDEDPRIE =
@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_EXTENDEDPRIE 'L_EXTENDEDPRIE',
L_PARTKEY 'L_PARTKEY',
L_SUPPKEY 'L_SUPPKEY',
L_TAX 'L_TAX',
L_DISCOUNT 'L_DISCOUNT'
from LINEITEM
where L_ORDERKEY = @o_key and
L_LINENUMBER = @l_key
print " "
print "Row from HISTORY:"
select *
from HISTORY_ACI
where H_O_KEY = @o_key and
H_L_KEY = @l_key

```

## Appendix C

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

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

end

go

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

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

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

from    acid_values

where   acid_test= 'Isolation 1'

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

exec tran_w_com @rand_o_key,
               @rand_l_key,
               @rand_delta

GO

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

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

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

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

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

exec iso_query  @rand_o_key
GO

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

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

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

from    acid_values

where   acid_test= 'Isolation 2'

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

exec tran_w_rb  @rand_o_key,
               @rand_l_key,
               @rand_delta

GO

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

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

declare @acid_test      char(25),
        @rand_o_key    int

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

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

exec iso_query  @rand_o_key
GO

-- File:  ISOL3_1.SQL
```

## Appendix C

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

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

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

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

exec tran_w_com @rand_o_key,
               @rand_l_key,
               @rand_delta

GO

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

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

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

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

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

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

exec iso34_tran_w_com @rand_o_key,
```

```
@rand_l_key,
@rand_delta
```

GO

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

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

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

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

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

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

GO

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

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

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

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

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

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

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



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

exec iso34_tran_w_com @rand_o_key,
                    @rand_l_key,
                    @rand_delta

GO

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

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

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

from acid_values
where acid_test= 'Isolation 5'

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

exec tran_w_com @rand_o_key,
               @rand_l_key,
               @rand_delta

GO

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

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

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

select @rand_part = acid_part,
       @rand_supp = acid_supp

from acid_values
where acid_test= 'Isolation 5'

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

exec iso5_parts @rand_part,
               @rand_supp

GO

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

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

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

## Appendix C

```
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_gry1.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
```



## Appendix C

```

and          where  H_O_KEY = acid_o_key          (          o_orderkey
              H_L_KEY = acid_l_key              int,
and          H_DELTA = acid_delta              money,
              )          int,
-- Durability Stream 5
select *          money
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,
              I.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 I
ON o.O_ORDERKEY = I.L_ORDERKEY
WHERE a.acid_test = 'Consistency_Durability'
GROUP BY o.O_ORDERKEY, o.O_TOTALPRICE,
I.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
-- -----
```

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```
--
-- 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 D: Query text and Output**



## Appendix D

55889619119.831841    25.505794    38250.854626  
0.050009            1478870

(4 row(s) affected)

-- using default substitutions

-- using default substitutions

-- using default substitutions

/\* TPC\_H Query 2 - Minimum Cost Supplier \*/

/\* 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
56586554400.730164  53758257134.870079
55909065222.827675  25.522006      38273.129735
0.049985      1478493
N      F      991417.000000      1487504710.380000
1413082168.054096  1469649223.194375  25.516472
38284.467761      0.050093      38854
N      O      74476040.000000
111701729697.739880  106118230307.605480
110367043872.497310  25.502227      38249.117989
0.049997      2920374
R      F      37719753.000000
56568041380.900032  53741292684.604088

```

```

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

```

-----  
-----  
-----

## Appendix D

9938.530000	Supplier#000005359	UNITED KINGDOM	185358	Manufacturer#4	QKuHYh,vZGiwu2FWEJoLDx04	33-429-790-6131	blithely silent pinto beans are furiously. slyly final deposits across
9937.840000	Supplier#000005969	ROMANIA	108438	Manufacturer#1	ANDENSOSmk,miq23Xfb5RWt6dvUcvt6Qa	29-520-692-3537	carefully slow deposits use furiously. slyly ironic platelets above the ironic
9936.220000	Supplier#000005250	UNITED KINGDOM	249	Manufacturer#4	B3rqp0xbSEim4Mpy2RH J	33-320-228-2957	blithely special packages are. stealthily express deposits across the closely final instructi
9923.770000	Supplier#000002324	GERMANY	29821	Manufacturer#4	y3OD9UywSTOK	17-779-299-1839	quickly express packages breach quiet pinto beans. requ
9871.220000	Supplier#000006373	GERMANY	43868	Manufacturer#5	J8fcXWstQm	17-813-485-8637	never silent deposits integrate furiously blit
9870.780000	Supplier#000001286	GERMANY	81285	Manufacturer#2	YKA,E2fjiVd7eUrzp2Ef8j1QxGo2DFnosaTEH	17-516-924-4574	final theodolites cajole slyly special,
9870.780000	Supplier#000001286	GERMANY	181285	Manufacturer#4	YKA,E2fjiVd7eUrzp2Ef8j1QxGo2DFnosaTEH	17-516-924-4574	final theodolites cajole slyly special,
9852.520000	Supplier#000008973	RUSSIA	18972	Manufacturer#2	t5L67YdBYH6o,Vz24jpdYQ9	32-188-594-7038	quickly regular instructions wake-- carefully unusual braids into the expres
9847.830000	Supplier#000008097	RUSSIA	130557	Manufacturer#2	xMe97bpE69NzdwLoX	32-375-640-3593	slyly regular dependencies sleep slyly furiously express dep
9847.570000	Supplier#000006345	FRANCE	86344	Manufacturer#1	VSt3rzK3qG698u6ld8HhOByvrTcSTSvQIDQDag	16-886-766-7945	silent pinto beans should have to snooze carefully along the final reques
9847.570000	Supplier#000006345	FRANCE	173827	Manufacturer#2	VSt3rzK3qG698u6ld8HhOByvrTcSTSvQIDQDag	16-886-766-7945	silent pinto beans should have to snooze carefully along the final reques
9836.930000	Supplier#000007342	RUSSIA	4841	Manufacturer#4	JOIK7C1,7xrEZSSow	32-399-414-5385	final accounts haggle. bold accounts are furiously dugouts. furiously silent asymptotes are slyly
9817.100000	Supplier#000002352	RUSSIA	124815	Manufacturer#2	4LfoHUZjgjEbAKw	32-551-831-1437	blithely pending packages across the ironic accounts grow slyly after the furiously
9817.100000	Supplier#000002352	RUSSIA	152351	Manufacturer#3	4LfoHUZjgjEbAKw	32-551-831-1437	blithely pending packages across the ironic accounts grow slyly after the furiously
9739.860000	Supplier#000003384	FRANCE	138357	Manufacturer#2	o,Z3v4POifevE k9U1b	16-494-913-5925	slyly ironic theodolites hag
9721.950000	Supplier#000008757	UNITED KINGDOM	156241	Manufacturer#3	Atg6GnM4dT2	33-821-407-2995	ironic, even dolphins above the furiously ironic foxes sleep slyly around the caref
9681.330000	Supplier#000008406	RUSSIA	78405	Manufacturer#1	,qUuXcftUI	32-139-873-8571	furiously even deposits affix thinly special theodolites. furiou
9643.550000	Supplier#000005148	ROMANIA	107617	Manufacturer#1	kT4ciVFslx9z4s79p Js825	29-252-617-4850	doggedly even ideas boost furiously against the furiously express
9624.820000	Supplier#000001816	FRANCE	34306	Manufacturer#3	e7vab91vLJPWxxZnewmnDBpDmxYHrb	16-392-237-6726	blithely regular accounts cajole furiously. regular
9624.780000	Supplier#000009658	ROMANIA	189657	Manufacturer#1	oE9uBgEfSS4opIcepXyAYM,x	29-748-876-2014	regular deposits haggle. furiously express asympto
9612.940000	Supplier#000003228	ROMANIA	120715	Manufacturer#2	KDdpNKN3cWu7ZSrbdpq7AfSLxx,qWB	29-325-784-8187	carefully pending accounts serve. furiously close deposits boost slyly. q
9612.940000	Supplier#000003228	ROMANIA	198189	Manufacturer#4	KDdpNKN3cWu7ZSrbdpq7AfSLxx,qWB	29-325-784-8187	carefully pending accounts serve. furiously close deposits boost slyly. q
9571.830000	Supplier#000004305	ROMANIA	179270	Manufacturer#2	qNHZ7WmCzygwMPRDO9Ps	29-973-481-1831	furiously final deposits
9558.100000	Supplier#000003532	UNITED KINGDOM	88515	Manufacturer#4	EOeuiiOn21OVpTIGguufFDFsbN1p0lhpXHp	33-152-301-2164	daring, sly accounts breach about th
9492.790000	Supplier#000005975	GERMANY	25974	Manufacturer#5	S6mliCTx82z7IV	17-992-579-4839	always pending packages boost slyly.
9461.050000	Supplier#000002536	UNITED KINGDOM	20033	Manufacturer#1	8mmGbyzaU 7ZS2wJumTibypncu9pNkDc4FYA	33-556-973-5522	even foxes are quickly furiously express requests. packages
9453.010000	Supplier#000000802	ROMANIA	175767	Manufacturer#1	,6HYXb4uaHITmtMBj4Ak57Pd	29-342-882-6463	final, regular packages across the slowly regular packag

## Appendix D

9408.650000	Supplier#000007772	UNITED	I8IjnXd7NSJRs594RxsRR0	32-155-440-7120
KINGDOM	117771	Manufacturer#4	regular pinto beans sleep ca	
AiC5YAH, gdu0i7		33-152-491-1126	blithely	
final ideas sleep carefully. requests are				
9359.610000	Supplier#000004856	ROMANIA	9104.830000	Supplier#000008520
62349	Manufacturer#5	HYogcF3Jb yhl	150974	Manufacturer#4
29-334-870-9731		carefully unusual packages sleep carefully	b41vR2,3	17-728-804-1793
even ideas. dogged accoun			deposits sleep	
9357.450000	Supplier#000006188	UNITED	9101.000000	Supplier#000005791
KINGDOM	138648	Manufacturer#1	128254	Manufacturer#5
g801,ssP8wpTk4Hm		33-583-607-1633	zub2zCV, jhHPPQqi, P2INAjE1zI n66cOEoXFG	29-549-
carefully regular deposits wake carefully furiously even i			251-5384	carefully ironic packages after the
9352.040000	Supplier#000003439	GERMANY	9094.570000	Supplier#000004582
170921	Manufacturer#4	qYPDgoiBGhCYxjgC	39575	Manufacturer#1
17-128-996-4650		fluffily regular pinto beans wake. unusual,	n, h9VIxjrr9ARHFvKgMDf	32-587-577-1351
final ideas c			above the slyly even requests haggle furiously about the	
9312.970000	Supplier#000007807	RUSSIA	regular accounts	
90279	Manufacturer#5		8996.870000	Supplier#000004702
oGYMPCk9XHGB2PBfKRnHA		32-673-872-	102191	Manufacturer#5
5854	unusual asymptotes above the		16-811-269-8946	stealthy requests haggle c
9312.970000	Supplier#000007807	RUSSIA	8996.140000	Supplier#000009814
100276	Manufacturer#5		139813	Manufacturer#2
oGYMPCk9XHGB2PBfKRnHA		32-673-872-	af0O5pg83IPU4IDVmEylXZVqYZQzSDIYLA mR	29-995-
5854	unusual asymptotes above the		571-8781	ironic theodolites are evenly unusual requests--
9280.270000	Supplier#000007194	ROMANIA	pending pinto beans across the in	
47193	Manufacturer#3	zhRUQkBSrFYxIAXTfInj	8968.420000	Supplier#000010000
vyGRQjeK	29-318-454-2133	slyly ironic requests	119999	Manufacturer#5
despite the unusual ins			PDBdv665XBjHPyCOB0i	29-578-432-2146
9274.800000	Supplier#000008854	RUSSIA	furiously	
76346	Manufacturer#3		final ideas believe furiously. furiously final ideas	
1xhLoOUM7I3mZ1mKnerw OSqdbb4QbGa		32-524-	8936.820000	Supplier#000007043
148-5221	ruthlessly ironic instructions along the regular,		KINGDOM	109512
9249.350000	Supplier#000003973	FRANCE	FVajceZInZdbJE6Z9XsRUxrUEpiwHDrOXi, 1Rz	33-784-
26466	Manufacturer#1		177-8208	furiously regular excuses wake after the blithely
d18GiDsL6Wm2IsGXM, RZf1jCsgZAOjNYVThTRP4		16-	722-866-1658	quickly ironic sauternes use b
9249.350000	Supplier#000003973	FRANCE	8929.420000	Supplier#000008770
33972	Manufacturer#1		173735	Manufacturer#4
d18GiDsL6Wm2IsGXM, RZf1jCsgZAOjNYVThTRP4		16-	HckhfRi	16-242-746-9248
722-866-1658	quickly ironic sauternes use b		finally. blithely ironic foxes wake boldly across the	
9208.700000	Supplier#000007769	ROMANIA	furiously s	
40256	Manufacturer#5	rsimdze 5o9P Ht7xS	8920.590000	Supplier#000003967
29-964-424-9649	furiously ruthless epitaphs among the		26460	Manufacturer#1
furiously regular accounts use slowly fluffily ev			eHoAXe62SY9	
9201.470000	Supplier#000009690	UNITED	29-194-731-3944	quickly even requests should have to affix
KINGDOM	67183	Manufacturer#5	blithely-- fur	
BnUTlmi5zdeEl7R7		33-121-267-9529	8920.590000	Supplier#000003967
unusual accounts integrate slyly. platelets			173966	Manufacturer#2
9192.100000	Supplier#000000115	UNITED	eHoAXe62SY9	
KINGDOM	85098	Manufacturer#3	29-194-731-3944	quickly even requests should have to affix
2t0f7Ve, wL1, 6WzGBJLNUCKIsV		33-597-248-1220	blithely-- fur	
slyly bold pinto beans boost across the furiously regular			8913.960000	Supplier#000004603
packages. carefully regu			KINGDOM	137063
9189.980000	Supplier#000001226	GERMANY	OUzlvMUr7n, utLxmpNeYKSf3T24OXskxB5	33-789-
21225	Manufacturer#4	qsLCqSvLyZfuXlPjz	255-7342	slyly ironic packages detect furious accounts. ironic
17-725-903-1381	final, express instruction		de	
9128.970000	Supplier#000004311	RUSSIA	8877.820000	Supplier#000007967
146768	Manufacturer#5		167966	Manufacturer#5
			A3pi1BARM4nx6R, qrwFoRPU	16-442-147-9345
			final deposits after the silent deposits ha	
			8862.240000	Supplier#000003323
			73322	Manufacturer#3
			W9 IYcsC9FwBqk3ItL	
			29-736-951-3710	unusual, pending theodolites integrate
			furiously slyly even pinto beans. unusual sheaves sleep befor	

## Appendix D

8841.590000	Supplier#000005750	ROMANIA	8503.700000	Supplier#000006830	RUSSIA
100729	Manufacturer#5		44325	Manufacturer#4	BC4WFCYRUZyaIghU
Erx3lAgu0g62iaHF9x50uMH4EgeN9hEG	29-344-502-		4S	32-147-878-5069	quickly regular excuses
5481	excuses after the blithely regular packages mold				detect evenly around
	carefully deposits. regular a		8457.090000	Supplier#000009456	UNITED
8781.710000	Supplier#000003121	ROMANIA	KINGDOM	19455	Manufacturer#1
13120	Manufacturer#5		7SBhZs8gP1cJtT0Qf433YBk	33-858-440-4349	
wNqTogx238ZYCamFb,50v,bj 4IbNFW9Bvw1xP	29-707-				carefully final accounts sleep blithely special foxes. slyly
291-5144	packages are quickly after the final, even packages.				regular pinto beans alon
	furiously regular		8441.400000	Supplier#000003817	FRANCE
8754.240000	Supplier#000009407	UNITED	141302	Manufacturer#2	hU3fz3xL78
KINGDOM	179406	Manufacturer#4			16-339-356-5115 blithely blithe ideas are
CHRCbkaWcf5B	33-903-970-9604	regular	8432.890000	Supplier#000003990	RUSSIA
	dependencies haggle across the carefully bold		191470	Manufacturer#1	
8691.060000	Supplier#000004429	UNITED	wehBBp1RQbfxAYDASS75MsywmsKHRVdkrvNe6m	32-	
KINGDOM	126892	Manufacturer#2	839-509-9301	final requests along the blithely ironic packages	
k,BQms5UhoAF1B2Asi,fLib	33-964-337-5038			kindle against the carefully fina	
	quickly special foxes against the furiously silent platelets		8431.400000	Supplier#000002675	ROMANIA
	wake quickly after t		5174	Manufacturer#1	
8655.990000	Supplier#000006330	RUSSIA	HJFStOu9R5NGPOegKhgzbYdyvrG2yh8w	29-474-643-	
193810	Manufacturer#2			1443	express, final deposits cajole carefully. stealthily unusual
UozlaENR0ytKe2w6CeIEWFWn iO3S8Rae7Ou	32-561-				requests
198-3705	blithely even packages alongside		8407.040000	Supplier#000005406	RUSSIA
8638.360000	Supplier#000002920	RUSSIA	162889	Manufacturer#4	j7 gYF5RW8DC5UrxjKC
75398	Manufacturer#1	Je2a8bszf3L			32-626-152-4621 quickly final sheaves boost. car
	32-122-621-7549	express deposits wake. furiously silent	8386.080000	Supplier#000008518	FRANCE
	requests wake carefully silent instru		36014	Manufacturer#3	
8638.360000	Supplier#000002920	RUSSIA	2jqzqqAVe9crMVGP,n9nTsQXulNLTUYoJjEDcqWV	16-	
170402	Manufacturer#3	Je2a8bszf3L	618-780-7481	slyly ironic theodolites are slyly. dogged,	
	32-122-621-7549	express deposits wake. furiously silent		pendin	
	requests wake carefully silent instru		8376.520000	Supplier#000005306	UNITED
8607.690000	Supplier#000006003	UNITED	KINGDOM	190267	Manufacturer#5
KINGDOM	76002	Manufacturer#2	9t8Y8		
EH9wADcEiuenM0NR08zDwMidw,52Y2RyILEiA	33-		QqSIsoADPt6NLdk,TP5zyRx41oBUlgoGc9	33-632-514-	
416-807-5206	always special foxes wake slyly bold, ironic			7931	furiously even instructions integrate during the furiously
	accounts. ironic instructions affix carefull				regular re
8569.520000	Supplier#000005936	RUSSIA	8348.740000	Supplier#000008851	FRANCE
5935	Manufacturer#5		66344	Manufacturer#4	nWxi7GwEbjhw1
jXaNZ6vwnEWJ2ksLZJpjtgt0bY2a3AU	32-644-251-				16-796-240-2472 ironic instructions nag slyly against the
7916	packages sleep furiously. special requests about the				slyly even theodolites. requests alongside of
	fluffily even accounts detect		8338.580000	Supplier#000007269	FRANCE
8564.120000	Supplier#000000033	GERMANY	17268	Manufacturer#4	ZwhJSwABUoiB04,3
110032	Manufacturer#1				16-267-277-4365 ruthlessly regular asymptotes a
gfeKpYw3400L0SDyWXA6Ya1Qmq1w6YB9f3R	17-138-		8328.460000	Supplier#000001744	ROMANIA
897-9374	ironic instructions are. special pearls above		69237	Manufacturer#5	
8553.820000	Supplier#000003979	ROMANIA	oLo3fV64q2,FKHa3p,qHnS7Yzv,ps8	29-330-728-5873	
143978	Manufacturer#4				blithely silent excuses are slyly above the furiously even
BfmVhCAnCMY3jzpjUMy4CNWs9 HzpdQR7INJU	29-				courts
124-646-4897	express, ironic pinto beans cajole around the		8307.930000	Supplier#000003142	GERMANY
	express, even packages. qu		18139	Manufacturer#1	dqblvV8dCNAorGIJ
8517.230000	Supplier#000009529	RUSSIA			17-595-447-6026 theodolites sleep blithely carefully regular
37025	Manufacturer#5	e44R8o7JAIS9iMcr			warhorses. slyly regular ins
	32-565-297-8775	furiously silent requests cajole furiously	8231.610000	Supplier#000009558	RUSSIA
	furiously ironic foxes. slyly express p		192000	Manufacturer#2	mcdgen,yT1iJDHDS5fv
8517.230000	Supplier#000009529	RUSSIA			32-762-137-5858 slyly regular theodolites sleep fluffily
59528	Manufacturer#2	e44R8o7JAIS9iMcr			express depos
	32-565-297-8775	furiously silent requests cajole furiously	8152.610000	Supplier#000002731	ROMANIA
	furiously ironic foxes. slyly express p		15227	Manufacturer#4	nluXJCuY1tu
					29-805-463-2030 gifts use. slyly silent ideas are carefully
					beneath the silent instructions. slyly sil

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8109.090000	Supplier#000009186	FRANCE	7871.500000	Supplier#000007206	RUSSIA
99185	Manufacturer#1		104695	Manufacturer#1	3w
wgfosrVPexl9pEXWyaqlBMDYYf 16-668-570-1402 quickly pending requests are blithely along the ironic, final requests; instr			fNCnrVmvJjE95sgWZzvW 32-432-452-7731 furiously dogged pinto beans cajole. bold, express notornis until the slyly pending		
8102.620000	Supplier#000003347	UNITED KINGDOM	7852.450000	Supplier#000005864	RUSSIA
18344	Manufacturer#5	m	8363	Manufacturer#4	WCNfBPZeSXh3h,c
CtXS2S16i 33-454-274-8532 packages grow special orbits. regular theodolites about the carefully pe			32-454-883-3821 blithely regular deposits		
8046.070000	Supplier#000008780	FRANCE	7850.660000	Supplier#000001518	UNITED KINGDOM
191222	Manufacturer#3	AczzuE0UK9osj ,Lx0Jmh	86501	Manufacturer#1	
16-473-215-6395 regular epitaphs integrate slyly.			ONda3YJiHKJOC 33-730-383-3892 furiously final accounts wake carefully idle requests. even dolphins wake acc		
8042.090000	Supplier#000003245	RUSSIA	7843.520000	Supplier#000006683	FRANCE
135705	Manufacturer#4		11680	Manufacturer#4	
Dh8Ikg39onrbOL4DyTfGw8a9oKUX3d9Y 32-836-132-8872 carefully regular instructions integrate blithely silent foxes. furiously express instructions hagggl			2Z0JGkiv01Y00oCFwUGfviIbhzcDy 16-464-517-8943 carefully bold accounts doub		
8042.090000	Supplier#000003245	RUSSIA	(100 row(s) affected)		
150729	Manufacturer#1		-- using default substitutions		
Dh8Ikg39onrbOL4DyTfGw8a9oKUX3d9Y 32-836-132-8872 carefully regular instructions integrate blithely silent foxes. furiously express instructions hagggl			/* TPC_H Query 3 - Shipping Priority */		
7992.400000	Supplier#000006108	FRANCE	SELECT TOP 10		
118574	Manufacturer#1	8tBydnTDwUqfBfFV413	L_ORDERKEY,		
16-974-998-8937 regular pinto beans are after			SUM(L_EXTENDEDPRICE*(1-L_DISCOUNT))		
7980.650000	Supplier#000001288	FRANCE	AS REVENUE,		
13784	Manufacturer#4	zE,7HgVPrCn	O_ORDERDATE,		
16-646-464-8247 unusual pinto beans cajole furiously according t			O_SHIPRIORITY		
7950.370000	Supplier#000008101	GERMANY	FROM CUSTOMER,		
33094	Manufacturer#5	kkYvL6IuvojJgTNG	ORDERS,		
IKkaXQDYgx8ILohj 17-627-663-8014 quickly regular requests are furiously. pending deposits wake			LINEITEM		
7937.930000	Supplier#000009012	ROMANIA	WHEREC_MKTSEGMENT = 'BUILDING' AND		
83995	Manufacturer#2		C_CUSTKEY = O_CUSTKEY AND		
iUiTziH,Ek3i4lwSgunXMgrcTzwdb 29-250-925-9690 blithely bold ideas haggle quickly final, regular request			L_ORDERKEY = O_ORDERKEY AND		
7914.450000	Supplier#000001013	RUSSIA	O_ORDERDATE < '1995-03-15' AND		
125988	Manufacturer#2		L_SHIPDATE > '1995-03-15'		
riRcntps4KEDtYScjpMIWeYF6mNnR 32-194-698-3365 final, ironic theodolites alongside of the ironic			GROUP BY L_ORDERKEY,		
7912.910000	Supplier#000004211	GERMANY	O_ORDERDATE,		
159180	Manufacturer#5		O_SHIPRIORITY		
2wQRVovHrm3,v03IKzfTd,1PYsFXQFFOG 17-266-947-7315 final requests integrate slyly above the silent, even			ORDER BY REVENUE DESC,		
7912.910000	Supplier#000004211	GERMANY	O_ORDERDATE		
184210	Manufacturer#4		L_ORDERKEY REVENUE		
2wQRVovHrm3,v03IKzfTd,1PYsFXQFFOG 17-266-947-7315 final requests integrate slyly above the silent, even			O_ORDERDATE O_SHIPRIORITY		
7894.560000	Supplier#000007981	GERMANY	-----		
85472	Manufacturer#4	NSJ96vMROAbeXP	2456423	406181.011100	1995-03-05
17-963-404-3760 regular, even theodolites integrate carefully. bold, special theodolites are slyly fluffily iron			00:00:00.000 0		
7887.080000	Supplier#000009792	GERMANY	3459808	405838.698900	1995-03-04
164759	Manufacturer#3		00:00:00.000 0		
Y28ITVeYriT3kIGdV2K8fSZ V2UqT5H1Otz 17-988-938-4296 pending, ironic packages sleep among the carefully ironic accounts. quickly final accounts			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		

## Appendix D

```

5521732      375153.921500      1995-03-13
00:00:00.000 0
2628192      373133.309400      1995-02-22
00:00:00.000 0
993600       371407.459500      1995-03-05
00:00:00.000 0
2300070      367371.145200      1995-03-13
00:00:00.000 0

```

(10 row(s) affected)

-- using default substitutions

/\* TPC\_H Query 4 - Order Priority Checking \*/

```

SELECT      O_ORDERPRIORITY,
            COUNT(*)          AS ORDER_COUNT
FROM        ORDERS
WHEREO_ORDERDATE >= '1993-07-01' AND
            O_ORDERDATE < dateadd (mm, 3, '1993-
07-01') AND
            EXISTS          (
                SELECT      *
                FROM        LINEITEM
                WHEREL_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
WHEREC_CUSTKEY = O_CUSTKEY AND
            L_ORDERKEY = O_ORDERKEY AND
            L_SUPPKEY = S_SUPPKEY AND
            C_NATIONKEY = S_NATIONKEY AND
            S_NATIONKEY = N_NATIONKEY AND
            N_REGIONKEY = R_REGIONKEY AND

```

```

R_NAME      = 'ASIA' AND
O_ORDERDATE >= '1994-01-01' AND
O_ORDERDATE < DATEADD(Y, 1,
'1994-01-01')

```

```

GROUP BY    N_NAME
ORDER BY    REVENUE DESC
N_NAME      REVENUE

```

```

-----
INDONESIA     55502041.169700
VIETNAM      55295086.996700
CHINA        53724494.256600
INDIA        52035512.000200
JAPAN        45410175.695400

```

(5 row(s) affected)

-- using default substitutions

/\* TPC\_H Query 6 - Forecasting Revenue Change \*/

```

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

```

```

-----
123141078.228300

```

(1 row(s) affected)

-- 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

```

## Appendix D

```

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

```

```

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

```

(4 row(s) affected)

-- using default substitutions

/\* TPC\_H Query 8 - National Market Share \*/

```

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

```

```

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

```

```

1995 0.034436
1996 0.041486

```

(2 row(s) affected)

-- using default substitutions

/\* TPC\_H Query 9 - Product Type Profit Measure \*/

```

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

```

## Appendix D

	PS_SUPPKEY = L_SUPPKEY	EGYPT	1993	48904292.969200	
AND		EGYPT	1992	49434932.619200	
	PS_PARTKEY = L_PARTKEY	ETHIOPIA	1998	28040717.267400	
AND		ETHIOPIA	1997	47455009.866400	
	P_PARTKEY = L_PARTKEY	ETHIOPIA	1996	46491097.572900	
AND		ETHIOPIA	1995	46804449.300900	
	O_ORDERKEY =	ETHIOPIA	1994	48516143.917000	
L_ORDERKEY AND		ETHIOPIA	1993	46551891.562900	
	S_NATIONKEY =	ETHIOPIA	1992	44934648.642800	
N_NATIONKEY AND		FRANCE	1998	32226407.839200	
	P_NAME LIKE	FRANCE	1997	47121485.860200	
'%%green%%'		FRANCE	1996	47263135.496000	
)	AS PROFIT	FRANCE	1995	47275997.570700	
GROUP BY	NATION,	FRANCE	1994	47067209.331500	
	O_YEAR	FRANCE	1993	51163370.106200	
ORDER BY	NATION,	FRANCE	1992	47846235.331300	
	O_YEAR	GERMANY	1998	28624942.659800	
	DESC	GERMANY	1997	49309074.877300	
NATION	O_YEAR	GERMANY	1996	49918683.168400	
	SUM_PROFIT	GERMANY	1995	52650718.724200	
-----	-----	GERMANY	1994	50346900.422600	
ALGERIA	1998	31342867.234500	GERMANY	1993	50991895.805900
ALGERIA	1997	57138193.023300	GERMANY	1992	48274126.099100
ALGERIA	1996	56140140.133000	INDIA	1998	29943144.354400
ALGERIA	1995	53051469.653400	INDIA	1997	50665453.231200
ALGERIA	1994	53867582.128600	INDIA	1996	50283092.291200
ALGERIA	1993	54942718.132400	INDIA	1995	50006774.644600
ALGERIA	1992	54628034.712700	INDIA	1994	48995190.755600
ARGENTINA	1998	30211185.708100	INDIA	1993	50286902.852500
ARGENTINA	1997	50805741.752300	INDIA	1992	50850329.402300
ARGENTINA	1996	51923746.575500	INDONESIA	1998	27672339.996500
ARGENTINA	1995	49298625.766600	INDONESIA	1997	50512145.725600
ARGENTINA	1994	50835610.109500	INDONESIA	1996	51653060.116600
ARGENTINA	1993	51646079.177500	INDONESIA	1995	51508779.594000
ARGENTINA	1992	50410314.994800	INDONESIA	1994	52817950.321800
BRAZIL	1998	27217924.383200	INDONESIA	1993	47959994.955100
BRAZIL	1997	48378669.198900	INDONESIA	1992	51776605.032300
BRAZIL	1996	50482870.357200	IRAN	1998	29065736.238100
BRAZIL	1995	47623383.634900	IRAN	1997	50042063.054500
BRAZIL	1994	47840165.725600	IRAN	1996	50926653.188100
BRAZIL	1993	49054694.035100	IRAN	1995	51249667.648500
BRAZIL	1992	48667639.084200	IRAN	1994	50337085.865000
CANADA	1998	30379833.768500	IRAN	1993	51730763.490200
CANADA	1997	50465052.311400	IRAN	1992	49955856.563400
CANADA	1996	52560501.390400	IRAQ	1998	31624551.001700
CANADA	1995	52375332.809200	IRAQ	1997	55121749.019500
CANADA	1994	52600364.658700	IRAQ	1996	55897663.793700
CANADA	1993	52644504.073500	IRAQ	1995	54815472.517000
CANADA	1992	53932871.697000	IRAQ	1994	54408516.126600
CHINA	1998	31075466.164900	IRAQ	1993	53633167.977000
CHINA	1997	50551874.449900	IRAQ	1992	55891939.339600
CHINA	1996	51039293.875400	JAPAN	1998	27934179.669500
CHINA	1995	49287534.616900	JAPAN	1997	44517162.546300
CHINA	1994	50851090.067400	JAPAN	1996	42545606.120400
CHINA	1993	54229629.833000	JAPAN	1995	43749356.399600
CHINA	1992	52400529.372000	JAPAN	1994	44840243.070000
EGYPT	1998	29054433.385600	JAPAN	1993	44660015.532800
EGYPT	1997	50627611.452400	JAPAN	1992	45410249.121600
EGYPT	1996	49542212.844600	JAPAN	1998	26901488.578100
EGYPT	1995	48311550.320700	JORDAN		
EGYPT	1994	49790644.736000			



## Appendix D

JORDAN	1997	45471878.409900
JORDAN	1996	46794325.791800
JORDAN	1995	45178828.576000
JORDAN	1994	45333636.507600
JORDAN	1993	47971496.097900
JORDAN	1992	44717239.177400
KENYA	1998	28597614.337000
KENYA	1997	47949733.727400
KENYA	1996	46886924.622900
KENYA	1995	46072338.755200
KENYA	1994	45772061.171100
KENYA	1993	46308728.234500
KENYA	1992	47257780.840600
MOROCCO	1998	26732115.580000
MOROCCO	1997	45637304.249900
MOROCCO	1996	45558221.745100
MOROCCO	1995	47851318.887400
MOROCCO	1994	46272172.944500
MOROCCO	1993	46764326.181800
MOROCCO	1992	48122783.583100
MOZAMBIQUE	1998	30712392.011200
MOZAMBIQUE	1997	50316528.762500
MOZAMBIQUE	1996	51640320.250900
MOZAMBIQUE	1995	50693774.506000
MOZAMBIQUE	1994	49253277.626000
MOZAMBIQUE	1993	49153016.536700
MOZAMBIQUE	1992	48247551.850300
PERU	1998	29326102.319600
PERU	1997	49753780.395100
PERU	1996	50935170.292700
PERU	1995	53309883.407200
PERU	1994	50643531.796800
PERU	1993	51584622.002000
PERU	1992	47523899.054700
ROMANIA	1998	30368667.399900
ROMANIA	1997	50365683.852600
ROMANIA	1996	49598999.014800
ROMANIA	1995	47537642.869700
ROMANIA	1994	51455283.009500
ROMANIA	1993	50407136.892200
ROMANIA	1992	48185385.128600
RUSSIA	1998	28322384.026600
RUSSIA	1997	50106685.182200
RUSSIA	1996	51753342.430200
RUSSIA	1995	49215820.364700
RUSSIA	1994	52205666.440700
RUSSIA	1993	51860230.034000
RUSSIA	1992	53251677.153000
SAUDI ARABIA	1998	31541259.810000
SAUDI ARABIA	1997	52438750.807600
SAUDI ARABIA	1996	52543737.819700
SAUDI ARABIA	1995	52938696.533100
SAUDI ARABIA	1994	51389601.966800
SAUDI ARABIA	1993	52937508.881800
SAUDI ARABIA	1992	54843459.641400
UNITED KINGDOM	1998	28494874.004000
UNITED KINGDOM	1997	49381810.898600
UNITED KINGDOM	1996	51386853.960400
UNITED KINGDOM	1995	51509586.788500

UNITED KINGDOM	1994	48086499.711500
UNITED KINGDOM	1993	49166827.223500
UNITED KINGDOM	1992	49349122.082500
UNITED STATES	1998	25126238.946100
UNITED STATES	1997	50077306.418600
UNITED STATES	1996	48048649.470300
UNITED STATES	1995	48809032.422600
UNITED STATES	1994	49296747.182700
UNITED STATES	1993	48029946.801400
UNITED STATES	1992	48671944.498300
VIETNAM	1998	30442736.059400
VIETNAM	1997	50309179.794200
VIETNAM	1996	50488161.410000
VIETNAM	1995	49658284.612500
VIETNAM	1994	50596057.260700
VIETNAM	1993	50953919.151900
VIETNAM	1992	49613838.315100

(175 row(s) affected)

-- using default substitutions

/\* TPC\_H Query 10 - Returned Item Reporting \*/

```

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

## Appendix D

```

-----
-----
-----
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
vXCxocSuo0Bad5JQI ,oobkZ 20-834-292-4707
express requests sublate blithely regular requests. regular,
even ideas solve.
39922 Customer#000039922 584878.113400
7321.110000 GERMANY
Zgy4s50l2GKN4pLDPBU8m342gIw6R 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

```

```

iANyZHjqhyy7AjahOpTrYyhJ 10-886-956-3143
furiously even accounts are blithely above the furiouslyl
115640 Customer#000115640 569341.193300
6436.100000 ARGENTINA Vtgfia9qI
7EpHgecU1X 11-411-543-4901 final instructions
are slyly according to the
73606 Customer#000073606 568656.857800
1785.670000 JAPAN
xuR0Tro5yChDfOCrjkd2ol 22-437-653-6966
furiously bold orbits about the furiously busy requests wake
across the furiously quiet theodolites. d
110246 Customer#000110246 566842.981500
7763.350000 VIETNAM 7KzflgX
MDOq7sOkI 31-943-426-9837 dolphins sleep
blithely among the slyly final
142549 Customer#000142549 563537.236800
5085.990000 INDONESIA
ChqEoK43OysjdHbtKCp6dKqjNyyvi9 19-955-562-
2398 regular, unusual dependencies boost slyly; ironic
attainments nag fluffily into the unusual packages?
146149 Customer#000146149 557254.986500
1791.550000 ROMANIA s87fvzFQpU
29-744-164-6487 silent, unusual requests detect quickly slyly
regul
52528 Customer#000052528 556397.350900
551.790000 ARGENTINA
NFztyTOR10UOJ 11-208-192-3205 unusual
requests detect. slyly dogged theodolites use slyly. deposit
23431 Customer#000023431 554269.536000
3381.860000 ROMANIA
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
WHEREPS_SUPPKEY = S_SUPPKEY AND
S_NATIONKEY = N_NATIONKEY AND
N_NAME = 'GERMANY'
GROUP BY PS_PARTKEY
HAVING
SUM(PS_SUPPLYCOST*PS_AVAILQTY) >
(
SELECT
SUM(PS_SUPPLYCOST*PS_AVAILQTY) *
0.0001000000
FROM PARTSUPP,
SUPPLIER,
NATION
WHEREPS_SUPPKEY =
S_SUPPKEY AND

```

## Appendix D

```

N_NATIONKEYAND
      = 'GERMANY'
      )
ORDER BY    VALUE DESC
PS_PARTKEY VALUE
-----
129760  17538456.860000
166726  16503353.920000
191287  16474801.970000
161758  16101755.540000
34452   15983844.720000
139035  15907078.340000
9403    15451755.620000
154358  15212937.880000
38823   15064802.860000
85606   15053957.150000
33354   14408297.400000
154747  14407580.680000
82865   14235489.780000
76094   14094247.040000
222     13937777.740000
121271  13908336.000000
55221   13716120.470000
22819   13666434.280000
76281   13646853.680000
85298   13581154.930000
85158   13554904.000000
139684  13535538.720000
31034   13498025.250000
87305   13482847.040000
10181   13445148.750000
62323   13411824.300000
26489   13377256.380000

```

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

```

139680  7939242.360000
31134   7938318.300000
45636   7937240.850000
56694   7936015.950000
8114    7933921.880000
71518   7932261.690000
72922   7930400.640000
146699  7929167.400000
92387   7928972.670000
186289  7928786.190000
95952   7927972.780000
196514  7927180.700000
4403    7925729.040000
2267    7925649.370000
45924   7925047.680000
11493   7916722.230000
104478  7916253.600000
166794  7913842.000000
161995  7910874.270000
23538   7909752.060000

```

```

S_NATIONKEY = 41093  7909579.920000
              112073  7908617.570000
N_NAME       92814  7908262.500000
              88919  7907992.500000
              79753  7907933.880000
              108765 7905338.980000
              146530 7905336.600000
              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

```

## Appendix D

```

L_SHIPDATE < L_COMMITDATE                26    1593
AND                                         27    1185
L_RECEIPTDATE >= '1994-01-01'            4     1033
AND                                         28     869
L_RECEIPTDATE < dateadd(yy, 1, '1994-01-
01')                                       29     559
                                           3     398
GROUP BY L_SHIPMODE                       30     373
ORDER BY L_SHIPMODE                       31     235
L_SHIPMODE HIGH_LINE_COUNT LOW_LINE_COUNT 2     144
-----
MAIL    6202    9324                       33     71
SHIP    6200    9262                       34     48
                                           35     33
(2 row(s) affected)                       1     23
                                           36     17
-- using default substitutions           37     7
                                           40     4
/* TPC_H Query 13 - Customer Distribution */ 38     4
                                           39     2
SELECT C_COUNT,                            41     1
COUNT(*) AS CUSTDIST
FROM ( SELECT C_CUSTKEY,
COUNT(O_ORDERKEY)
FROM CUSTOMER left outer join
ORDERS on
C_CUSTKEY = O_CUSTKEY
AND
O_COMMENT not like
'%special%requests%'
)
GROUP BY C_CUSTKEY
AS C_ORDERS (C_CUSTKEY,
C_COUNT)
ORDER BY C_COUNT
CUSTDIST DESC,
C_COUNT DESC
C_COUNT CUSTDIST
-----
0    50004
9    6641
10   6566
11   6058
8    5949
12   5553
13   4989
19   4748
7    4707
18   4625
15   4552
17   4530
14   4484
20   4461
16   4323
21   4217
22   3730
6    3334
23   3129
24   2622
25   2079
5    1972

                                           26    1593
                                           27    1185
                                           4     1033
                                           28     869
                                           29     559
                                           3     398
                                           30     373
                                           31     235
                                           2     144
                                           32    128
                                           33     71
                                           34     48
                                           35     33
                                           1     23
                                           36     17
                                           37     7
                                           40     4
                                           38     4
                                           39     2
                                           41     1
(42 row(s) affected)
-- using default substitutions
/* TPC_H Query 14 - Promotion Effect */
SELECT 100.00 * SUM ( CASE WHEN
P_TYPE LIKE 'PROMO%'
THEN
L_EXTENDEDPRICE*(1-L_DISCOUNT)
ELSE 0
END) /
SUM(L_EXTENDEDPRICE*(1-L_DISCOUNT)) AS
PROMO_REVENUE
FROM LINEITEM,
PART
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

```

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```

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 */
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_CNTDESC,
P_BRAND,
P_TYPE,
P_SIZE
P_BRAND P_TYPE P_SIZE
SUPPLIER_CNT
-----
Brand#41 MEDIUM BRUSHED TIN 3 28
Brand#54 STANDARD BRUSHED COPPER 14 27
Brand#11 STANDARD BRUSHED TIN 23 24
Brand#11 STANDARD BURNISHED BRASS 36 24
Brand#15 MEDIUM ANODIZED NICKEL 3 24
Brand#15 SMALL ANODIZED BRASS 45 24
Brand#15 SMALL BURNISHED NICKEL 19 24
Brand#21 MEDIUM ANODIZED COPPER 3 24
Brand#22 SMALL BRUSHED NICKEL 3 24
Brand#22 SMALL BURNISHED BRASS 19 24
Brand#25 MEDIUM BURNISHED COPPER 36 24
Brand#31 PROMO POLISHED COPPER 36 24
Brand#33 LARGE POLISHED TIN 23 24
Brand#33 PROMO POLISHED STEEL 14 24
Brand#35 PROMO BRUSHED NICKEL 14 24
Brand#41 ECONOMY BRUSHED STEEL 9 24
Brand#41 ECONOMY POLISHED TIN 19 24
Brand#41 LARGE PLATED COPPER 36 24
Brand#42 ECONOMY PLATED BRASS 3 24
Brand#42 STANDARD POLISHED TIN 49 24
Brand#43 PROMO BRUSHED TIN 3 24
Brand#43 SMALL ANODIZED COPPER 36 24
Brand#44 STANDARD POLISHED NICKEL 3 24
Brand#52 ECONOMY PLATED TIN 14 24
Brand#52 STANDARD BURNISHED NICKEL 3 24
Brand#53 MEDIUM ANODIZED STEEL 14 24
Brand#14 PROMO ANODIZED NICKEL 45 23
Brand#32 ECONOMY PLATED BRASS 9 23
Brand#52 SMALL ANODIZED COPPER 3 23
Brand#11 ECONOMY BRUSHED COPPER 45 20
Brand#11 ECONOMY PLATED BRASS 23 20
Brand#11 LARGE BRUSHED COPPER 49 20
Brand#11 LARGE POLISHED COPPER 49 20
Brand#12 STANDARD ANODIZED TIN 49 20
Brand#12 STANDARD PLATED BRASS 19 20
Brand#13 ECONOMY BRUSHED BRASS 9 20
Brand#13 ECONOMY BURNISHED STEEL 14 20
Brand#13 LARGE BURNISHED NICKEL 19 20
Brand#13 MEDIUM BURNISHED COPPER 36 20
Brand#13 SMALL BRUSHED TIN 45 20
Brand#13 STANDARD ANODIZED COPPER 3 20
Brand#13 STANDARD PLATED NICKEL 23 20

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

Brand#55 STANDARD BURNISHED TIN 19 4
Brand#55 STANDARD BURNISHED TIN 36 4
Brand#55 STANDARD BURNISHED TIN 49 4
Brand#55 STANDARD PLATED BRASS 9 4
Brand#55 STANDARD PLATED BRASS 45 4
Brand#55 STANDARD PLATED BRASS 49 4

```

## Appendix D

```

Brand#55 STANDARD PLATED COPPER 9 4 FROM
Brand#55 STANDARD PLATED COPPER 45 4 LINEITEM
Brand#55 STANDARD PLATED NICKEL 3 4 WHERE
Brand#55 STANDARD PLATED NICKEL 19 4 L_PARTKEY = P_PARTKEY
Brand#55 STANDARD PLATED NICKEL 45 4 )
Brand#55 STANDARD PLATED STEEL 14 4 AVG_YEARLY
Brand#55 STANDARD PLATED STEEL 23 4 -----
Brand#55 STANDARD PLATED STEEL 49 4 348406.054286
Brand#55 STANDARD PLATED TIN 9 4
Brand#55 STANDARD PLATED TIN 14 4 (1 row(s) affected)
Brand#55 STANDARD PLATED TIN 36 4
Brand#55 STANDARD POLISHED BRASS 3 4 -- using default substitutions
Brand#55 STANDARD POLISHED BRASS 9 4
Brand#55 STANDARD POLISHED BRASS 23 4 /* TPC_H Query 18 - Large Volume Customer */
Brand#55 STANDARD POLISHED COPPER 3 4
Brand#55 STANDARD POLISHED COPPER 23 4 SELECT TOP 100
Brand#55 STANDARD POLISHED COPPER 45 4 C_NAME,
Brand#55 STANDARD POLISHED NICKEL 3 4 C_CUSTKEY,
Brand#55 STANDARD POLISHED NICKEL 23 4 O_ORDERKEY,
Brand#55 STANDARD POLISHED NICKEL 36 4 O_ORDERDATE,
Brand#55 STANDARD POLISHED NICKEL 45 4 O_TOTALPRICE,
Brand#55 STANDARD POLISHED NICKEL 49 4 SUM(L_QUANTITY)
Brand#55 STANDARD POLISHED STEEL 14 4 FROM CUSTOMER,
Brand#55 STANDARD POLISHED STEEL 23 4 ORDERS,
Brand#55 STANDARD POLISHED TIN 9 4 LINEITEM
Brand#55 STANDARD POLISHED TIN 19 4 WHEREO_ORDERKEY IN ( SELECT
Brand#55 STANDARD POLISHED TIN 36 4 L_ORDERKEY FROM
Brand#11 SMALL BRUSHED TIN 19 3 LINEITEM
Brand#15 LARGE PLATED NICKEL 45 3 GROUP BY
Brand#15 LARGE POLISHED NICKEL 9 3 L_ORDERKEY HAVING SUM(L_QUANTITY) >
Brand#21 PROMO BURNISHED STEEL 45 3 300
Brand#22 STANDARD PLATED STEEL 23 3 ) AND
Brand#25 LARGE PLATED STEEL 19 3 C_CUSTKEY = O_CUSTKEY AND
Brand#32 STANDARD ANODIZED COPPER 23 3 O_ORDERKEY = L_ORDERKEY
Brand#33 SMALL ANODIZED BRASS 9 3 GROUP BY C_NAME,
Brand#35 MEDIUM ANODIZED TIN 19 3 C_CUSTKEY,
Brand#51 SMALL PLATED BRASS 23 3 O_ORDERKEY,
Brand#52 MEDIUM BRUSHED BRASS 45 3 O_ORDERDATE,
Brand#53 MEDIUM BRUSHED TIN 45 3 O_TOTALPRICE
Brand#54 ECONOMY POLISHED BRASS 9 3 ORDER BY O_TOTALPRICE DESC,
Brand#55 PROMO PLATED BRASS 19 3 O_ORDERDATE
Brand#55 STANDARD PLATED TIN 49 3 C_NAME C_CUSTKEY O_ORDERKEY
(18314 row(s) affected) O_ORDERDATE O_TOTALPRICE
-----
-- using default substitutions
-----
/* TPC_H Query 17 - Small-Quantity-Order Revenue */
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

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

```

## Appendix D

Customer#000146608	146608	3342468	1994-	Customer#000018188	18188	3037414	1995-
06-12 00:00:00.000	499794.580000	303.000000		01-25 00:00:00.000	443807.220000	308.000000	
Customer#000096103	96103	5984582	1992-	Customer#000066533	66533	29158	1995-
03-16 00:00:00.000	494398.790000	312.000000		10-21 00:00:00.000	443576.500000	305.000000	
Customer#000024341	24341	1474818	1992-	Customer#000037729	37729	4134341	1995-
11-15 00:00:00.000	491348.260000	302.000000		06-29 00:00:00.000	441082.970000	309.000000	
Customer#000137446	137446	5489475	1997-	Customer#000003566	3566	2329187	1998-
05-23 00:00:00.000	487763.250000	311.000000		01-04 00:00:00.000	439803.360000	304.000000	
Customer#000107590	107590	4267751	1994-	Customer#000045538	45538	4527553	1994-
11-04 00:00:00.000	485141.380000	301.000000		05-22 00:00:00.000	436275.310000	305.000000	
Customer#000050008	50008	2366755	1996-	Customer#000081581	81581	4739650	1995-
12-09 00:00:00.000	483891.260000	302.000000		11-04 00:00:00.000	435405.900000	305.000000	
Customer#000015619	15619	3767271	1996-	Customer#000119989	119989	1544643	1997-
08-07 00:00:00.000	480083.960000	318.000000		09-20 00:00:00.000	434568.250000	320.000000	
Customer#000077260	77260	1436544	1992-	Customer#000003680	3680	3861123	1998-
09-12 00:00:00.000	479499.430000	307.000000		07-03 00:00:00.000	433525.970000	301.000000	
Customer#000109379	109379	5746311	1996-	Customer#000113131	113131	967334	1995-
10-10 00:00:00.000	478064.110000	302.000000		12-15 00:00:00.000	432957.750000	301.000000	
Customer#000054602	54602	5832321	1997-	Customer#000141098	141098	565574	1995-
02-09 00:00:00.000	471220.080000	307.000000		09-24 00:00:00.000	430986.690000	301.000000	
Customer#000105995	105995	2096705	1994-	Customer#000093392	93392	5200102	1997-
07-03 00:00:00.000	469692.580000	307.000000		01-22 00:00:00.000	425487.510000	304.000000	
Customer#000148885	148885	2942469	1992-	Customer#000015631	15631	1845057	1994-
05-31 00:00:00.000	469630.440000	313.000000		05-12 00:00:00.000	419879.590000	302.000000	
Customer#000114586	114586	551136	1993-	Customer#000112987	112987	4439686	1996-
05-19 00:00:00.000	469605.590000	308.000000		09-17 00:00:00.000	418161.490000	305.000000	
Customer#000105260	105260	5296167	1996-	Customer#000012599	12599	4259524	1998-
09-06 00:00:00.000	469360.570000	303.000000		02-12 00:00:00.000	415200.610000	304.000000	
Customer#000147197	147197	1263015	1997-	Customer#000105410	105410	4478371	1996-
02-02 00:00:00.000	467149.670000	320.000000		03-05 00:00:00.000	412754.510000	302.000000	
Customer#000064483	64483	2745894	1996-	Customer#000149842	149842	5156581	1994-
07-04 00:00:00.000	466991.350000	304.000000		05-30 00:00:00.000	411329.350000	302.000000	
Customer#000136573	136573	2761378	1996-	Customer#000010129	10129	5849444	1994-
05-31 00:00:00.000	461282.730000	301.000000		03-21 00:00:00.000	409129.850000	309.000000	
Customer#000016384	16384	502886	1994-	Customer#000069904	69904	1742403	1996-
04-12 00:00:00.000	458378.920000	312.000000		10-19 00:00:00.000	408513.000000	305.000000	
Customer#000117919	117919	2869152	1996-	Customer#000017746	17746	6882	1997-
06-20 00:00:00.000	456815.920000	317.000000		04-09 00:00:00.000	408446.930000	303.000000	
Customer#000012251	12251	735366	1993-	Customer#000013072	13072	1481925	1998-
11-24 00:00:00.000	455107.260000	309.000000		03-15 00:00:00.000	399195.470000	301.000000	
Customer#000120098	120098	1971680	1995-	Customer#000082441	82441	857959	1994-
06-14 00:00:00.000	453451.230000	308.000000		02-07 00:00:00.000	382579.740000	305.000000	
Customer#000066098	66098	5007490	1992-	Customer#000088703	88703	2995076	1994-
08-07 00:00:00.000	453436.160000	304.000000		01-30 00:00:00.000	363812.120000	302.000000	
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					

(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

```

## Appendix D

```

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

```

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
FROM PARTSUPP
WHERE PS_PARTKEY in ( SELECT
            P_PARTKEY
FROM PART
WHERE P_NAME like 'forest%'
)
AND
sum(L_QUANTITY) > ( SELECT PS_AVAILQTY
            0.5 *
FROM LINEITEM
WHERE L_PARTKEY = PS_PARTKEY
AND L_SUPPKEY = PS_SUPPKEY
AND L_SHIPDATE >= '1994-01-01'
AND L_SHIPDATE <
            dateadd(yy,1,'1994-01-01')
)
)
AND
S_NATIONKEY = N_NATIONKEY AND
N_NAME = 'CANADA'
ORDER BY S_NAME
S_NAME      S_ADDRESS
-----
Supplier#000000020  iybAE,RmTymrZVYaFZva2SH,j
Supplier#000000091  YV45D7TkfdQanOOZ7q9QxkyGUapU1oOWU6q3
Supplier#000000197  YC2Acon6kjY3zj3Fbxs2k4Vdf7X0cd2F
Supplier#000000226  83qOdU2EYRdPQAQhEtn GRZED
Supplier#000000285  Br7e1nnt1yxrw6ImgpJ7YdhFDjuBf
Supplier#000000378  FfbhyCxWvcPrO8ltp9
Supplier#000000402  i9Sw4DoyMhzhKXCH9By,AYSgmD
Supplier#000000530  0qwCMwobKY
OcmLyfRXlagA8ukENJv,
Supplier#000000688  D
fw5ocppmZpYBBIPI718hCihLDZ5KhKX
Supplier#000000710  f19YPvOyb
QoYwjKC,oPycpGfieBAcwKJo

```



## Appendix D

Supplier#00000736	l6i2nMwVuovfKnuVgaSGK2rDy65D1AFLegiL7	Supplier#000007402	4UVv58ery1rjmqSR5
Supplier#00000761	zlSLelQUj2XrvTTFnv7WAcYZGvvMTx882d4	Supplier#000007448	yhphWiJi7EJ6Q5VCaQ
Supplier#00000884	bmhEShejaS	Supplier#000007477	9m9j0wfhWzCvVHxkU,PpAxwSH0h
Supplier#00000887	urEaTejH5POADP2ARrf	Supplier#000007509	q8,V6LJRoHJjHcOuSG7aLTMg
Supplier#00000935	ij98czM	Supplier#000007561	rMcFg2530VC
2KzWe7dDT0xB8sq0UfCdvrX		Supplier#000007789	rQ7cUcPrtudOyO3svNSkimqH6qrfWT2Sz
Supplier#00000975	,AC e,tBpNwKb5xMUzeohxIRn,	Supplier#000007801	69fi,U1r6enUb
hdZJo73gFQF8y		Supplier#000007818	yhhc2CQec Jrvc8zqBi83
Supplier#000001263	rQWr6nf8ZhB2TAiIDivo5Io	Supplier#000007885	u3sicchh5ZpyTUpN1cJKNcAoabiWgY
Supplier#000001399	LmrocniMSyYOWuANx7	Supplier#000007918	r,v9mBQ6LoEYyj1
Supplier#000001446	lch9HMNU1R7a0LIybsUodVknk6	Supplier#000007926	ErzCF80K9Uy
Supplier#000001454	TOpingu2TVXIjhiL93h,	Supplier#000007957	ELwnio14ssoU1 dRyZIL OK3Vtzb
Supplier#000001500	wDmF5xLxtQch9ctVu,	Supplier#000007965	F7Un5Ij7p5hhj
Supplier#000001602	uKNWleafaM644	Supplier#000007968	DsF9UIZ2Fo6HXN9aErvyglkHoD582HSGZpP
Supplier#000001626	UhxNRzUu1dtFmp0	Supplier#000007998	LnASFBfYRFOo9d6d,asBvVq9Lo2P
Supplier#000001682	pXTkGxrTQVyH1Rr	Supplier#000008168	aOa82a8ZbKcfnDLX
Supplier#000001699	Q9C4rfJ26oijVPqqcqVXeRI	Supplier#000008231	IK7eGw Yj90sTdspP,vcqWxLB
Supplier#000001700	7hMICof1Y5zLFg	Supplier#000008243	2AyePMkDqmqzVzjGTizXthFLo8h
Supplier#000001726	TeRY7TtTH24sEword7yAaSkjx8	EiudCMxOmIIG	
Supplier#000001730	Rc8e,1Pybn r6zo0VJIEiD0UD vhk	Supplier#000008275	B1bNdfWg,gpXKQILN
Supplier#000001746	qWsendlOekQG1aW4uq06uQaCm51se8lirv7 hBRd	Supplier#000008323	75I18sZmASwm
Supplier#000001752	Fra7outx41THYJaRThdOGiBk	POeheRMdj9tmpyeQ,BfCXN5BIAB	
Supplier#000001856	jXcRgzYF0ah05iR8p6w5SbJLcUGyYiURPvFwUWM	Supplier#000008366	h778cEj14BuW9OEKlvPTWq4iwASR6EBBXN7zeS8
Supplier#000001931	FpJbMU2h6ZR2eBv8I9NixF	Supplier#000008423	RQhKnkAhR0DAr3Ix4Q1weMMn00hNe Kq
Supplier#000001939	Nrk,JA4bfReUs	Supplier#000008480	4sSDA4ACReklNjEm5T6b
Supplier#000001990	DSDJkCgBJzuPg1yuM,CUdLnsRliOxkkHezTCA	Supplier#000008532	Uc29q4,5xVdDOF87UZrxhr4xWS0ihEUXuh
Supplier#000002020	jb6r1d7MxP6co	Supplier#000008595	MH0iB73GQ3z UW3O DbCbqmc
Supplier#000002022	dwebGX71d2pc25YvY33	Supplier#000008610	SgVgP90vP452sUNTgzL9zKwXHXAzV6tV
Supplier#000002036	20ytTtVObjKUUI2WCB0A	Supplier#000008705	aE,trRNdPx,4yinTD9O3DebDIp
Supplier#000002204	uYmlr46C06udCqanj0KiRsoTQakZsEyssL	Supplier#000008742	HmPIQEzKCPEcTUL14,kKq
Supplier#000002243	nSOEV3JeOU79	Supplier#000008841	I 85Lu1sekbq2xrSIzm0
Supplier#000002245	hz2qWXWVjOyKhqPYMoEwz6zFkrTaDM	Supplier#000008895	2cH4okfaLSZTTg8sKRbbJQxkmeFu2Esj
Supplier#000002282	ES21K9dXoW1IITzWCj7ekdlNwSWnv1Z 6mQ,BKn	Supplier#000008967	2kwEHyMG
Supplier#000002303	nCoWfpB6YOymbgOht7ltfklpkHI	7FwozNImAUE6mH0hYtqYculJM	
Supplier#000002373	RzHSxOTQmElCjxIBiVA52Z	Supplier#000008972	w2vF6 D5YZO3visPXsqVfLADTK
JB58rJhPRyIR		Supplier#000009032	qK,trB6Sdy4Dz1BRUFNy
Supplier#000002419	qydBQd14I515mVXa4fYY	Supplier#000009147	rOAuryHxpZ9eOvx
Supplier#000002481	nLKHUOn2MI9TOA06Znq9GEMcIIMO2	Supplier#000009252	F7cZaPUHwh1
Supplier#000002571	JZUugz04c iJFLrlGsz9O N,W	ZKjy3xmAVWC1XdP ue1p5m,i	
1rVHNIReyq		Supplier#000009278	RqYTzgxj93CLX 0mcYfCENOfD
Supplier#000002585	CsPoKpw2QuTY4AV1NkWuttneIa4SN	Supplier#000009327	uoqMdf7e7Gj9dbQ53
Supplier#000002630	ZIQAvjNUY9KH5ive zm7k	Supplier#000009430	igRqmneFt
VIPiDI7CCo21		Supplier#000009567	r4Wfx4c3xsEAjcGj71HHZByornl
Supplier#000002719	4nnzQI2CbqREQUuIsXTBVUkaP4mNS3	D9vrztXlv4	
Supplier#000002721	HVdFAN2JHMQSpKm	Supplier#000009601	51m637bO,Rw5DnHWFUVLacRx9
Supplier#000002730	lIFxR4fzm31C6,muzJwl84z		

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

## Appendix D

Supplier#000009709 rRnCbHYgDgl9PZYnyWKVYSUW0vKg	S_NAME	NUMWAIT
Supplier#000009753    wLhVEcRmd7PkJF4FBnGK7Z	Supplier#000002829	20
Supplier#000009796    z,y4Idmr15DOvPUqYG	Supplier#000005808	18
Supplier#000009799    4wNjXGa4OKWl	Supplier#000000262	17
Supplier#000009811    E3iuyq7UnZxU7oPZIE2Gu6	Supplier#000000496	17
Supplier#000009812	Supplier#000002160	17
APFRMy3lCbGfGa53n5t9DxzFPQPgnjrGt32	Supplier#000002301	17
Supplier#000009862    rJzweWeN58	Supplier#000002540	17
Supplier#000009868    ROjGgx5gvtkmnUUoeyy7v	Supplier#000003063	17
Supplier#000009869	Supplier#000005178	17
ucLqxzrpBTRMewGSM29t0rNTM30g1Tu3Xgg3mKag	Supplier#000008331	17
Supplier#000009899    7XdpAHzr1t,UQFZE	Supplier#000002005	16
Supplier#000009974	Supplier#000002095	16
7wJ,J5DKcxSU4Kp1cQLpbcAvB5AsvKT	Supplier#000005799	16
	Supplier#000005842	16
(204 row(s) affected)	Supplier#000006450	16
	Supplier#000006939	16
-- using default substitutions	Supplier#000009200	16
	Supplier#000009727	16
/* TPC_H Query 21 - Suppliers Who Kept Orders Waiting */	Supplier#000000486	15
	Supplier#000000565	15
SELECT            TOP 100	Supplier#000001046	15
S_NAME,	Supplier#000001047	15
COUNT(*)    AS NUMWAIT	Supplier#000001161	15
FROM    SUPPLIER,	Supplier#000001336	15
LINEITEM L1,	Supplier#000001435	15
ORDERS,	Supplier#000003075	15
NATION	Supplier#000003335	15
WHERE S_SUPPKEY        = L1.L_SUPPKEY	Supplier#000005649	15
AND	Supplier#000006027	15
O_ORDERKEY       = L1.L_ORDERKEY	Supplier#000006795	15
AND	Supplier#000006800	15
O_ORDERSTATUS       = 'F'	Supplier#000006824	15
AND	Supplier#000007131	15
L1.L_RECEIPTDATE    > L1.L_COMMITDATE	Supplier#000007382	15
AND	Supplier#000008913	15
EXISTS (            SELECT            *	Supplier#000009787	15
FROM    LINEITEM L2	Supplier#000000633	14
WHERE L2.L_ORDERKEY	Supplier#000001960	14
= L1.L_ORDERKEY    AND	Supplier#000002323	14
L2.L_SUPPKEY <>	Supplier#000002490	14
L1.L_SUPPKEY	Supplier#000002993	14
)            AND	Supplier#000003101	14
NOT EXISTS (            SELECT            *	Supplier#000004489	14
FROM    LINEITEM L3	Supplier#000005435	14
WHERE	Supplier#000005583	14
L3.L_ORDERKEY       =	Supplier#000005774	14
L1.L_ORDERKEY       AND	Supplier#000007579	14
L3.L_SUPPKEY	Supplier#000008180	14
<> L1.L_SUPPKEY       AND	Supplier#000008695	14
Supplier#000009224	14	
L3.L_RECEIPTDATE    > L3.L_COMMITDATE	Supplier#000000357	13
)            AND	Supplier#000000436	13
S_NATIONKEY = N_NATIONKEY    AND	Supplier#000000610	13
N_NAME               = 'SAUDI ARABIA'	Supplier#000000788	13
GROUP BY    S_NAME	Supplier#000000889	13
ORDER BY    NUMWAIT        DESC,	Supplier#000001062	13
S_NAME	Supplier#000001498	13

## Appendix D

```

Supplier#000002056 13
Supplier#000002312 13
Supplier#000002344 13
Supplier#000002596 13
Supplier#000002615 13
Supplier#000002978 13
Supplier#000003048 13
Supplier#000003234 13
Supplier#000003727 13
Supplier#000003806 13
Supplier#000004472 13
Supplier#000005236 13
Supplier#000005906 13
Supplier#000006241 13
Supplier#000006326 13
Supplier#000006384 13
Supplier#000006394 13
Supplier#000006624 13
Supplier#000006629 13
Supplier#000006682 13
Supplier#000006737 13
Supplier#000006825 13
Supplier#000007021 13
Supplier#000007417 13
Supplier#000007497 13
Supplier#000007602 13
Supplier#000008134 13
Supplier#000008234 13
Supplier#000009435 13
Supplier#000009436 13
Supplier#000009564 13
Supplier#000009896 13
Supplier#000000379 12
Supplier#000000673 12
Supplier#000000762 12
Supplier#000000811 12
Supplier#000000821 12
Supplier#000001337 12
Supplier#000001916 12
Supplier#000001925 12
Supplier#000002039 12
Supplier#000002357 12
Supplier#000002483 12

```

```

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 CENTRYCODE
ORDER BY CENTRYCODE
CENTRYCODE NUMCUST TOTACCTBAL
-----
13 888 6737713.990000
17 861 6460573.720000
18 964 7236687.400000
23 892 6701457.950000
29 948 7158866.630000
30 909 6808436.130000
31 922 6806670.180000

```

(7 row(s) affected)

(100 row(s) affected)

-- using default substitutions

/\* TPC\_H Query 22 - Global Sales Opportunity \*/

```

SELECT CENTRYCODE,
COUNT(*) AS NUMCUST,
SUM(C_ACCTBAL) AS TOTACCTBAL
FROM (
SELECT
SUBSTRING(C_PHONE,1,2) AS
CENTRYCODE,
C_ACCTBAL
FROM CUSTOMER

```

## ***Appendix E: Seed and Input Parameters***

**Appendix E**

**Seed**

727040433

**Stream0**

1 87  
 2 32 NICKEL MIDDLE EAST  
 3 FURNITURE 1995-03-31  
 4 1997-10-01  
 5 EUROPE 1993-01-01  
 6 1993-01-01 0.07 24  
 7 PERU ALGERIA  
 8 ALGERIA AFRICA ECONOMY  
 POLISHED STEEL  
 9 royal  
 10 1994-01-01  
 11 ARGENTINA 0.0000010000  
 12 REG AIR AIR 1994-01-01  
 13 special requests  
 14 1994-07-01  
 15 1997-07-01  
 16 Brand#54 ECONOMY PLATED 5  
 33 9 23 37 36 31  
 14  
 17 Brand#44 LG PACK  
 18 314  
 19 Brand#24 Brand#13 Brand#13  
 7 20 25  
 20 orange 1993-01-01 IRAQ  
 21 EGYPT  
 22 11 21 15 17 34 13  
 23

**Stream1**

21 VIETNAM  
 3 MACHINERY 1995-03-16  
 18 312  
 5 MIDDLE EAST 1993-01-01  
 11 KENYA0.0000010000  
 7 INDONESIA PERU  
 6 1993-01-01 0.05 25  
 20 bisque 1997-01-01 ALGERIA  
 17 Brand#41 LG DRUM  
 12 SHIP AIR 1994-01-01  
 16 Brand#34 STANDARD POLISHED 27  
 10 43 3 7 11 8  
 15  
 15 1995-04-01  
 13 special requests  
 10 1994-10-01  
 2 20 TIN ASIA

8 PERU AMERICA ECONOMY  
 BURNISHED STEEL  
 14 1994-10-01  
 19 Brand#21 Brand#51 Brand#52  
 2 10 21  
 9 powder  
 22 10 33 12 15 17 31  
 11  
 1 95  
 4 1995-07-01

**Stream2**

6 1994-01-01 0.02 24  
 17 Brand#43 MED BOX  
 14 1995-01-01  
 16 Brand#14 LARGE ANODIZED 23  
 24 11 32 21 8 2  
 10  
 19 Brand#33 Brand#34 Brand#51  
 7 11 28  
 10 1993-07-01  
 9 pale  
 2 7 STEEL AFRICA  
 15 1997-10-01  
 8 INDONESIA ASIA LARGE BRUSHED  
 STEEL  
 5 AFRICA 1994-01-01  
 22 25 31 21 17 14 32  
 19  
 12 MAIL AIR 1994-01-01  
 7 ARGENTINA INDONESIA  
 13 pending requests  
 18 314  
 1 103  
 4 1993-04-01  
 20 lemon 1995-01-01 MOROCCO  
 3 FURNITURE 1995-03-02  
 11 BRAZIL 0.0000010000  
 21 JORDAN

**Stream3**

8 ARGENTINA AMERICA LARGE  
 PLATED STEEL  
 5 AMERICA 1994-01-01  
 4 1995-11-01  
 6 1994-01-01 0.07 24  
 17 Brand#45 MED PACK  
 7 CHINA ARGENTINA  
 1 111  
 18 315  
 22 20 29 10 14 16 24  
 11  
 14 1995-05-01  
 9 moccasin

## Appendix E

10	1994-05-01									14	1995-11-01								
15	1995-07-01									22	10	26	34	16	17	11			
11	MOROCCO	0.0000010000									25								
20	spring	1994-01-01	ETHIOPIA							11	MOZAMBIQUE	0.0000010000							
2	45	BRASS ASIA								13	pending accounts								
21	ETHIOPIA									3	MACHINERY	1995-03-20							
19	Brand#35	Brand#22	Brand#41							1	66								
	2	13	25							2	21	TIN	EUROPE						
13	pending requests									5	EUROPE	1994-01-01							
16	Brand#54	PROMO BURNISHED	6							8	IRAN	MIDDLE EAST	MEDIUM POLISHED						
	35	12	11	22	41	30					COPPER								
	14									20	puff	1996-01-01	INDONESIA						
12	TRUCK RAIL	1995-01-01								12	AIR	RAIL	1995-01-01						
3	MACHINERY	1995-03-18								17	Brand#44	JUMBO BOX							
										10	1993-11-01								
										9	lawn								

### Stream4

5	ASIA	1994-01-01																	
21	RUSSIA																		
14	1995-08-01																		
19	Brand#32	Brand#55	Brand#45																
	8	14	21																
15	1993-04-01																		
17	Brand#42	MED DRUM																	
12	RAIL	TRUCK	1993-01-01																
6	1994-01-01	0.05	25																
4	1993-08-01																		
9	maroon																		
8	CHINA ASIA	LARGE ANODIZED STEEL																	
16	Brand#34	SMALL POLISHED	29																
	2	46	31	37	27	5													
	19																		
11	CANADA	0.0000010000																	
2	33	NICKEL	AFRICA																
10	1993-02-01																		
18	313																		
1	119																		
13	pending accounts																		
7	IRAN	CHINA																	
22	22	28	33	11	16	23													
	25																		
3	BUILDING	1995-03-04																	
20	forest	1997-01-01	SAUDI ARABIA																

### Stream5

21	MOROCCO																		
15	1995-11-01																		
4	1996-03-01																		
6	1994-01-01	0.02	24																
7	BRAZIL	IRAN																	
16	Brand#14	LARGE BRUSHED	19																
	32	31	20	1	26	13													
	23																		
19	Brand#44	Brand#42	Brand#44																
	3	15	28																
18	314																		

## ***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->okey);
    PR_HUGE(fp_o, &o->custkey);
    PR_STR(fp_o, o->opriority, O_OPRIO_LEN);
}

```

```

PR_INT(fp_o, o->spriority);
PR_STR(fp_o, o->clerk, O_CLRK_LEN);
PR_CHR(fp_o, &o->orderstatus);
PR_MONEY(fp_o, &o->totalprice);
PR_VSTR_LAST(fp_o, o->comment,
  (columnar)?(long)(ceil(O_CMNT_LEN *
V_STR_HGH)):o->cflen);
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].cflen);
    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->cflen);
  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_START(fp);
    PR_HUGE(fp, &supp->suppkey);
    PR_HUGE(fp, &supp->nation_code);
    PR_STR(fp, supp->name, S_NAME_LEN);
    PR_VSTR(fp, supp->address,
        (columnar)?(long)(ceil(S_ADDR_LEN *
V_STR_HGH)):supp->alen);
    PR_STR(fp, supp->phone, PHONE_LEN);
    PR_MONEY(fp, &supp->acctbal);
    PR_VSTR_LAST(fp, supp->comment,
        (columnar)?(long)(ceil(S_CMNT_LEN *
V_STR_HGH)):supp->clen);
    PR_END(fp);

    return(0);
}

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

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

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

```

```

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

    return(0);
}

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

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

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

    return(0);
}

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

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

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

```

```

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

rows_per_segment = (cnt / delete_segments) + 1;

if(++rows_this_segment) > rows_per_segment)
{

fclose(dfp);
dfp =
print_prep(tbl, -num);
if (dfp
== NULL) return(-1);

last_num = num;

rows_this_segment=1;
}
}

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

return(0);
}

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

return(0);
}

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

return(0);
}

```

```

}

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

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

    return(0);
}

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

    return(0);
}

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

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

    return(0);
}

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

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

    return(0);
}

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

    return(0);
}

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

    return(0);
}

```

```

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

  return(0);
}

```

```

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

  return(0);
}

```

### 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 LINTEITEM tables
--
WHILE @startdate < @enddate
  BEGIN
    --
    -- Insert into ORDERS and LINEITEM tables
    --
    INSERT_TRANS:
    SET @success = 1
    BEGIN TRANSACTION

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

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

    COMMIT TRANSACTION

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

```

```

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

```

### 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

' Structure 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 TPCH_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 TPCH_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

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

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

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

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

If iQueryId = miQueryIdRF1 Then
sLabel = msLabelThroughputRF1

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

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

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

ParentInstIdEnd = IInstId

#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 TPCH_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 + 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."
        End Sub
    End 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 TPCHMetric 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 TPCH_KIT Then
Case miQuery15
LabelStartPower = msStartStepLabelPower15
#End If

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

```

```

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 TPCH_KIT 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 TPCH_KIT 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 TPCH_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 TPCH_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 TPCH_KIT Then
    Dim iQIndex As Integer
#End If

Select Case iQuery
    Case miQueryIdRF1
        IteratorThroughput = msFirstRFIterator

    Case miQueryIdRF2
        IteratorThroughput = msFirstRFIterator

    Case Else
        #If TPCH_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
label
            ' Determine the start time for the step using the step
            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!"
            End 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,
msFmtNumberWOZeros)
            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

```

```

        ' 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 TPCH_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
        IParentInstId = ParentInstId(iStreamId, iQueryId)
        If IParentInstId = 0 Then Exit Sub
        sSql = sSql & " and parent_instance_id = " &
CStr(IParentInstId)
        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 TPCH_KIT Then
    sLabel = LabelEndThroughput(iStreamId,
iQueryId)
#Else
    If iQueryId = miQueryIdRF1 Then
        sLabel = LabelEndThroughput(iStreamId,
iQueryId)
    End If
#End If
IParentInstId = ParentInstIdEnd(iStreamId,
iQueryId)

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

        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(IParentInstId)

            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 TPCH_KIT Then
    End If
#End If

#If Not TPCH_KIT Then
ElseIf iQueryId = miQuery15 Then
    sLabel = LabelStartThroughput(iStreamId,
iQueryId)
        sIt = GetEndStepIfThroughput(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 TPCH_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
            IParentInstId = ParentInstId(iNextStream,
iNextQuery)
            If IParentInstId = 0 Then Exit Sub
            sSql = sSql & " and parent_instance_id = " &
CStr(IParentInstId)
            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 & _
        "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,
msFmtNumberWOZeroses) & vbTab
        Print #hOutputFile, sPrint;
    Next iQIndex

    For iQIndex = miQueryIdRF1 To miQueryIdRF2
        sPrint = "RF" & Format$(iQIndex - miQueryIdRF1 + 1,
msFmtNumberWOZeroses) & 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)*.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
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
        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***



Microsoft Corporation  
One Microsoft Way  
Redmond, WA 98052-6399

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

**Microsoft**

July 31, 2006

Dell  
Gene Purdy  
1 Dell Way  
Round Rock, TX 78664

Mr. Purdy:

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

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

Part Number	Description	Unit Price	Quantity	Price
810-04793	<b>SQL Server 2005 Enterprise x64 Edition</b> <i>Server License with 25 CALs</i> <i>Discount Schedule: Open Program - No Level</i> <i>Unit Price reflects a 39% discount from the retail unit price of \$13,969.</i>	\$8,487	1	\$8,487
359-01911	<b>SQL Server 2005 Client License</b> <i>Discount Schedule: Open Program - No Level</i> <i>Unit Price reflects a 4% discount from the retail unit price of \$163.</i>	\$156	25	\$3,900
P72-00274	<b>Windows Server 2003 Enterprise x64 Edition</b> <i>Server License Only - No CALs</i> <i>Discount Schedule: Open Program - No Level</i> <i>Unit Price reflects a 42% discount from the retail unit price of \$3,999.</i>	\$2,334	1	\$2,334
254-00170	<b>Visual C++ Standard Edition</b> <i>No Discounts Applied</i>	\$109	1	\$109
046-00856	<b>Visual Basic 2003 .Net Professional</b> <i>No Discounts Applied</i>	\$109	1	\$109
N/A	<b>Microsoft Problem Resolution Services</b> <i>Professional Support</i> <i>(1 Incident)</i>	\$245	1	\$245

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

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

This quote is valid for the next 90 days.

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

Reference ID: PHgepu0731061336.

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